

**GW -** 107

## **REPORTS**

**YEAR(S):**

1997



February 13, 1998

Mr. William C. Olson  
Hydrogeologist, Environmental Bureau  
Energy, Mineral and Natural Resources Department  
New Mexico Oil Conservation Division  
2040 S. Pacheco St.  
Santa Fe, New Mexico 87505

**RECEIVED**

**FEB 16 1998**

Environmental Bureau  
Oil Conservation Division

**RE: Phase IV Ground Water Contamination Study  
EPNG Jal No. 4, Lea County New, Mexico  
1997 Annual Report**

Dear Mr. Olson:

This annual report documents the sampling and analysis conducted at Jal No. 4 in 1997. The report includes quarterly water table maps and monitoring well sampling results. Specific monitor well sampling frequency and analysis is described below.

- Quarterly ground water samples were collected from monitor wells ACW-12, ACW-13 and ACW-14 and analyzed for concentrations of benzene, toluene, ethylbenzene, xylene (BTEX), total dissolved solids and major cations and anions using EPA approved methods and quality assurance/quality control (QA/QC).
- Annual ground water samples were collected from monitoring wells ACW-1, ACW-2A, ACW-4, ACW-5, ACW-6, ACW-7, ACW-8, ACW-9, ACW-10, ACW-11, ACW-12, ACW-13 and ACW-14 and analyzed for concentrations of BTEX, total dissolved solids, major cations and anions and New Mexico Water Quality Control Commission (WQCC) metals using EPA approved methods and QA/QC.

Quarterly groundwater samples were collected in February, May and August. Annual ground water samples were collected in October and November.

Water recovery system start-up has not occurred. Right-of-way issues have not been resolved and negotiations with a third party to obtain electrical power to one of the recovery wells is continuing. EPNG has, however, obtained a permit, for each recovery well, to supplement the underground waters of the State of New Mexico from the State Engineer office in Roswell. EPNG will submit, on a quarterly basis, the amount of water

Mr. William C. Olson  
New Mexico Oil Conservation Division  
February 13, 1998  
Page 2

pumped from each recovery well to the State Engineer office once the system is in operation. Ground water monitoring has continued at the site. The recovery system is not presently in operation; therefore, the proposed remediation activities have not taken place. The recovery system is expected to be operating in 1998. Once the system is in operation, the generated ground water monitoring data will be used to evaluate the efficiency of the recovery system. Project recommendations will be made based on this system evaluation in future annual reports.

If you have any questions or need additional information, please contact me at (713) 757-3827.

Sincerely,

Handwritten signature of Gerry Garibay in cursive script.

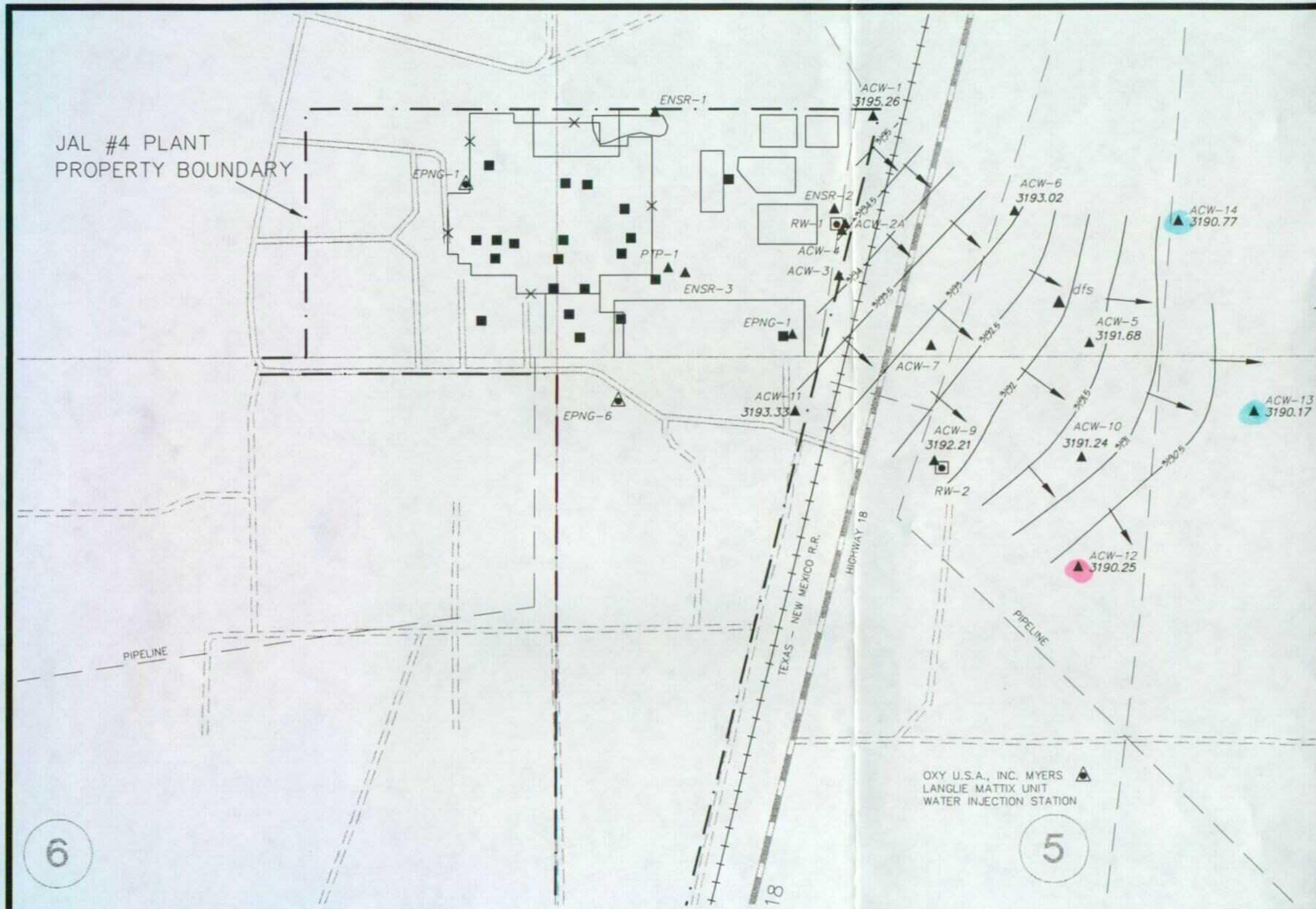
Gerry Garibay  
Senior Environmental Scientist  
Environmental Remediation Department

Attachments

cc: Jerry Sexton,  
Hobbs District Supervisor  
New Mexico Oil Conservation Division  
P.O. Box 1980  
Hobbs, NM 88240

## **TABLE OF CONTENTS**

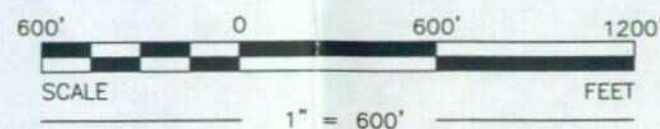
Tab A	Location Map and Quarterly Water Table Maps
Tab B	Quarterly Analytical Results Tables
Tab C	BTEX Plots
Tab D	Sodium, Chlorides, and TDS Plots
Tab E	First Quarter Analytical Results
Tab F	Second Quarter Analytical Results
Tab G	Third Quarter Analytical Results
Tab H	Annual Analytical Results



# **LEGEND**

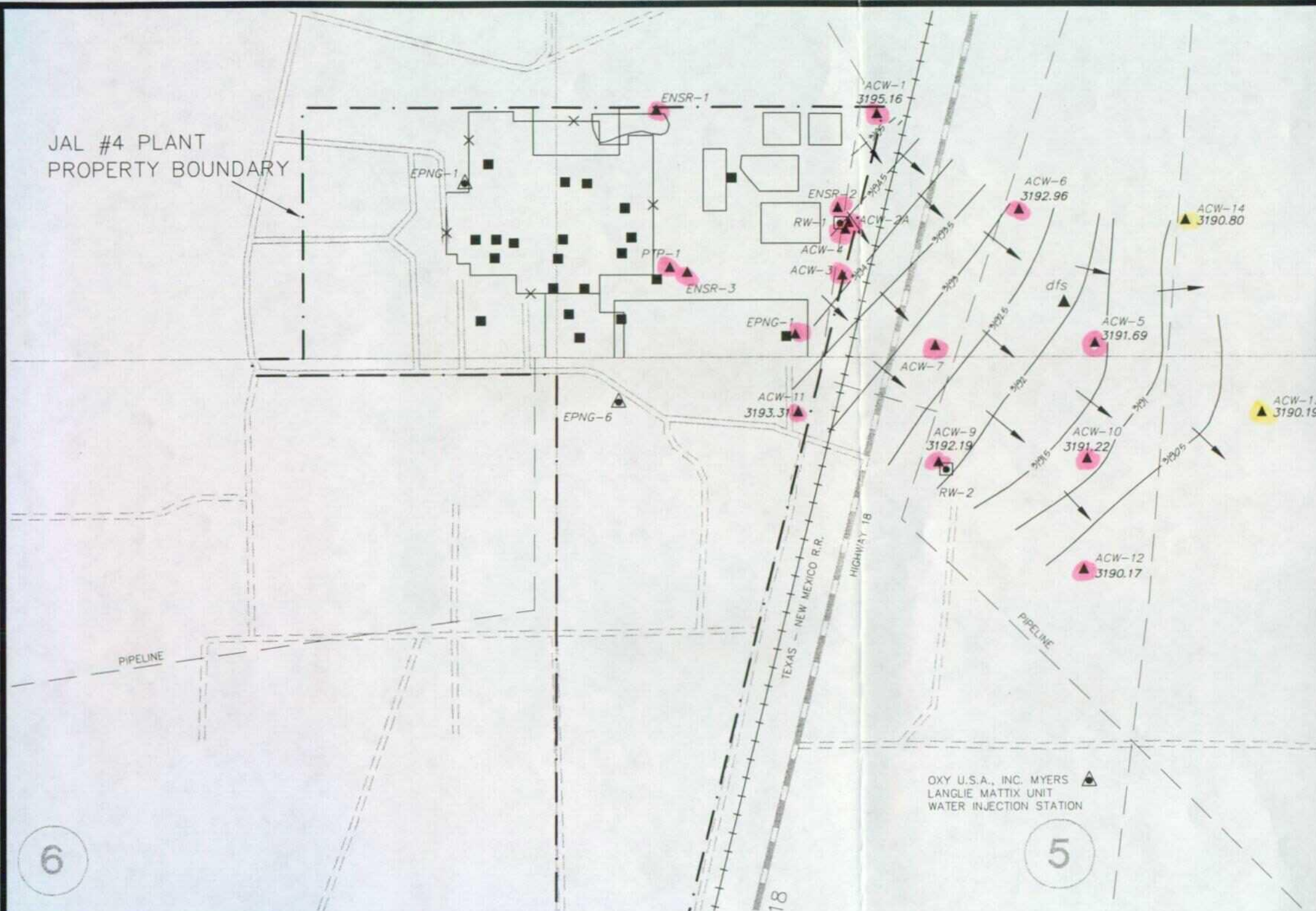
- ▲ ACW-5 3191.68 GROUNDWATER MONITOR WELL AND GROUNDWATER ELEVATION WITHIN UPPERMOST GROUNDWATER SYSTEM, ON AUGUST 18-20, 1997, FEET AMSL
- ◻ RW-2 GROUNDWATER RECOVERY WELL
- ▲ EPNG-1 INJECTION WELL
- X—X— FENCE
- == SECONDARY ROAD
- +—+— RAILROAD TRACK
- PIPELINE
- CONTOUR OF GROUNDWATER ELEVATION WITHIN UPPERMOST GROUNDWATER SYSTEM ON AUGUST 18-20, 1997, FEET AMSL
- DIRECTION OF GROUNDWATER FLOW

NOTE:  
JAL #4 PLANT PROPERTY IS LOCATED WITHIN SECTIONS 31 AND 32 OF TOWNSHIP 23 SOUTH, RANGE 37 EAST, AND SECTIONS 5 AND 6 OF TOWNSHIP 24 SOUTH, RANGE 37 EAST, LEA COUNTY, NEW MEXICO



Client:	EL PASO ENERGY CORP.	Figure Title:	GROUNDWATER POTENTIOMETRIC SURFACE OF UPPERMOST GROUNDWATER SYSTEM ON AUGUST 18-20, 1997
Location:	JAL #4 PLANT LEA COUNTY, NEW MEXICO	Document Title:	
<b>ROBERTS/SCHORNICK &amp; ASSOCIATES, INC.</b> Environmental Consultants 2400 East 81st Street, Suite 610 Tulsa, Oklahoma 74137 (918) 496-0059		DATE:	2/5/88
		SCALE:	1"=600'
		PROJECT NO:	9717101 M04
		PREPARED BY:	GHR
		CHECKED BY:	GHR
		DRAFTED BY:	RDS
		FIGURE NO.:	

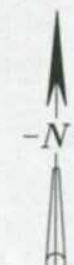
JAL #4 PLANT  
PROPERTY BOUNDARY



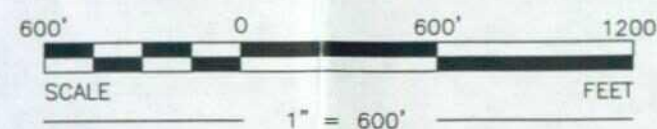
# LEGEND

- ▲ ACW-5 3191.69  
GROUNDWATER MONITOR WELL AND GROUNDWATER ELEVATION WITHIN UPPERMOST GROUNDWATER SYSTEM, ON OCTOBER 21-23, 1997, FEET AMSL
- RW-2  
GROUNDWATER RECOVERY WELL
- ▲ EPNG-1  
INJECTION WELL
- ✕ ✕ ✕  
FENCE
- SECONDARY ROAD
- RAILROAD TRACK
- PIPELINE
- CONTOUR OF GROUNDWATER ELEVATION WITHIN UPPERMOST GROUNDWATER SYSTEM ON OCTOBER 21-23, 1997, FEET AMSL
- DIRECTION OF GROUNDWATER FLOW

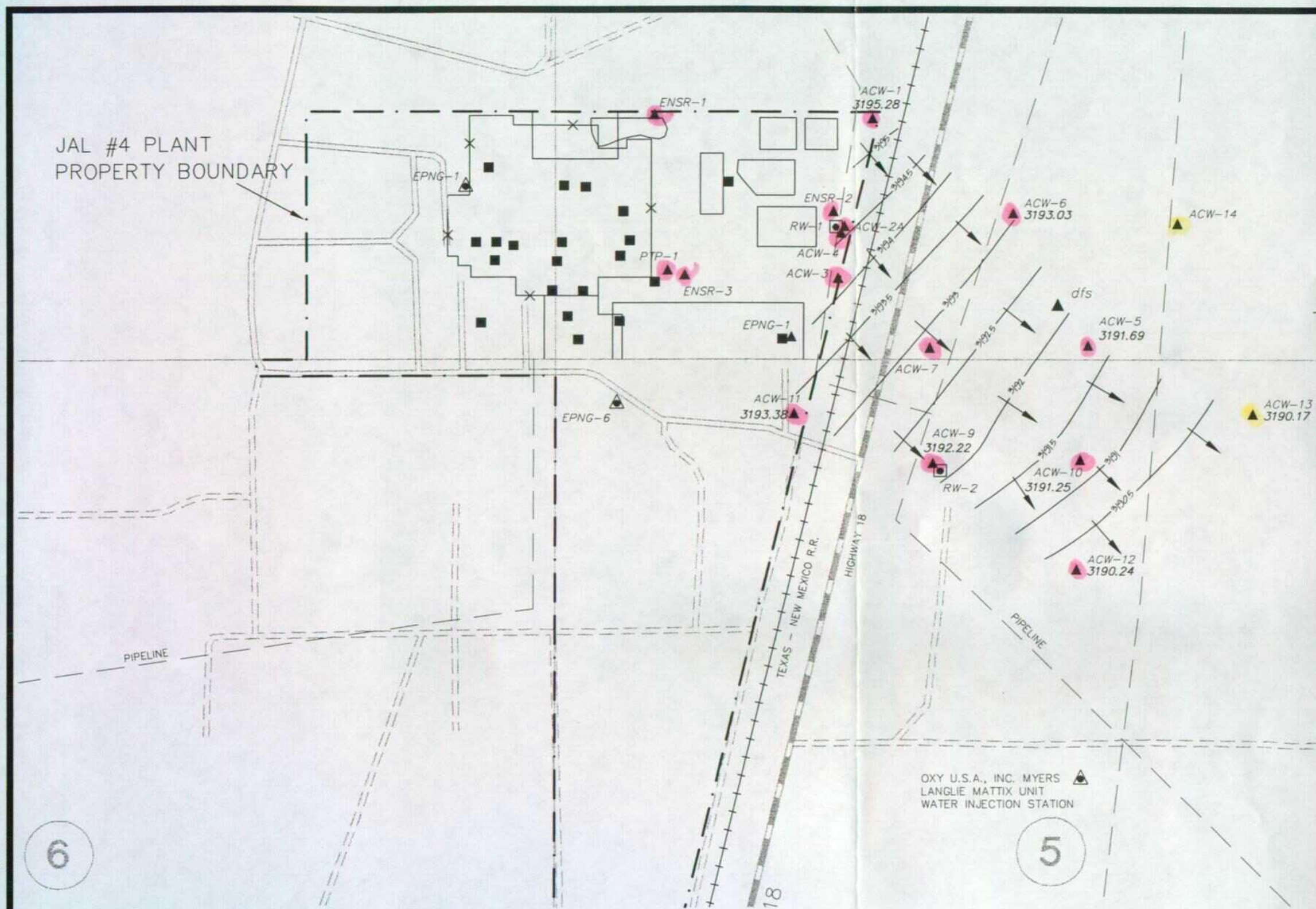
OXY U.S.A., INC. MYERS  
LANGUE MATTIX UNIT  
WATER INJECTION STATION



NOTE:  
JAL #4 PLANT PROPERTY IS LOCATED WITHIN SECTIONS 31 AND 32 OF TOWNSHIP 23 SOUTH, RANGE 37 EAST, AND SECTIONS 5 AND 6 OF TOWNSHIP 24 SOUTH, RANGE 37 EAST, LEA COUNTY, NEW MEXICO

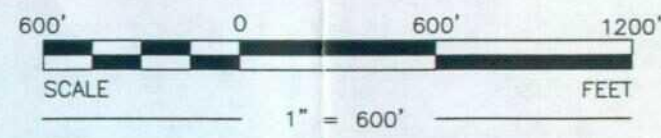


Client:	EL PASO ENERGY CORP.	Figure Title:	GROUNDWATER POTENTIOMETRIC SURFACE OF UPPERMOST GROUNDWATER SYSTEM ON OCTOBER 21-23, 1997
Location:	JAL #4 PLANT LEA COUNTY, NEW MEXICO	Document Title:	
<b>ROBERTS/SCHORNICK &amp; ASSOCIATES, INC.</b> Environmental Consultants 2488 East 61st Street/Suite 610 Tulsa, Oklahoma 74137 (918) 466-0059		DATE:	2/5/88
		SCALE:	1"=600'
		PROJECT NO:	9717101 M05
		PREPARED BY:	GHR
		CHECKED BY:	GHR
		DRAFTED BY:	RDS
		FIGURE NO.:	

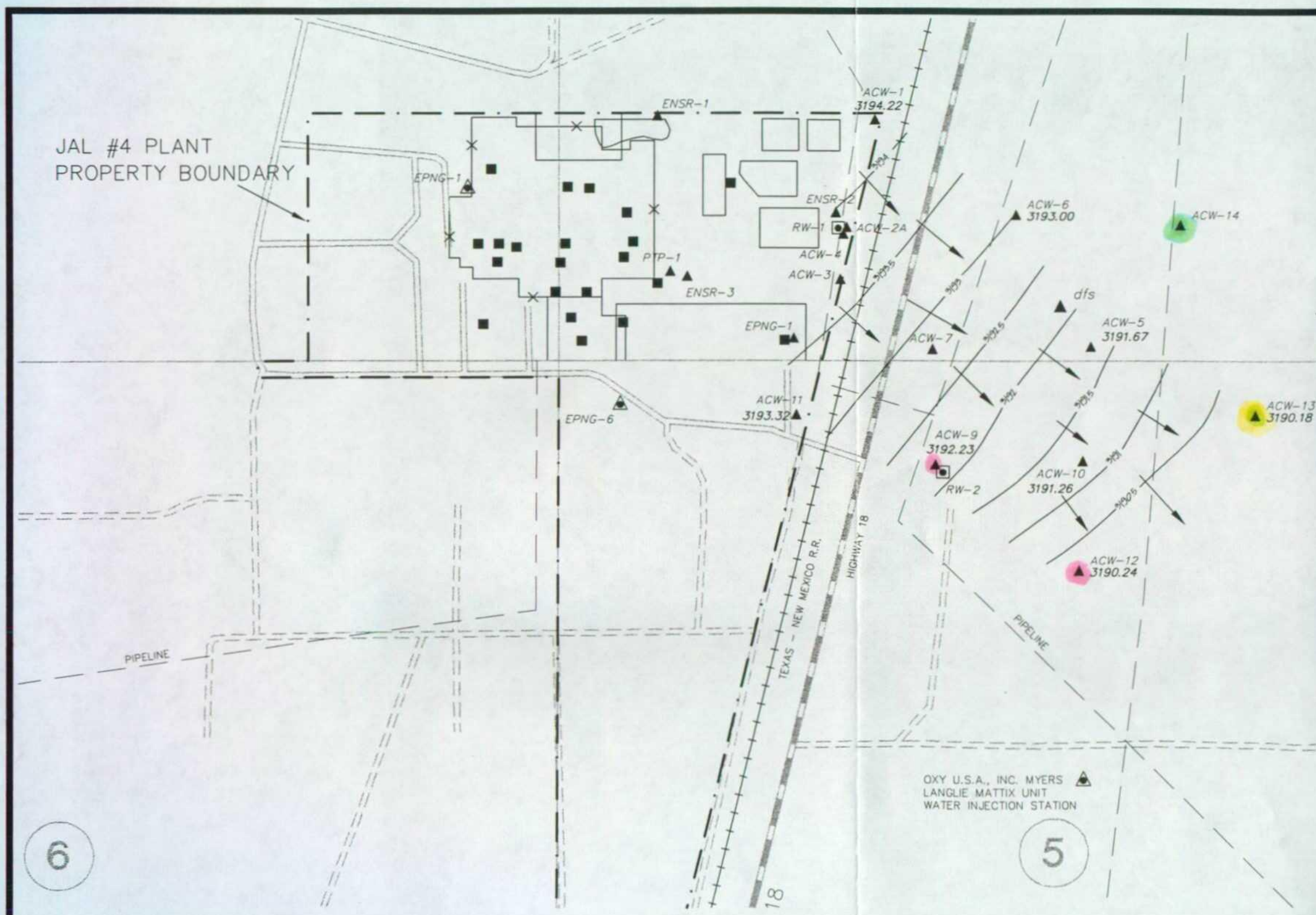


- LEGEND**
- ▲ ACW-5 3191.69 GROUNDWATER MONITOR WELL AND GROUNDWATER ELEVATION WITHIN UPPERMOST GROUNDWATER SYSTEM, ON MAY 6-8, 1997, FEET AMSL
  - RW-2 GROUNDWATER RECOVERY WELL
  - ▲ EPNG-1 INJECTION WELL
  - X—X— FENCE
  - SECONDARY ROAD
  - RAILROAD TRACK
  - PIPELINE
  - CONTOUR OF GROUNDWATER ELEVATION WITHIN UPPERMOST GROUNDWATER SYSTEM ON MAY 6-8, 1997, FEET AMSL
  - DIRECTION OF GROUNDWATER FLOW

NOTE:  
JAL #4 PLANT PROPERTY IS LOCATED WITHIN SECTIONS 31 AND 32 OF TOWNSHIP 23 SOUTH, RANGE 37 EAST, AND SECTIONS 5 AND 6 OF TOWNSHIP 24 SOUTH, RANGE 37 EAST, LEA COUNTY, NEW MEXICO

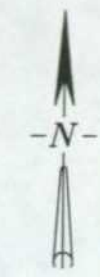


Client: EL PASO ENERGY CORP.		Figure Title: GROUNDWATER POTENTIOMETRIC SURFACE OF UPPERMOST GROUNDWATER SYSTEM ON MAY 6-8, 1997	
Location: JAL #4 PLANT LEA COUNTY, NEW MEXICO		Document Title:	
<b>ROBERTS/SCHORNICK &amp; ASSOCIATES, INC.</b> Environmental Consultants 2408 East 81st Street/Suite 610 Tulsa, Oklahoma 74137 (918) 496-0069		DATE: 2/5/88	PREPARED BY: GHR
		SCALE: 1"=600'	CHECKED BY: GHR
		PROJECT NO: 9717101 M03	DRAFTED BY: RDS
		FIGURE NO.:	

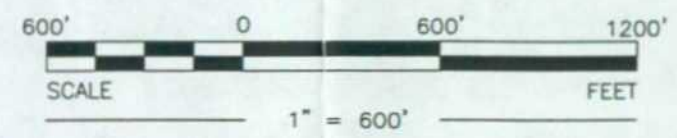


# LEGEND

- ▲ ACW-5 3191.67 GROUNDWATER MONITOR WELL AND GROUNDWATER ELEVATION WITHIN UPPERMOST GROUNDWATER SYSTEM, ON FEBRUARY 19-20, 1997, FEET AMSL
- ◼ RW-2 GROUNDWATER RECOVERY WELL
- ▲ EPNG-1 INJECTION WELL
- × × × FENCE
- == SECONDARY ROAD
- RAILROAD TRACK
- - - PIPELINE
- CONTOUR OF GROUNDWATER ELEVATION WITHIN UPPERMOST GROUNDWATER SYSTEM ON FEBRUARY 19-20, 1997, FEET AMSL
- DIRECTION OF GROUNDWATER FLOW



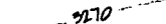


NOTE:  
JAL #4 PLANT PROPERTY IS LOCATED WITHIN SECTIONS 31 AND 32 OF TOWNSHIP 23 SOUTH, RANGE 37 EAST, AND SECTIONS 5 AND 6 OF TOWNSHIP 24 SOUTH, RANGE 37 EAST, LEA COUNTY, NEW MEXICO



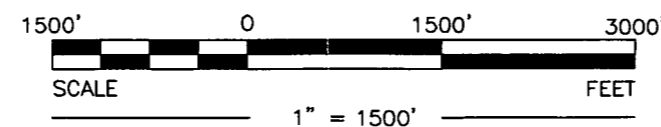
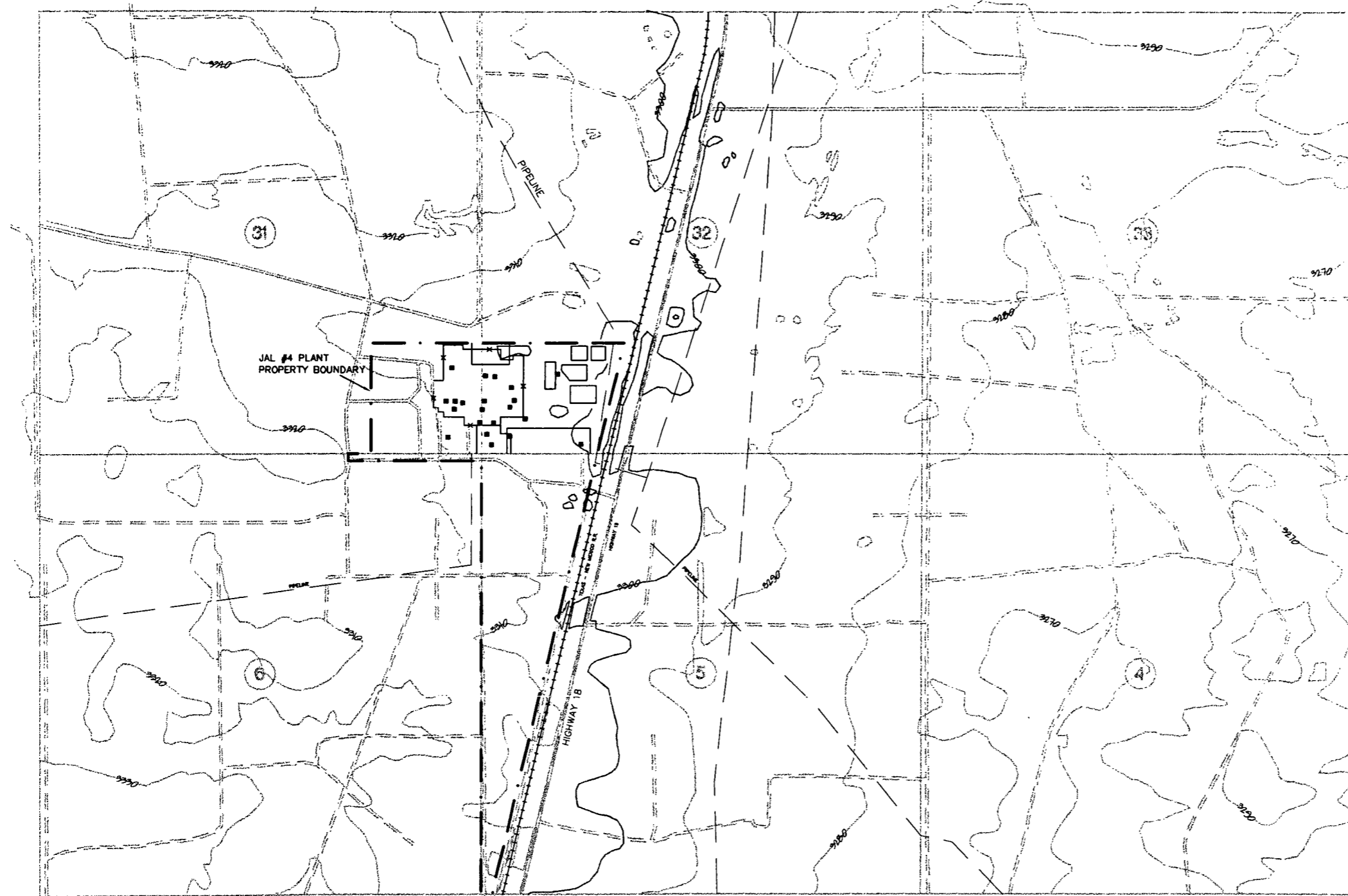
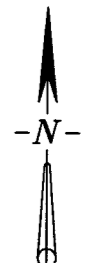
Client:	EL PASO ENERGY CORP.	Figure Title:	GROUNDWATER POTENTIOMETRIC SURFACE OF UPPERMOST GROUNDWATER SYSTEM ON FEBRUARY 19-20, 1997
Location:	JAL #4 PLANT LEA COUNTY, NEW MEXICO	Document Title:	
<b>ROBERTS/SCHORNICK &amp; ASSOCIATES, INC.</b> Environmental Consultants 2400 East 61st Street/Suite 610 Tulsa, Oklahoma 74137 (918) 456-0059		DATE:	2/5/88
		SCALE:	1"=600'
		PROJECT NO:	9717101 M02
		PREPARED BY:	GHR
		CHECKED BY:	GHR
		DRAFTED BY:	RDS
		FIGURE NO.:	

R 37 E

**LEGEND**

-  GROUND ELEVATION  
FEET AMSL
-  PIPELINE
-  SECONDARY ROAD

T  
23  
S  
  
T  
24  
S



AFTER U.S.G.S. 7.5 MIN. TOPO. QUAD., RATTLESNAKE CANYON, NEW MEXICO, JAL NW, NEW MEXICO

Client: EL PASO ENERGY CORP.		Figure Title: SITE LOCATION	
Location: JAL #4 PLANT LEA COUNTY, NEW MEXICO		Document Title:	
<b>ROBERTS/SCHORNICK &amp; ASSOCIATES, INC.</b> Environmental Consultants 2488 East 81st Street/Suite 610 Tulsa, Oklahoma 74137 (918) 498-0069		DATE: 2/5/98	PREPARED BY: GHR
		SCALE: 1"=1500'	CHECKED BY: GHR
		PROJECT NO: 9717101 M01	DRAFTED BY: RDS
		FIGURE NO.:	

## JAL #4 MONITOR WELL ANALYTICAL DATA

2/10/98

SAMPLE DATE	SAMPLE NUMBER	SAMPLE DESCRIPTION	Chloride mg/l	Residue, Filterable (TDS) mg/l	Specific Conductance umho/cm	pH	Fluoride mg/l	Nitrate mg/l	Boron mg/l	Calcium mg/l	Copper mg/l	Iron mg/l	Magnesium mg/l	Manganese mg/l	Potassium mg/l	Sodium mg/l	Zinc mg/l	Benzene ug/l	Toluene ug/l	Ethylbenzene ug/l	Total Xylene ug/l	Alkalinity (as CaCO3) mg/l	Hardness (as CaCO3) mg/l	Bromide mg/l	Sulfate mg/l	Silica mg/l
5/8/97	S97-0244	Production Well #1			718													0.56	0.55	<0.5	<1.0					
10/23/97	S97-0607	Production Well #1	91	470	890													<0.5	<0.5	<0.5	<1.0					
5/7/97	S97-0227	Well ENSR#1	3200	5200	9620													7.3	3.7	2.4	2					
10/21/97	S97-0539	Well ENSR#1	4400	7600	13800													13	6.3	4.2	5.6					
5/6/97	S97-0218	Well ENSR#2	17000	27000	50000													250	230	110	190					
10/20/97	S97-0538	Well ENSR#2	17000	30000	57900													130	160	77	120					
5/7/97	S97-0223	Well ENSR#3	650	1500	2050													7.6	3.3	2.9	3					
5/7/97	S97-0224	Well ENSR#3D	480	1400	1990													6.8	3.1	2.8	2.9					
10/21/97	S97-0544	Well ENSR#3	580	1300	2230													5	2.5	3	4.1					
5/7/97	S97-0222	Well PTP1	490	1500	2420													38	0.51	22	8.4					
10/21/97	S97-0543	Well PTP1	470	1400	2250													7.9	<0.5	18	3.1					
3/5/93	S93-0100	Monitor Well ACW #01	4045	8505	14350																					
9/15/93	S93-0531	Monitor Well ACW #01	2915	6016	10360																					
11/10/93	S93-0683	Monitor Well ACW #01	3683	7340	11780																					
4/20/94	S94-0377	Monitor Well ACW #01	5400	8430	16520																					
10/27/94	S94-0717	Monitor Well ACW #01	3700	8440	14630																					
5/16/95	S95-0231	Monitor Well ACW #01	4100	8200	14000	8.3	25	<2.0	0.9	66	<0.025	0.38	72	0.062	12	2600	<0.020	<5	<10	<5	0	700	470	1.8	240	33
6/27/95	S95-0383	Monitor Well ACW #01	6700	8400	1400	8.4	22	<2.0	1.0	74	<0.025	0.59	92	0.077	15	3200	<0.02	4.6	4.6	<2.5	140	710	510	1.9	260	35
8/29/95	S95-0448	Monitor Well ACW #01	3300	12000	21000	8.2	18	<2.0	0.8	67	<0.025	0.18	78	0.069	11	2400	<0.02	6	<10	<5	<15	820	590	2.2	210	28
2/6/96	S96-0063	Monitor Well ACW #01	5200	9700	16000	8.3	0.88	0.02	1.0	78	<0.006	0.56	100	0.069	16	4300	<0.010	6.1	3	1.9	2.8	830	620	2.1	280	36
2/6/96	S96-0064*	Monitor Well ACW #01	5770	9440	16170	8.2	2.1	<1.25	1.1	84	<0.1	0.7	102	0.1	17	3900	<0.1	5.6	2.7	3	<7.5	759	630	2.06	293	41
5/8/96	S96-0263	Monitor Well ACW #01	4130	8190	14520	8.2	2.2	<1.25	1.0	93	0.01	0.6	118	0.09	18	3070	<0.05	6.3	2.03	<1.0	<3.0	310	718	<1.25	268	54
8/13/96	S96-0381	Monitor Well ACW #01	3500	7400	12000	8.1	4.9	<0.05	1.1	110	0.019	0.68	100	0.078	8.6	2400	0.008	3.5	1.2	<1.0	<2.0	730	690	1.9	270	41
11/5/96	S96-0576	Monitor Well ACW #01	3700	7200	11000	8.1	4.4	<0.05	1.0	81	<0.007	0.59	98	0.062	11	3000	0.011	5.6	2.5	<1.0	1.3	810	610	2	250	16
5/6/97	S97-0219	Monitor Well ACW #01	5200	8800	14800													14	15	<5.0	5.7					
11/21/97	S97-0799	Monitor Well ACW #01	7800	12000	20800	8.4	2.1	<0.5	1.0	83	<0.01	0.6	110	0.06	20	3900	0.04	6.1	4.8	<0.5	2.4	680		<2	320	14
11/21/97	S97-0800	Monitor Well ACW #01D	7500	12000	20700	8.2	2.2	<0.5	0.9	76	<0.01	0.5	100	0.07	20	4000	0.03	6.7	5.7	<0.5	2.1	670		2	320	13
5/6/97	S97-0215	Monitor Well ACW #02A	11000	17000	26800													140	100	<50	<100					
10/20/97	S97-0536	Monitor Well ACW #02A	8600	16000	24400	9.2	7.6	<0.5	1.1	3	<0.01	0.2	<1	<0.01	12	6000	<0.02	89	100	13	26	2200		5	<10	10
5/6/97	S97-0217	Monitor Well ACW #03	6900	11000	18500													350	22	110	43					
10/20/97	S97-0535	Monitor Well ACW #03	7800	13000	23000													160	8.2	69	32					
5/6/97	S97-0216	Monitor Well ACW #04	21000	25000	48500													29	12	<5.0	<10					
10/20/97	S97-0537	Monitor Well ACW #04	58000	94000	172000	7.3	<0.5	<0.5	0.7	580	<0.01	0.2	360	6.1	250	33000	<0.02	170	150	<5.0	110	500		33	2100	13
3/10/93	S93-0114	Monitor Well ACW #05	2544	6110	10400																					
6/17/93	S93-0387	Monitor Well ACW #05	1228	323	4480																					
9/16/93	S93-0536	Monitor Well ACW #05	650	3064	4140																					
11/9/93	S93-0678	Monitor Well ACW #05	720	3202	4390																					
4/21/94	S94-0385	Monitor Well ACW #05	800	3300	4131																					
10/28/94	S94-0749	Monitor Well ACW #05	550	3112	4500																					
1/31/95	S95-0015	Monitor Well ACW #05	499	2848	4050																					
5/16/95	S95-0229	Monitor Well ACW #05	530	2800	3900	7.0	<1.0	3.5	0.9	270	<0.025	0.46	39	0.028	6.6	540	<0.020	<5	<10	<5	0	320	980	1.3	1100	57
6/27/95	S95-0380	Monitor Well ACW #05	460	2800	3600	7.3	<1.0	3.4	1.0	270	<0.025	0.34	40	0.02	6.9	530	<0.020	<2.5	<2.5	<2.5	<5.0	320	240	1.1	800	56
8/30/95	S95-0450	Monitor Well ACW #05	510	2700	3900	7.0	<1.0	<2.0	1.1	240	<0.025	<0.10	36	<0.015	8.7	550	<0.020	<5	<10	<5	<15	310	810	1	890	44
2/6/96	S96-0061	Monitor Well ACW #05	510	2200	3800	7.5	0.12	4.7	1.4	240	<0.006	1.5	32	0.026	6.5	580	0.015	<1.0	<1.0	<1.0	<2.0	260	740	0.92	920	64
2/6/96	S96-0062*	Monitor Well ACW #05	506	2745	3090	7.3	0.29	4.9	1.4	240	<0.1	2	32	0.1	8.1	580	<0.1	<2.5	<2.5	<2.5	<7.5	284	730	<1.25	835	66
5/8/96	S96-0258	Monitor Well ACW #05	519	2480	3650	7.2	0.42	5	0.8	167	0.01	0.2	24	<0.05	8	506	<0.05	<1.0	<1.0	<1.0	<3.0	190	515	4.5	653	35
8/13/96	S96-0385	Monitor Well ACW #05	500	2500	3400	7.3	0.7	5.4	2.0	200	<0.006	0.024	26	<0.007	6.3	520	0.033	<1.0	1.2	<1.0	<2.0	320	620	1	710	58
11/6/96	S96-0588	Monitor Well ACW #05	500	2300	3300	7.5	0.57	<0.05	1.9	180	<0.007	0.3	25	0.008	6	520	0.022	1.1	1.4	1.2	<2.0	350	560	1.2	710	27
5/7/97	S97-0231	Monitor Well ACW #05	430	2000	3020													0.84	1.2	0.93	<1.0					
10/22/97	S97-0553	Monitor Well ACW #05	470	2000	3160	7.7	0.6	6	1.3	170	<0.01	0.5	24	<0.01	5	480	<0.02	0.9	1.6	0.8	1.9	320		1.7	320	26

## JAL #4 MONITOR WELL ANALYTICAL DATA

2/10/98

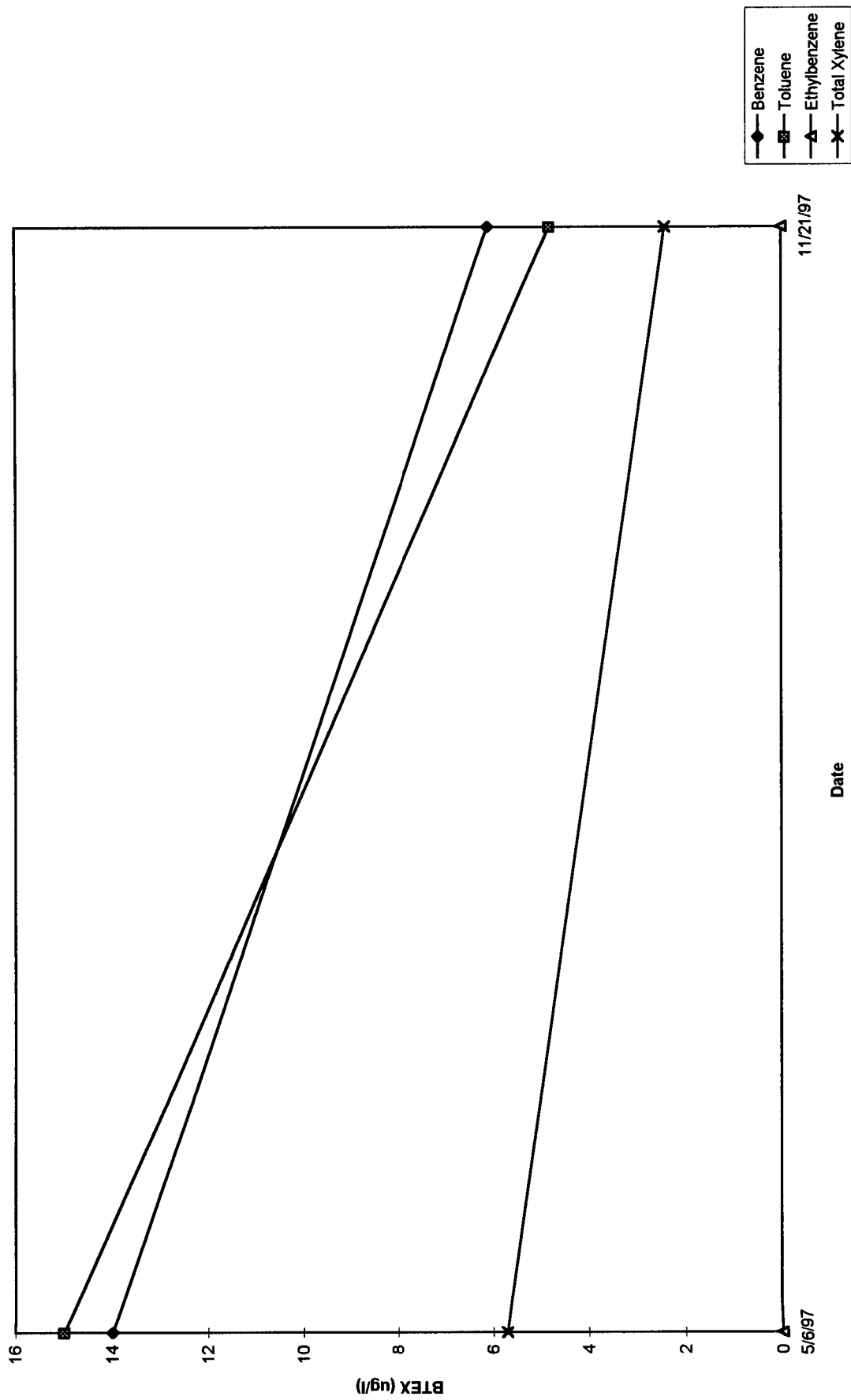
SAMPLE DATE	SAMPLE NUMBER	SAMPLE DESCRIPTION	Chloride mg/l	Residue, Filterable (TDS) mg/l	Specific Conductance umho/cm	pH	Fluoride mg/l	Nitrate mg/l	Boron mg/l	Calcium mg/l	Copper mg/l	Iron mg/l	Magnesium mg/l	Manganese mg/l	Potassium mg/l	Sodium mg/l	Zinc mg/l	Benzene ug/l	Toluene ug/l	Ethylbenzene ug/l	Total Xylene ug/l	Alkalinity (as CaCO3) mg/l	Hardness (as CaCO3) mg/l	Bromide mg/l	Sulfate mg/l	Silica mg/l
6/18/93	S93-0388	Monitor Well ACW #06	2108	5027	8220																					
9/16/93	S93-0537	Monitor Well ACW #06	2737	6656	11130																					
11/8/93	S93-0577	Monitor Well ACW #06	2154	5646	8540																					
4/21/94	S94-0384	Monitor Well ACW #06	3600	6930	11080																					
10/28/94	S94-0750	Monitor Well ACW #06	2100	6910	11988																					
1/31/95	S95-0016	Monitor Well ACW #06	2873	6755	11530																					
5/16/95	S95-0230	Monitor Well ACW #06	2800	6400	10000	8.1	31	<2.0	0.9	70	<0.025	3.9	19	0.079	<5.0	2200	<0.020	<5	<10	<5	0	1300	200	1.4	110	48
6/27/95	S95-0379	Monitor Well ACW #06	3500	8600	10000	9.0	44	<2.0	1.1	64	<0.025	5.8	16	0.062	<5.0	3000	<0.080	14	<2.5	<2.5	<5.0	1500	130	1.8	110	44
8/29/95	S95-0449	Monitor Well ACW #06	3000	7100	12000	8.4	26	<2.0	0.9	42	<0.025	0.54	16	0.04	<5.0	2500	<0.020	7	<10	<5	<15	1500	200	1.8	110	42
2/6/96	S96-0059	Monitor Well ACW #06	2600	6600	11000	8.0	3.8	<0.0071	1.1	91	<0.006	4.6	23	0.12	3.6	2700	0.029	6.6	3.2	<1.0	<2.0	1400	320	1.3	72	62
2/6/96	S96-0060*	Monitor Well ACW #06	3180	5630	10320	7.8	10	<1.25	1.3	78	<0.1	5	21	0.1	3.6	2400	<0.1	<2.5	<2.5	<2.5	<7.5	1315	275	1.52	79	50
5/8/96	S96-0257	Monitor Well ACW #06	2880	6480	10620	7.7	6.4	<1.25	1.3	35	0.02	4.1	21	0.14	4	2380	<0.05	4.08	1.58	<1.0	<3.0	1396	175	<1.25	48	40
8/14/96	S96-0321	Monitor Well ACW #06	2900	7100	11000	7.9	21	<0.05	1.2	85	<0.006	4.5	23	0.13	3.4	2900	0.024	4.2	2.6	<2.0	<2.0	1400	310	1.8	88	60
11/6/96	S96-0585	Monitor Well ACW #06	3400	7700	12000	8.6	18	<0.05	1.2	98	<0.007	5.3	27	0.16	3.8	2800	0.032	4.5	1.5	<1.0	<2.0	1600	380	1.3	74	32
11/6/96	S96-0586	Monitor Well ACW #06	3600	7700	12000	8.6	18	<0.05	1.1	88	<0.007	4	22	0.13	3.6	2400	0.019	4.6	1.5	<1.0	<2.0	1600	310	1.3	62	27
5/8/97	S97-0233	Monitor Well ACW #06	2300	5500	8450													8.2	2.8	2.6	2.7					
10/22/97	S97-0549	Monitor Well ACW #06	2900	6500	10200	8.2	16.5	<0.05	0.9	68	<0.01	2.6	19	0.11	3	2200	<0.02	10	3.8	1.4	1.2	1400		3	100	21
10/22/97	S97-0550	Monitor Well ACW #06D	2900	6200	10700	8.3	17.2	<0.05	0.9	68	<0.01	2.3	19	0.11	3	2200	<0.02	9.5	3.1	1.2	1.2	1400		3	98	21
5/7/97	S97-0230	Monitor Well ACW #07	3600	8100	13200													7.3	2.5	3.1	1.7					
10/22/97	S97-0552	Monitor Well ACW #07	4400	7500	13800	7.3	4	<0.05	0.6	200	<0.01	14.4	80	0.2	3	2500	<0.2	6.4	3.4	3	3	730		4	50	18
5/6/97	S97-0220	Monitor Well ACW #08	29000	50000	89200													99	10	4.1	3.9					
11/21/97	S97-0797	Monitor Well ACW #08	17000	29000	49200	7.0	0.6	<0.5	0.6	440	<0.01	1.3	210	2.2	57	9300	<0.02	36	3.9	2	14	520		<5	800	19
6/17/93	S93-0391	Monitor Well ACW #09	2288	4435	5900																					
9/14/93	S93-0525	Monitor Well ACW #09	915	2119	3100																					
11/8/93	S93-0579	Monitor Well ACW #09	1184	2300	3670																					
4/22/94	S94-0387	Monitor Well ACW #09	1150	2508	3900																					
12/1/94	S94-0795	Monitor Well ACW #09	1650	3510	5450																					
1/31/95	S95-0017	Monitor Well ACW #09	2083	4240	7110																					
5/17/95	S95-0233	Monitor Well ACW #09	5600	6800	11000	8.6	<1.0	<2.0	0.4	820	<0.025	0.17	280	1	16	910	0.025	<5	22	<5	0	320	4500	2.1	440	49
6/28/95	S95-0384	Monitor Well ACW #09	3500	6200	9100	7.0	<1.0	<2.0	0.4	770	<0.025	0.28	250	0.98	15	1000	<0.020	<2.5	<2.5	<2.5	<5.0	300	2700	1.9	360	51
8/30/95	S95-0419	Monitor Well ACW #09	2500	4500	7150	6.5	<1.0	<2.0	0.4	640	<0.025	0.19	220	0.86	14	880	<0.040	<5	<10	<5	<15	240	2000	1.5	370	43
2/7/96	S96-0069	Monitor Well ACW #09	2400	5400	7500	7.7	0.16	0.039	0.4	570	<0.006	0.48	180	0.71	14	810	<0.010	1.8	<1.0	<1.0	<2.0	300	2200	1.5	320	47
2/7/96	S96-0070*	Monitor Well ACW #09	2300	4620	7450	6.8	0.36	<1.25	0.4	600	<0.1	0.4	175	0.7	16	810	<0.1	<2.5	<2.5	<2.5	<7.5	291	2220	1.85	341	56
5/8/96	S96-0259	Monitor Well ACW #09	2210	4210	7530	6.8	0.35	<1.25	<0.5	508	0.01	0.4	183	0.49	17	687	<0.05	<1.0	<1.0	<1.0	<3.0	209	2020	3	322	60
8/14/96	S96-0326	Monitor Well ACW #09	1200	3600	4400	7.4	1.4	0.13	0.4	490	<0.006	0.66	160	0.65	13	730	0.027	1.4	1.6	<1.0	<2.0	220	1900	1.2	180	53
11/7/96	S96-0590	Monitor Well ACW #09	1200	3100	4200	7.3	1.1	0.055	0.3	360	<0.007	0.4	110	0.44	10	510	0.029	2.3	2.2	<1.0	<2.0					
2/19/97	S97-0041	Monitor Well ACW #09	1260	2500	4110													1.3	4.0	10	4.2					
5/8/97	S97-0234	Monitor Well ACW #09	830	2100	2800													2.6	2.6	1.4	1.7					
10/23/97	S97-0556	Monitor Well ACW #09	880	1600	3380	7.2	1.2	<0.05	0.2	270	<0.01	0.6	84	0.31	10	320	0.05	<0.5	<0.5	<0.5	<1.0	200		1.3	130	17

## JAL #4 MONITOR WELL ANALYTICAL DATA

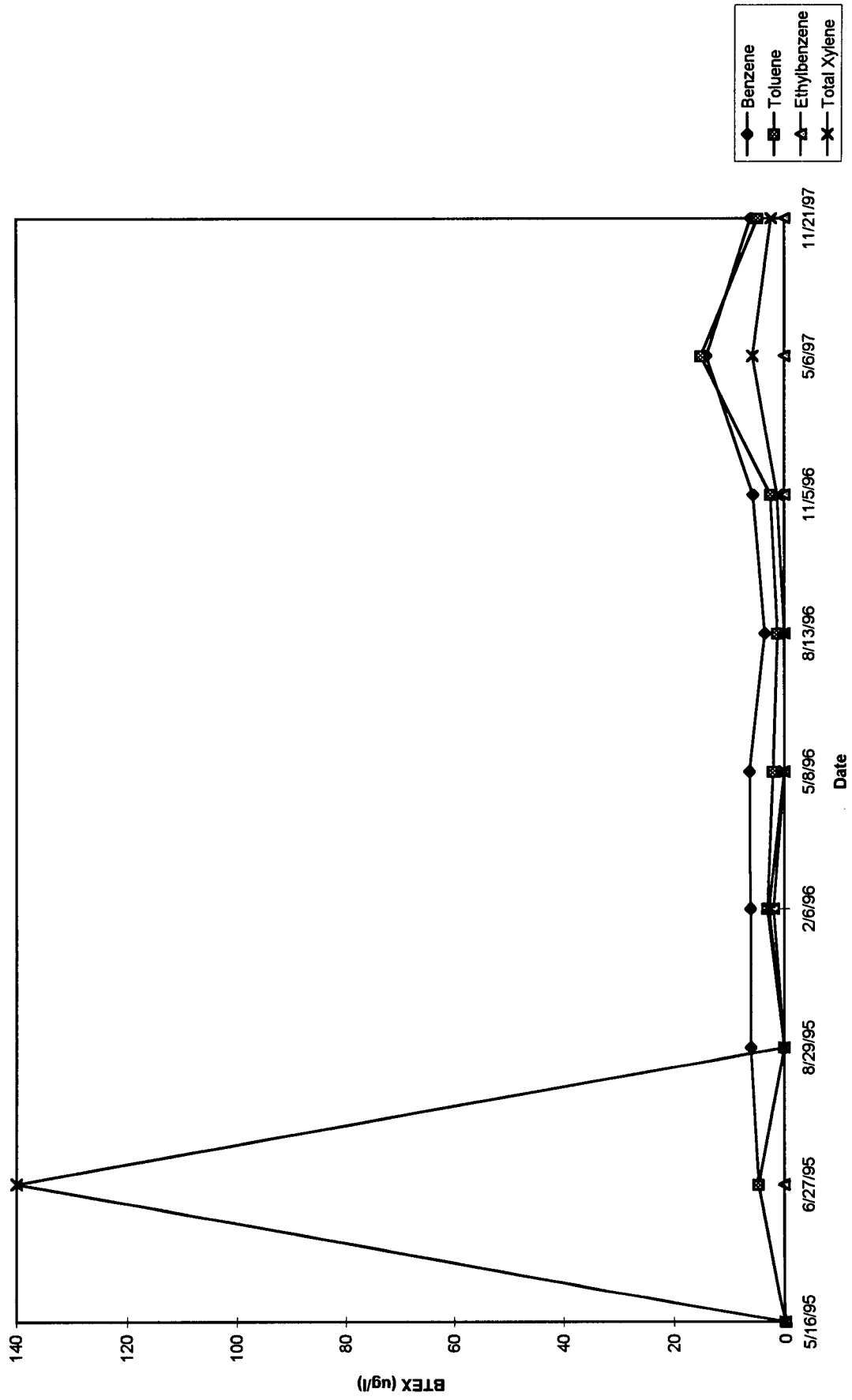
2/10/98

SAMPLE DATE	SAMPLE NUMBER	SAMPLE DESCRIPTION	Chloride mg/l	Residue, Filterable (TDS) mg/l	Specific Conductance umho/cm	pH	Fluoride mg/l	Nitrate mg/l	Boron mg/l	Calcium mg/l	Copper mg/l	Iron mg/l	Magnesium mg/l	Manganese mg/l	Potassium mg/l	Sodium mg/l	Zinc mg/l	Benzene ug/l	Toluene ug/l	Ethylbenzene ug/l	Total Xylene ug/l	Alkalinity (as CaCO3) mg/l	Hardness (as CaCO3) mg/l	Bromide mg/l	Sulfate mg/l	Silica mg/l
6/18/93	S93-0392	Monitor Well ACW #10	1027	701	1061																					
9/14/93	S93-0526	Monitor Well ACW #10	421	1190	1349																					
11/9/93	S93-0680	Monitor Well ACW #10	420	1238	1800																					
4/22/94	S94-0388	Monitor Well ACW #10	700	1638	2440																					
10/28/94	S94-0751	Monitor Well ACW #10	800	1694	2592																					
2/1/95	S95-0019	Monitor Well ACW #10	619	1426	2660																					
5/17/95	S95-0234	Monitor Well ACW #10	1600	2300	3900	6.9	<1.0	1.1	0.3	320	<0.025	0.12	110	0.037	8	170	<0.020	<5	<10	<5	0	190	1300	1.1	300	43
6/28/95	S95-0385	Monitor Well ACW #10	1900	2300	3100	7.3	<1.0	<2.0	0.3	280	<0.025	0.28	94	0.029	7.5	160	<0.020	<2.5	<2.5	<2.5	<5.0	190	1200	0.98	230	48
8/30/95	S95-0420	Monitor Well ACW #10	790	2200	3100	7.0	<1.0	<2.0	0.2	280	<0.025	<0.20	95	0.034	52	150	<0.040	<5	<10	<5	<15	180	1100	0.9	210	42
2/7/96	S95-0071	Monitor Well ACW #10	850	2300	3200	7.8	0.24	0.42	0.3	320	<0.006	0.24	110	0.032	8.4	190	0.011	3.9	<1.0	<1.0	<2.0	200	1200	0.88	230	36
2/7/96	S96-0072*	Monitor Well ACW #10	829	2100	3100	7.1	0.44	<1.25	0.3	320	<0.1	0.4	107	<0.1	9.4	190	<0.1	4.3	<2.5	<2.5	<7.5	194	1240	<1.25	242	54
5/6/96	S96-0281	Monitor Well ACW #10	603	1290	2322	7.2	0.46	2.2	<0.5	206	<0.01	0.1	92	<0.05	8	127	<0.05	1.22	<1.0	<1.0	<3.0	137	893	4.5	190	62
8/14/96	S96-0327	Monitor Well ACW #10	560	1900	2400	7.6	1.4	0.58	0.3	210	<0.006	0.14	71	0.019	7	140	0.037	<1.0	<1.0	<1.0	<2.0	170	810	0.82	160	47
11/7/96	S96-0591	Monitor Well ACW #10	610	1800	250	7.5	1.1	0.49	0.2	200	<0.007	0.22	70	0.017	7.4	150	0.025	1.2	1.5	<1.0	<2.0	170	800	0.83	170	20
5/8/97	S97-0235	Monitor Well ACW #10	480	1500	1880													1.3	1	<0.5	<1.0					
10/23/97	S97-0558	Monitor Well ACW #10	670	1500	2870	7.2	1	0.36	0.2	220	<0.01	0.2	71	0.02	6	140	<0.02	1.14	1.17	<0.5	0.58	200		1.2	210	20
6/19/93	S93-0393	Monitor Well ACW #11	9737	15670	25000																					
9/15/93	S93-0534	Monitor Well ACW #11	3437	6820	10570																					
11/9/93	S93-0681	Monitor Well ACW #11	3620	6582	10180																					
4/21/94	S94-0382	Monitor Well ACW #11	6400	9520	16290																					
10/27/94	S94-0720	Monitor Well ACW #11	6200	13280	20060																					
10/27/94	S94-0721	Monitor Well ACW #11	9600	12900	20550																					
2/1/95	S95-0020	Monitor Well ACW #11	11582	19880	32200																					
5/17/95	S95-0235	Monitor Well ACW #11	4400	7200	12000	8.8	<1.0	<2.0	0.3	740	<0.025	0.36	260	0.23	16	1200	<0.020	<5	<10	<5	0	230	3300	1.9	250	42
6/27/95	S95-0381	Monitor Well ACW #11	6500	7000	11000	7.2	<1.0	<2.0	0.4	720	<0.025	0.29	270	0.2	16	980	<0.020	5.1	<2.5	<2.5	<5.0	210	2800	1.6	210	45
8/29/95	S95-0447	Monitor Well ACW #11	3400	6000	10000	6.8	6.2	<2.0	0.3	550	<0.025	0.17	210	0.088	16	880	<0.020	8	<10	<5	<15	220	2700	2.2	220	44
2/7/96	S96-0085	Monitor Well ACW #11	3400	7400	11000	7.8	0.15	0.087	0.3	660	<0.006	0.38	230	0.13	28	1500	<0.010	6.9	<1.0	<1.0	<2.0	210	2600	1.5	230	47
2/7/96	S96-0066*	Monitor Well ACW #11	3770	6740	11030	7.2	0.39	<1.25	0.4	668	<0.1	0.5	224	0.1	31	1400	<0.1	7.6	<2.5	<2.5	<7.5	200	2590	1.6	248	46
5/6/96	S96-0262	Monitor Well ACW #11	3120	5080	9840	7.3	0.37	<1.25	<0.5	484	0.02	0.3	220	0.09	29	1160	<0.05	6.76	<1.0	<1.0	<3.0	111	2110	<1.25	206	50
8/13/96	S96-0383	Monitor Well ACW #11	4200	10000	12000	7.3	1.0	0.18	0.4	540	0.013	0.28	190	0.061	24	1700	0.12	7.9	2.2	<1.0	<2.0	160	2100	2	230	47
11/5/96	S96-0578	Monitor Well ACW #11	13000	25000	29	7.3	0.4	0.31	0.3	1200	<0.007	0.25	430	0.14	35	5100	0.068	32	1.7	<1.0	1.2	170	4700	2.9	560	21
5/6/97	S97-0221	Monitor Well ACW #11	3600	6700	10200													21	5.3	3.1	3.5					
11/21/97	S97-0798	Monitor Well ACW #11	9800	16000	27900	7.6	<0.5	0.16	0.3	1000	<0.01	0.4	330	0.22	27	2700	0.21	28	3.1	<0.5	2.8	170		<4	520	18
2/19/97	S97-0042	Monitor Well ACW #12	380	950	1610													<0.5	<0.5	1.5	<1.0					
2/19/97	S97-0043	Monitor Well ACW #12D	390	960	1630													2.9	<0.5	<0.5	<1.0					
5/8/97	S97-0236	Monitor Well ACW #12	290	900	1240													3	0.89	<0.5	<1.0					
8/20/97	S97-0422	Monitor Well ACW #12	260	740	1120	8.1	1.3	0.2	0.2	84	<0.01	0.5	31	0.05	23	100	<0.02	1.2	<0.5	<0.5	<1.0	130		0.6	85	18
8/20/97	S97-0423	Monitor Well ACW #12D	280	740	1150	8.1	1.3	0.3	0.2	91	<0.01	0.4	34	0.05	22	100	<0.02	1.4	<0.5	<0.5	<1.0	120		0.7	90	19
10/23/97	S97-0557	Monitor Well ACW #12	380	850	1810	7.5	1	0.34	0.2	150	<0.01	0.2	54	0.03	13	120	<0.02	1.4	0.58	<0.5	<1.0	160		1	120	20
2/20/97	S97-0045	Monitor Well ACW #13	53	440	691													<0.5	<0.5	1.5	<1.0					
5/8/97	S97-0237	Monitor Well ACW #13	57	480	643													0.61	0.58	<0.5	<1.0					
5/8/97	S97-0238	Monitor Well ACW #13D	52	480	630													0.65	0.82	<0.5	<1.0					
8/20/97	S97-0425	Monitor Well ACW #13	55	440	654	8.3	1.3	0.99	0.2	39	<0.01	0.3	14	0.02	10	79	<0.02	<0.5	<0.5	<0.5	<1.0	160		0.4	96	20
10/23/97	S97-0559	Monitor Well ACW #13	50	400	728	8.3	1.3	1	0.2	34	<0.01	0.2	14	<0.01	15	84	<0.02	0.59	0.76	<0.5	<1.0	170		0.4	95	21
2/20/97	S97-0046	Monitor Well ACW #14	86	570	830													<0.5	<0.5	<0.5	<1.0					
5/7/97	S97-0232	Monitor Well ACW #14	72	480	746													0.88	1.1	0.52	<1.0					
8/20/97	S97-0421	Monitor Well ACW #14	80	460	691	7.8	1.6	0.94	0.2	45	<0.01	0.5	15	0.03	5	81	0.03	<0.5	<0.5	<0.5	<1.0	150		0.4	82	20
10/22/97	S97-0554	Monitor Well ACW #14	71	440	747	8.1	1.5	0.9	0.2	46	<0.01	0.3	16	0.01	5	81	<0.02	<0.5	1.2	<0.5	1.5	180		0.5	95	20

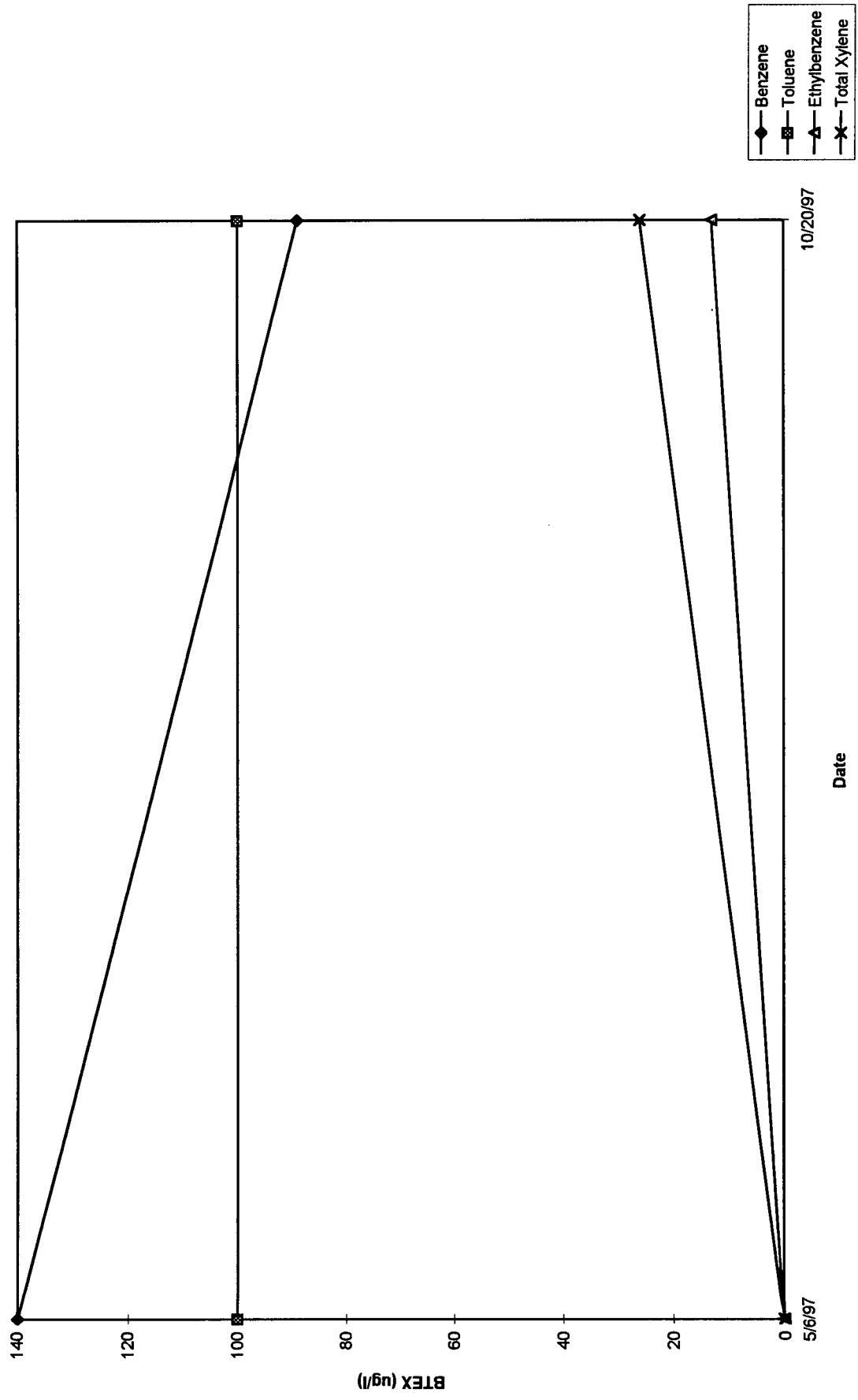
MONITOR WELL ACW #01 (1997)



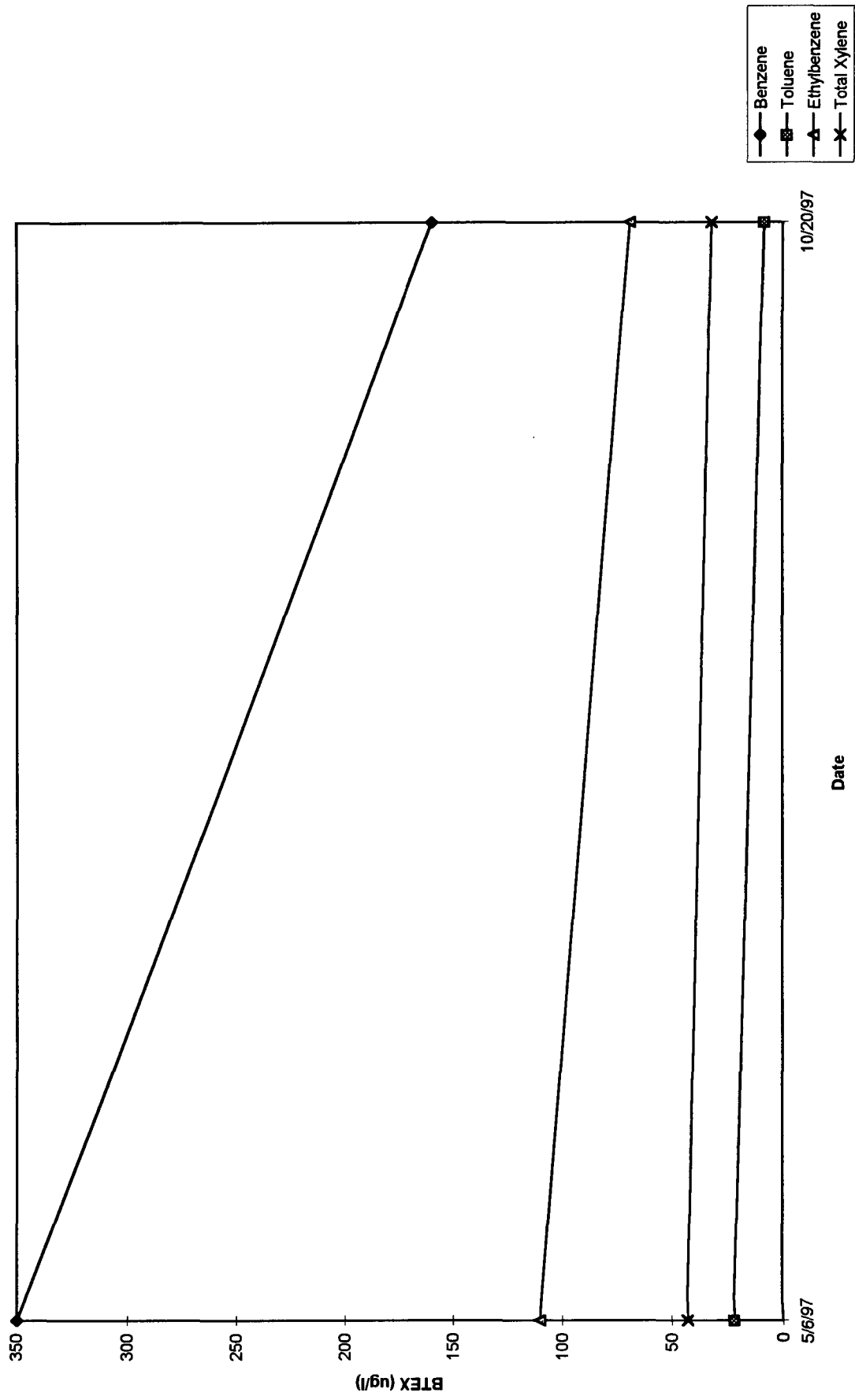
# Monitor Well ACW#01



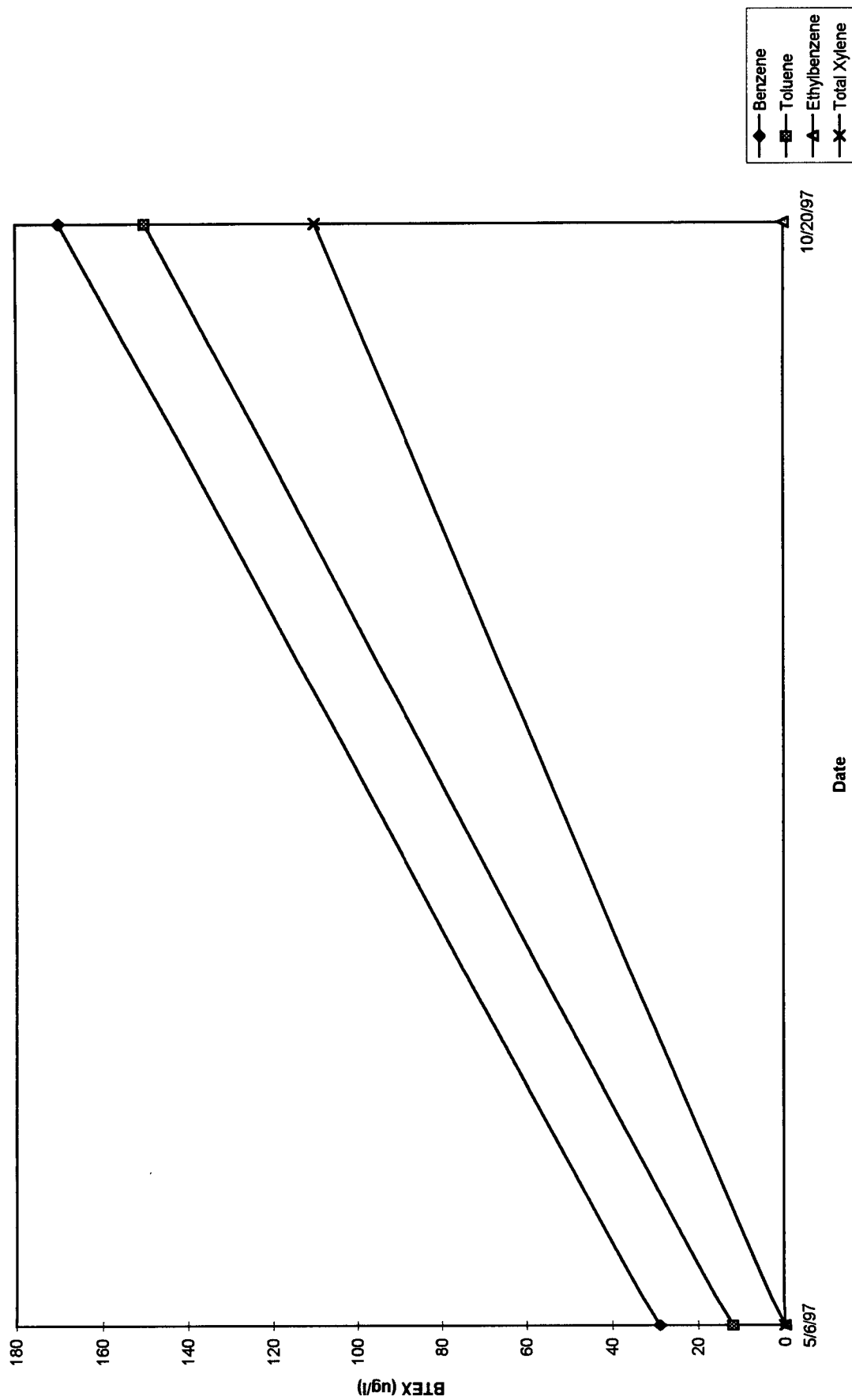
MONITOR WELL #02A



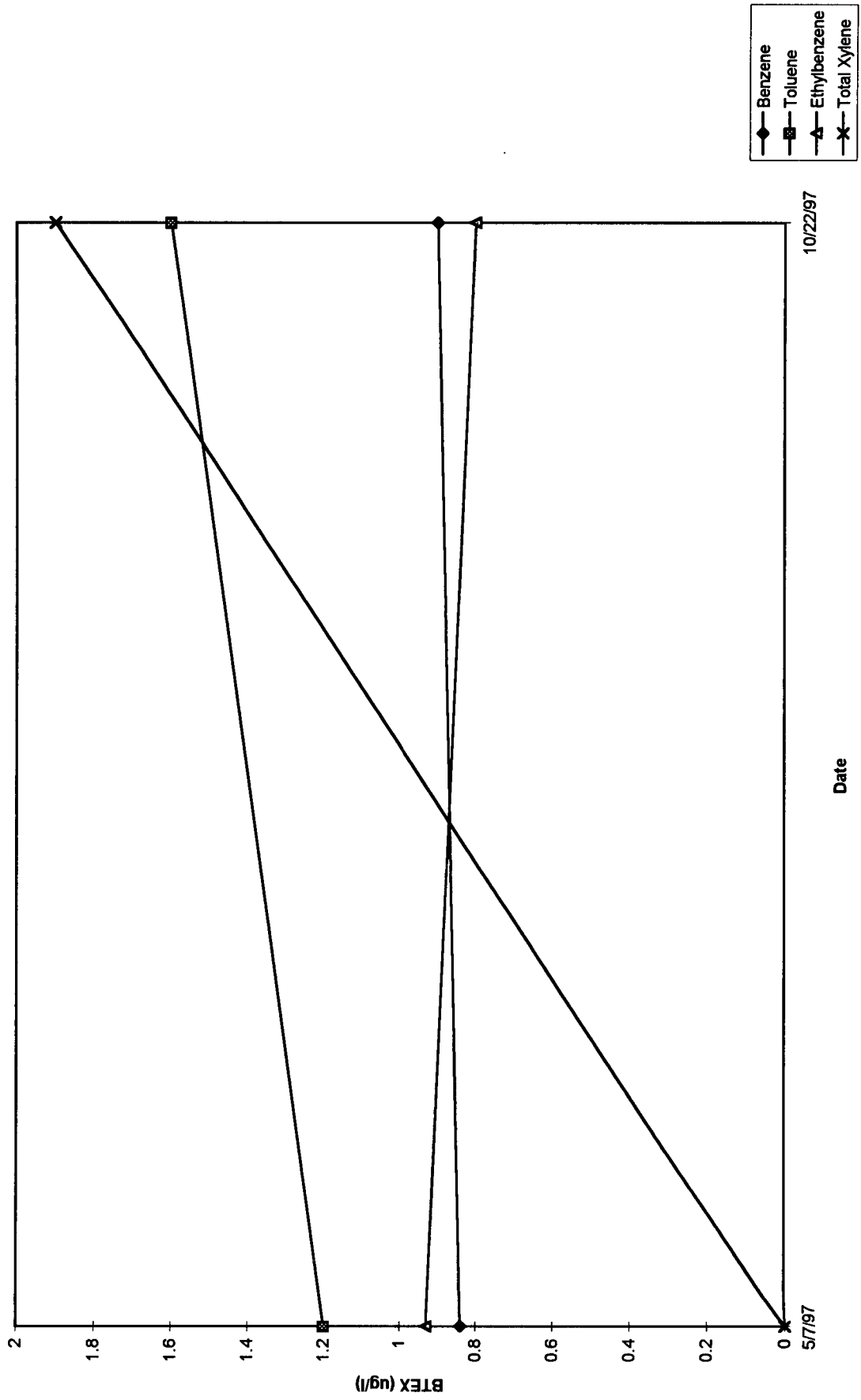
MONITOR WELL ACW #03



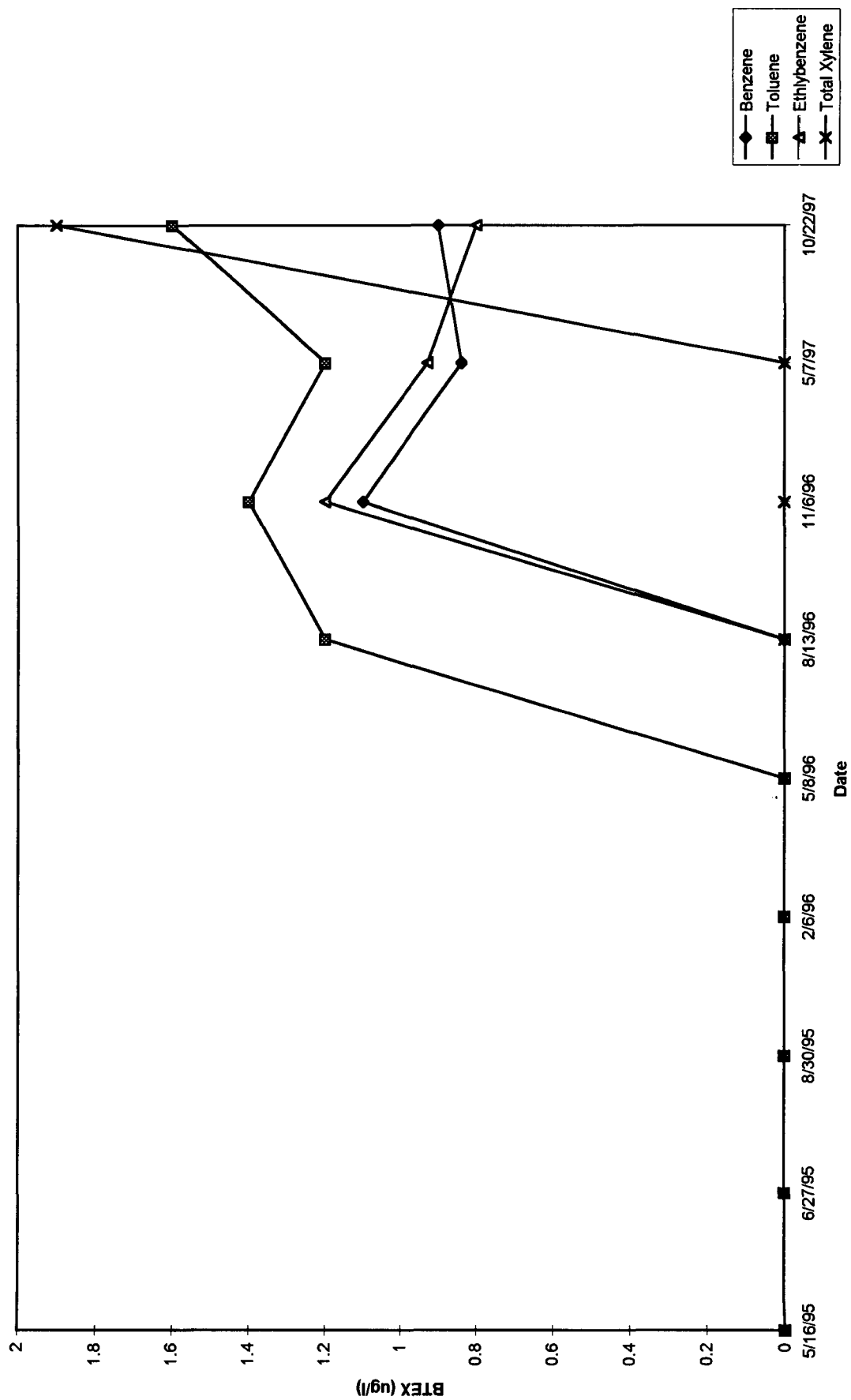
MONITOR WELL ACW #04



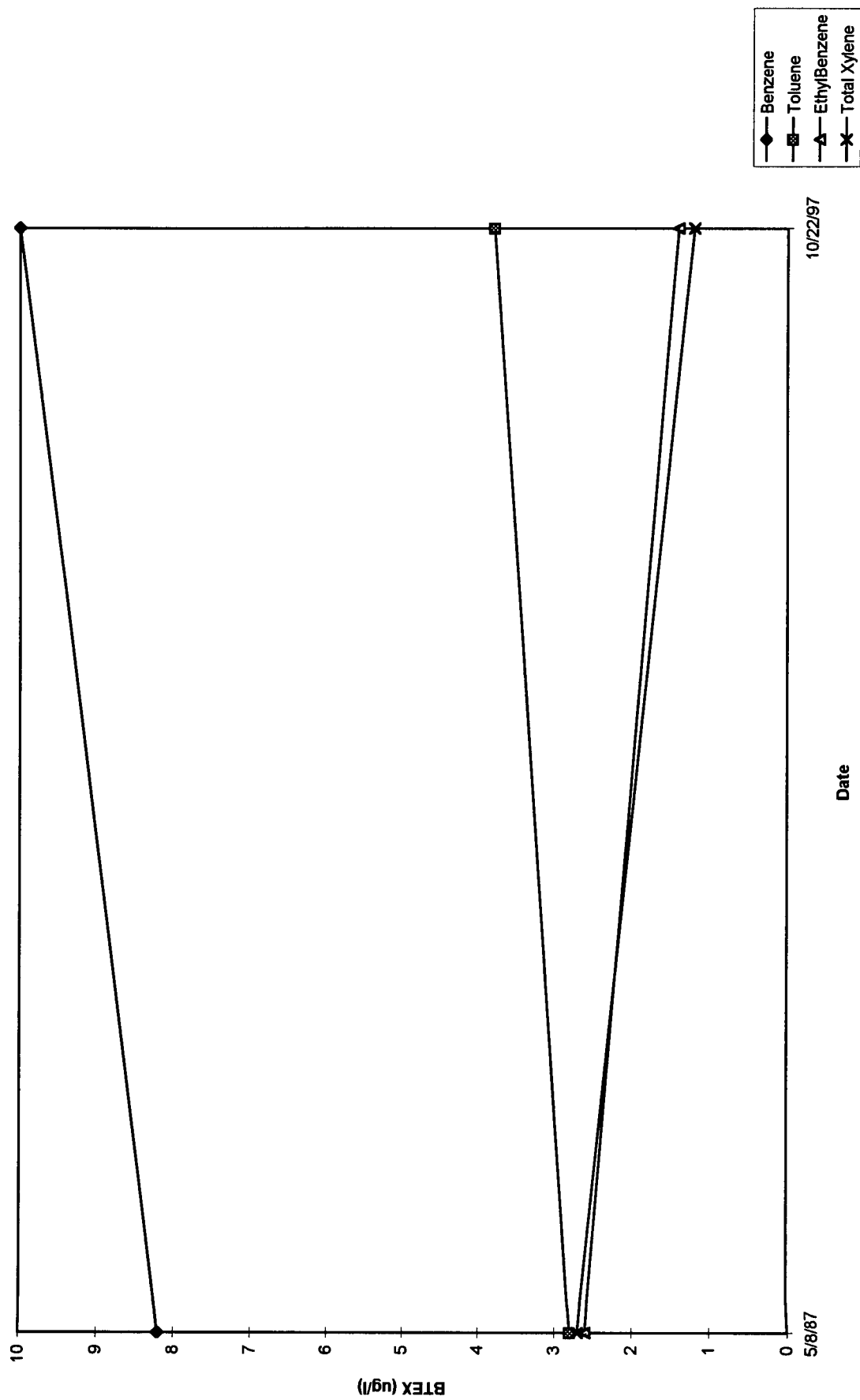
MONITOR WELL ACW #05 (1997)



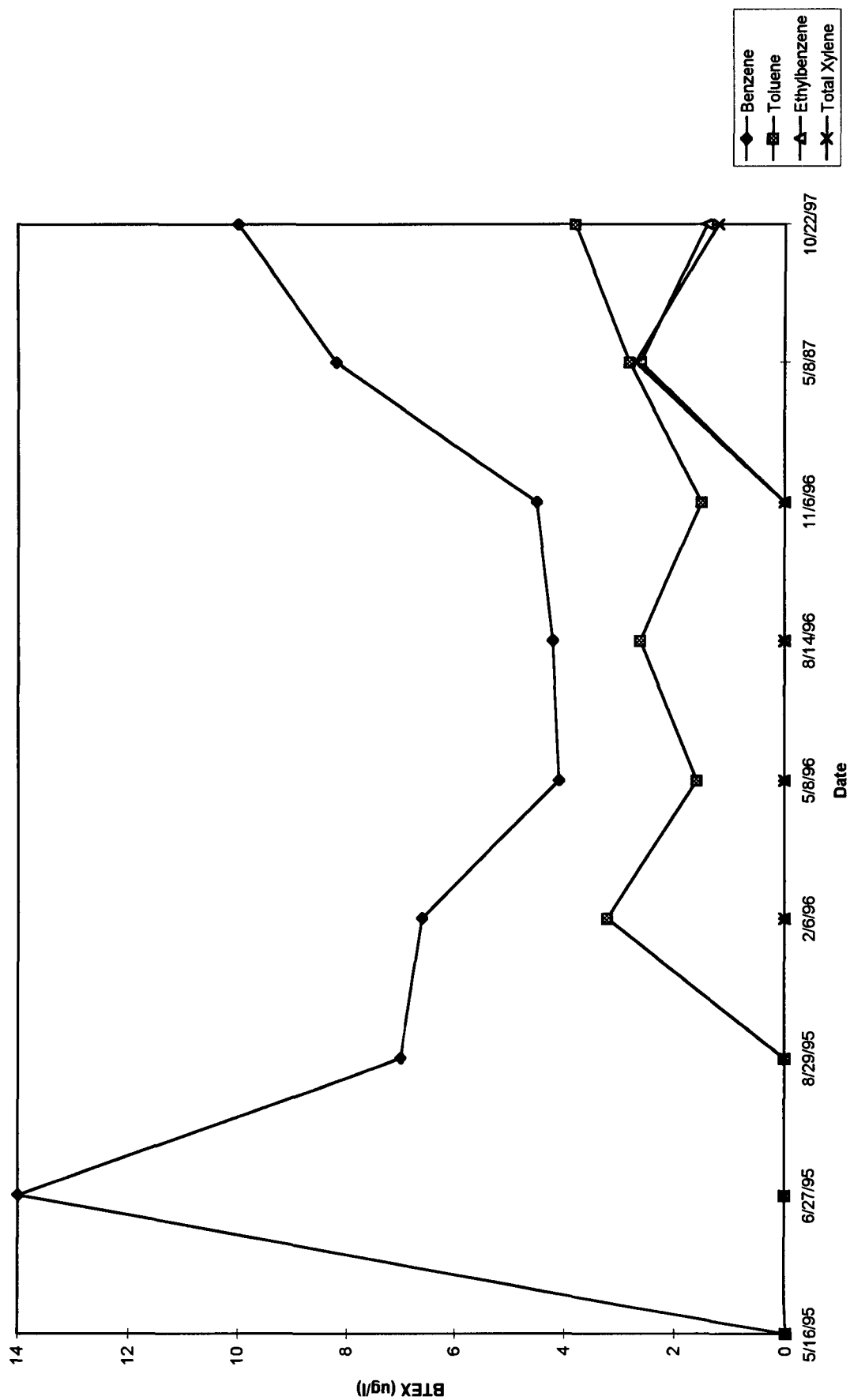
# MONITOR WELL ACW #05



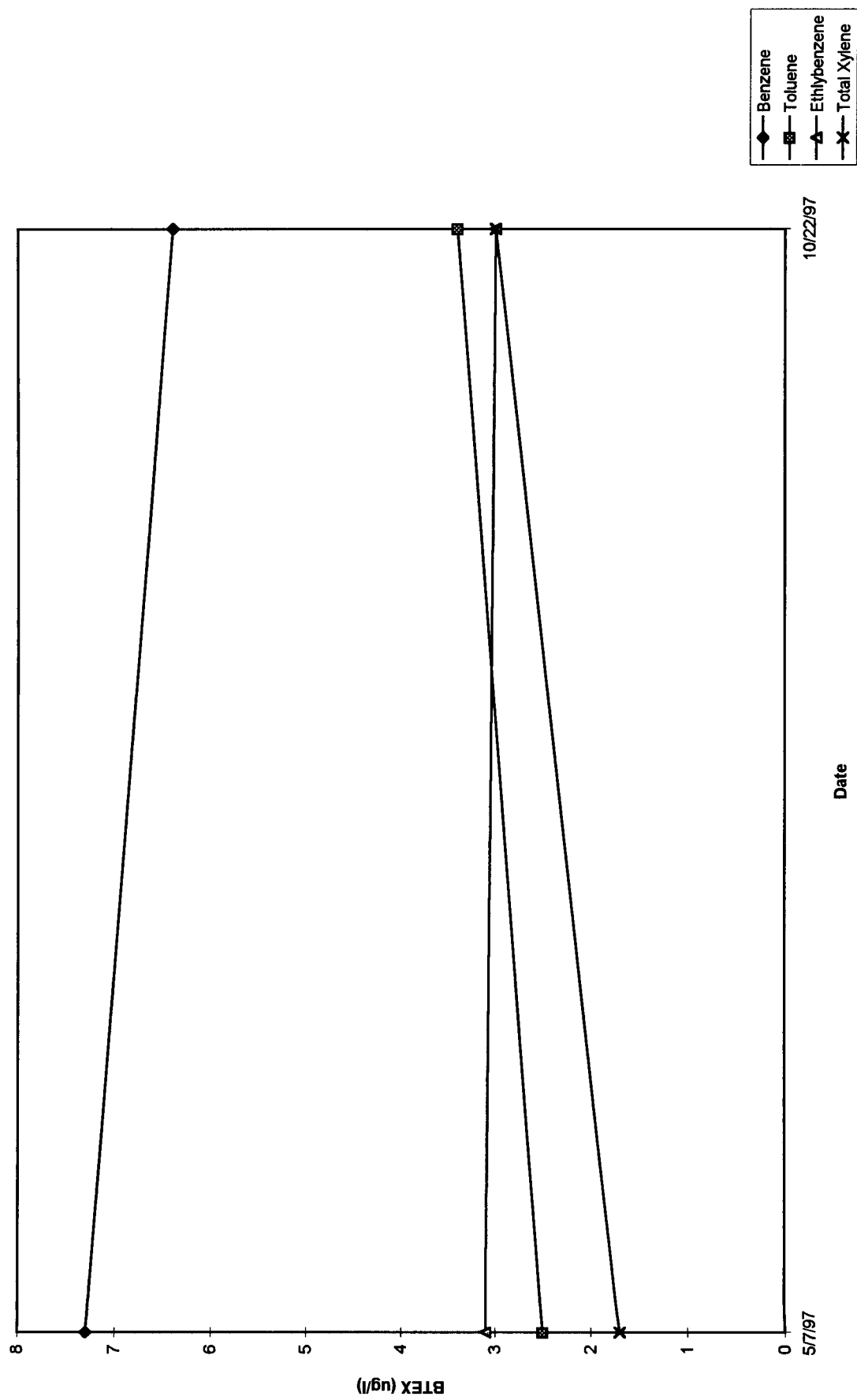
MONITOR WELL ACW #06 (1997)



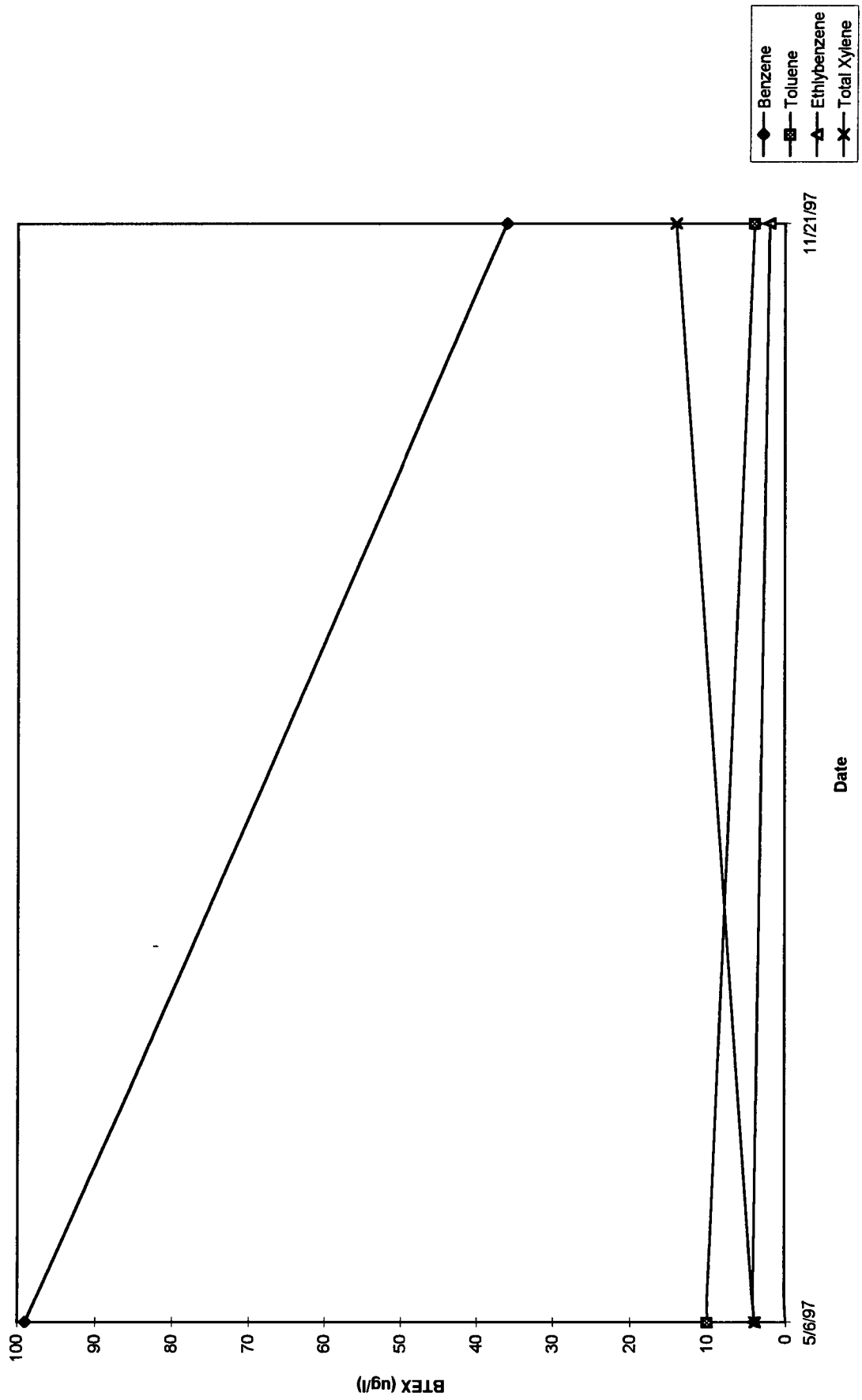
MONITOR WELL ACW #06



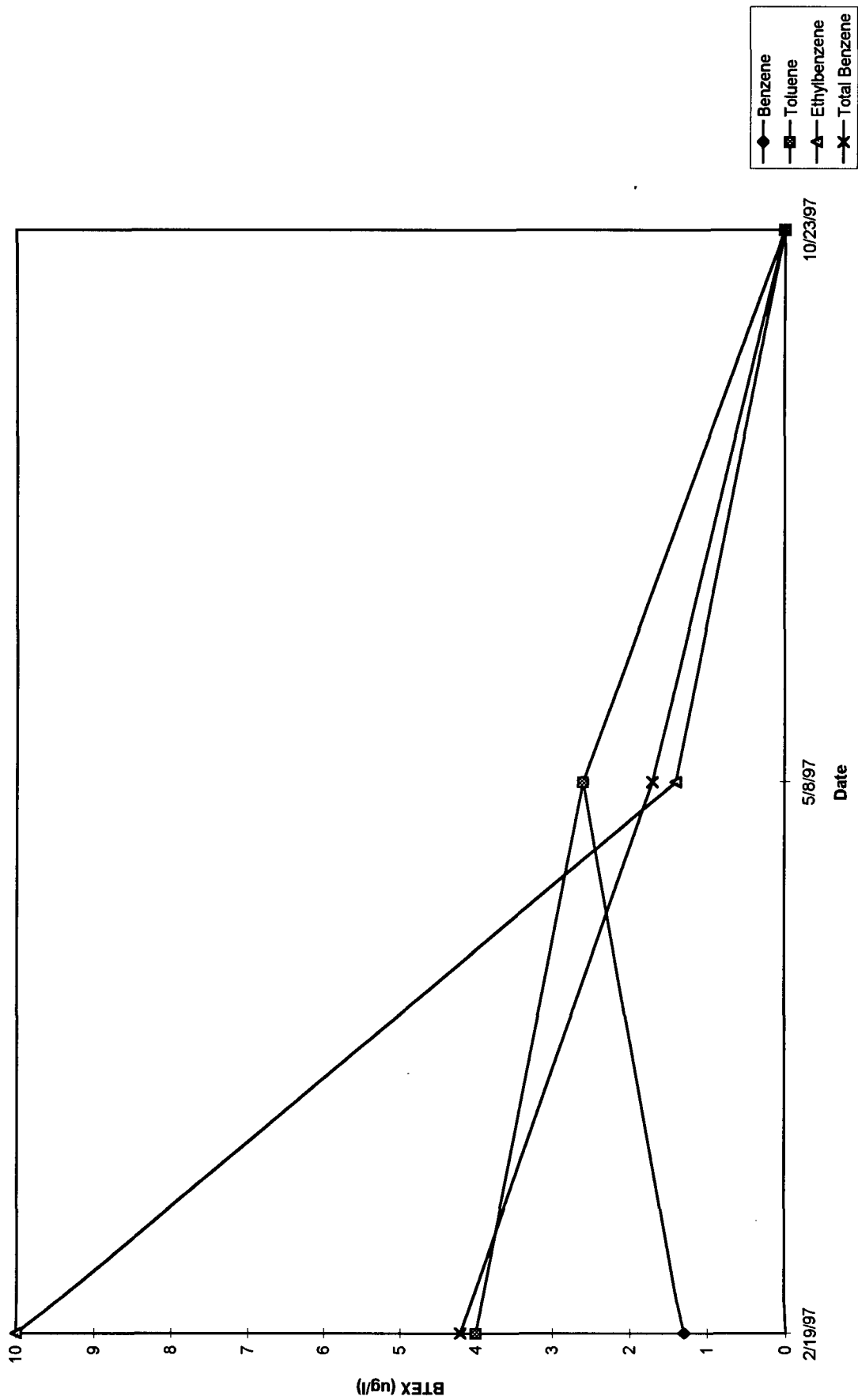
MONITOR WELL ACW #07



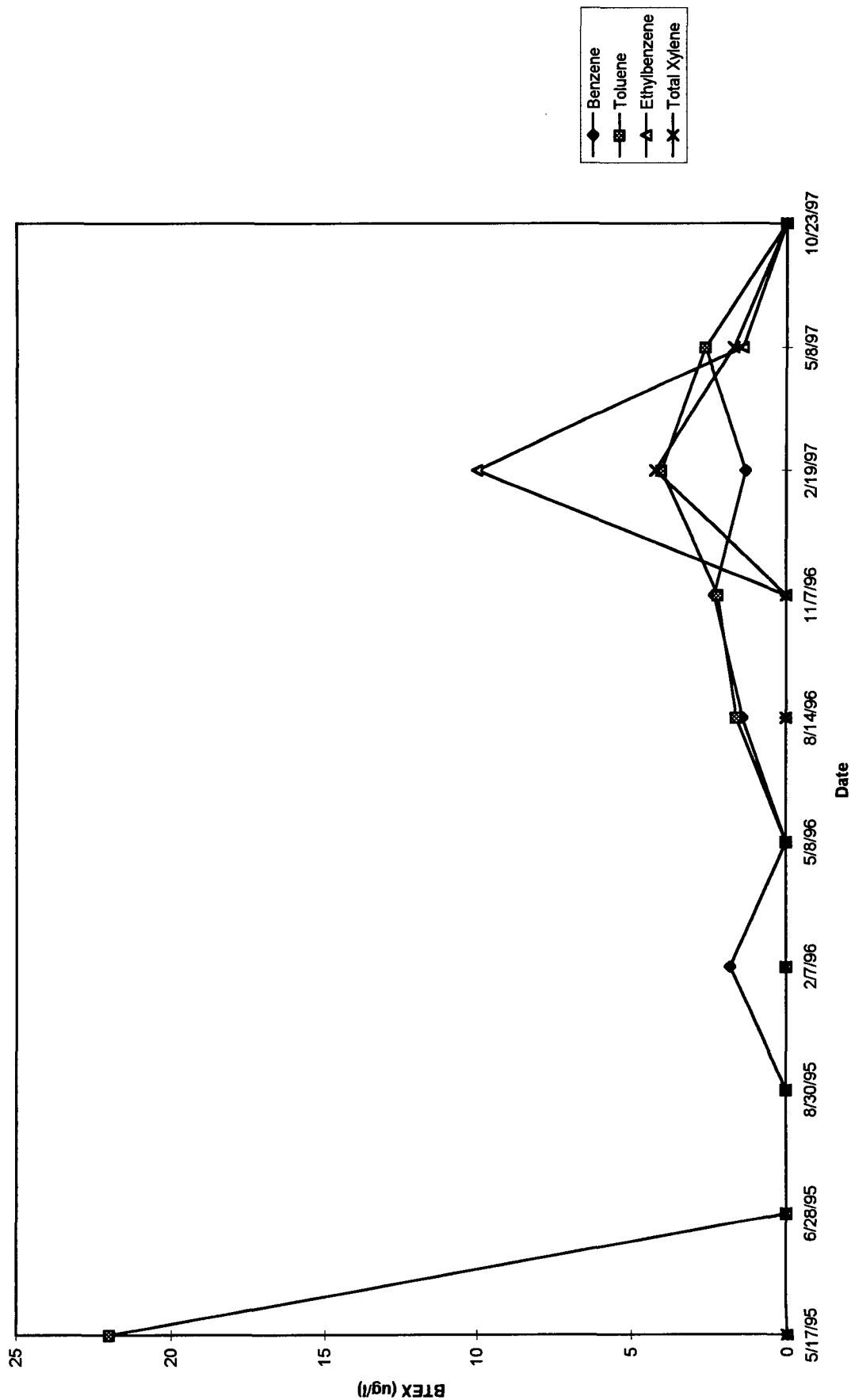
MONITOR WELL ACW #08



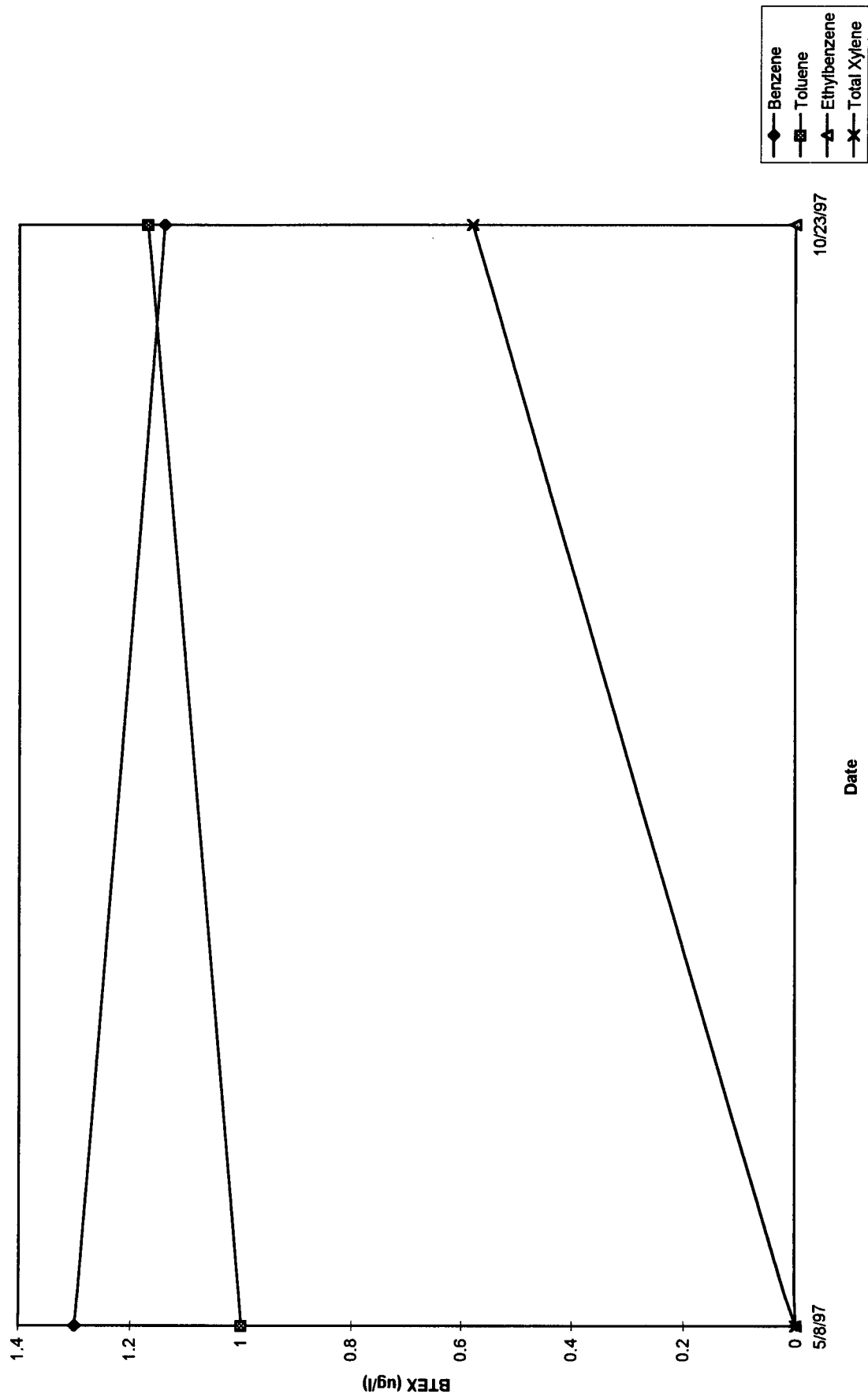
MONITOR WELL ACW #09 (1997)



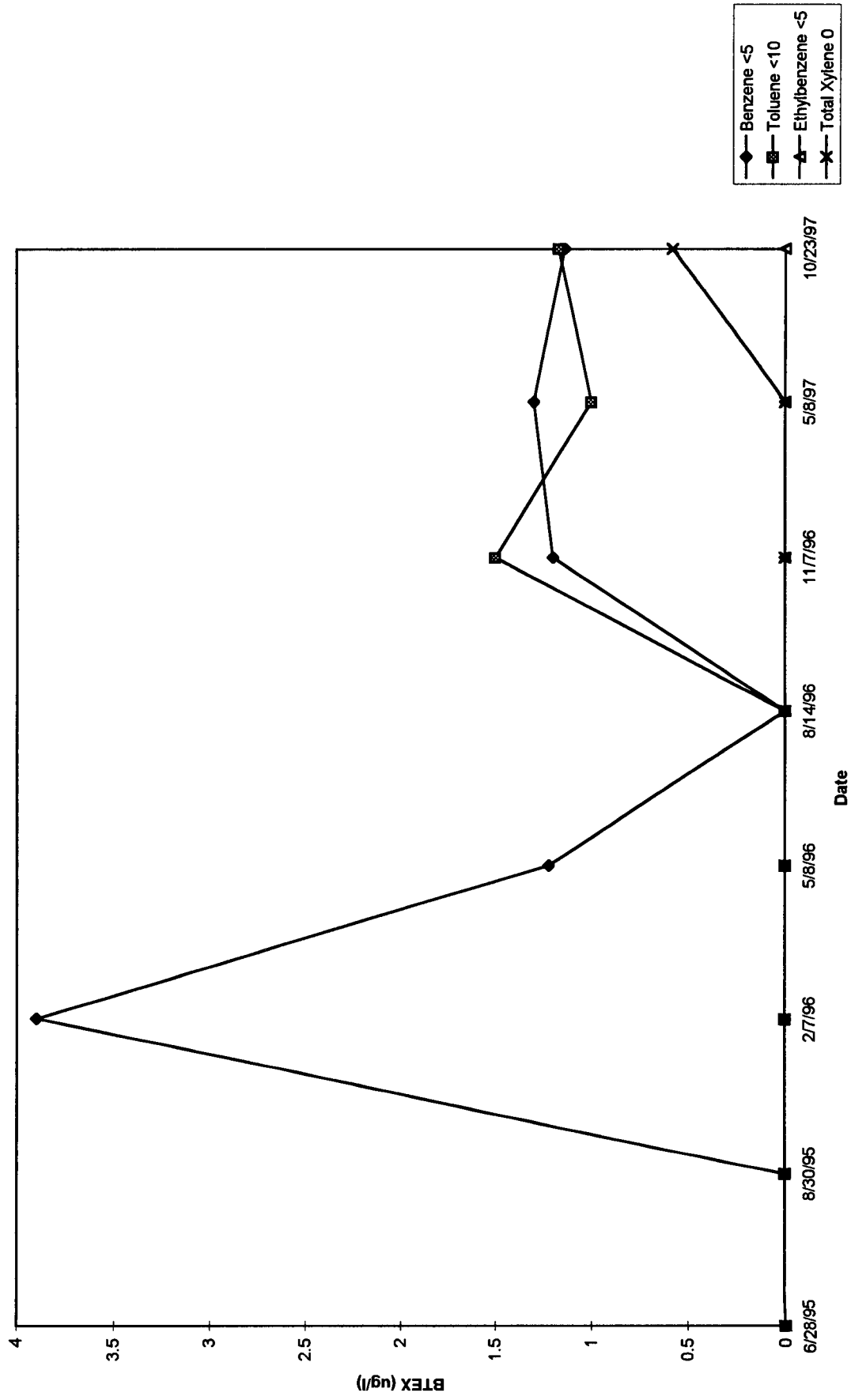
# MONITOR WELL ACW #09



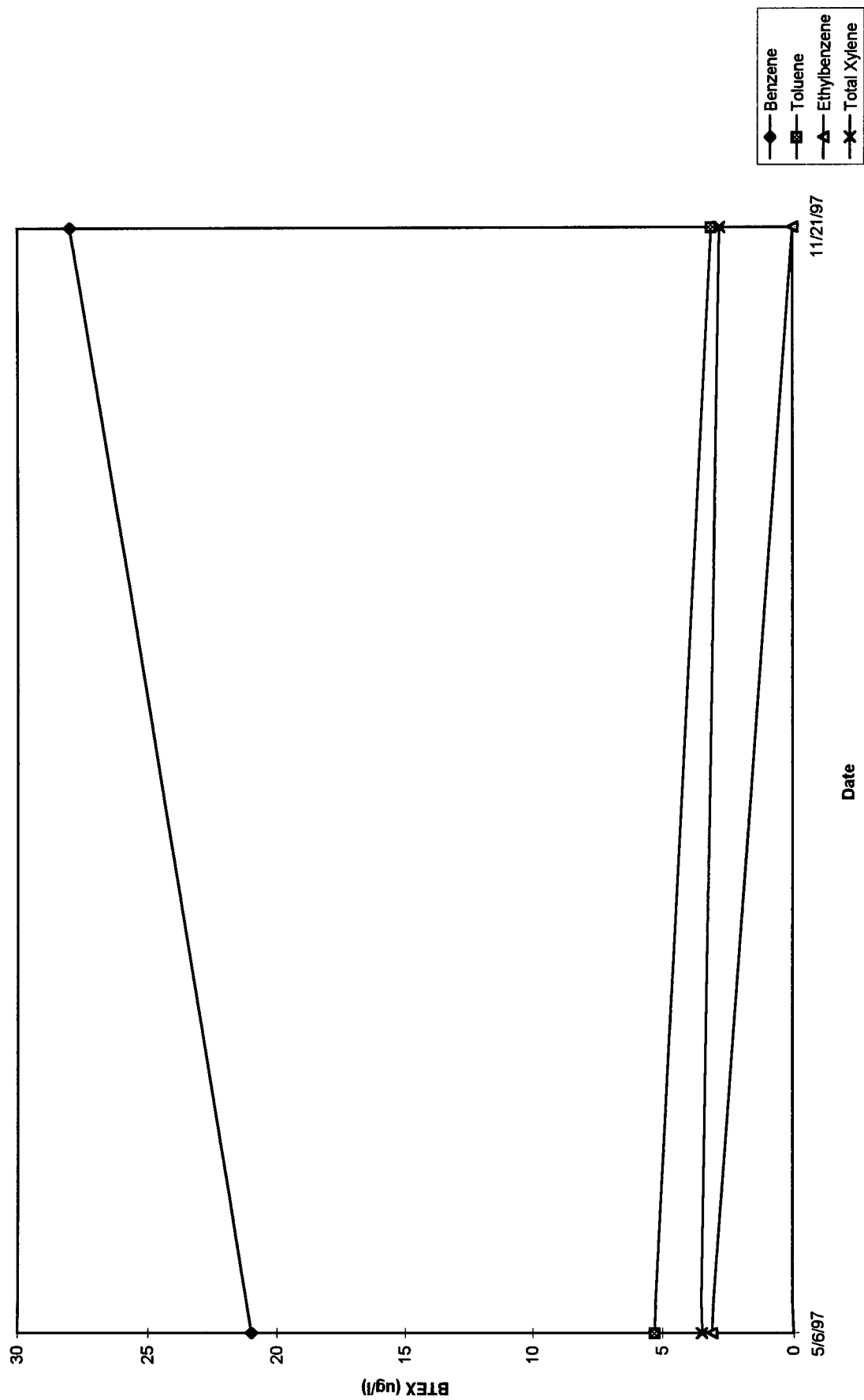
MONITOR WELL ACW #10  
(1997)



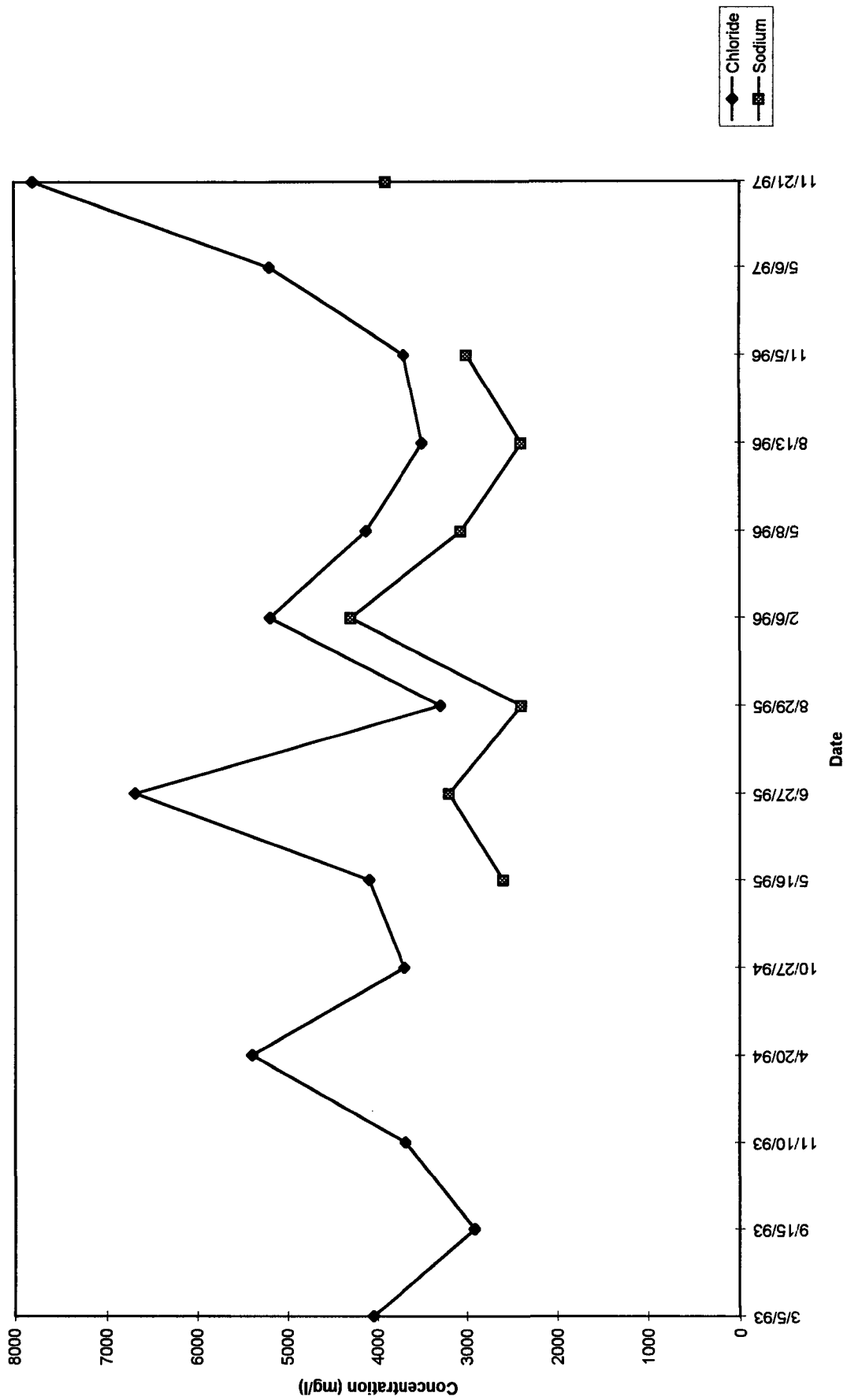
MONITOR WELL ACW #10



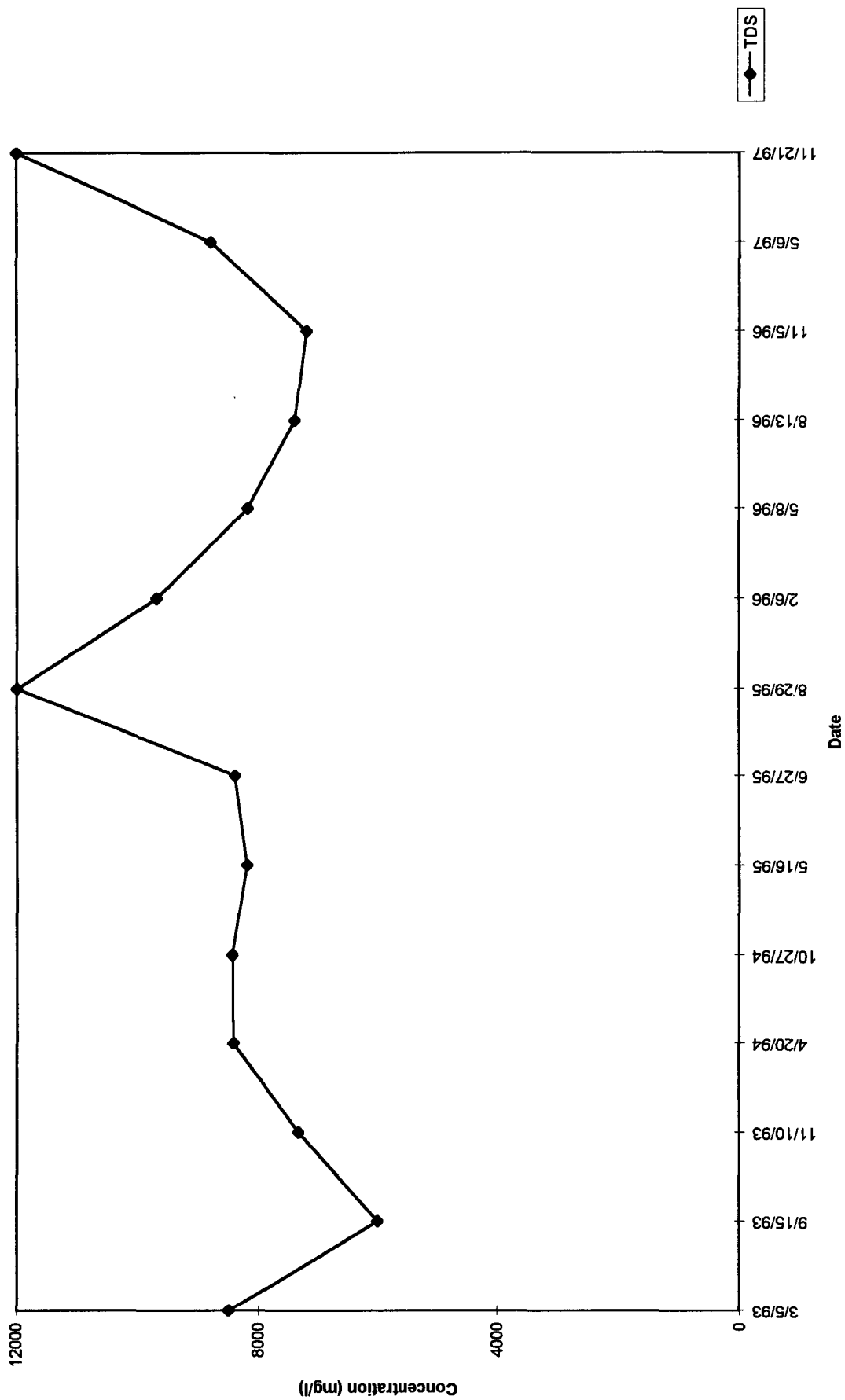
MONITOR WELL ACW #11  
(1997)



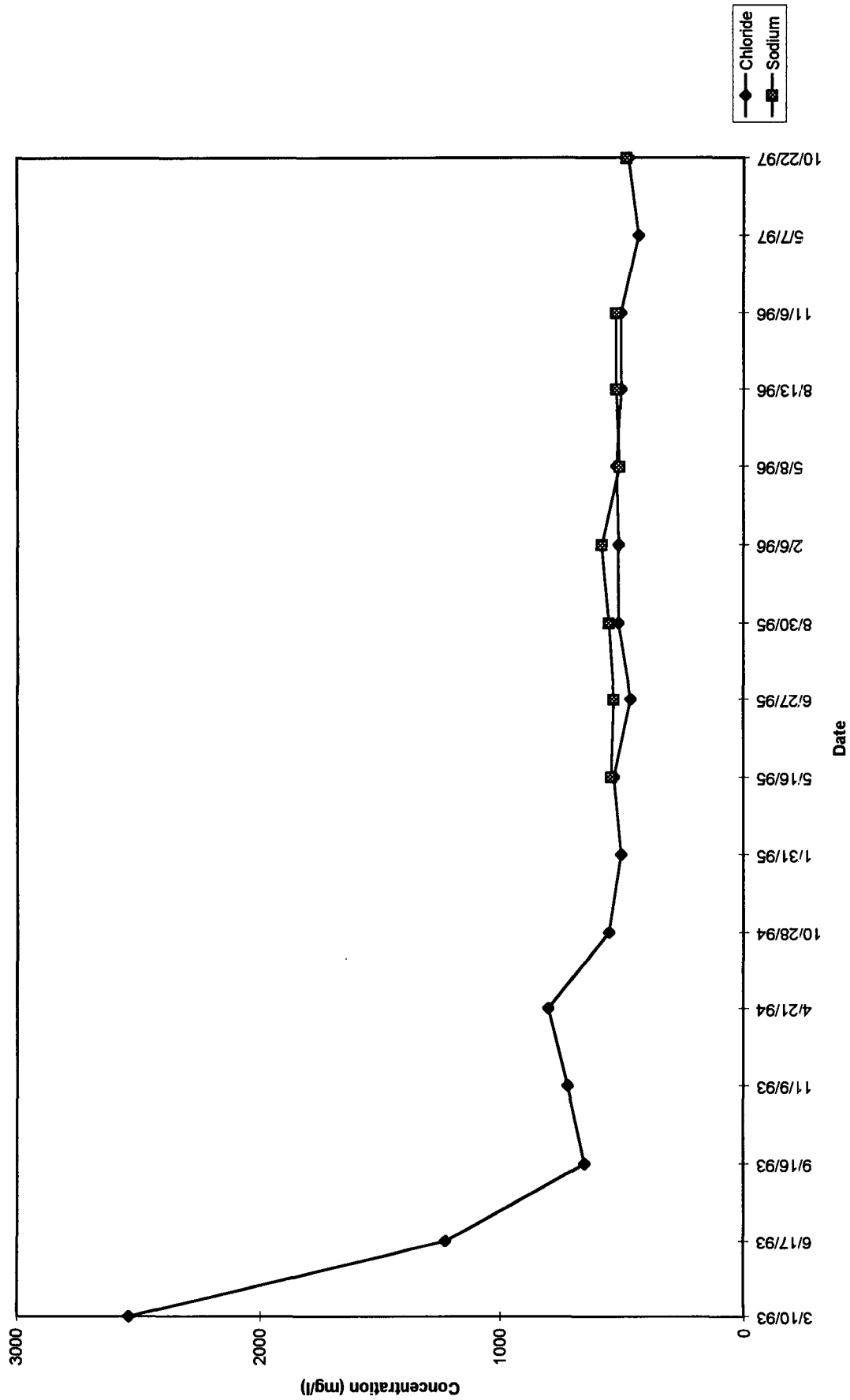
MONITOR WELL ACW #01



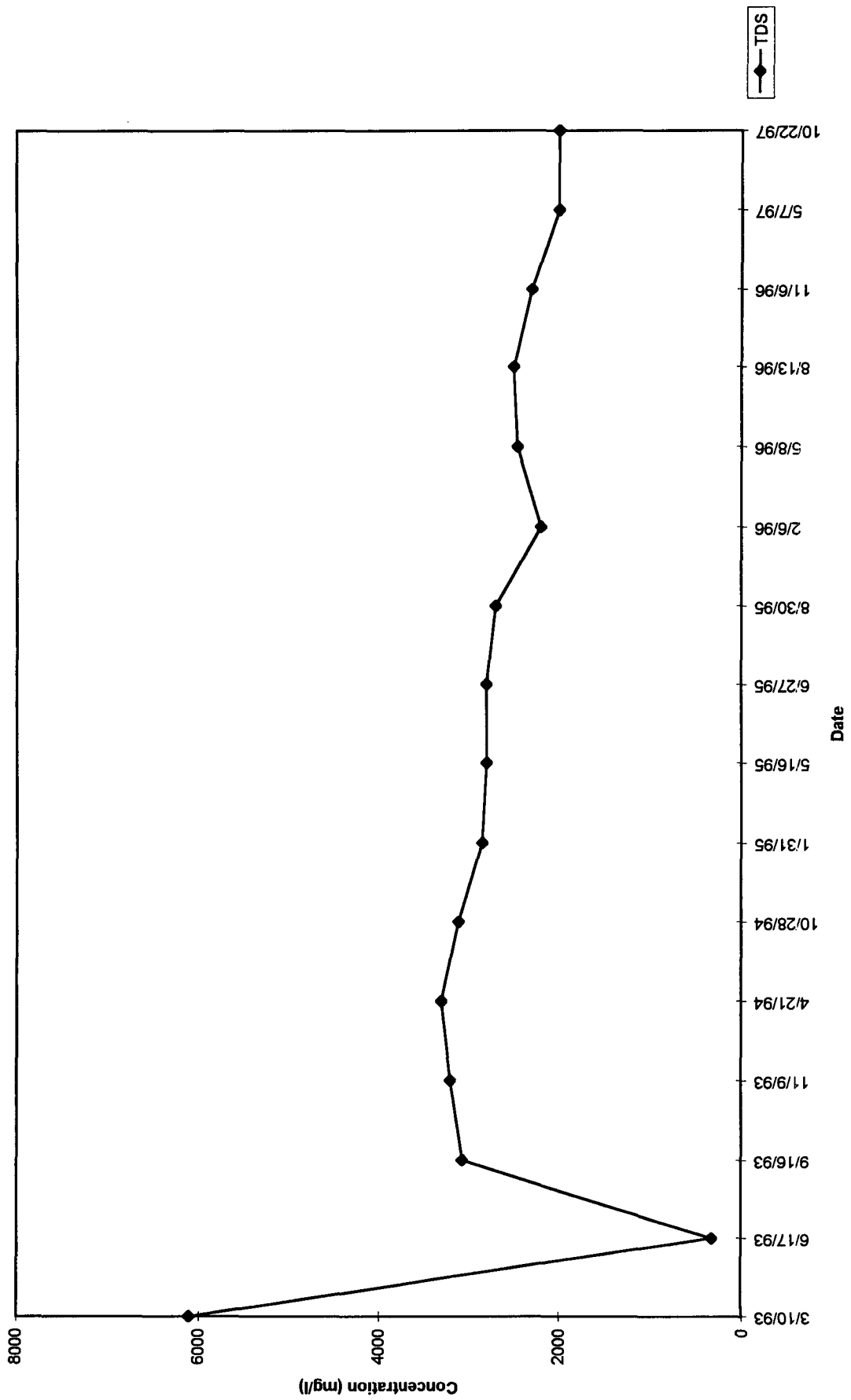
MONITOR WELL ACW #01



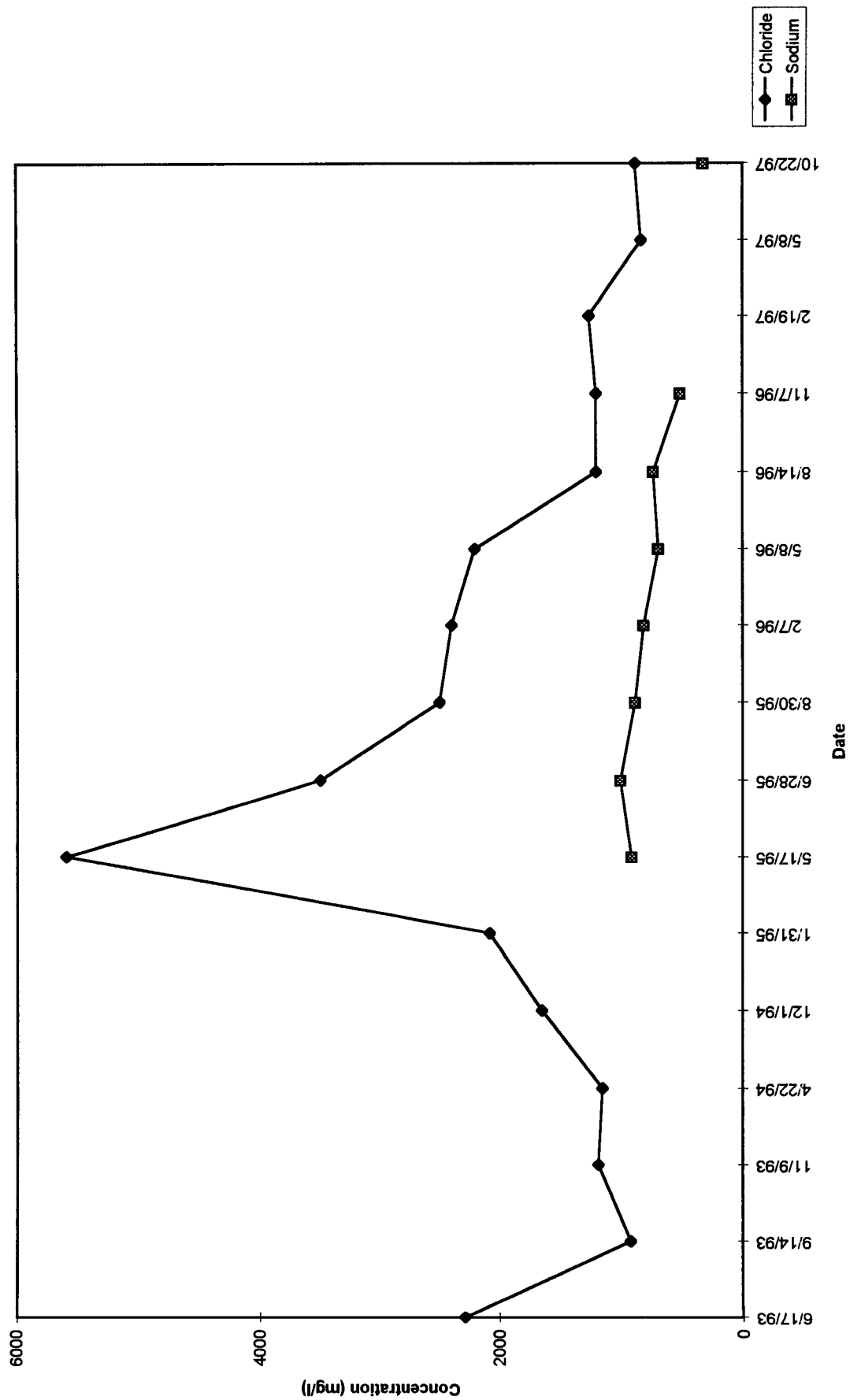
MONITOR WELL ACW #05



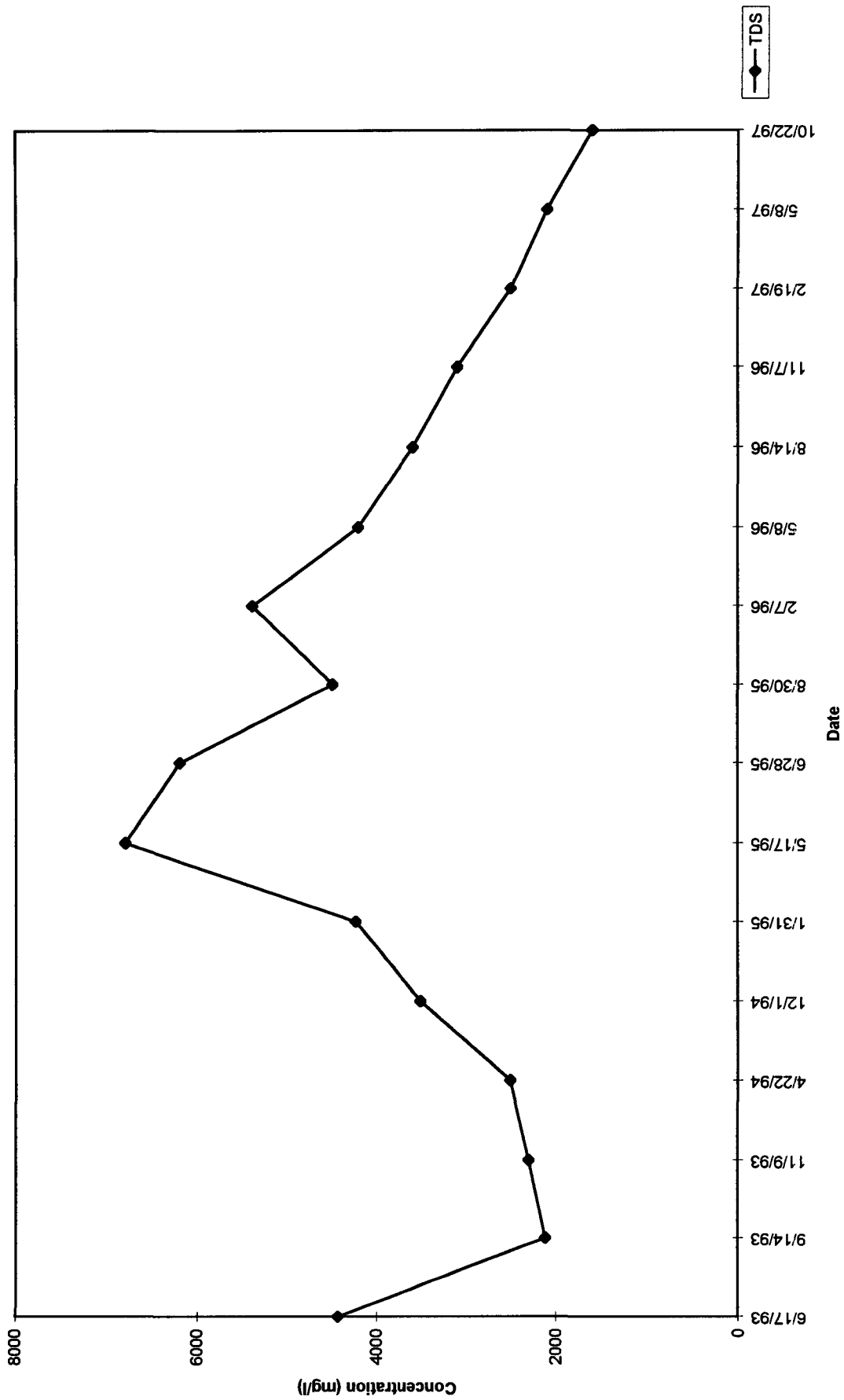
MONITOR WELL ACW #05



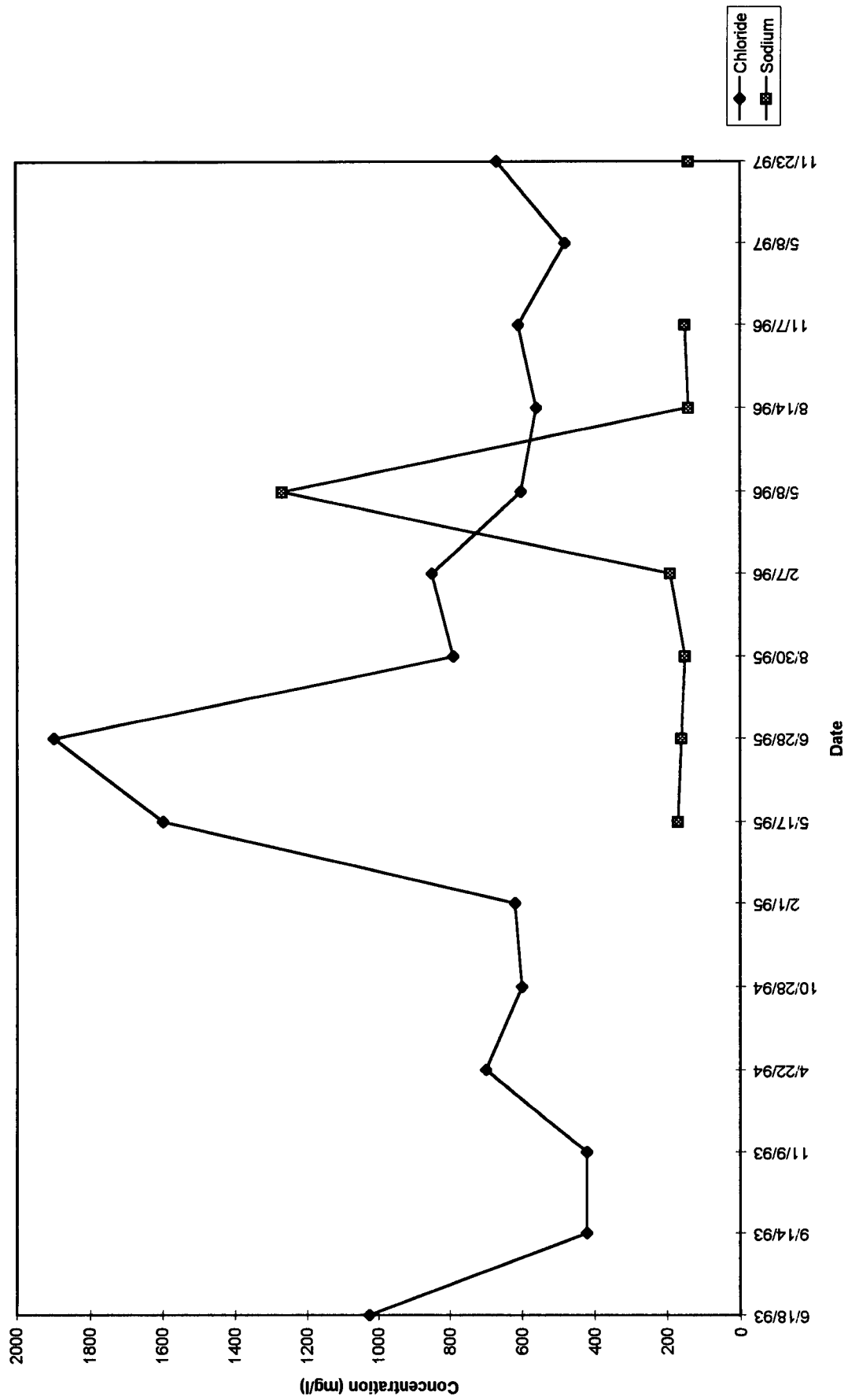
# MONITOR WELL ACW #09



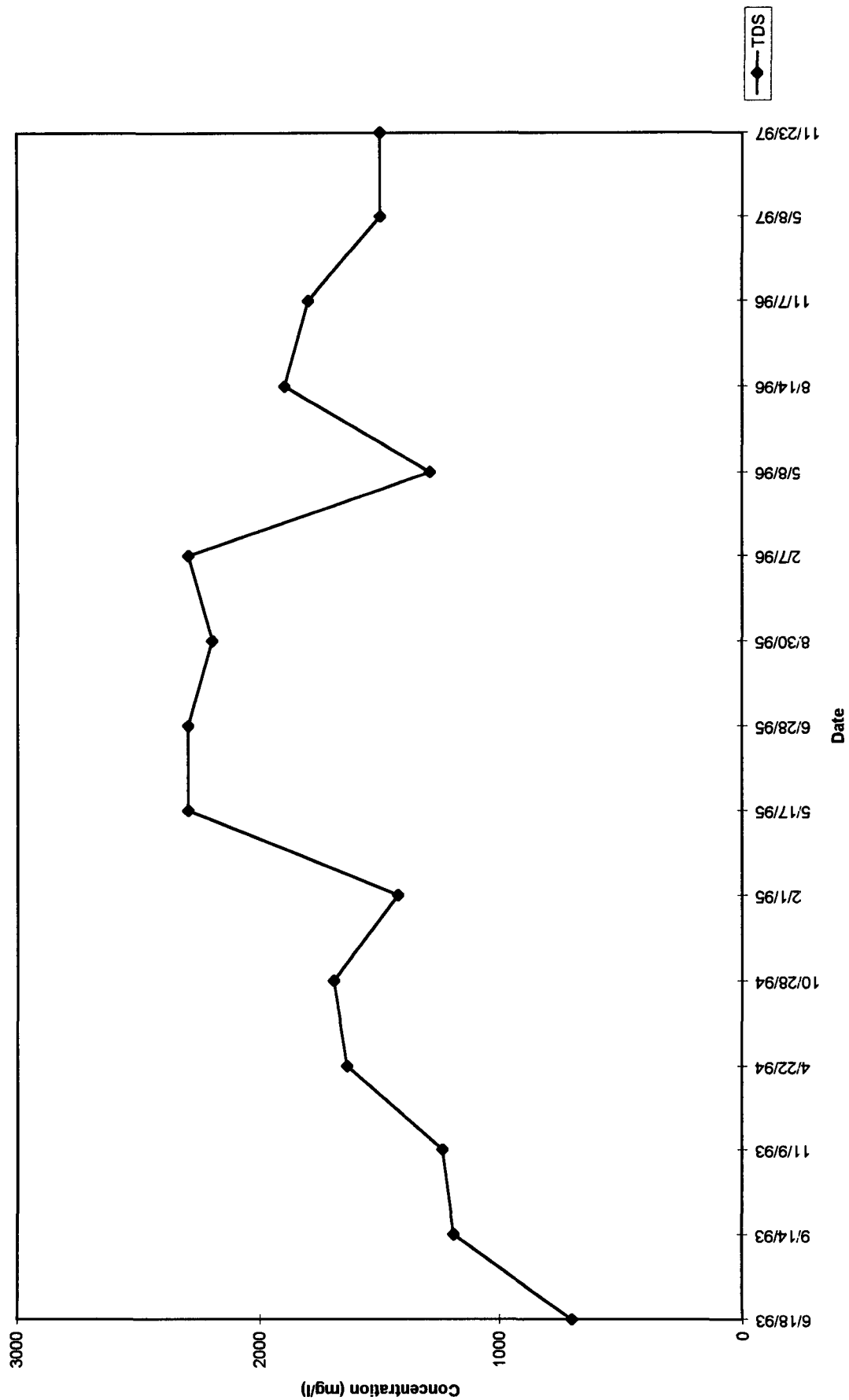
MONITOR WELL ACW #09



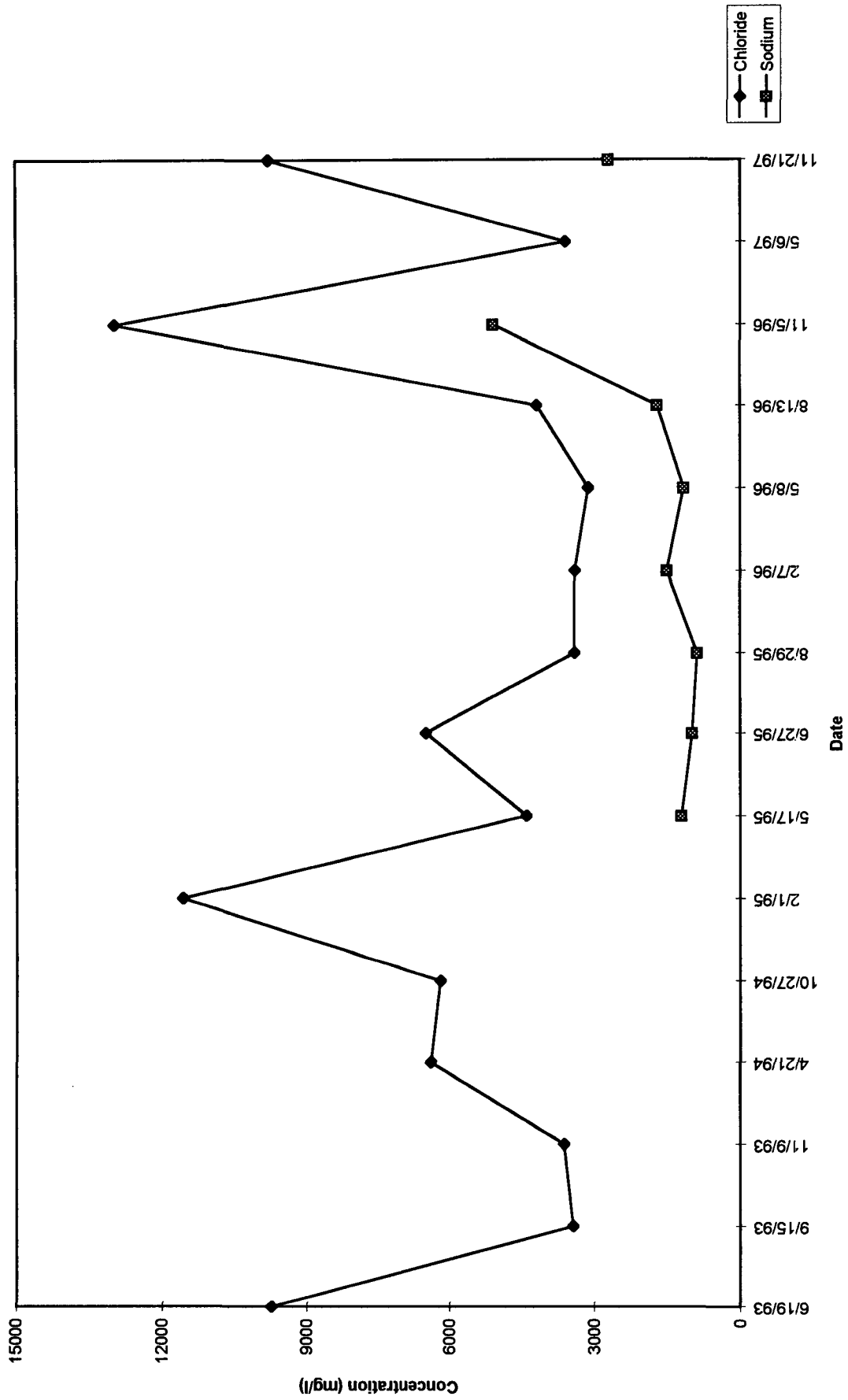
MONITOR WELL ACW #10



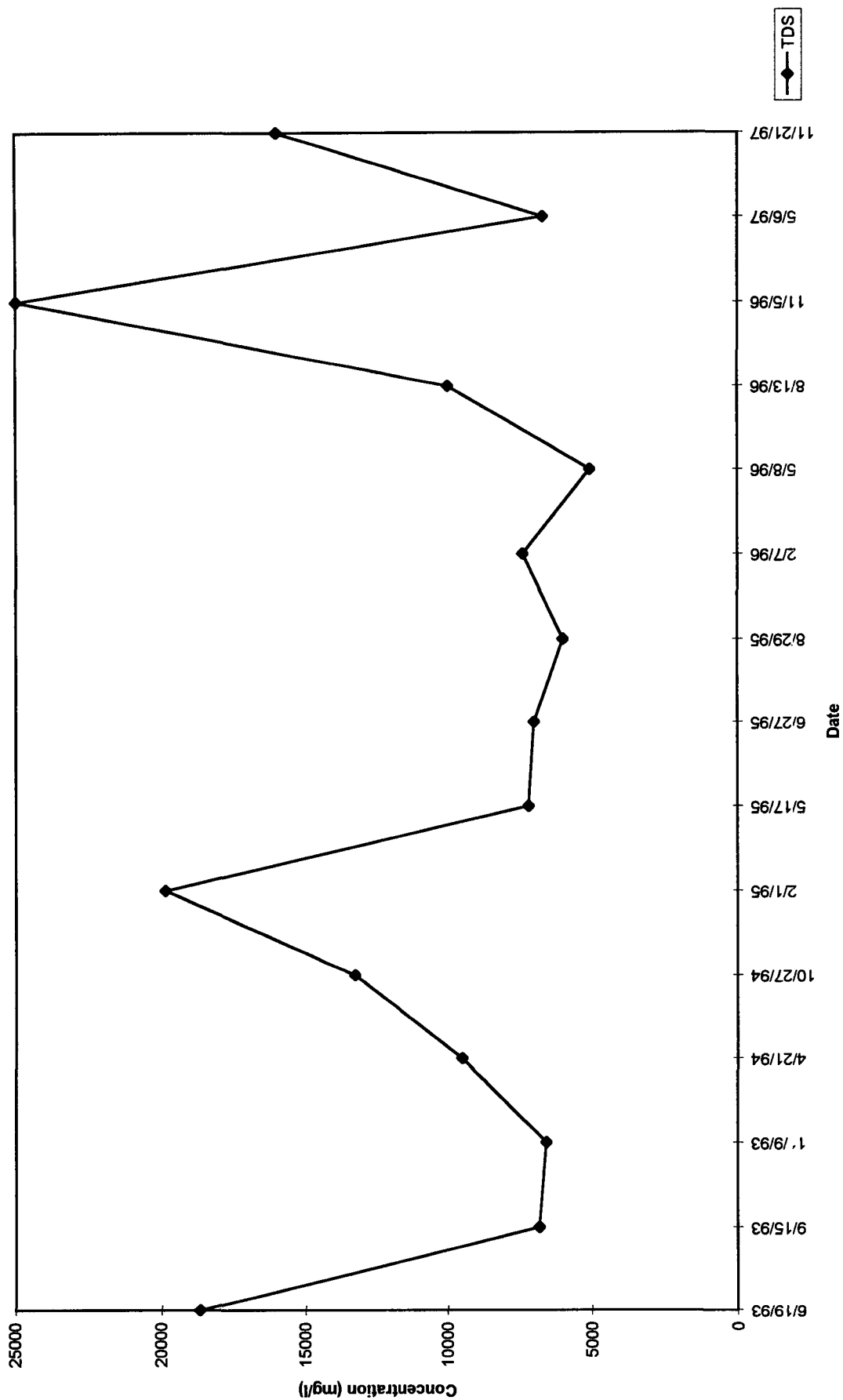
MONITOR WELL ACW #10



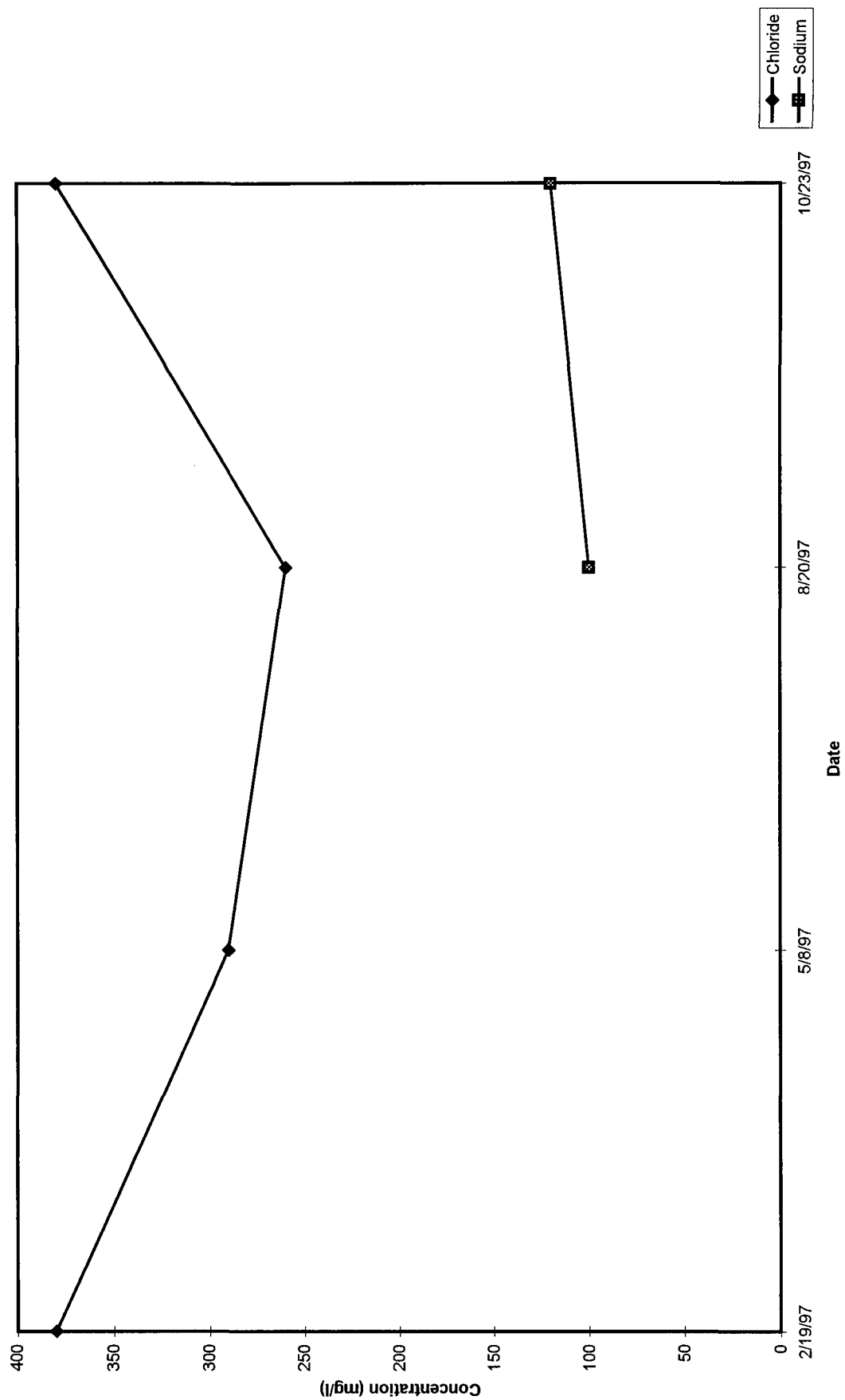
MONITOR WELL ACW #11



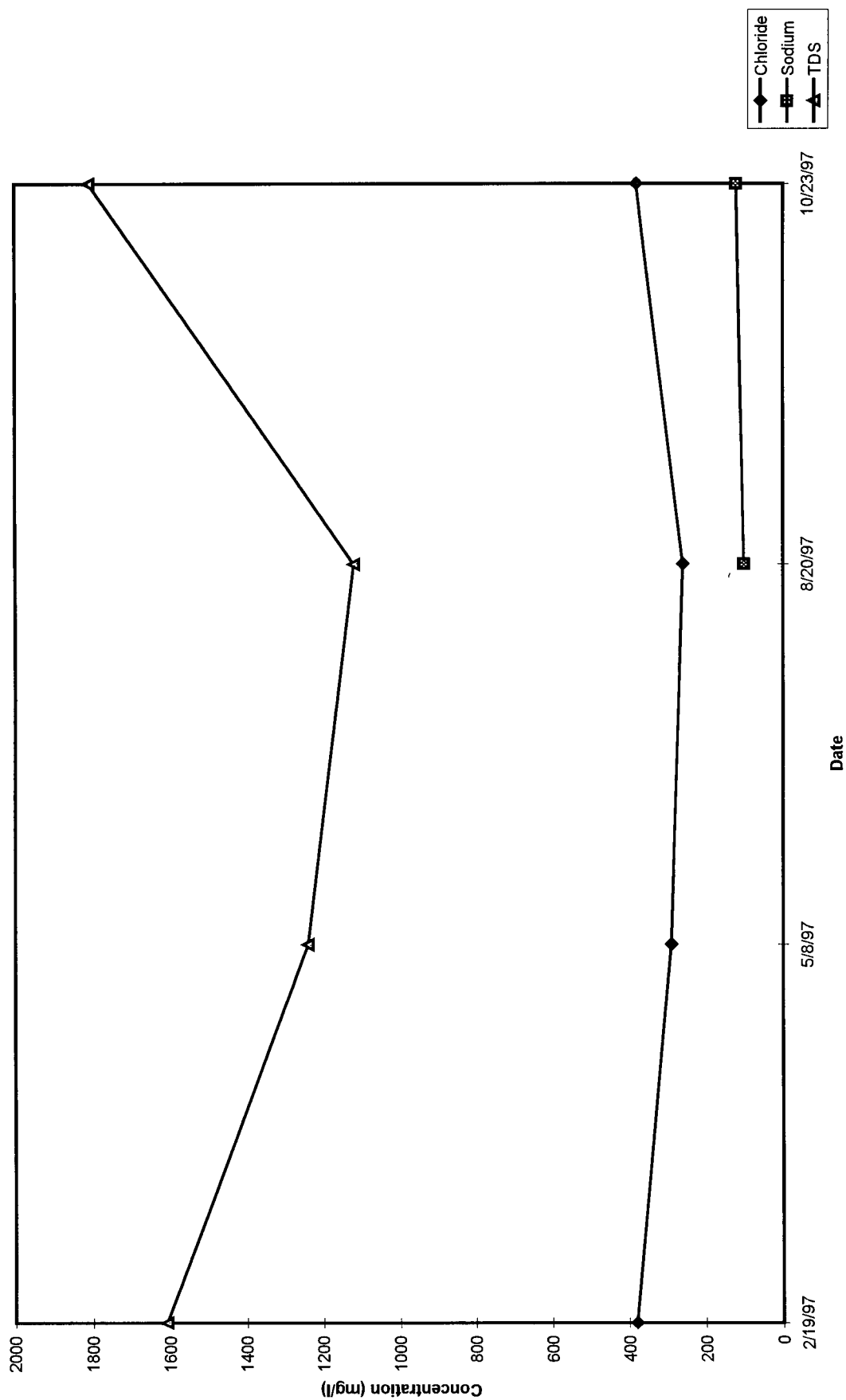
MONITOR WELL ACW #11



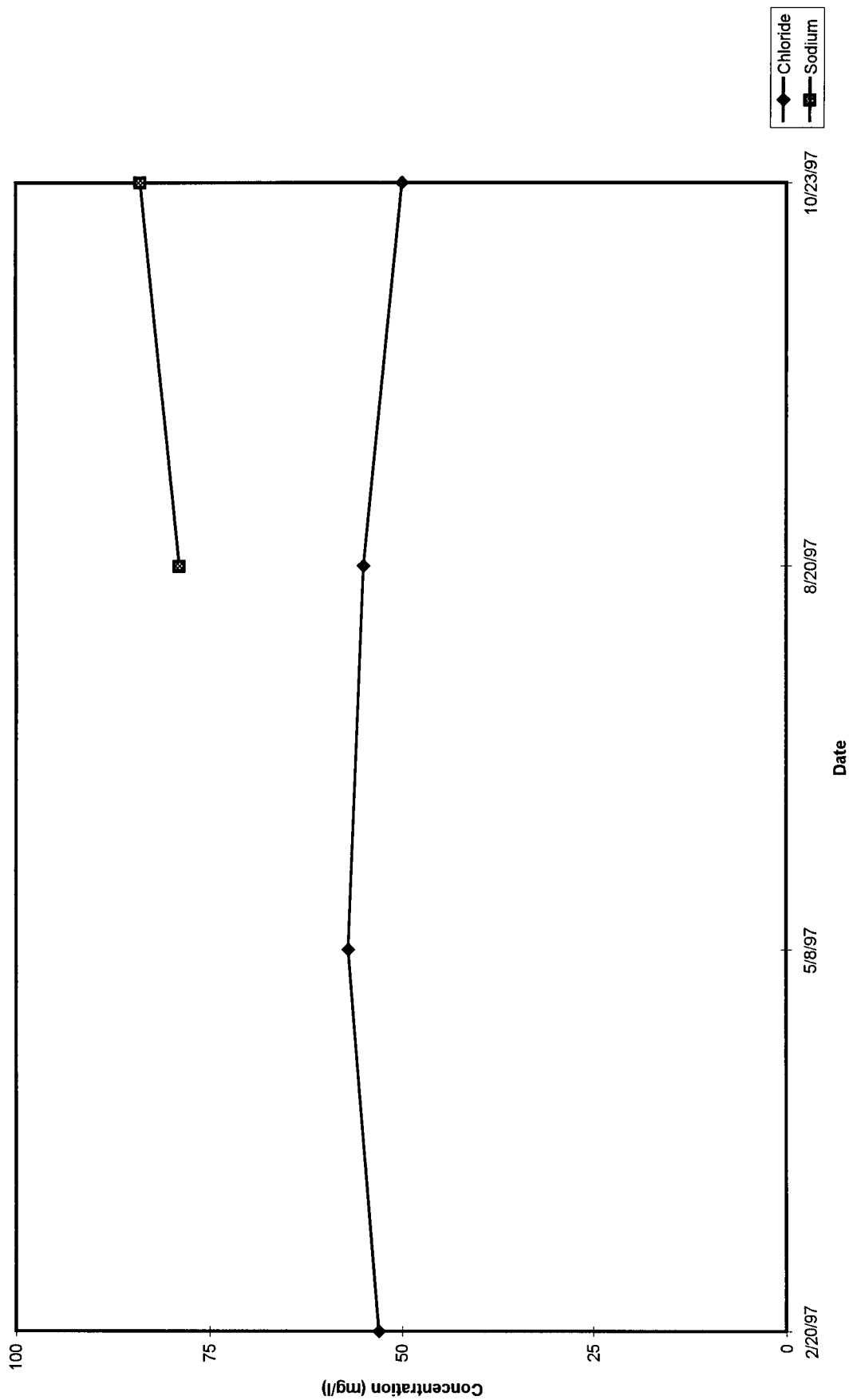
MONITOR WEL ACW #12



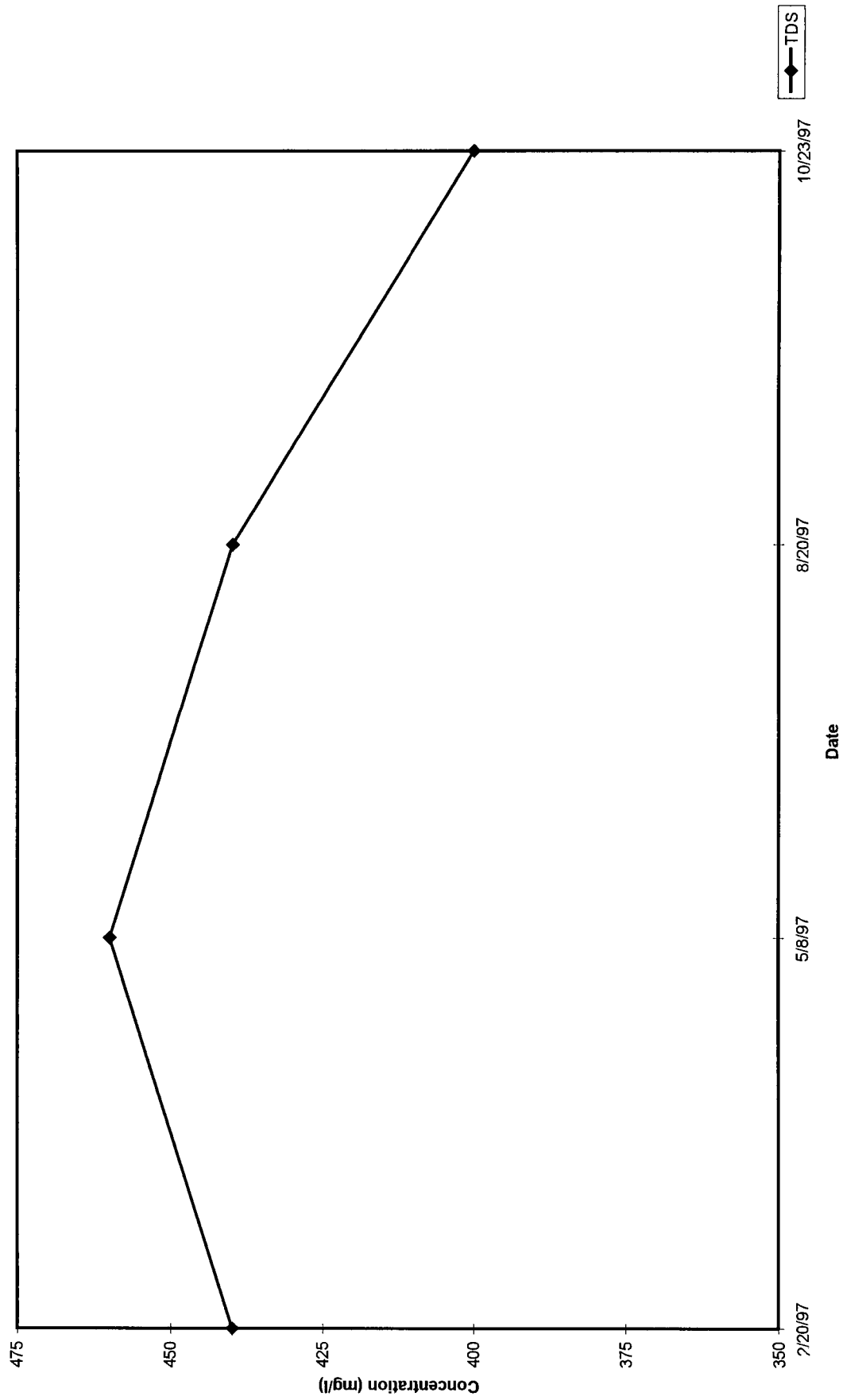
MONITOR WELL ACW 12



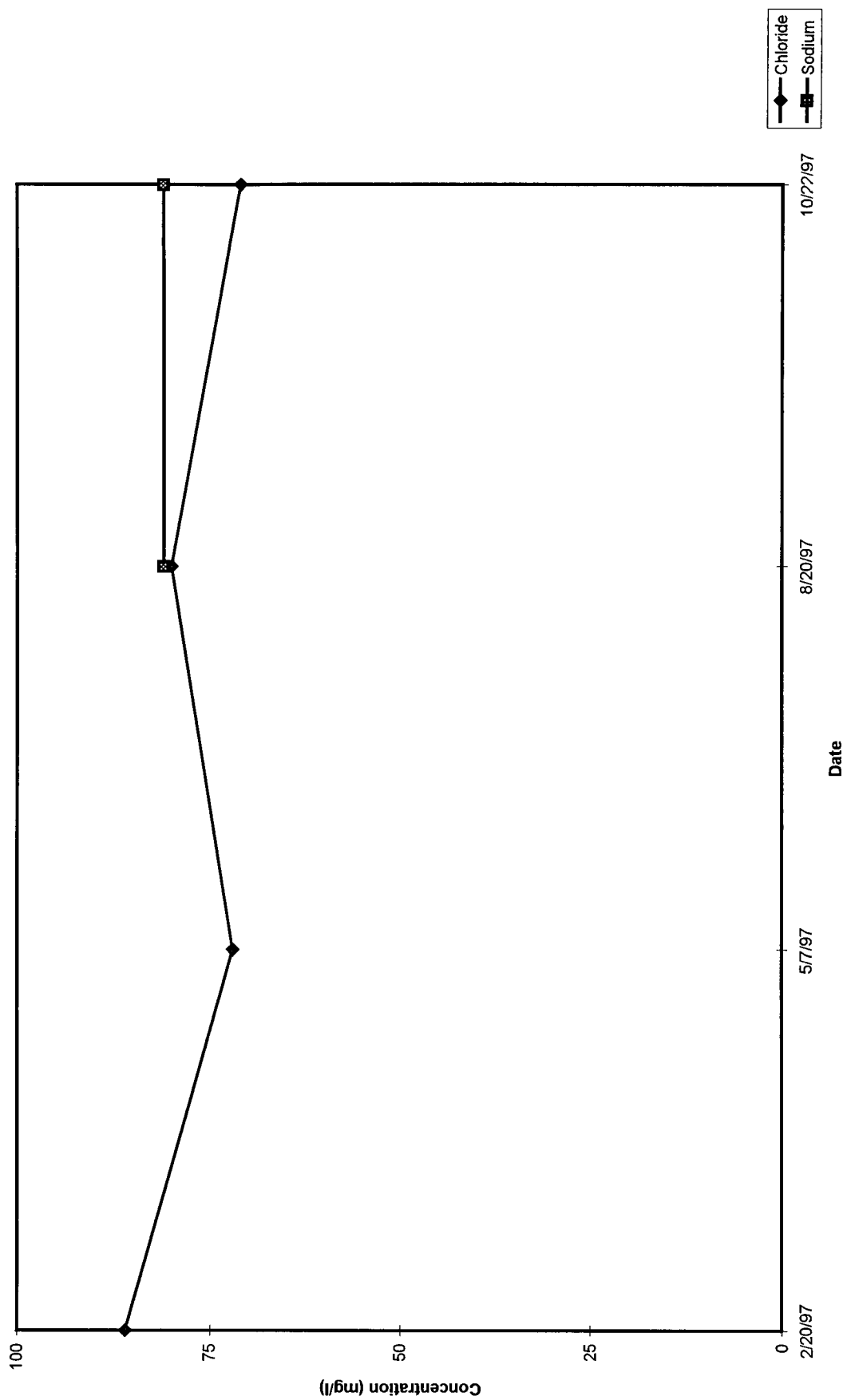
MONITOR WELL ACW 13



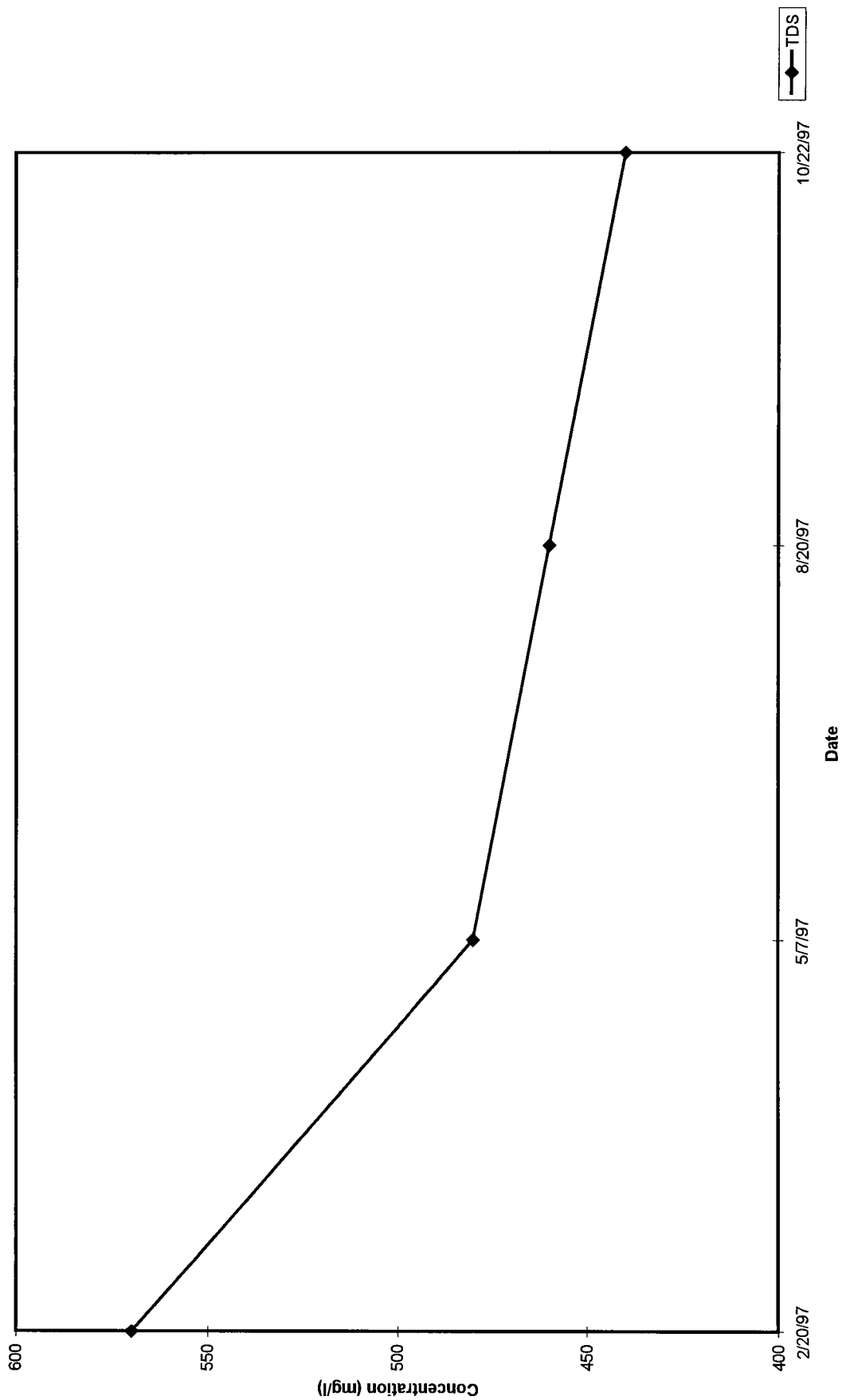
MONITOR WELL ACW 13



MONITOR WELL ACW #14



MONITOR WELL ACW #14



**SAMPLE KEY**

SAMPLE NUMBER: S97-0043 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL # ACW12 DUP.  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 17:55 SAMPLE DATE: 02/19/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0044 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: PRODUCTION WELL #OXY  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 17:30 SAMPLE DATE: 02/19/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0045 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL # ACW13  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 11:45 SAMPLE DATE: 02/20/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0046 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL #ACW15/4  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 10:25 SAMPLE DATE: 02/26/97

# *American Environmental Network (Arizona), Inc.*

AEN I.D. 702277

March 7, 1997

El Paso Natural Gas Company  
8645 Railroad Drive  
El Paso, TX 79904

Project Name/Number: Jal #4

Attention: Darrell Campbell

On 02/22/97, American Environmental Network (Arizona), Inc., received a request to analyze aqueous sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

EPA method 160.1-total dissolved solids analysis was added on 02/26/97 for all samples. Per the clients request, run analysis past holding time.

If you have any questions or comments, please do not hesitate to contact us at (602) 496-4400.



Linda Eshelman  
Project Manager

LE/jk

Enclosure

ADHS License No. AZ0061  
Sherman McCutcheon, General Manager

*American Environmental Network (Arizona), Inc.*

CLIENT : EL PASO NATURAL GAS  
PROJECT # : (NONE)  
PROJECT NAME : JAL #4

DATE RECEIVED : 02/22/97

REPORT DATE : 03/07/97

ATI I.D. : 702277

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	S97-0037	AQUEOUS	02/18/97
02	S97-0038	AQUEOUS	02/18/97
03	S97-0039	AQUEOUS	02/18/97
04	S97-0040	AQUEOUS	02/19/97
05	S97-0041	AQUEOUS	02/19/97
06	S97-0042	AQUEOUS	02/19/97
07	S97-0043	AQUEOUS	02/19/97
08	S97-0044	AQUEOUS	02/19/97
09	S97-0045	AQUEOUS	02/20/97

----- TOTALS -----

MATRIX	# SAMPLES
-----	-----
AQUEOUS	9

ATI STANDARD DISPOSAL PRACTICE

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

*American Environmental Network (Arizona), Inc.*

GENERAL CHEMISTRY RESULTS

ATI I.D. : 702277

CLIENT : EL PASO NATURAL GAS  
PROJECT # : (NONE)  
PROJECT NAME : JAL #4

DATE RECEIVED : 02/22/97

REPORT DATE : 03/07/97

PARAMETER	UNITS	01	02	03	04	05
CHLORIDE (EPA 325.2)	MG/L	<0.5	<0.5	110	38	1260
CONDUCTIVITY, (UMHOS/CM)		2	2	732	618	4110
T. DISSOLVED SOLIDS (160.1)	MG/L	<10	<10	460	440	2500

*American Environmental Network (Arizona), Inc.*

GENERAL CHEMISTRY RESULTS

ATI I.D. : 702277

CLIENT : EL PASO NATURAL GAS

DATE RECEIVED : 02/22/97

PROJECT # : (NONE)

PROJECT NAME : JAL #4

REPORT DATE : 03/07/97

PARAMETER	UNITS	06	07	08	09
CHLORIDE (EPA 325.2)	MG/L	380	390	70	53
CONDUCTIVITY, (UMHOS/CM)		1610	1630	659	681
T. DISSOLVED SOLIDS (160.1)	MG/L	950	960	440	440

*American Environmental Network (Arizona), Inc.*

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : EL PASO NATURAL GAS  
PROJECT # : (NONE)  
PROJECT NAME : JAL #4

ATI I.D. : 702277

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CHLORIDE	MG/L	70218004	15	14	7	68	50	106
CHLORIDE	MG/L	70227702	<0.5	<0.5	NA	9	10	90
CHLORIDE	MG/L	70231401	150	150	0	350	200	100
CONDUCTIVITY (UMHOS/CM)		70228804	316	314	0.6	NA	NA	NA
TOTAL DISSOLVED SOLIDS	MG/L	70227701	<10	<10	NA	NA	NA	NA

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

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

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 70227701

TEST : BTEX + MTBE (EPA METHOD 8020)

CLIENT : EL PASO NATURAL GAS  
PROJECT # : (NONE)  
PROJECT NAME : JAL #4  
CLIENT I.D. : S97-0037  
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 02/18/97  
DATE RECEIVED : 02/22/97  
DATE EXTRACTED : N/A  
DATE ANALYZED : 02/24/97  
UNITS : UG/L  
DILUTION FACTOR : 1

-----  
COMPOUNDS

RESULTS  
-----

BENZENE	<0.5
TOLUENE	<0.5
ETHYLBENZENE	<0.5
TOTAL XYLENES	<1.0
METHYL-t-BUTYL ETHER	<2.5

SURROGATE PERCENT RECOVERIES

BROMOFLUOROBENZENE (%) 96

*American Environmental Network (Arizona), Inc.*

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 70227702

TEST : BTEX + MTBE (EPA METHOD 8020)

CLIENT : EL PASO NATURAL GAS  
PROJECT # : (NONE)  
PROJECT NAME : JAL #4  
CLIENT I.D. : S97-0038  
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 02/18/97  
DATE RECEIVED : 02/22/97  
DATE EXTRACTED : N/A  
DATE ANALYZED : 02/24/97  
UNITS : UG/L  
DILUTION FACTOR : 1

-----  
COMPOUNDS

RESULTS  
-----

BENZENE	<0.5
TOLUENE	<0.5
ETHYLBENZENE	<0.5
TOTAL XYLENES	<1.0
METHYL-t-BUTYL ETHER	<2.5

SURROGATE PERCENT RECOVERIES

BROMOFLUOROBENZENE (%) 98

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 70227703

TEST : BTEX + MTBE (EPA METHOD 8020)

CLIENT : EL PASO NATURAL GAS  
PROJECT # : (NONE)  
PROJECT NAME : JAL #4  
CLIENT I.D. : S97-0039  
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 02/18/97  
DATE RECEIVED : 02/22/97  
DATE EXTRACTED : N/A  
DATE ANALYZED : 02/24/97  
UNITS : UG/L  
DILUTION FACTOR : 1

-----  
COMPOUNDS RESULTS  
-----

BENZENE	<0.5
TOLUENE	<0.5
ETHYLBENZENE	<0.5
TOTAL XYLENES	<1.0
METHYL-t-BUTYL ETHER	<2.5

SURROGATE PERCENT RECOVERIES

BROMOFLUOROBENZENE (%)	100
------------------------	-----

*American Environmental Network (Arizona), Inc.*

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 70227704

TEST : BTEX + MTBE (EPA METHOD 8020)

CLIENT : EL PASO NATURAL GAS  
PROJECT # : (NONE)  
PROJECT NAME : JAL #4  
CLIENT I.D. : S97-0040  
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 02/19/97  
DATE RECEIVED : 02/22/97  
DATE EXTRACTED : N/A  
DATE ANALYZED : 02/24/97  
UNITS : UG/L  
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
BENZENE	<0.5
TOLUENE	<0.5
ETHYLBENZENE	<0.5
TOTAL XYLENES	<1.0
METHYL-t-BUTYL ETHER	<2.5

SURROGATE PERCENT RECOVERIES

BRCMOFLUOROBENZENE (%)	92
------------------------	----

*American Environmental Network (Arizona), Inc.*

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 70227705

TEST : BTEX + MTBE (EPA METHOD 8020)

CLIENT : EL PASO NATURAL GAS  
PROJECT # : (NONE)  
PROJECT NAME : JAL #4  
CLIENT I.D. : S97-0041  
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 02/19/97  
DATE RECEIVED : 02/22/97  
DATE EXTRACTED : N/A  
DATE ANALYZED : 02/24/97  
UNITS : UG/L  
DILUTION FACTOR : 1

-----  
COMPOUNDS

RESULTS  
-----

BENZENE	1.3
TOLUENE	4.0
ETHYLBENZENE	10
TOTAL XYLENES	4.2
METHYL-t-BUTYL ETHER	8.0

SURROGATE PERCENT RECOVERIES

BROMOFLUOROBENZENE (%) 103

*American Environmental Network (Arizona), Inc.*

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 70227706

TEST : BTEX + MTBE (EPA METHOD 8020)

CLIENT : EL PASO NATURAL GAS  
PROJECT # : (NONE)  
PROJECT NAME : JAL #4  
CLIENT I.D. : S97-0042  
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 02/19/97  
DATE RECEIVED : 02/22/97  
DATE EXTRACTED : N/A  
DATE ANALYZED : 02/24/97  
UNITS : UG/L  
DILUTION FACTOR : 1

-----  
COMPOUNDS

RESULTS  
-----

BENZENE	<0.5
TOLUENE	<0.5
ETHYLBENZENE	1.5
TOTAL XYLENES	<1.0
METHYL-t-BUTYL ETHER	<2.5

SURROGATE PERCENT RECOVERIES

BROMOFLUOROBENZENE (%) 93

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 70227707

TEST : BTEX + MTBE (EPA METHOD 8020)

CLIENT : EL PASO NATURAL GAS  
PROJECT # : (NONE)  
PROJECT NAME : JAL #4  
CLIENT I.D. : S97-0043  
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 02/19/97  
DATE RECEIVED : 02/22/97  
DATE EXTRACTED : N/A  
DATE ANALYZED : 02/24/97  
UNITS : UG/L  
DILUTION FACTOR : 1

-----  
COMPOUNDS

RESULTS  
-----

BENZENE	2.9
TOLUENE	<0.5
ETHYLBENZENE	<0.5
TOTAL XYLENES	<1.0
METHYL-t-BUTYL ETHER	8.1

SURROGATE PERCENT RECOVERIES

BROMOFLUOROBENZENE (%)	98
------------------------	----

*American Environmental Network (Arizona), Inc.*

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 70227708

TEST : BTEX + MTBE (EPA METHOD 8020)

CLIENT : EL PASO NATURAL GAS  
PROJECT # : (NONE)  
PROJECT NAME : JAL #4  
CLIENT I.D. : S97-0044  
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 02/19/97  
DATE RECEIVED : 02/22/97  
DATE EXTRACTED : N/A  
DATE ANALYZED : 02/24/97  
UNITS : UG/L  
DILUTION FACTOR : 1

-----  
COMPOUNDS

RESULTS  
-----

BENZENE	<0.5
TOLUENE	<0.5
ETHYLBENZENE	1.4
TOTAL XYLENES	<1.0
METHYL-t-BUTYL ETHER	<2.5

SURROGATE PERCENT RECOVERIES

BROMOFLUOROBENZENE (%) 98

*American Environmental Network (Arizona), Inc.*

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 70227709

TEST : BTEX + MTBE (EPA METHOD 8020)

CLIENT : EL PASO NATURAL GAS  
PROJECT # : (NONE)  
PROJECT NAME : JAL #4  
CLIENT I.D. : S97-0045  
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 02/20/97  
DATE RECEIVED : 02/22/97  
DATE EXTRACTED : N/A  
DATE ANALYZED : 02/24/97  
UNITS : UG/L  
DILUTION FACTOR : 1

-----  
COMPOUNDS

RESULTS  
-----

BENZENE	<0.5
TOLUENE	<0.5
ETHYLBENZENE	1.5
TOTAL XYLENES	<1.0
METHYL-t-BUTYL ETHER	<2.5

SURROGATE PERCENT RECOVERIES

BROMOFLUOROBENZENE (%)	98
------------------------	----

*American Environmental Network (Arizona), Inc.*

GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : BTEX + MTBE (EPA METHOD 8020)

CLIENT : EL PASO NATURAL GAS  
PROJECT # : (NONE)  
PROJECT NAME : JAL #4  
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 702277  
DATE EXTRACTED : N/A  
DATE ANALYZED : 02/24/97  
UNITS : UG/L  
DILUTION FACTOR : N/A

COMPOUNDS	RESULTS
BENZENE	<0.5
TOLUENE	<0.5
ETHYLBENZENE	<0.5
TOTAL XYLENES	<1.0
METHYL-t-BUTYL ETHER	<2.5

SURROGATE PERCENT RECOVERIES

BROMOFLUOROBENZENE (%) 103

*American Environmental Network (Arizona), Inc.*

QUALITY CONTROL DATA

ATI I.D. : 702277

TEST : BTEX + MTBE (EPA METHOD 8020)

CLIENT : EL PASO NATURAL GAS

PROJECT # : (NONE)

DATE ANALYZED : 02/24/97

PROJECT NAME : JAL #4

SAMPLE MATRIX : AQUEOUS

REF I.D. : 70227709

UNITS : UG/L

COMPOUNDS	SAMPLE CONC.		SPIKED	% SPIKED	DUP.		RPD
	RESULT	SPIKED			SAMPLE	REC.	
BENZENE	<0.5	20	18	90	18	90	0
TOLUENE	<0.5	20	18	90	19	95	5
ETHYLBENZENE	1.5	20	18	82	19	83	5
TOTAL XYLENES	<0.5	60	55	92	55	92	0
METHYL-t-BUTYL ETHER	<2.5	40	45	112	45	112	0

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

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

*American Environmental Network (Arizona), Inc.*

DATE OF ANALYSIS

ACCESSION #: 702277

SAMPLE ID	TEST AND METHOD NUMBER	DATE OF ANALYSIS	ANALYST
70227701	CHLORIDE (EPA 325.2)	03/05/97	CM
70227702	CHLORIDE (EPA 325.2)	03/05/97	CM
70227703	CHLORIDE (EPA 325.2)	03/05/97	CM
70227704	CHLORIDE (EPA 325.2)	03/05/97	CM
70227705	CHLORIDE (EPA 325.2)	03/06/97	CM
70227706	CHLORIDE (EPA 325.2)	03/06/97	CM
70227707	CHLORIDE (EPA 325.2)	03/06/97	CM
70227708	CHLORIDE (EPA 325.2)	03/05/97	CM
70227709	CHLORIDE (EPA 325.2)	03/06/97	CM
70227701	CONDUCTIVITY, (UMHOS/CM)	02/25/97	PS
70227702	CONDUCTIVITY, (UMHOS/CM)	02/25/97	PS
70227703	CONDUCTIVITY, (UMHOS/CM)	02/25/97	PS
70227704	CONDUCTIVITY, (UMHOS/CM)	02/25/97	PS
70227705	CONDUCTIVITY, (UMHOS/CM)	02/25/97	PS
70227706	CONDUCTIVITY, (UMHOS/CM)	02/25/97	PS
70227707	CONDUCTIVITY, (UMHOS/CM)	02/25/97	PS
70227708	CONDUCTIVITY, (UMHOS/CM)	02/25/97	PS
70227709	CONDUCTIVITY, (UMHOS/CM)	02/25/97	PS
70227701	T. DISSOLVED SOLIDS (160.1)	02/27/97	DH
70227702	T. DISSOLVED SOLIDS (160.1)	02/27/97	DH
70227703	T. DISSOLVED SOLIDS (160.1)	02/27/97	DH
70227704	T. DISSOLVED SOLIDS (160.1)	02/27/97	DH
70227705	T. DISSOLVED SOLIDS (160.1)	02/27/97	DH
70227706	T. DISSOLVED SOLIDS (160.1)	02/27/97	DH
70227707	T. DISSOLVED SOLIDS (160.1)	02/27/97	DH
70227708	T. DISSOLVED SOLIDS (160.1)	02/27/97	DH
70227709	T. DISSOLVED SOLIDS (160.1)	02/27/97	DH

REFERENCES:

Methods for Chemical Analysis of Water and Wastes, March 1983, EPA-600 4-79-020



CHAIN OF CUSTODY RECORD

Page 1 of 1

#1 702277

PROJECT NUMBER		PROJECT NAME		TOTAL NUMBER OF CONTAINERS		COMPOSITE OR GRAB		REQUESTED ANALYSIS		CONTRACT LABORATORY P. O. NUMBER	
LAB ID		DATE	TIME	MATRIX	SAMPLE NUMBER						
1	2118197	11:00	11:20	H <sub>2</sub> O	597-0037	3		BTEX	CI		
2	2118197	11:20	11:20	H <sub>2</sub> O	597-0038	3			X		
3	2118197	11:50	11:20	H <sub>2</sub> O	597-0039	3					
4	2118197	13:30	11:20	H <sub>2</sub> O	597-0040	3					
5	2118197	15:39	11:20	H <sub>2</sub> O	597-0041	3					
6	2118197	17:55	11:20	H <sub>2</sub> O	597-0042	3					
7	2118197	17:55	11:20	H <sub>2</sub> O	597-0043	3					
8	2118197	17:30	11:20	H <sub>2</sub> O	597-0044	3					
9	2118197	11:45	11:20	H <sub>2</sub> O	597-0045	3					
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)		DATE/TIME		RELINQUISHED BY: (Signature)		RECEIVED BY: (Signature)	
John S. Smith		9/18/97 12:00								9/18/97 10:14	
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)		DATE/TIME		RELINQUISHED BY: (Signature)		RECEIVED BY: (Signature)	
										M. L. Smith	
HELD FOR TURBOCHARGE TIME		ROUTINE		RUSH		SAMPLE RECEIPT REMAINS		RESULTS & INVOICES TO:		TRANSMISSION OPERATIONS LABORATORY	
CARRIER CO										EL PASO NATURAL GAS COMPANY	
BILL NO										8645 RAILROAD DRIVE	
										EL PASO, TEXAS 79904	
										915-759-2229 FAX: 915-759-2335	

# *American Environmental Network (Arizona), Inc.*

AEN I.D. 702384

March 18, 1997

El Paso Natural Gas Company  
8645 Railroad Drive  
El Paso, TX 79904

Project Name/Number: JAL #4

Attention: Darrell Campbell

On 02/28/97, American Environmental Network (Arizona), Inc., received a request to analyze aqueous sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

If you have any questions or comments, please do not hesitate to contact us at (602) 496-4400.



Linda Eshelman  
Project Manager

LE/jk

Enclosure

ADHS License No. AZ0061  
Sherman McCutcheon, General Manager

*American Environmental Network (Arizona), Inc.*

CLIENT : EL PASO NATURAL GAS  
PROJECT # : (NONE)  
PROJECT NAME : JAL #4

DATE RECEIVED : 02/28/97

REPORT DATE : 03/17/97

ATI I.D. : 702384

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	S97-0046	AQUEOUS	02/26/97

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	1

ATI STANDARD DISPOSAL PRACTICE

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

*American Environmental Network (Arizona) Inc*  
GENERAL CHEMISTRY RESULTS

ATI I.D. : 702384

CLIENT : EL PASO NATURAL GAS  
PROJECT # : (NONE)  
PROJECT NAME : JAL #4

DATE RECEIVED : 02/28/97

REPORT DATE : 03/17/97

PARAMETER	UNITS	01
CHLORIDE (EPA 325.2)	MG/L	86
CONDUCTIVITY, (UMHOS/CM)		830
T. DISSOLVED SOLIDS (160.1)	MG/L	570

*American Environmental Network (Arizona) Inc.*

GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : EL PASO NATURAL GAS  
PROJECT # : (NONE)  
PROJECT NAME : JAL #4

ATI I.D. : 702384

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CHLORIDE	MG/L	70317003	7	7	0	17	10	100
CONDUCTIVITY(UMHOS/CM)		70231501	920	917	0.3	NA	NA	NA
TOTAL DISSOLVED SOLIDS	MG/L	70236301	290	290	0	NA	NA	NA

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

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

*American Environmental Network (Arizona), Inc.*

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 70238401

TEST : BTEX + MTBE (EPA METHOD 8020)

CLIENT : EL PASO NATURAL GAS  
PROJECT # : (NONE)  
PROJECT NAME : JAL #4  
CLIENT I.D. : S97-0045  
SAMPLE MATRIX : AQUEOUS

DATE SAMPLED : 02/26/97  
DATE RECEIVED : 02/28/97  
DATE EXTRACTED : N/A  
DATE ANALYZED : 03/06/97  
UNITS : UG/L  
DILUTION FACTOR : 1

-----  
COMPOUNDS

RESULTS  
-----

BENZENE	<0.5
TOLUENE	<0.5
ETHYLBENZENE	<0.5
TOTAL XYLENES	<1.0
METHYL-t-BUTYL ETHER	<2.5

SURROGATE PERCENT RECOVERIES

BROMOFLUOROBENZENE (%) 86

*American Environmental Network (AEN) - RESULTS*

REAGENT BLANK

TEST : BTEX + MTBE (EPA METHOD 8020)

CLIENT : EL PASO NATURAL GAS  
PROJECT # : (NONE)  
PROJECT NAME : JAL #4  
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 702384  
DATE EXTRACTED : N/A  
DATE ANALYZED : 03/06/97  
UNITS : UG/L  
DILUTION FACTOR : N/A

COMPOUNDS

RESULTS

BENZENE	<0.5
TOLUENE	<0.5
ETHYLBENZENE	<0.5
TOTAL XYLENES	<1.0
METHYL-t-BUTYL ETHER	<2.5

SURROGATE PERCENT RECOVERIES

BROMOFLUOROBENZENE (%)	99
------------------------	----

*American Environmental Network (Arizona), Inc.*

QUALITY CONTROL DATA

ATI I.D. : 702384

TEST : BTEX + MTBE (EPA METHOD 8020)

CLIENT : EL PASO NATURAL GAS  
PROJECT # : (NONE)  
PROJECT NAME : JAL #4  
REF I.D. : 70238401

DATE ANALYZED : 03/06/97  
SAMPLE MATRIX : AQUEOUS  
UNITS : UG/L

COMPOUNDS	SAMPLE CONC.		SPIKED SAMPLE	% REC.	DUP.	DUP.	RPD
	RESULT	SPIKED			SPIKED SAMPLE	% REC.	
BENZENE	<0.5	20	19	95	19	95	0
TOLUENE	<0.5	20	19	95	19	95	0
ETHYLBENZENE	<0.5	20	21	105	20	100	5
TOTAL XYLENES	<1.0	60	65	108	63	105	3
METHYL-t-BUTYL ETHER	<2.5	40	37	92	38	95	3

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

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

*American Environmental Network (Arizona), Inc.*

DATE OF ANALYSIS

ACCESSION #: 702384

SAMPLE ID	TEST AND METHOD NUMBER	DATE OF ANALYSIS	ANALYST
70238401	CHLORIDE (EPA 325.2)	3/13/97	CM
70238401	CONDUCTIVITY. (UMHOS/CM)	2/28/97	PS
70238401	T. DISSOLVED SOLIDS (160.1)	2/28/97	DH

REFERENCES: Methods for Chemical Analysis of Water and Wastes, March 1983. EPA-600 4-79-020

[illegible]

**SAMPLE KEY**

SAMPLE NUMBER: S97-0213 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: PUMP BLANK BEFORE PURGING WELL'S EMP#3  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 06:30 SAMPLE DATE: 05/06/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0215 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW #2A  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 06:30 SAMPLE DATE: 05/06/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0216 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW #4  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 10:33 SAMPLE DATE: 05/06/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0217 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW #3  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 12:06 SAMPLE DATE: 05/06/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0218 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ENSR#2  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 13:10 SAMPLE DATE: 05/06/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0219 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW#1  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 14:22 SAMPLE DATE: 05/06/97

Environmental Affairs  
JUN 19 1997  
Discontinued Operations

**SAMPLE KEY**

SAMPLE NUMBER: S97-0220 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW#8  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 16:07 SAMPLE DATE: 05/06/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0221 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW#11  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 17:40 SAMPLE DATE: 05/06/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0222 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL PTP#1  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 08:37 SAMPLE DATE: 05/07/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0223 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ENSR#3  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 10:00 SAMPLE DATE: 05/07/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0224 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ENSR#3 DUP  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 10:00 SAMPLE DATE: 05/07/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0225 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: PRODUCTION WELL DOOM'S WATER WELL  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 11:00 SAMPLE DATE: 05/07/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0226 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: FIELD BLANK  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 11:25 SAMPLE DATE: 05/07/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0227 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ENSR#1  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 12:13 SAMPLE DATE: 05/07/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0228 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: PUMP BLANK MIDDLE OF PURGING EMP#3  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 13:15 SAMPLE DATE: 05/07/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0229 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: BAILER BLANK MIDDLE OF SAMPLING WELL'S  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 13:38 SAMPLE DATE: 05/07/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0230 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW #7  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 14:13 SAMPLE DATE: 05/07/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0231 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW #5  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 16:10 SAMPLE DATE: 05/07/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0232 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW #15<sub>4</sub>  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 17:40 SAMPLE DATE: 05/07/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0233 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW #6  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 08:41 SAMPLE DATE: 05/08/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0234 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW #9  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 10:25 SAMPLE DATE: 05/08/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0235 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW #10  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 12:04 SAMPLE DATE: 05/08/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0236 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW #12  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 13:56 SAMPLE DATE: 05/08/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0237 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW #13  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 15:55 SAMPLE DATE: 05/08/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0238 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW #13 DUP.  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 15:55 SAMPLE DATE: 05/08/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0239 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: PUMP BLANK AFTER PURGING WELL'S EMP #3  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 16:20 SAMPLE DATE: 05/08/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0240 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: BAILER BLANK AFTER SAMPLING WELL'S  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 16:25 SAMPLE DATE: 05/08/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0241 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: PRODUCTION WELL OXY  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 16:50 SAMPLE DATE: 05/08/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0244 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: PRODUCTION WELL #1  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 19:20 SAMPLE DATE: 05/08/97



# PARAGON ANALYTICS, INC.

225 Commerce Drive ♦ Fort Collins, CO 80524 ♦ (800) 443-1511 ♦ (970) 490-1511 ♦ FAX (970) 490-1522

May 29, 1997

Mr. Darrell Campbell  
El Paso Natural Gas CO.  
8645 Railroad Drive  
El Paso, TX 79904

RE: Paragon Workorder: 97-05-056  
Client Project Name: S97-0213  
Client Project Number : Not Submitted

Dear Mr. Campbell:

Nine water samples were received from El Paso Natural Gas Co. on May 8, 1997. The samples were scheduled for Inorganic, Specific Conductance and Aromatic Volatile analysis. The results for these analyses are contained in the enclosed report.

Thank you for your confidence in Paragon Analytics, Inc. Should you have any questions, please call.

Sincerely,

Paragon Analytics, Inc.  
Victoria Bayly  
Project Manager

VB/jjc  
Enclosure: report



# Paragon Analytics, Inc.

## INORGANICS CASE NARRATIVE

---

### El Paso Natural Gas Co.

S97-0213

Order Number - 9705056

1. This report consists of data for 9 water samples analyzed for chloride and total dissolved solids.
2. The samples were received cool and intact on 05/05/97.
3. The samples had been correctly preserved for the requested analyses.
4. The samples were analyzed using procedures based on the following methods from the USEPA:

<u>Analyte</u>	<u>Method</u>
Chloride	300.0
Total Dissolved Solids	160.1

5. All standards and reagents were used within their recommended shelf life.
6. The samples were prepared and analyzed within the established hold times.
7. Sample results which are below the reporting limit are reported as "ND" on the enclosed report.

All in house quality control procedures were followed, as described below.

8. General quality control procedures.
  - A matrix duplicate or a matrix spike and matrix spike duplicate (MS/MSD) and a blank spike (LCS) were analyzed with each analysis batch.
  - For each analysis batch the method blank results were below the reporting limit for the requested analyte. This indicates that no contaminants were introduced to the samples during analysis.
  - The MS and MSD results for chloride were within acceptance limits.



- The matrix duplicate results for total dissolved solids were within acceptance limits.
- The LCS results for chloride and total dissolved solids were within acceptance limits.

The data contained in the following report have been reviewed and approved by the personnel listed below:

BJ  
Reporter's Initials

5-29-97  
Date

SW  
Reviewer's Initials

5/29/97  
Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

**Paragon Analytics, Inc.**

**SAMPLE NUMBER(S) CROSS-REFERENCE TABLE**

**Client Name: El Paso Natural Gas Co.**

**Client Project ID: S97-0213**

PAI-ID	Client ID	MATRIX	DATE
			SAMPLED
9705056-1	S97-0213 <i>Blank - EMP#3</i>	Water	05/06/97
9705056-2	S97-0210	Water	05/06/97
9705056-3	S97-0215 <i>ACW-2A</i>	Water	05/06/97
9705056-4	S97-0216 <i>ACW-4</i>	Water	05/06/97
9705056-5	S97-0217 <i>ACW-3</i>	Water	05/06/97
9705056-6	S97-0218 <i>ENSE-2</i>	Water	05/06/97
9705056-7	S97-0219 <i>ACW-1</i>	Water	05/06/97
9705056-8	S97-0220 <i>ACW-8</i>	Water	05/06/97
9705056-9	S97-0221 <i>ACW-11</i>	Water	05/06/97

# CHLORIDE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0213

Client Project No: Not Given

Lab Workorder Number: 9705056

Date Collected: 05/06/97

Date Analyzed: 05/22-23/97

Sample Matrix: Water

Client ID	Lab Sample ID	Chloride Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.2
S97-0213 <i>Blank</i>	9705056-1	95	20
S97-0210	9705056-2	ND	0.2
S97-0215 <i>ADD-2A</i>	9705056-3	11000	600
S97-0216 <i>ADD-4</i>	9705056-4	21000	1000
S97-0217 <i>ADD-5</i>	9705056-5	6900	400
S97-0218 <i>STR-2</i>	9705056-6	17000	1000
S97-0219 <i>ADD-1</i>	9705056-7	5200	400
S97-0220 <i>ADD-8</i>	9705056-8	29000	1800
S97-0221 <i>ADD-11</i>	9705056-9	3600	200

ND = Not Detected

# CHLORIDE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9705056-1

Date Analyzed: 05/22/97

Sample Matrix: Water

Sample ID

**S97-0213**

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Chloride	500	95	595	100	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Chloride	500	606	102	2	0-20 %

# TOTAL DISSOLVED SOLIDS

Method 160.1

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0213  
Client Project No: Not Given  
Lab Workorder Number: 9705056

Date Collected: 05/06/97  
Date Prepared: 05/13/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Total Dissolved Solids Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	20
S97-0213 <i>ACW-1</i>	9705056-1	700	20
S97-0210	9705056-2	ND	20
S97-0215 <i>ACW-2</i>	9705056-3	17000	20
S97-0216 <i>ACW-3</i>	9705056-4	25000	20
S97-0217 <i>ACW-4</i>	9705056-5	11000	20
S97-0218 <i>ACW-5</i>	9705056-6	27000	20
S97-0219 <i>ACW-6</i>	9705056-7	8800	20
S97-0220 <i>ACW-7</i>	9705056-8	50000	20
S97-0221 <i>ACW-8</i>	9705056-9	6700	20

ND = Not Detected

# TDS Calculations and Quality Control Results

Preparation Date: 05/13/97

ID	sample vol (mL)	empty beaker tare (g)	beaker + residue gross (g)	net (mg)	calculated conc (mg/L)	DL (mg/L)
Method Blank	100	106.8500	106.8491	-0.9	-9	20
Blank Spike	100	106.0581	106.0965	38.4	384	20
Blank Spike dup	100	107.8544	107.8929	38.5	385	20
9705056-1	100	107.7688	107.8389	70.1	701	20
9705056-1 dup	100	99.9488	100.0182	69.4	694	20
9705056-2	100	103.3699	103.3692	-0.7	-7	20
9705056-3	100	109.4689	111.1983	1729.4	17294	20
9705056-4	100	102.5194	105.0649	2545.5	25455	20
9705056-5	100	103.3171	104.4653	1148.2	11482	20
9705056-6	100	103.8837	106.6123	2728.6	27286	20
9705056-7	100	100.9182	101.7958	877.6	8776	20
9705056-8	100	103.3826	108.3931	5010.5	50105	20
9705056-9	100	97.9645	98.6305	666.0	6660	20
9705068-1	100	103.5135	103.6665	153.0	1530	20
9705068-2	100	97.7515	97.8970	145.5	1455	20
9705068-3	100	105.7064	105.8510	144.6	1446	20
9705068-4	100	104.1013	104.1432	41.9	419	20
9705068-5	100	104.2785	104.2767	-1.8	-18	20
9705068-6	100	113.7099	114.2331	523.2	5232	20
9705068-7	100	108.8069	108.8500	43.1	431	20
9705068-8	100	100.4005	100.3980	-2.5	-25	20
9705068-9	100	101.3278	102.1402	812.4	8124	20
9705068-10	100	105.3772	105.5799	202.7	2027	20
9705068-11	100	105.3777	105.4259	48.2	482	20

## BLANK SUMMARY

ID	blank TDS conc (mg/L)	accept. limit (mg/L)
Method Blank	ND	< 20

## BLANK SPIKE SUMMARY

ID	spike added mg	spike added TDS conc (mg/L)	spiked sample TDS conc (mg/L)	recovery %	accept. limits
Blank Spike	40	400	384	96	85-115%
Blank Spike dup	40	400	385	96	85-115%

## DUPLICATE SUMMARY

ID	sample TDS conc (mg/L)	duplic TDS conc (mg/L)	RPD %	accept. limits
9705056-1	701	694	1.0	< 15%

ND = not detected

# Paragon Analytics, Inc.



## SPECIFIC CONDUCTANCE CASE NARRATIVE

### **El Paso Natural Gas Co.**

S97-0213

**Order Number - 9705056**

1. This report consists of 9 water samples.
2. Samples were received intact on 05/08/97 at a temperature of 9 degrees Celsius.
3. The samples were prepared for analysis based on SW-846, 3<sup>rd</sup> Edition method 9050.
4. All standards and solutions are NIST traceable and were used within their recommended shelf life.
5. The samples were not analyzed within 24 hours of collection time.

All in house quality control procedures were followed, as described below.

6. General quality control procedures.
  - All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analyte. This indicates a valid calibration and stable instrument conditions.
7. A sample from this Order Number was used for the matrix QC samples for this batch.
  - A duplicate was prepared and analyzed with this batch. All acceptance criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below:



Krista Mobley  
Krista Mobley  
Inorganic Technician

5-20-97  
Date

SW  
Reviewer's Initials

5/20/97  
Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

## SPECIFIC CONDUCTANCE

Method 9050

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0213  
Lab Workorder Number: 9705056

Date Collected: 05/06/97  
Date Analyzed: 05/08/97  
Sample Matrix: Water

Client Sample ID	Lab Sample ID	Specific Conductance µmho/cm
S97-0213 <i>Blank</i>	9705056-1	1060
S97-0210	9705056-2	2
S97-0215 <i>2-L</i>	9705056-3	26800
S97-0216 <i>4</i>	9705056-4	48500 *
S97-0217 <i>5</i>	9705056-5	18500
S97-0218 <i>5-1000</i>	9705056-6	50000 *
S97-0219 <i>1</i>	9705056-7	14800
S97-0220 <i>5</i>	9705056-8	89200 *
S97-0221 <i>10</i>	9705056-9	10200

\* Dilution required to keep response within analytical range.



# Paragon Analytics, Inc.

## Aromatic Volatile Organics Case Narrative

---

**El Paso Natural Gas Co.**

**S97-0213**

**Order Number - 9705056**

1. This report consists of 9 water samples received by Paragon on 05/08/97.
2. These samples were prepared and analyzed according to SW-846, 3rd Edition procedures. Specifically, the water samples were prepared by heating and purging 5 mls using purge and trap procedures based on Method 5030.
3. The samples were analyzed using a GC with a DB-624 or DB-VRX capillary column and a PID detector according to protocols based on SW-846 Method 8020. All positive results were quantitated using the responses from the initial calibration curve using the internal standard technique. Second column confirmation was performed on all samples with positive results on a DB-VRX or DB-624 capillary column.
4. All samples were analyzed within the established holding times.
5. The method blanks associated with this project were below the reporting limits for all analytes.
6. All matrix spike and matrix spike duplicate recoveries and RPDs were within acceptance criteria.
7. All blank spike and blank spike duplicate recoveries and RPDs were within the acceptance criteria.
8. All surrogate recoveries were within acceptable limits with the following exceptions;

Sample  
9705056-8

Surrogate  
2,3,4-TFT



The sample was re-analyzed to evaluate whether the original outlier was due to matrix effects or laboratory performance. The re-analysis also had surrogates outside the control limits, which demonstrated the presence of matrix effects

9. All internal standard recoveries were within acceptance criteria.
10. Due to high levels of target analytes samples 9705056-3, -4, -5, -6, and -7 were analyzed at a higher dilution. The reporting limits have been adjusted accordingly.
11. All initial and continuing calibration criteria were within acceptance criteria.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Roland P. Bruggeman  
Roland P. Bruggeman  
Organics Manager

5-22-97  
Date

mb  
Reviewer's Initials

5-22-97  
Date

**Paragon Analytics, Inc.**

**SAMPLE NUMBER(S) CROSS-REFERENCE TABLE**

**Client Name: El Paso Natural Gas Co.**

**Client Project ID: S97-0213**

PAI-ID	Client ID	MATRIX	DATE SAMPLED
9705056-1	S97-0213 <i>El Paso</i>	Water	05/06/97
9705056-2	S97-0210	Water	05/06/97
9705056-3	S97-0215 <i>El</i>	Water	05/06/97
9705056-4	S97-0216 <i>El</i>	Water	05/06/97
9705056-5	S97-0217 <i>El</i>	Water	05/06/97
9705056-6	S97-0218 <i>El Paso</i>	Water	05/06/97
9705056-7	S97-0219 <i>El</i>	Water	05/06/97
9705056-8	S97-0220 <i>El</i>	Water	05/06/97
9705056-9	S97-0221 <i>El</i>	Water	05/06/97

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0213

Lab Sample ID: WRB1 05/12/97

Sample Matrix: Water

Sample ID

**Reagent Blank**

Date Collected: N/A  
Date Extracted: 5/12/97  
Date Analyzed: 5/12/97

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	101	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0213

Sample ID

**S97-0213**

Lab Sample ID: 9705056-1

Date Collected: 5/06/97

Date Extracted: 5/12/97

Date Analyzed: 5/12/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	4.3	0.50
Toluene	4.8	0.50
Ethylbenzene	0.56	0.50
M,P-Xylene	1.3	1.0
O-Xylene	ND	0.50
Total Xylenes	1.3	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	98	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0213

Lab Sample ID: 9705056-2

Sample Matrix: Water

Sample ID

**S97-0210**

Date Collected: 5/06/97

Date Extracted: 5/12/97

Date Analyzed: 5/12/97

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	99	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0213

Sample ID

**S97-0215**

Lab Sample ID: 9705056-3

Date Collected: 5/06/97

Date Extracted: 5/12/97

Date Analyzed: 5/12/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 100

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	140	50
Toluene	100	50
Ethylbenzene	ND	50
M,P-Xylene	ND	100
O-Xylene	ND	50
Total Xylenes	ND	100

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	102	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0213

Sample ID

**S97-0216**

Lab Sample ID: 9705056-4

Date Collected: 5/06/97

Date Extracted: 5/12/97

Date Analyzed: 5/12/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 10

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	29	5.0
Toluene	12	5.0
Ethylbenzene	ND	5.0
M,P-Xylene	ND	10
O-Xylene	ND	5.0
Total Xylenes	ND	10

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	99	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0213

Sample ID

**S97-0217**

3

Lab Sample ID: 9705056-5

Date Collected: 5/06/97

Date Extracted: 5/12/97

Date Analyzed: 5/12/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 10

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	350	5.0
Toluene	22	5.0
Ethylbenzene	110	5.0
M,P-Xylene	36	10
O-Xylene	6.5	5.0
Total Xylenes	43	10

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	101	85 - 115

ND = Not Detected at or above client requested reporting limit.

# AROMATIC VOLATILE ORGANICS BLANK SPIKE

Method 8020

Lab Name: Paragon Analytics, Inc.  
 Client Name: El Paso Natural Gas Co.  
 Client Project ID: S97-0213

Lab Sample ID: WBS1 05/12/97

Sample Matrix: Water

Sample ID

**Blank Spike**

Date Extracted: 5/12/97

Date Analyzed: 5/12/97

Sample Volume: 5 mL

Analyte	Spike Added (ug/L)	BS Concentration (ug/L)	BS Percent Recovery	QC Limits % Rec
Benzene	40.0	39.3	98	85 - 115
Toluene	40.0	39.9	100	85 - 115
Ethylbenzene	40.0	40.3	101	85 - 115
M,P-Xylene	80.0	80.3	100	85 - 115
O-Xylene	40.0	39.8	100	85 - 115
Total Xylenes	120	120	100	85 - 115

Analyte	Spike Added (ug/L)	BSD Concentration (ug/L)	BSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	38.8	97	1	20
Toluene	40.0	39.1	98	2	20
Ethylbenzene	40.0	39.7	99	1	20
M,P-Xylene	80.0	79.2	99	1	20
O-Xylene	40.0	39.5	99	1	20
Total Xylenes	120	119	99	1	20

## SURROGATE RECOVERY BS/BSD

Analyte	% Recovery BS	% Recovery BSD	% Rec Limits	
2,3,4-Trifluorotoluene	100	98	85 - 115	

D = Detected

# AROMATIC VOLATILE ORGANICS MATRIX SPIKE

Method 8020

Sample ID

**In HouseMS**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0213

Date Collected: 5/03/97  
Date Extracted: 5/12/97  
Date Analyzed: 5/12/97

Lab Sample ID: 9705041-08MS

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Spike Added (ug/L)	Sample Concentration (ug/L)	MS Concentration (ug/L)	MS Percent Recovery	QC Limits % Rec
Benzene	40.0	45.1	82.5	93	85 - 115
Toluene	40.0	8.87	46.5	94	85 - 115
Ethylbenzene	40.0	13.3	52.6	98	85 - 115
M,P-Xylene	80.0	2.86	81.0	98	85 - 115
O-Xylene	40.0	2.24	40.5	96	85 - 115
Total Xylenes	120	5.10	122	97	85 - 115

Analyte	Spike Added (ug/L)	MSD Concentration (ug/L)	MSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	80.9	89	4	20
Toluene	40.0	47.4	96	2	20
Ethylbenzene	40.0	51.7	96	2	20
M,P-Xylene	80.0	81.1	98	0	20
O-Xylene	40.0	41.2	97	2	20
Total Xylenes	120	122	98	1	20

## SURROGATE RECOVERY MS/MSD

Analyte	% Recovery MS	% Recovery MSD	% Rec Limits
2,3,4-Trifluorotoluene	101	98	85 - 115

ND = Not Detected

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0213

Lab Sample ID: WRB1 05/13/97

Sample Matrix: Water

Sample ID

**Reagent Blank**

Date Collected: N/A  
Date Extracted: 5/13/97  
Date Analyzed: 5/13/97

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	100	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0213

Sample ID

**S97-0218**

Lab Sample ID: 9705056-6

Date Collected: 5/06/97

Date Extracted: 5/13/97

Date Analyzed: 5/13/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 10

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	250	5.0
Toluene	230	5.0
Ethylbenzene	110	5.0
M,P-Xylene	140	10
O-Xylene	50	5.0
Total Xylenes	190	10

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	87	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0213

Lab Sample ID: 9705056-7

Sample Matrix: Water

Sample ID

**S97-0219**

Date Collected: 5/06/97

Date Extracted: 5/13/97

Date Analyzed: 5/13/97

Sample Volume: 5 mL

Dilution Factor: 10

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	14	5.0
Toluene	15	5.0
Ethylbenzene	ND	5.0
M,P-Xylene	ND	10
O-Xylene	5.7	5.0
Total Xylenes	5.7	10

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	95	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0213

Sample ID

**S97-0220**

Lab Sample ID: 9705056-8

Date Collected: 5/06/97

Date Extracted: 5/13/97

Date Analyzed: 5/13/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	99	0.50
Toluene	10	0.50
Ethylbenzene	4.1	0.50
M,P-Xylene	2.3	1.0
O-Xylene	1.6	0.50
Total Xylenes	3.9	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	76 *	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0213

Sample ID

**S97-0221**

Lab Sample ID: 9705056-9

Date Collected: 5/06/97

Date Extracted: 5/13/97

Date Analyzed: 5/13/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	21	0.50
Toluene	5.3	0.50
Ethylbenzene	3.1	0.50
M,P-Xylene	2.5	1.0
O-Xylene	1.0	0.50
Total Xylenes	3.5	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	100	85 - 115

ND = Not Detected at or above client requested reporting limit.

# AROMATIC VOLATILE ORGANICS BLANK SPIKE

Method 8020

Sample ID

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0213

Lab Sample ID: WBS1

Sample Matrix: Water

Blank Spike

Date Extracted: 5/13/97

Date Analyzed: 5/13/97

Sample Volume: 5 mL

Analyte	Spike Added (ug/L)	BS Concentration (ug/L)	BS Percent Recovery	QC Limits % Rec
Benzene	40.0	37.3	93	85 - 115
Toluene	40.0	38.1	95	85 - 115
Ethylbenzene	40.0	38.5	96	85 - 115
M,P-Xylene	80.0	77.0	96	85 - 115
O-Xylene	40.0	38.3	96	85 - 115
Total Xylenes	120	115	96	85 - 115

Analyte	Spike Added (ug/L)	BSD Concentration (ug/L)	BSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	38.6	97	4	20
Toluene	40.0	39.3	98	3	20
Ethylbenzene	40.0	39.8	100	3	20
M,P-Xylene	80.0	79.5	99	3	20
O-Xylene	40.0	39.5	99	3	20
Total Xylenes	120	119	99	3	20

## SURROGATE RECOVERY BS/BSD

Analyte	% Recovery BS	% Recovery BSD	% Rec Limits
2,3,4-Trifluorotoluene	100	97	85 - 115

D = Detected

# AROMATIC VOLATILE ORGANICS MATRIX SPIKE

Method 8020

Sample ID

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0213

<b>In HouseMS</b>
-------------------

Date Collected: 5/08/97  
Date Extracted: 5/13/97  
Date Analyzed: 5/13/97

Lab Sample ID: 9705065-01MS

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Spike Added (ug/L)	Sample Concentration (ug/L)	MS Concentration (ug/L)	MS Percent Recovery	QC Limits % Rec
Benzene	40.0	ND	39.7	99	85 - 115
Toluene	40.0	ND	40.4	101	85 - 115
Ethylbenzene	40.0	ND	41.0	103	85 - 115
M,P-Xylene	80.0	ND	81.6	102	85 - 115
O-Xylene	40.0	ND	40.9	102	85 - 115
Total Xylenes	120	ND	122	102	85 - 115

Analyte	Spike Added (ug/L)	MSD Concentration (ug/L)	MSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	35.2	88	12	20
Toluene	40.0	38.3	96	5	20
Ethylbenzene	40.0	41.0	102	0	20
M,P-Xylene	80.0	83.7	105	2	20
O-Xylene	40.0	41.9	105	3	20
Total Xylenes	120	126	105	3	20

## SURROGATE RECOVERY MS/MSD

Analyte	% Recovery MS	% Recovery MSD	% Rec Limits
2,3,4-Trifluorotoluene	101	104	85 - 115

ND = Not Detected



## CHAIN OF CUSTODY RECORD

Page 1 of 1

PROJECT NUMBER		PROJECT NAME				REQUESTED ANALYSIS						CONTRACT LABORATORY P. O. NUMBER	
SAMPLES: (Signature)		DATE:		5/16/97									
LAB ID	DATE	TIME	MATRIX	SAMPLE NUMBER	TOTAL NUMBER OF CONTAINERS	COMPOSITE OR GRAB	C-TDS	BTEX				REMARKS	
01	5/16/97	0630	H <sub>2</sub> O	S97-0813	3		X	X				9705-056-01 Note - past hold	
02	5/16/97	0638	H <sub>2</sub> O	S97-0810	3		X	X				02 time for SR.	
03	5/16/97	0805	H <sub>2</sub> O	S97-0815	3		X	X				03	
04	5/16/97	1033	H <sub>2</sub> O	S97-0816	3		X	X				04	
05	5/16/97	1206	H <sub>2</sub> O	S97-0817	3		X	X				05	
06	5/16/97	1310	H <sub>2</sub> O	S97-0818	3		X	X				06	
07	5/16/97	1408	H <sub>2</sub> O	S97-0819	3		X	X				07	
08	5/16/97	1607	H <sub>2</sub> O	S97-0820	3		X	X				08	
09	5/16/97	1740	H <sub>2</sub> O	S97-0821	3		X	X				09	
RELINQUISHED BY: (Signature) [Signature]					DATE/TIME	5/18/97	RECEIVED BY: (Signature) [Signature]	RELINQUISHED BY: (Signature)				1 liter poly (P) 2x 40ml wa / (HCL)	
RELINQUISHED BY: (Signature) [Signature]					DATE/TIME	5/17/97	RECEIVED BY: (Signature) [Signature]	RELINQUISHED BY: (Signature)					
REQUESTED TURNAROUND TIME: <input checked="" type="checkbox"/> ROUTINE <input type="checkbox"/> RUSH					SAMPLE RECEIPT REMARKS					RESULTS & INVOICES TO:			
CARRIER CO.					CHARGE CODE					TRANSMISSION OPERATIONS LABORATORY EL PASO NATURAL GAS COMPANY 8645 RAILROAD DRIVE EL PASO, TEXAS 79904 915-759-2229 FAX: 915-759-2335			
BILL NO.:					EPG TR-190000-71-EVIRACORR-1-								

## CONDITION OF SAMPLE UPON RECEIPT

CLIENT: EPNGSHIPPING CONTAINER #: coolerWORKORDER NO. 97-05-056INITIALS: FBDATE: 5/8/97

1. Does this project require special handling according to NEESA, Level 3, or CLP protocols? If yes, complete a. and b. a. Cooler Temperature _____ b. Lot No's. _____ c. Airbill Number _____	Yes	<u>No</u>
2. Are custody seals on the cooler intact? If so, how many	<u>N/A</u>	No
3. Are custody seals on sample containers intact?	<u>N/A</u>	No
4. Is there a Chain of Custody (COC) or other representative documents, letters or shipping memos?	<u>Yes</u>	No
5. Is the COC complete? Relinquished: Yes <input checked="" type="checkbox"/> No Requested Analysis: Yes <input checked="" type="checkbox"/> No	<u>N/A</u>	No
6. Is the COC in agreement with the samples received? No. of Samples: Yes <input checked="" type="checkbox"/> No Sample ID's: Yes <input checked="" type="checkbox"/> No Matrix: Yes <input checked="" type="checkbox"/> No No. of Containers: Yes <input checked="" type="checkbox"/> No	<u>Yes</u>	No
7. Are the samples requiring acid preservation preserved correctly?	<u>N/A</u>	No
8. Is there enough sample? If so, are they in the proper containers?	<u>Yes</u>	No
9. Are all samples within holding times for the requested analyses?	<u>FB</u>	No
10. Were the sample received on ice?	<u>N/A</u>	No
11. Were all sample containers received intact? (not broken or leaking, etc.)	<u>Yes</u>	No
12. Are samples requiring no headspace, headspace free?	<u>N/A</u>	No
13. Do the samples require quarantine?	<u>Yes</u>	No
14. Do samples require Paragon disposal?	<u>Yes</u>	No
15. Did the client return any unused bottles?	<u>Yes</u>	No

Describe "NO" items (except No's 1, 13, &amp; 14):

10) we expired  
 9) Spec. Cond. Hold time expired

Was the client contacted? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, Date: \_\_\_\_\_ Name of person contacted: \_\_\_\_\_

Describe actions taken or client instructions: \_\_\_\_\_

Group Leader's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Cooler Temperature: 9°C



# PARAGON ANALYTICS, INC.

225 Commerce Drive ♦ Fort Collins, CO 80524 ♦ (800) 443-1511 ♦ (970) 490-1511 ♦ FAX (970) 490-1522

May 29, 1997

Mr. Darrell Campbell  
El Paso Natural Gas CO.  
8645 Railroad Drive  
El Paso, TX 79904

RE: Paragon Workorder: 97-05-068  
Client Project Name: S97-0222  
Client Project Number : Not Submitted

Dear Mr. Campbell:

Eleven water samples were received from El Paso Natural Gas Co. on May 9, 1997. The samples were scheduled for Inorganic and Aromatic Volatile analysis. The results for these analyses are contained in the enclosed report.

Thank you for your confidence in Paragon Analytics, Inc. Should you have any questions, please call.

Sincerely,

Paragon Analytics, Inc.  
Victoria Bayly  
Project Manager

VB/jjc  
Enclosure: report



# Paragon Analytics, Inc.

## INORGANICS CASE NARRATIVE

---

### El Paso Natural Gas Co.

S97-0222

Order Number - 9705068

1. This report consists of data for 11 water samples analyzed for chloride and total dissolved solids.
2. The samples were received cool and intact on 05/09/97.
3. The samples had been correctly preserved for the requested analyses.
4. The samples were analyzed using procedures based on the following methods from the USEPA:

<u>Analyte</u>	<u>Method</u>
Chloride	300.0
Total Dissolved Solids	160.1

5. All standards and reagents were used within their recommended shelf life.
6. The samples were prepared and analyzed within the established hold times.
7. Sample results which are below the reporting limit are reported as "ND" on the enclosed report.

All in house quality control procedures were followed, as described below.

8. General quality control procedures.
  - A matrix duplicate or a matrix spike and matrix spike duplicate (MS/MSD) and a blank spike (LCS) were analyzed with each analysis batch.
  - For each analysis batch the method blank results were below the reporting limit for the requested analyte. This indicates that no contaminants were introduced to the samples during analysis.
  - The MS and MSD results for chloride were within acceptance limits.



- The matrix duplicate results for total dissolved solids were within acceptance limits.
- The LCS results for chloride and total dissolved solids were within acceptance limits.

The data contained in the following report have been reviewed and approved by the personnel listed below:

BS  
Reporter's Initials

5-29-97  
Date

SW  
Reviewer's Initials

5/29/97  
Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Paragon Analytics, Inc.

SAMPLE NUMBER(S) CROSS-REFERENCE TABLE

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0222

PAI-ID	Client ID	MATRIX	DATE
			SAMPLED
9705068-1	S97-0222 PTP-1	Water	05/07/97
9705068-2	S97-0223 ENCK-5	Water	05/07/97
9705068-3	S97-0224 ENCK-5D	Water	05/07/97
9705068-4	S97-0225 DOON-5	Water	05/07/97
9705068-5	S97-0226 PTP-1	Water	05/07/97
9705068-6	S97-0227 ENCK-5	Water	05/07/97
9705068-7	S97-0228 ENCK-5	Water	05/07/97
9705068-8	S97-0229 ENCK-5	Water	05/07/97
9705068-9	S97-0230 -	Water	05/07/97
9705068-10	S97-0231 -	Water	05/07/97
9705068-11	S97-0232 -	Water	05/07/97

# CHLORIDE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0222

Client Project No: Not Given

Lab Workorder Number: 9705068

Date Collected: 05/07/97

Date Analyzed: 05/22-23/97

Sample Matrix: Water

Client ID	Lab Sample ID	Chloride Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.2
S97-0222	9705068-1	490	50
S97-0223	9705068-2	650	40
S97-0224	9705068-3	480	40
S97-0225	9705068-4	30	12
S97-0226	9705068-5	ND	0.2
S97-0227	9705068-6	3200	160
S97-0228	9705068-7	110	14
S97-0229	9705068-8	ND	0.2
S97-0230	9705068-9	3600	100
S97-0231	9705068-10	430	60
S97-0232	9705068-11	72	14

ND = Not Detected

# CHLORIDE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9705068-10

Date Analyzed: 05/23/97

Sample Matrix: Water

Sample ID

**S97-0231**

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Chloride	1500	428	1971	103	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Chloride	1500	1982	104	1	0-20 %

# TOTAL DISSOLVED SOLIDS

Method 160.1

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0222  
Client Project No: Not Given  
Lab Workorder Number: 9705068

Date Collected: 05/07/97  
Date Prepared: 05/13/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Total Dissolved Solids Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	20
S97-0222 PTP-1	9705068-1	1500	20
S97-0223 ENSR-3	9705068-2	1500	20
S97-0224 ENSR-3D	9705068-3	1400	20
S97-0225	9705068-4	420	20
S97-0226	9705068-5	ND	20
S97-0227 ENSR-1	9705068-6	5200	20
S97-0228	9705068-7	430	20
S97-0229	9705068-8	ND	20
S97-0230 7	9705068-9	8100	20
S97-0231 5	9705068-10	2000	20
S97-0232 14	9705068-11	480	20

ND = Not Detected

# TDS Calculations and Quality Control Results

Preparation Date: 05/13/97

ID	sample vol (mL)	empty beaker tare (g)	beaker + residue gross (g)	net (mg)	calculated conc (mg/L)	DL (mg/L)
Method Blank	100	106.8500	106.8491	-0.9	-9	20
Blank Spike	100	106.0581	106.0965	38.4	384	20
Blank Spike dup	100	107.8544	107.8929	38.5	385	20
9705056-1	100	107.7688	107.8389	70.1	701	20
9705056-1 dup	100	99.9488	100.0182	69.4	694	20
9705056-2	100	103.3699	103.3692	-0.7	-7	20
9705056-3	100	109.4689	111.1983	1729.4	17294	20
9705056-4	100	102.5194	105.0649	2545.5	25455	20
9705056-5	100	103.3171	104.4653	1148.2	11482	20
9705056-6	100	103.8837	106.6123	2728.6	27286	20
9705056-7	100	100.9182	101.7958	877.6	8776	20
9705056-8	100	103.3826	108.3931	5010.5	50105	20
9705056-9	100	97.9645	98.6305	666.0	6660	20
9705068-1	100	103.5135	103.6665	153.0	1530	20
9705068-2	100	97.7515	97.8970	145.5	1455	20
9705068-3	100	105.7064	105.8510	144.6	1446	20
9705068-4	100	104.1013	104.1432	41.9	419	20
9705068-5	100	104.2785	104.2767	-1.8	-18	20
9705068-6	100	113.7099	114.2331	523.2	5232	20
9705068-7	100	108.8069	108.8500	43.1	431	20
9705068-8	100	100.4005	100.3980	-2.5	-25	20
9705068-9	100	101.3278	102.1402	812.4	8124	20
9705068-10	100	105.3772	105.5799	202.7	2027	20
9705068-11	100	105.3777	105.4259	48.2	482	20

## BLANK SUMMARY

ID	blank TDS conc (mg/L)	accept. limit (mg/L)
Method Blank	ND	< 20

## BLANK SPIKE SUMMARY

ID	spike added mg	spike added TDS conc (mg/L)	spiked sample TDS conc (mg/L)	recovery %	accept. limits
Blank Spike	40	400	384	96	85-115%
Blank Spike dup	40	400	385	96	85-115%

## DUPLICATE SUMMARY

ID	sample TDS conc (mg/L)	duplic TDS conc (mg/L)	RPD %	accept. limits
9705056-1	701	694	1.0	< 15%

ND = not detected

# Paragon Analytics, Inc.



## SPECIFIC CONDUCTANCE CASE NARRATIVE

**El Paso Natural Gas Co.**

**S97-0222**

**Order Number - 9705068**

1. This report consists of 11 water samples.
2. The samples were received intact on 05/09/97 at a temperature of 15 degrees Celsius.
3. The samples were prepared for analysis based on SW-846, 3<sup>rd</sup> Edition method 9050.
4. All standards and solutions are NIST traceable and were used within their recommended shelf life.
5. The samples were not analyzed within 24 hours of collection.

All in house quality control procedures were followed, as described below.

6. General quality control procedures.
  - All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analyte. This indicates a valid calibration and stable instrument conditions.
7. A sample from this Order Number was used for the matrix QC samples for this batch.
  - A duplicate was prepared and analyzed with this batch. All acceptance criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below:



Steve Landreth

Steve Landreth  
Inorganic Technician

5-20-97

Date

SW

Reviewer's Initials

5/20/97

Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0222  
Lab Workorder Number: 9705068

Date Collected: 05/07/97  
Date Analyzed: 05/09/97  
Sample Matrix: Water

Client Sample ID	Lab Sample ID	Specific Conductance µmho/cm
S97-0222 <i>PTP-1</i>	9705068-1	2420
S97-0223 <i>ENSE-3</i>	9705068-2	2050
S97-0224 <i>ENSE-3D</i>	9705068-3	1990
S97-0225	9705068-4	622
S97-0226	9705068-5	<1 *
S97-0227 <i>ENSE-1</i>	9705068-6	8620
S97-0228	9705068-7	713
S97-0229	9705068-8	1
S97-0230 <i>7</i>	9705068-9	13200
S97-0231 <i>5</i>	9705068-10	3020
S97-0232 <i>14</i>	9705068-11	746

\* The sample was below the analytical range of the instrument.



# Paragon Analytics, Inc.

## Aromatic Volatile Organics Case Narrative

---

### **El Paso Natural Gas Co.**

S97-0222

**Order Number - 9705068**

1. This report consists of 11 water samples received by Paragon on 05/09/97.
2. These samples were prepared and analyzed according to SW-846, 3rd Edition procedures. Specifically, the water samples were prepared by heating and purging 5 mls using purge and trap procedures based on Method 5030.
3. The samples were analyzed using a GC with a DB-VRX capillary column and a PID detector according to protocols based on SW-846 Method 8020. All positive results were quantitated using the responses from the initial calibration curve using the internal standard technique. Second column confirmation was performed on all samples with positive results on a DB-624 capillary column.
4. All samples were analyzed within the established holding times.
5. The method blanks associated with this project were below the reporting limits for all analytes.
6. All matrix spike and matrix spike duplicate recoveries and RPDs were within acceptance criteria.
7. All blank spike and blank spike duplicate recoveries and RPDs were within the acceptance criteria.
8. All surrogate recoveries were within acceptance criteria.
9. All internal standard recoveries were within acceptance criteria.



10. All initial and continuing calibration criteria were within acceptance criteria.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Roland P. Bruggeman  
Roland P. Bruggeman  
Organics Manager

5-22-97  
Date

RS  
Reviewer's Initials

5-22-97  
Date

**Paragon Analytics, Inc.**

**SAMPLE NUMBER(S) CROSS-REFERENCE TABLE**

**Client Name: El Paso Natural Gas Co.**

**Client Project ID: S97-0222**

PAI-ID	Client ID	MATRIX	DATE
			SAMPLED
9705068-1	S97-0222	Water	05/07/97
9705068-2	S97-0223	Water	05/07/97
9705068-3	S97-0224	Water	05/07/97
9705068-4	S97-0225	Water	05/07/97
9705068-5	S97-0226	Water	05/07/97
9705068-6	S97-0227	Water	05/07/97
9705068-7	S97-0228	Water	05/07/97
9705068-8	S97-0229	Water	05/07/97
9705068-9	S97-0230	Water	05/07/97
9705068-10	S97-0231	Water	05/07/97
9705068-11	S97-0232	Water	05/07/97

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0222

Lab Sample ID: WRB1 05/13/97

Sample Matrix: Water

Sample ID

**Reagent Blank**

Date Collected: N/A  
Date Extracted: 5/13/97  
Date Analyzed: 5/13/97

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	100	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0222

Sample ID

**S97-0222**

PTP-1

Lab Sample ID: 9705068-1

Date Collected: 5/07/97

Date Extracted: 5/13/97

Date Analyzed: 5/13/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	38	0.50
Toluene	0.51	0.50
Ethylbenzene	22	0.50
M,P-Xylene	7.5	1.0
O-Xylene	0.89	0.50
Total Xylenes	8.4	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	100	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0222

Sample ID

**S97-0223**

ENSC-3

Lab Sample ID: 9705068-2

Date Collected: 5/07/97

Date Extracted: 5/13/97

Date Analyzed: 5/13/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	7.6	0.50
Toluene	3.3	0.50
Ethylbenzene	2.9	0.50
M,P-Xylene	2.4	1.0
O-Xylene	0.52	0.50
Total Xylenes	3.0	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	99	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0222

Sample ID

**S97-0224**

ENSE-30

Lab Sample ID: 9705068-3

Date Collected: 5/07/97

Date Extracted: 5/13/97

Date Analyzed: 5/13/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	6.8	0.50
Toluene	3.1	0.50
Ethylbenzene	2.8	0.50
M,P-Xylene	2.4	1.0
O-Xylene	0.5	0.50
Total Xylenes	2.9	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	101	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0222

Lab Sample ID: 9705068-4

Sample Matrix: Water

Sample ID

**S97-0225**

Date Collected: 5/07/97

Date Extracted: 5/13/97

Date Analyzed: 5/13/97

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	101	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0222

Lab Sample ID: 9705068-5

Sample Matrix: Water

Sample ID

**S97-0226**

Date Collected: 5/07/97

Date Extracted: 5/13/97

Date Analyzed: 5/13/97

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	101	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0222

Lab Sample ID: 9705068-6

Sample Matrix: Water

Sample ID

**S97-0227**

ENS-1

Date Collected: 5/07/97

Date Extracted: 5/13/97

Date Analyzed: 5/13/97

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	7.3	0.50
Toluene	3.7	0.50
Ethylbenzene	2.4	0.50
M,P-Xylene	2.0	1.0
O-Xylene	ND	0.50
Total Xylenes	2.0	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	102	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0222

Sample ID

**S97-0228**

Lab Sample ID: 9705068-7

Date Collected: 5/07/97

Date Extracted: 5/13/97

Date Analyzed: 5/13/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	5.5	0.50
Toluene	5.5	0.50
Ethylbenzene	3.3	0.50
M,P-Xylene	3.0	1.0
O-Xylene	0.79	0.50
Total Xylenes	3.8	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	102	85 - 115

ND = Not Detected at or above client requested reporting limit.

# AROMATIC VOLATILE ORGANICS BLANK SPIKE

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0222

Sample ID

**Blank Spike**

Lab Sample ID: WBS1 05/13/97

Date Extracted: 5/13/97

Date Analyzed: 5/13/97

Sample Matrix: Water

Sample Volume: 5 mL

Analyte	Spike Added (ug/L)	BS Concentration (ug/L)	BS Percent Recovery	QC Limits % Rec
Benzene	40.0	37.3	93	85 - 115
Toluene	40.0	38.1	95	85 - 115
Ethylbenzene	40.0	38.5	96	85 - 115
M,P-Xylene	80.0	77.0	96	85 - 115
O-Xylene	40.0	38.3	96	85 - 115
Total Xylenes	120	115	96	85 - 115

Analyte	Spike Added (ug/L)	BSD Concentration (ug/L)	BSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	38.6	97	4	20
Toluene	40.0	39.3	98	3	20
Ethylbenzene	40.0	39.8	100	3	20
M,P-Xylene	80.0	79.5	99	3	20
O-Xylene	40.0	39.5	99	3	20
Total Xylenes	120	119	99	3	20

## SURROGATE RECOVERY BS/BSD

Analyte	% Recovery BS	% Recovery BSD	% Rec Limits
2,3,4-Trifluorotoluene	100	97	85 - 115

D = Detected

# AROMATIC VOLATILE ORGANICS MATRIX SPIKE

Method 8020

Sample ID

In HouseMS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0222

Date Collected: 5/08/97  
Date Extracted: 5/13/97  
Date Analyzed: 5/13/97

Lab Sample ID: 9705065-01MS

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Spike Added (ug/L)	Sample Concentration (ug/L)	MS Concentration (ug/L)	MS Percent Recovery	QC Limits % Rec
Benzene	40.0	ND	39.7	99	85 - 115
Toluene	40.0	ND	40.4	101	85 - 115
Ethylbenzene	40.0	ND	41.0	103	85 - 115
M,P-Xylene	80.0	ND	81.6	102	85 - 115
O-Xylene	40.0	ND	40.9	102	85 - 115
Total Xylenes	120	ND	122	102	85 - 115

Analyte	Spike Added (ug/L)	MSD Concentration (ug/L)	MSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	35.2	88	12	20
Toluene	40.0	38.3	96	5	20
Ethylbenzene	40.0	41.0	102	0	20
M,P-Xylene	80.0	83.7	105	2	20
O-Xylene	40.0	41.9	105	3	20
Total Xylenes	120	126	105	3	20

## SURROGATE RECOVERY MS/MSD

Analyte	% Recovery MS	% Recovery MSD	% Rec Limits
2,3,4-Trifluorotoluene	101	104	85 - 115

ND = Not Detected

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0222

Lab Sample ID: WRB1 05/14/97

Sample Matrix: Water

Sample ID

**Reagent Blank**

Date Collected: N/A  
Date Extracted: 5/14/97  
Date Analyzed: 5/14/97

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	101	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0222

Lab Sample ID: 9705068-8

Sample Matrix: Water

Sample ID

**S97-0229**

Date Collected: 5/07/97

Date Extracted: 5/14/97

Date Analyzed: 5/14/97

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	101	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0222

Sample ID

**S97-0230**

7

Lab Sample ID: 9705068-9

Date Collected: 5/07/97

Date Extracted: 5/14/97

Date Analyzed: 5/14/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	7.3	0.50
Toluene	2.5	0.50
Ethylbenzene	3.1	0.50
M,P-Xylene	ND	1.0
O-Xylene	0.73	0.50
Total Xylenes	1.7	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	101	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0222

Lab Sample ID: 9705068-10

Sample Matrix: Water

Sample ID

**S97-0231**

Date Collected: 5/07/97

Date Extracted: 5/14/97

Date Analyzed: 5/14/97

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	0.84	0.50
Toluene	1.2	0.50
Ethylbenzene	0.93	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	102	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0222

Sample ID

**S97-0232**

14

Lab Sample ID: 9705068-11

Date Collected: 5/07/97

Date Extracted: 5/14/97

Date Analyzed: 5/14/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	0.88	0.50
Toluene	1.1	0.50
Ethylbenzene	0.52	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	103	85 - 115

ND = Not Detected at or above client requested reporting limit.

CHAIN OF CUSTODY RECORD

97.05.068

PROJECT NUMBER		PROJECT NAME		CONTRACT LABORATORY P. O. NUMBER	
SAMPLERS: (Signature)		DATE: 5/1/97			
LAB ID	DATE	TIME	MATRIX	SAMPLE NUMBER	TOTAL NUMBER OF CONTAINERS
01	5/1/97	0837	H <sub>2</sub> O	S97-0A002	3
02	5/1/97	1000	H <sub>2</sub> O	S97-0A003	3
03	5/1/97	1000	H <sub>2</sub> O	S97-0A004	3
04	5/1/97	1100	H <sub>2</sub> O	S97-0A005	3
05	5/1/97	1125	H <sub>2</sub> O	S97-0A006	3
06	5/1/97	1213	H <sub>2</sub> O	S97-0A007	3
07	5/1/97	1315	H <sub>2</sub> O	S97-0A008	3
08	5/1/97	1338	H <sub>2</sub> O	S97-0A009	3
09	5/1/97	1413	H <sub>2</sub> O	S97-0A030	3
10	5/1/97	1610	H <sub>2</sub> O	S97-0A031	3
11	5/1/97	1740	H <sub>2</sub> O	S97-0A032	3

RECEIVED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME
<i>[Signature]</i>	5/1/97 0800	<i>[Signature]</i>		<i>[Signature]</i>	5/1/97
<i>[Signature]</i>		<i>[Signature]</i>		<i>[Signature]</i>	

REQUESTED TURNAROUND TIME:	SAMPLE RECEIPT REMARKS	RESULTS & INVOICES TO:
<input type="checkbox"/> ROUTINE <input type="checkbox"/> RUSH		TRANSMISSION OPERATIONS LABORATORY EL PASO NATURAL GAS COMPANY 8645 RAILROAD DRIVE EL PASO, TEXAS 79904 915-759-2229 FAX: 915-759-2335

## CONDITION OF SAMPLE UPON RECEIPT

CLIENT: EPNGSHIPPING CONTAINER #: CobraWORKORDER NO. 9705-068INITIALS: NSLDATE: 5/1/92

1. Does this project require special handling according to NEESA, Level 3, or CLP protocols? If yes, complete a. and b. a. Cooler Temperature _____ b. Lot No's. _____ c. Airbill Number _____	Yes	<u>No</u>
2. Are custody seals on the cooler intact? If so, how many _____	<u>N/A</u>	Yes No
3. Are custody seals on sample containers intact? _____	<u>N/A</u>	Yes No
4. Is there a Chain of Custody (COC) or other representative documents, letters or shipping memos?	<u>Yes</u>	Yes No
5. Is the COC complete? Relinquished: Yes <u>/</u> No Requested Analysis: Yes <u>/</u> No	<u>N/A</u>	<u>Yes</u> No
6. Is the COC in agreement with the samples received? No. of Samples: Yes <u>/</u> No Sample ID's: Yes <u>/</u> No Matrix: Yes <u>/</u> No No. of Containers: Yes <u>/</u> No	<u>Yes</u>	Yes No
7. Are the samples requiring acid preservation preserved correctly? _____	<u>N/A</u>	<u>Yes</u> No
8. Is there enough sample? If so, are they in the proper containers?	<u>Yes</u>	Yes No
9. Are all samples within holding times for the requested analyses?	<u>Yes</u>	Yes <u>No</u>
10. Were the sample received on ice? _____	<u>N/A</u>	<u>Yes</u> No
11. Were all sample containers received intact? (not broken or leaking, etc.)	<u>Yes</u>	Yes No
12. Are samples requiring no headspace, headspace free? _____	<u>N/A</u>	<u>Yes</u> No
13. Do the samples require quarantine?	<u>Yes</u>	Yes <u>No</u>
14. Do samples require Paragon disposal?	<u>Yes</u>	Yes No
15. Did the client return any unused bottles?	<u>Yes</u>	Yes <u>No</u>

Describe "NO" items (except No's 1, 13, & 14): G-Specific Conductance out of spec.ICE EXPIREDWas the client contacted? Yes \_\_\_\_\_ No \_\_\_\_\_  
If yes, Date: \_\_\_\_\_ Name of person contacted: \_\_\_\_\_

Describe actions taken or client instructions: \_\_\_\_\_

Group Leader's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Cooler Temperature: 15°C



# PARAGON ANALYTICS, INC.

225 Commerce Drive ♦ Fort Collins, CO 80524 ♦ (800) 443-1511 ♦ (970) 490-1511 ♦ FAX (970) 490-1522

May 30, 1997

Mr. Darrell Campbell  
El Paso Natural Gas CO.  
8645 Railroad Drive  
El Paso, TX 79904

RE: Paragon Workorder: 97-05-080  
Client Project Name: S97-0233  
Client Project Number : Not Submitted

Dear Mr. Campbell:

Ten water samples were received from El Paso Natural Gas Co. on May 10, 1997. The samples were scheduled for Specific Conductance, Inorganic and Aromatic Volatile analysis. The results for these analyses are contained in the enclosed report.

Thank you for your confidence in Paragon Analytics, Inc. Should you have any questions, please call.

Sincerely,

Paragon Analytics, Inc.  
Victoria Bayly  
Project Manager

VB/jjc  
Enclosure: report

# Paragon Analytics, Inc.



## SPECIFIC CONDUCTANCE CASE NARRATIVE

### **El Paso Natural Gas Co.**

S97-0233

**Order Number - 9705080**

1. This report consists of 10 water samples.
2. The samples were received cool and intact on 05/10/97.
3. The samples were prepared for analysis based on SW-846, 3<sup>rd</sup> Edition method 9050.
4. All standards and solutions are NIST traceable and were used within their recommended shelf life.
5. The samples were not analyzed within 24 hours of collection.

All in house quality control procedures were followed, as described below.

6. General quality control procedures.
  - All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analyte. This indicates a valid calibration and stable instrument conditions.
7. A sample from this Order Number was used for the matrix QC samples for this batch.
  - A duplicate was prepared and analyzed with this batch. All acceptance criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below:



Steve Landreth  
Steve Landreth  
Inorganic Technician

5-22-97  
Date

Sw  
Reviewer's Initials

5/22/97  
Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

**Paragon Analytics, Inc.**

**SAMPLE NUMBER(S) CROSS-REFERENCE TABLE**

**Client Name: El Paso Natural Gas Co.**

**Client Project ID: S97-0233**

PAI-ID	Client ID	MATRIX	DATE SAMPLED
9705080-1	S97-0233 6	Water	05/08/97
9705080-2	S97-0234 9	Water	05/08/97
9705080-3	S97-0235 10	Water	05/08/97
9705080-4	S97-0236 12	Water	05/08/97
9705080-5	S97-0237 13	Water	05/08/97
9705080-6	S97-0238 13D	Water	05/08/97
9705080-7	S97-0239 <i>Purgine Exp-3</i>	Water	05/08/97
9705080-8	S97-0240 <i>Sailer blank 2196</i>	Water	05/08/97
9705080-9	S97-0241 <i>Day</i>	Water	05/08/97
9705080-10	S97-0244 <i>SW-1</i>	Water	05/08/97

## SPECIFIC CONDUCTANCE

Method 9050

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0233

Lab Workorder Number: 9705080

Date Collected: 05/08/97

Date Analyzed: 05/10/97

Sample Matrix: Water

Client Sample ID	Lab Sample ID	Specific Conductance μmho/cm
S97-0233 6	9705080-1	8450
S97-0234 9	9705080-2	2800
S97-0235 10	9705080-3	1880
S97-0236 12	9705080-4	1240
S97-0237 13	9705080-5	643
S97-0238 13D	9705080-6	630
S97-0239	9705080-7	666
S97-0240	9705080-8	1
S97-0241	9705080-9	646
S97-0244 PW-1	9705080-10	718

52



# Paragon Analytics, Inc.

## INORGANICS CASE NARRATIVE

---

### El Paso Natural Gas Co.

S97-0233

Order Number - 9705080

1. This report consists of data for 10 water samples analyzed for chloride and total dissolved solids.
2. The samples were received cool and intact on 05/10/97.
3. The samples had been correctly preserved for the requested analyses.
4. The samples were analyzed using procedures based on the following methods from the USEPA:

<u>Analyte</u>	<u>Method</u>
Chloride	300.0
Total Dissolved Solids	160.1

5. All standards and reagents were used within their recommended shelf life.
6. The samples were prepared and analyzed within the established hold times.
7. Sample results which are below the reporting limit are reported as "ND" on the enclosed report.

All in house quality control procedures were followed, as described below.

8. General quality control procedures.
  - A matrix duplicate or a matrix spike and matrix spike duplicate (MS/MSD) and a blank spike (LCS) were analyzed with each analysis batch.
  - For each analysis batch the method blank results were below the reporting limit for the requested analyte. This indicates that no contaminants were introduced to the samples during analysis.
  - The MS and MSD results for chloride were within acceptance limits.



- The matrix duplicate results for total dissolved solids were within acceptance limits.
- The LCS results for chloride and total dissolved solids were within acceptance limits.

The data contained in the following report have been reviewed and approved by the personnel listed below:

BJ  
Reporter's Initials

5-29-97  
Date

SW  
Reviewer's Initials

5/29/97  
Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

**Paragon Analytics, Inc.**

**SAMPLE NUMBER(S) CROSS-REFERENCE TABLE**

**Client Name: El Paso Natural Gas Co.**

**Client Project ID: S97-0233**

PAI-ID	Client ID	MATRIX	DATE SAMPLED
9705080-1	S97-0233	Water	05/08/97
9705080-2	S97-0234	Water	05/08/97
9705080-3	S97-0235	Water	05/08/97
9705080-4	S97-0236	Water	05/08/97
9705080-5	S97-0237	Water	05/08/97
9705080-6	S97-0238	Water	05/08/97
9705080-7	S97-0239	Water	05/08/97
9705080-8	S97-0240	Water	05/08/97
9705080-9	S97-0241	Water	05/08/97
9705080-10	S97-0244	Water	05/08/97

# CHLORIDE

Method 300.0

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0233  
Client Project No: Not Given  
Lab Workorder Number: 9705080

Date Collected: 05/08/97  
Date Analyzed: 05/23,28/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Chloride Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.2
S97-0233 6	9705080-1	2300	160
S97-0234 9	9705080-2	830	60
S97-0235 10	9705080-3	480	40
S97-0236 12	9705080-4	290	20
S97-0237 13	9705080-5	57	10
S97-0238 130	9705080-6	52	10
S97-0239	9705080-7	110	10
S97-0240	9705080-8	ND	0.2
S97-0241	9705080-9	97	10
S97-0242	9705080-10	81	10

ND = Not Detected

# CHLORIDE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9705068-10

Date Analyzed: 05/23/97

Sample Matrix: Water

Sample ID

In House

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Chloride	1500	428	1971	103	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Chloride	1500	1982	104	1	0-20 %

# TOTAL DISSOLVED SOLIDS

Method 160.1

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0233  
Client Project No: Not Given  
Lab Workorder Number: 9705080

Date Collected: 05/08/97  
Date Prepared: 05/15/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Total Dissolved Solids Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	20
S97-0233 6	9705080-1	5500	20
S97-0234 7	9705080-2	2100	20
S97-0235 10	9705080-3	1500	20
S97-0236 12	9705080-4	900	20
S97-0237 13	9705080-5	460	20
S97-0238 13D	9705080-6	460	20
S97-0239	9705080-7	450	20
S97-0240	9705080-8	ND	20
S97-0241	9705080-9	470	20
S97-0242	9705080-10	470	20

ND = Not Detected

# TDS Calculations and Quality Control Results

Preparation Date: 05/15/97

ID	sample vol (mL)	empty beaker tare (g)	beaker + residue gross (g)	net (mg)	calculated conc (mg/L)	DL (mg/L)
Method Blank	100	104.2303	104.2309	0.6	6	20
Blank Spike	100	102.9081	102.9455	37.4	374	20
Blank Spike dup	100	101.9006	101.9412	40.6	406	20
9705080-1	100	101.6900	102.2437	553.7	5537	20
9705080-1 dup	100	105.5350	106.0942	559.2	5592	20
9705080-2	100	103.9539	104.1657	211.8	2118	20
9705080-3	100	107.7193	107.8649	145.6	1456	20
9705080-4	100	100.2363	100.3262	89.9	899	20
9705080-5	100	102.9478	102.9934	45.6	456	20
9705080-6	100	104.4851	104.5308	45.7	457	20
9705080-7	100	107.0079	107.0528	44.9	449	20
9705080-8	100	108.0551	108.0558	0.7	7	20
9705080-9	100	105.5500	105.5966	46.6	466	20
9705080-10	100	105.0458	105.0926	46.8	468	20
9705084-1	100	105.4584	105.5228	64.4	644	20

## BLANK SUMMARY

ID	blank TDS conc (mg/L)	accept. limit (mg/L)
Method Blank	6	< 20

## BLANK SPIKE SUMMARY

ID	spike added mg	spike added TDS conc (mg/L)	spiked sample TDS conc (mg/L)	recovery %	accept. limits
Blank Spike	40	400	374	93	85-115%
Blank Spike dup	40	400	406	101	85-115%

## DUPLICATE SUMMARY

ID	sample TDS conc (mg/L)	duplic TDS conc (mg/L)	RPD %	accept. limits
9705080-1	5537	5592	1.0	< 15%

ND = not detected



# Paragon Analytics, Inc.

## Aromatic Volatile Organics Case Narrative

---

**El Paso Natural Gas Co.**

**S97-0233**

**Order Number - 9705080**

1. This report consists of 10 water samples received by Paragon on 05/10/97.
2. These samples were prepared and analyzed according to SW-846, 3rd Edition procedures. Specifically, the water samples were prepared by heating and purging 5 mls using purge and trap procedures based on Method 5030.
3. The samples were analyzed using a GC with a DB-VRX capillary column and a PID detector according to protocols based on SW-846 Method 8020. All positive results were quantitated using the responses from the initial calibration curve using the internal standard technique. Second column confirmation was performed on all samples with positive results on a DB-624 capillary column.
4. All samples were analyzed within the established holding times.
5. The method blanks associated with this project were below the reporting limits for all analytes.
6. All matrix spike and matrix spike duplicate recoveries and RPDs were within acceptance criteria.
7. All blank spike and blank spike duplicate recoveries and RPDs were within the acceptance criteria.
8. All surrogate recoveries were within acceptance criteria.
9. All internal standard recoveries were within acceptance criteria.



10. All initial and continuing calibration criteria were within acceptance criteria.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Roland P. Bruggeman  
Roland P. Bruggeman  
Organics Manager

5-22-97  
Date

mb  
Reviewer's Initials

5-22-97  
Date

**Paragon Analytics, Inc.**

**SAMPLE NUMBER(S) CROSS-REFERENCE TABLE**

**Client Name: El Paso Natural Gas Co.**

**Client Project ID: S97-0233**

PAI-ID	Client ID	MATRIX	DATE
			SAMPLED
9705080-1	S97-0233	Water	05/08/97
9705080-2	S97-0234	Water	05/08/97
9705080-3	S97-0235	Water	05/08/97
9705080-4	S97-0236	Water	05/08/97
9705080-5	S97-0237	Water	05/08/97
9705080-6	S97-0238	Water	05/08/97
9705080-7	S97-0239	Water	05/08/97
9705080-8	S97-0240	Water	05/08/97
9705080-9	S97-0241	Water	05/08/97
9705080-10	S97-0244	Water	05/08/97

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0233

Lab Sample ID: WRB1 05/14/97

Sample Matrix: Water

Sample ID

**Reagent Blank**

Date Collected: N/A  
Date Extracted: 5/14/97  
Date Analyzed: 5/14/97

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	101	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0233

Sample ID

**S97-0233**

Lab Sample ID: 9705080-1

Date Collected: 5/08/97

Date Extracted: 5/14/97

Date Analyzed: 5/14/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	8.2	0.50
Toluene	2.8	0.50
Ethylbenzene	2.6	0.50
M,P-Xylene	1.3	1.0
O-Xylene	1.4	0.50
Total Xylenes	2.7	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	96	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0233

Lab Sample ID: 9705080-2

Sample Matrix: Water

Sample ID

**S97-0234**

9

Date Collected: 5/08/97

Date Extracted: 5/14/97

Date Analyzed: 5/14/97

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	2.6	0.50
Toluene	2.6	0.50
Ethylbenzene	1.4	0.50
M,P-Xylene	1.1	1.0
O-Xylene	0.66	0.50
Total Xylenes	1.7	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	104	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0233

Sample ID

**S97-0235**

10

Lab Sample ID: 9705080-3

Date Collected: 5/08/97

Date Extracted: 5/14/97

Date Analyzed: 5/14/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	1.3	0.50
Toluene	1.0	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	103	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0233

Sample ID

**S97-0236**

12

Lab Sample ID: 9705080-4

Date Collected: 5/08/97

Date Extracted: 5/14/97

Date Analyzed: 5/14/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	3.0	0.50
Toluene	0.89	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	102	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0233

Lab Sample ID: 9705080-5

Sample Matrix: Water

Sample ID

**S97-0237**

13

Date Collected: 5/08/97

Date Extracted: 5/14/97

Date Analyzed: 5/14/97

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	0.61	0.50
Toluene	0.58	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	101	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0233

Sample ID

**S97-0238**

13D

Lab Sample ID: 9705080-6

Date Collected: 5/08/97

Date Extracted: 5/14/97

Date Analyzed: 5/14/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	0.65	0.50
Toluene	0.62	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	101	85 - 115

ND = Not Detected at or above client requested reporting limit.

# AROMATIC VOLATILE ORGANICS BLANK SPIKE

Method 8020

Sample ID

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0233

**Blank Spike**

Date Extracted: 5/14/97

Date Analyzed: 5/14/97

Lab Sample ID: WBS1 05/14/97

Sample Matrix: Water

Sample Volume: 5 mL

Analyte	Spike Added (ug/L)	BS Concentration (ug/L)	BS Percent Recovery	QC Limits % Rec
Benzene	40.0	36.2	91	85 - 115
Toluene	40.0	37.6	94	85 - 115
Ethylbenzene	40.0	38.3	96	85 - 115
M,P-Xylene	80.0	76.4	96	85 - 115
O-Xylene	40.0	38.0	95	85 - 115
Total Xylenes	120	114	95	85 - 115

Analyte	Spike Added (ug/L)	BSD Concentration (ug/L)	BSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	36.0	90	1	20
Toluene	40.0	37.2	93	1	20
Ethylbenzene	40.0	37.8	95	1	20
M,P-Xylene	80.0	75.5	94	1	20
O-Xylene	40.0	37.5	94	1	20
Total Xylenes	120	113	94	1	20

## SURROGATE RECOVERY BS/BSD

Analyte	% Recovery BS	% Recovery BSD	% Rec Limits	
2,3,4-Trifluorotoluene	100	99	85 - 115	

D = Detected

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0233

Lab Sample ID: WRB1 05/15/97

Sample Matrix: Water

Sample ID

**Reagent Blank**

Date Collected: N/A  
Date Extracted: 5/15/97  
Date Analyzed: 5/15/97

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	101	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0233

Sample ID

**S97-0239**

Lab Sample ID: 9705080-7

Date Collected: 5/08/97

Date Extracted: 5/15/97

Date Analyzed: 5/15/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	0.60	0.50
Toluene	1.4	0.50
Ethylbenzene	1.1	0.50
M,P-Xylene	1.1	1.0
O-Xylene	ND	0.50
Total Xylenes	1.1	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	101	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0233

Sample ID

**S97-0240**

Lab Sample ID: 9705080-8

Date Collected: 5/08/97

Date Extracted: 5/15/97

Date Analyzed: 5/15/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	100	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0233

Lab Sample ID: 9705080-9

Sample Matrix: Water

Sample ID

**S97-0241**

Date Collected: 5/08/97

Date Extracted: 5/15/97

Date Analyzed: 5/15/97

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	102	85 - 115

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0233

Sample ID

**S97-0244**

pw-1

Lab Sample ID: 9705080-10

Date Collected: 5/08/97

Date Extracted: 5/15/97

Date Analyzed: 5/15/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	0.56	0.50
Toluene	0.55	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	101	85 - 115

ND = Not Detected at or above client requested reporting limit.

# AROMATIC VOLATILE ORGANICS BLANK SPIKE

Method 8020

Sample ID

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0233

**Blank Spike**

Lab Sample ID: WBS1 05/15/97

Date Extracted: 5/15/97

Date Analyzed: 5/15/97

Sample Matrix: Water

Sample Volume: 5 mL

Analyte	Spike Added (ug/L)	BS Concentration (ug/L)	BS Percent Recovery	QC Limits % Rec
Benzene	40.0	35.4	88	85 - 115
Toluene	40.0	36.5	91	85 - 115
Ethylbenzene	40.0	37.1	93	85 - 115
M,P-Xylene	80.0	73.8	92	85 - 115
O-Xylene	40.0	36.6	91	85 - 115
Total Xylenes	120	110	92	85 - 115

Analyte	Spike Added (ug/L)	BSD Concentration (ug/L)	BSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	36.4	91	3	20
Toluene	40.0	37.7	94	3	20
Ethylbenzene	40.0	38.4	96	3	20
M,P-Xylene	80.0	76.7	96	4	20
O-Xylene	40.0	38.1	95	4	20
Total Xylenes	120	115	96	4	20

## SURROGATE RECOVERY BS/BSD

Analyte	% Recovery BS	% Recovery BSD	% Rec Limits	
2,3,4-Trifluorotoluene	100	98	85 - 115	

D = Detected

# AROMATIC VOLATILE ORGANICS MATRIX SPIKE

Method 8020

Sample ID

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0233

**S97-0239MS**

Date Collected: 5/08/97  
Date Extracted: 5/15/97  
Date Analyzed: 5/15/97

Lab Sample ID: 9705080-7MS

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Spike Added (ug/L)	Sample Concentration (ug/L)	MS Concentration (ug/L)	MS Percent Recovery	QC Limits % Rec
Benzene	40.0	0.60	37.7	93	85 - 115
Toluene	40.0	1.38	39.3	95	85 - 115
Ethylbenzene	40.0	1.06	40.5	99	85 - 115
M,P-Xylene	80.0	1.07	79.2	98	85 - 115
O-Xylene	40.0	ND	39.1	98	85 - 115
Total Xylenes	120	1.07	118	98	85 - 115

Analyte	Spike Added (ug/L)	MSD Concentration (ug/L)	MSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	37.5	92	1	20
Toluene	40.0	39.4	95	0	20
Ethylbenzene	40.0	40.1	98	1	20
M,P-Xylene	80.0	79.0	97	0	20
O-Xylene	40.0	39.1	98	0	20
Total Xylenes	120	118	98	0	20

## SURROGATE RECOVERY MS/MSD

Analyte	% Recovery MS	% Recovery MSD	% Rec Limits
2,3,4-Trifluorotoluene	103	101	85 - 115

ND = Not Detected

97-05-082

CHAIN OF CUSTODY RECORD

Page \_\_\_\_\_ of \_\_\_\_\_

PROJECT NUMBER		PROJECT NAME		DATE		TOTAL NUMBER OF CONTAINERS		COMPOSITE OR GRAB		REQUESTED ANALYSIS				REMARKS	
SAMPLERS: (Signature)		DATE		DATE		TOTAL NUMBER OF CONTAINERS		COMPOSITE OR GRAB		REQUESTED ANALYSIS				REMARKS	
LAB ID	DATE	TIME	MATRIX	SAMPLE NUMBER											
01	5/18/97	0841	H <sub>2</sub> O	S97-0033	3										
02	5/18/97	1005	H <sub>2</sub> O	S97-0034	3										
03	5/18/97	1204	H <sub>2</sub> O	S97-0035	3										
04	5/18/97	1356	H <sub>2</sub> O	S97-0036	3										
05	5/18/97	1555	H <sub>2</sub> O	S97-0037	3										
06	5/18/97	1555	H <sub>2</sub> O	S97-0038	3										
07	5/18/97	1620	H <sub>2</sub> O	S97-0039	3										
08	5/18/97	1625	H <sub>2</sub> O	S97-0040	3										
09	5/18/97	1650	H <sub>2</sub> O	S97-0041	3										
10	5/18/97	1920	H <sub>2</sub> O	S97-0044	3										
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)		DATE/TIME		RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)		DATE/TIME	
5/19/97		0900		FAX				FAX				5/19/97		1000	
REQUESTED TURNAROUND TIME:		ROUTINE		RUSH		SAMPLE RECEIPT REMARKS		RESULTS & INVOICES TO:		TRANSMISSION OPERATIONS LABORATORY		EL PASO NATURAL GAS COMPANY		8645 RAILROAD DRIVE	
CARRIER CO.		BILL NO.		CHARGE CODE		EP67R-190000-71-ENVIRONMENTAL-Labor-0945-0230		915-759-2229		FAX: 915-759-2335		915-759-2229		FAX: 915-759-2335	

## CONDITION OF SAMPLE UPON RECEIPT

CLIENT: EPNGSHIPPING CONTAINER #: 001aWORKORDER NO. 9705.080INITIALS: SADATE: 5/10/92

1. Does this project require special handling according to NEESA, Level 3, or CLP protocols? If yes, complete a. and b. a. Cooler Temperature _____ b. Lot No's. _____ c. Airbill Number _____	Yes	<u>No</u>
2. Are custody seals on the cooler intact? If so, how many	<u>N/A</u>	No
3. Are custody seals on sample containers intact?	<u>N/A</u>	No
4. Is there a Chain of Custody (COC) or other representative documents, letters or shipping memos?	<u>Yes</u>	No
5. Is the COC complete? Relinquished: Yes <input checked="" type="checkbox"/> No Requested Analysis: Yes <input checked="" type="checkbox"/> No	<u>N/A</u>	No
6. Is the COC in agreement with the samples received? No. of Samples: Yes <input checked="" type="checkbox"/> No Sample ID's: Yes <input checked="" type="checkbox"/> No Matrix: Yes <input checked="" type="checkbox"/> No No. of Containers: Yes <input checked="" type="checkbox"/> No	<u>Yes</u>	No
7. Are the samples requiring acid preservation preserved correctly?	<u>N/A</u>	No
8. Is there enough sample? If so, are they in the proper containers?	<u>Yes</u>	No
9. Are all samples within holding times for the requested analyses?	<u>Yes</u>	<u>No</u>
10. Were the sample received on ice?	<u>N/A</u>	No
11. Were all sample containers received intact? (not broken or leaking, etc.)	<u>Yes</u>	No
12. Are samples requiring no headspace, headspace free?	<u>N/A</u>	No
13. Do the samples require quarantine?	<u>Yes</u>	<u>No</u>
14. Do samples require Paragon disposal?	<u>Yes</u>	No
15. Did the client return any unused bottles?	<u>Yes</u>	<u>No</u>

Describe "NO" items (except No's 1, 13, & 14): (9) Specific cond. out of hold upon receipt for all samples.

Was the client contacted? Yes \_\_\_\_\_ No \_\_\_\_\_  
If yes, Date: \_\_\_\_\_ Name of person contacted: \_\_\_\_\_

Describe actions taken or client instructions: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Group Leader's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Cooler Temperature: 2°C

**SAMPLE KEY**

SAMPLE NUMBER: S97-0417 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: EMP#3 PUMP BEFORE PURGING WELL'S  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 03:00 SAMPLE DATE: 08/19/97

Environmental Affairs  
OCT 13 1997  
Discontinued Operations

**SAMPLE KEY**

SAMPLE NUMBER: S97-0418 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: BAILER BLANK BEFORE SAMPLING  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 03:20 SAMPLE DATE: 08/19/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0419 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: PRODUCTION WELL DOOM'S  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 04:30 SAMPLE DATE: 08/19/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0420 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: PRODUCTION WELL OXY  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 06:15 SAMPLE DATE: 08/19/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0421 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL #15 ~~#14~~  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 09:04 SAMPLE DATE: 08/20/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0422 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL #12  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 12:08 SAMPLE DATE: 08/20/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0423 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL #12 DUP.  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 12:08 SAMPLE DATE: 08/20/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0424 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: FIELD BLANK  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 10:40 SAMPLE DATE: 08/20/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0425 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL #13  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 02:40 SAMPLE DATE: 08/20/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0426 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: EMP#3 PUMP BLANK AFTER PURGING WELL'S  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 03:40 SAMPLE DATE: 08/20/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0427 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: BAILER BLANK AFTER SAMPLING WELL'S  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 03:45 SAMPLE DATE: 08/20/97



# PARAGON ANALYTICS, INC.

225 Commerce Drive ♦ Fort Collins, CO 80524 ♦ (800) 443-1511 ♦ (970) 490-1511 ♦ FAX (970) 490-1522

October 2, 1997

Mr. Darrell Campbell  
El Paso Natural Gas CO.  
8645 Railroad Drive  
El Paso, TX 79904

RE: Paragon Workorder: 97-08-263  
Client Project Name: S97-0417  
Client Project Number: Not Submitted

Dear Mr. Campbell:

Two water samples were received from El Paso Natural Gas Co. on August 21, 1997. The samples were scheduled for the following analyses:

Specific Conductance	pages 1-4
pH	pages 1-4
Aromatic Volatile Organics	pages 1-8
Total Recoverable Metals	pages 1-9
Inorganics	pages 1-19

The results for these analyses are contained in the enclosed reports.

Thank you for your confidence in Paragon Analytics, Inc. Should you have any questions, please call.

Sincerely,

Paragon Analytics, Inc.  
Victoria Bayly  
Project Manager

VB/jjc  
Enclosure: report

# Paragon Analytics, Inc.



## SPECIFIC CONDUCTANCE CASE NARRATIVE

### **El Paso Natural Gas Co.**

S97-0417

**Order Number - 9708263**

1. This report consists of two water samples.
2. The samples were received intact at a temperature of 9° C. on August 21, 1997.
3. The samples were prepared for analysis based on EPA Method 120.1.
4. All standards and solutions are NIST traceable and were used within their recommended shelf life.

All in house quality control procedures were followed, as described below.

5. General quality control procedures.
  - All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analyte. This indicates a valid calibration and stable instrument conditions.
6. A sample from another Order Number was used for the matrix QC sample for this batch.
  - A duplicate was prepared and analyzed with this batch. All acceptance criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below:



Krista Mobley  
Krista Mobley  
Inorganic Technician

9-4-97  
Date

SW  
Reviewer's Initials

9/5/97  
Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Paragon Analytics, Inc.

SAMPLE NUMBER(S) CROSS-REFERENCE TABLE

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0417

PAI-ID	Client ID	MATRIX	DATE
			SAMPLED
9708263-1	S97-0417	Water	08/19/97
9708263-2	S97-0418	Water	08/19/97

# Specific Conductance In Water

Method EPA 120.1

## Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

ClientName: El Paso Natural Gas Co.

Client Project ID: S97-0417

Work Order Number: 9708263

Reporting Basis: AS RECEIVED

Reported on: Thursday, September 04, 1997

Final Volume: N/A

Matrix: Water

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Units	Detection Limit	Flag	Sample Aliquot
S97-0417	9708263-1	8/19/97	N/A	8/1/97	N/A	1	681	umhos/cm			N/A
S97-0418	9708263-2	8/19/97	N/A	8/1/97	N/A	1	2.05	umhos/cm			N/A

Comments:

000004

# Paragon Analytics, Inc.



## PH ANALYSIS CASE NARRATIVE

---

### El Paso Natural Gas Co.

S97-0417

Order Number - 9708263

1. This report consists of two water samples.
2. The samples were received intact at a temperature of 9<sup>0</sup> C. on August 21, 1997.
3. The samples were prepared for analysis based on SW-846, 3<sup>rd</sup> Edition procedures. Specifically, the water samples were analyzed following Method 9040.
4. All standards and solutions were used within their recommended shelf life.  
All in house quality control procedures were followed, as described below.
5. General quality control procedures.
  - All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analyte. This indicates a valid calibration and stable instrument conditions.
6. A sample from another Order Number was used for the matrix QC sample for this batch.
  - A duplicate was prepared and analyzed with this batch. All acceptance criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below:



Krista Mobley  
Krista Mobley  
Inorganic Technician

9-4-97  
Date

SW  
Reviewer's Initials

9/5/97  
Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

**Paragon Analytics, Inc.**

**SAMPLE NUMBER(S) CROSS-REFERENCE TABLE**

**Client Name: El Paso Natural Gas Co.**

**Client Project ID: S97-0417**

PAI-ID	Client ID	MATRIX	DATE
			SAMPLED
9708263-1	S97-0417	Water	08/19/97
9708263-2	S97-0418	Water	08/19/97

**pH Water**  
**Method SW846 9040**  
**Sample Results**

Page 1 of 1

Lab Name: Paragon Analytics, Inc.  
ClientName: El Paso Natural Gas Co.  
Client Project ID: S97-0417  
Work Order Number: 9708263  
Reporting Basis: AS RECEIVED

Reported on: Thursday, September 04, 1997

Final Volume: N/A  
Matrix: Water

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Units	Detection Limit	Flag	Sample Aliquot
S97-0417	9708263-1	8/19/97	N/A	9/1/97	N/A	1	8.0	PH			N/A
S97-0418	9708263-2	8/19/97	N/A	9/1/97	N/A	1	6.2	PH			N/A

Comments:

000004 *km*



# Paragon Analytics, Inc.

## Aromatic Volatile Organics Case Narrative

---

### El Paso Natural Gas Co.

S97-0417

Order Number - 9708263

1. This report consists of 2 water samples received by Paragon on 08/21/97.
2. These samples were prepared and analyzed according to SW-846, 3rd Edition procedures. Specifically, the water samples were prepared by heating and purging 5 mls using purge and trap procedures based on Method 5030. The calibration curve was also prepared using the heated purge.
3. The samples were analyzed using a GC with a DB-VRX capillary column and a PID detector according to protocols based on SW-846 Method 8020. All positive results were quantitated using the responses from the initial calibration curve using the internal standard technique. Second column confirmation was performed on all samples with positive results on a DB-624 capillary column.
4. All samples were analyzed within the established holding times.
5. The method blank associated with this project was/were below the reporting limits for all analytes.
6. All matrix spike and matrix spike duplicate recoveries and RPDs were within acceptance criteria.
7. All blank spike and blank spike duplicate recoveries and RPDs were within the acceptance criteria.
8. All surrogate recoveries were within acceptance criteria.



9. All internal standard recoveries were within acceptance criteria.
10. All initial and continuing calibration criteria were within acceptance criteria.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Marty O Brown  
Marty Brown  
GC Analyst

9-12-97  
Date

RB  
Reviewer's Initials

9-14-97  
Date

**Paragon Analytics, Inc.**

**SAMPLE NUMBER(S) CROSS-REFERENCE TABLE**

**Client Name: El Paso Natural Gas Co.**

**Client Project ID: S97-0417**

PAI-ID	Client ID	MATRIX	DATE SAMPLED
9708263-1	S97-0417	Water	08/19/97
9708263-2	S97-0418	Water	08/19/97

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0417

**Reagent Blank**

Lab Sample ID: WRB1 8/26/97

Date Collected: N/A  
Date Extracted: 8/26/97  
Date Analyzed: 8/26/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	93	88 - 119

ND = Not Detected at or above client requested reporting limit.

000004

# AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0417**

*Pump before  
sampling*

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0417

Lab Sample ID: 9708263-1

Date Collected: 8/19/97

Date Extracted: 8/27/97

Date Analyzed: 8/27/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	0.78	0.50
Toluene	1.26	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	1.23	1.0
O-Xylene	0.61	0.50
Total Xylenes	1.84	1.0

## SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	90	88 - 119

ND = Not Detected at or above client requested reporting limit.

000005

# AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0418**

*Boiler  
Blank*

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0417

Lab Sample ID: 9708263-2

Date Collected: 8/19/97

Date Extracted: 8/27/97

Date Analyzed: 8/27/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

## SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	92	88 - 119

ND = Not Detected at or above client requested reporting limit.

000006

# AROMATIC VOLATILE ORGANICS BLANK SPIKE

Method 8020

Sample ID

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0417

**Blank Spike**

Lab Sample ID: WBS1 8/26/97

Date Extracted: 8/27/97

Date Analyzed: 8/27/97

Sample Matrix: Water

Sample Volume: 5 mL

Analyte	Spike Added (ug/L)	BS Concentration (ug/L)	BS Percent Recovery	QC Limits % Rec
Benzene	40.0	43.1	108	85 - 115
Toluene	40.0	41.5	104	85 - 115
Ethylbenzene	40.0	40.2	101	85 - 115
M,P-Xylene	80.0	80.2	100	85 - 115
O-Xylene	40.0	40.3	101	85 - 115
Total Xylenes	120	121	100	85 - 115

Analyte	Spike Added (ug/L)	BSD Concentration (ug/L)	BSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	44.0	110	2	20
Toluene	40.0	42.3	106	2	20
Ethylbenzene	40.0	40.7	102	1	20
M,P-Xylene	80.0	81.2	102	1	20
O-Xylene	40.0	41.3	103	2	20
Total Xylenes	120	122	102	2	20

## SURROGATE RECOVERY BS/BSD

Analyte	% Recovery BS	% Recovery BSD	% Rec Limits
2,3,4-Trifluorotoluene	93	95	88 - 119

D = Detected

000007

# AROMATIC VOLATILE ORGANICS MATRIX SPIKE

Method 8020

Sample ID

In House

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0417

Date Collected: 8/20/97  
Date Extracted: 8/27/97  
Date Analyzed: 8/27/97

Lab Sample ID: 97008275-1MS

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Spike Added (ug/L)	Sample Concentration (ug/L)	MS Concentration (ug/L)	MS Percent Recovery	QC Limits % Rec
Benzene	40.0	ND	41.3	103	85 - 115
Toluene	40.0	ND	39.5	99	85 - 115
Ethylbenzene	40.0	ND	37.8	95	85 - 115
M,P-Xylene	80.0	ND	78.0	98	85 - 115
O-Xylene	40.0	ND	40.5	101	85 - 115
Total Xylenes	120	ND	119	99	85 - 115

Analyte	Spike Added (ug/L)	MSD Concentration (ug/L)	MSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	41.4	104	0	20
Toluene	40.0	40.5	101	2	20
Ethylbenzene	40.0	39.2	98	4	20
M,P-Xylene	80.0	80.1	100	3	20
O-Xylene	40.0	40.9	102	1	20
Total Xylenes	120	121	101	2	20

## SURROGATE RECOVERY MS/MSD

Analyte	% Recovery MS	% Recovery MSD	% Rec Limits
2,3,4-Trifluorotoluene	88	92	88 - 119

ND = Not Detected

000003



# Paragon Analytics, Inc.

## TOTAL RECOVERABLE METALS CASE NARRATIVE

---

### El Paso Natural Gas Co.

S97-0417

Order Number - 9708263

1. This report consists of 2 water samples.
2. The samples were received intact on 08/21/97. The temperature of the samples upon receipt was 9° Celsius.
3. The samples had been correctly preserved for the requested analyses.
4. The samples were prepared for analysis based on SW-846, 3<sup>rd</sup> Edition procedures.  
For analysis by conventional ICP, the samples were digested following method 3005A.
5. The samples were analyzed following SW846 protocols by conventional ICP (Method 6010A).
6. All standards and solutions are NIST traceable and were used within their recommended shelf life.
7. The samples were prepared and analyzed within the established hold times.
8. Sample results which are below PAI's standard reporting limits are reported as "ND" on the enclosed report.

All in house quality control procedures were followed, as described below.

9. General quality control procedures.
  - A preparation (method) blank and laboratory control sample were digested and analyzed with the samples in this digestion batch. There were not more than 20 samples in the digestion batch.
  - The preparation (method) blank results associated with this batch were below the reporting limits for the requested analytes. This indicates that no contaminants were introduced to the samples during the digestion procedure.



- The laboratory control sample associated with this batch was within acceptance limits. This indicates complete digestion according to the method.
  - All initial and continuing calibration blanks associated with this batch were below the reporting limits for the requested analytes. This indicates a valid calibration and stable instrument conditions.
  - All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analytes. This indicates a valid calibration and stable instrument conditions.
  - The interference check samples, and high standard readbacks associated with Method 6010A analyses were within acceptance criteria.
10. A sample from another Order Number was used as the QC sample for this batch.
- A matrix spike and matrix spike duplicate were digested and analyzed with this batch. All acceptance criteria for accuracy were met with the following exception.

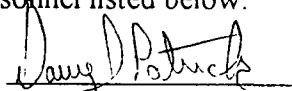
Analyte  
Silicon

Sample ID  
9708264-1S & DS

The concentration of silicon in the native sample was greater than 4 times the concentration of matrix spike added during the digestion. When sample concentration is that much greater than the spike added, spike recoveries may not be accurate. The Laboratory Control Sample is included to show that the digestion and analysis were in control.

- A sample duplicate and spike duplicate were digested and analyzed with this batch. All acceptance criteria for precision were met.
- A serial dilution was analyzed with this batch. All acceptance criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below:



Darryl Patrick  
Senior Inorganic Chemist

9/5/97

Date

SW

Reviewer's Initials

9/5/97

Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

**Paragon Analytics, Inc.**

**SAMPLE NUMBER(S) CROSS-REFERENCE TABLE**

**Client Name: El Paso Natural Gas Co.**

**Client Project ID: S97-0417**

PAI-ID	Client ID	MATRIX	DATE
			SAMPLED
9708263-1	S97-0417	Water	08/19/97
9708263-2	S97-0418	Water	08/19/97

000003

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0417  
Lab Sample ID: RB 9708263

Sample ID

**Reagent Blank**

Date Collected: N/A  
Prep Date: 08/29/97  
Date Analyzed: 09/02/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	ND	0.1
Calcium	ND	1
Copper	ND	0.01
Iron	ND	0.1
Magnesium	ND	1
Manganese	ND	0.01
Potassium	ND	1
Silicon	ND	0.05
Sodium	ND	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

000004

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0417  
Lab Sample ID: 9708263-1

Sample ID

**S97-0417**

*Pump before  
purging*

Sample Matrix: Water

Date Collected: 08/19/97

Prep Date: 08/29/97

Date Analyzed: 09/02/97

Hardness (in mg/L CaCO<sub>3</sub>) = 170 mg/L

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.2	0.1
Calcium	46	1
Copper	ND	0.01
Iron	0.7	0.1
Magnesium	14	1
Manganese	0.06	0.01
Potassium	4	1
Silicon	16	0.05
Sodium	76	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

000005

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0417  
Lab Sample ID: 9708263-2

Sample ID

**S97-0418**

*Baylor  
blank*

Sample Matrix: Water

Date Collected: 08/19/97

Prep Date: 08/29/97

Date Analyzed: 09/02/97

Hardness (in mg/L CaCO<sub>3</sub>) = < 3 mg/L

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	ND	0.1
Calcium	ND	1
Copper	ND	0.01
Iron	ND	0.1
Magnesium	ND	1
Manganese	ND	0.01
Potassium	ND	1
Silicon	ND	0.05
Sodium	ND	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

0000006

*DP*

# TOTAL RECOVERABLE METALS MATRIX SPIKE

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Lab Sample ID: 9708264-1

Sample ID

**In House**

Sample Matrix: Water

Prep Date: 08/29/97

Date Analyzed: 09/02/97

Analyte	Spike Added mg/L	Sample Conc. mg/L	MS Conc. mg/L	% Rec (limits 80-120%)	Flags
Boron	1.0	0.2	1.2	100	See note
Calcium	40	46	88	105	
Copper	0.25	< 0.01	0.25	100	
Iron	1.0	< 0.1	1.0	100	
Magnesium	40	16	58	105	
Manganese	0.50	< 0.01	0.49	98	
Potassium	40	4	45	103	
Silicon	0.5	23.9	24.4	100	
Sodium	40	64	106	105	
Zinc	0.50	0.05	0.52	94	

See note on following page.

000007

DP

# TOTAL RECOVERABLE METALS MATRIX SPIKE DUPLICATE

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Lab Sample ID: 9708264-1

Sample ID

**In House**

Sample Matrix: Water

Prep Date: 08/29/97

Date Analyzed: 09/02/97

Analyte	MSD Conc. mg/L	MSD % Rec (limits 80-120%)	Relative % Difference (limits 0-20%)	Flags
Boron	1.2	100	0	See note
Calcium	87	103	1	
Copper	0.24	96	4	
Iron	1.0	100	0	
Magnesium	57	103	2	
Manganese	0.48	96	2	
Potassium	45	103	0	
Silicon	21.6	-460	12	
Sodium	105	103	1	
Zinc	0.51	92	2	

Note: Due to the large concentration of analyte in the sample, matrix spike recoveries may not be accurate. The Laboratory Control Sample (LCS) is included on a separate page to show that the digestion and analysis were in control.

000008

DP

**TOTAL RECOVERABLE METALS  
LABORATORY CONTROL SAMPLE**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0417  
Order Number: 9708263

Date Analyzed: 09/02/97

Analyte	LCS Result mg/L	LCS True Value mg/L	LCS % Recovery	Limits
Silicon	0.51	0.50	102	80 - 120%

000009

BP



# Paragon Analytics, Inc.

## INORGANICS CASE NARRATIVE

---

### El Paso Natural Gas Co.

S97-0417

Order Number - 9708263

1. This report consists of data for 2 water samples analyzed for total alkalinity, bicarbonate, carbonate, bromide, chloride, fluoride, nitrate/nitrite, sulfate, and total dissolved solids (TDS).
2. The samples were received cool and intact on 08/21/97.
3. The samples had been correctly preserved for the requested analyses.
4. The samples were analyzed using procedures based on the following methods from the USEPA or *Standard Methods for the Examination of Water and Wastewater*, 17th Ed.:

<u>Analyte</u>	<u>Method</u>
Total Alkalinity	4500-CO <sub>2</sub>
Bicarbonate	4500-CO <sub>2</sub>
Carbonate	4500-CO <sub>2</sub>
Bromide	300.0
Chloride	300.0
Fluoride	340.2
Nitrate/Nitrite	353.3
Sulfate	300.0
Total Dissolved Solids	160.1

5. All standards and reagents were used within their recommended shelf life.
6. The samples were prepared and analyzed within the established hold times.
7. Sample results which are below the reporting limit are reported as "ND" on the enclosed report.



All in house quality control procedures were followed, as described below.

8. General quality control procedures.

- The method blank results were below the reporting limits for all analyses.
- The LCS results were within acceptance limits for all analyses.
- The MS and MSD results were within acceptance limits for all analyses
- The matrix duplicate results were within acceptance limits for total alkalinity, nitrate/nitrite, and total dissolved solids.

The data contained in the following report have been reviewed and approved by the personnel listed below:

Jm  
Reporter's Initials

9/19/97  
Date

B  
Reviewer's Initials

10-1-97  
Date

CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# TOTAL ALKALINITY

Method 4500-CO2

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID:  
Client Project No. S97-0417  
Lab Workorder Number: 9708263

Date Collected: 08/19/97  
Date Analyzed: 08/30/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Total Alkalinity as CaCO3 Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	5
S97-0417	9708263-1	140	5
S97-0418	9708263-2	10	5

ND = Not Detected

000003

# BICARBONATE ALKALINITY

Method 4500-CO2

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID:

Client Project No. S97-0417

Lab Workorder Number: 9708263

Date Collected: 08/19/97

Date Analyzed: 08/30/97

Sample Matrix: Water

Client ID	Lab Sample ID	Bicarbonate Alkalinity as CaCO3 Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	5
S97-0417	9708263-1	140	5
S97-0418	9708263-2	10	5

ND = Not Detected

000004

# CARBONATE ALKALINITY

Method 4500-CO2

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID:

Client Project No. S97-0417

Lab Workorder Number: 9708263

Date Collected: 08/19/97

Date Analyzed: 08/30/97

Sample Matrix: Water

Client ID	Lab Sample ID	Carbonate Alkalinity as CaCO3 Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	5
S97-0417	9708263-1	ND	5
S97-0418	9708263-2	ND	5

ND = Not Detected

000005

## Alkalinity Calculations and Quality Control Results

Date analyzed: August 30, 1997

ID	aliquot titrated (mL)	titrant normality N	vol to pH 8.3 (mL)	vol to pH 4.5 (mL)	total vol (mL)	HCO3CO3OHTotal				DL (mg/L)
						mg/L as CaCO3				
R Blank	100	0.0194	0	0.36	0.36	3	0	0	3.5	5
LCS	100	0.0194	10.38	0.63	11.01	0	12	94	106.6	5
9708263-1	100	0.0194	0	14.34	14.34	139	0	0	138.8	5
9708263-2	100	0.0194	0	1.04	1.04	10	0	0	10.1	5
9708264-1	100	0.0194	0	18.95	18.95	183	0	0	183.4	5
9708264-1 dup	100	0.0194	0	19.19	19.19	186	0	0	185.7	5
9708264-2	100	0.0194	0	14.92	14.92	144	0	0	144.4	5
9708275-1	100	0.0194	0	15.39	15.39	149	0	0	149.0	5
9708275-2	100	0.0194	0	13.63	13.63	132	0	0	131.9	5
9708275-3	100	0.0194	0	12.66	12.66	123	0	0	122.5	5
9708275-4	100	0.0194	0	0.41	0.41	4	0	0	4.0	5
9708275-5	100	0.0194	0	16.18	16.18	157	0	0	156.6	5
9708275-6	100	0.0194	0	13.52	13.52	131	0	0	130.9	5
9708275-7	100	0.0194	0	0.16	0.16	2	0	0	1.5	5
9708278-3	100	0.0194	0	10.83	10.83	105	0	0	104.8	5
9708215-1	100	0.0194	0	16.98	16.98	164	0	0	164.4	5
9708215-2	100	0.0194	0	17.65	17.65	171	0	0	170.8	5

### Standardization of titrant

Conc Na <sub>2</sub> CO <sub>3</sub> std	Na <sub>2</sub> CO <sub>3</sub> aliquot	HCl vol	HCl conc
0.0470	5.00	12.08	0.01945
0.0470	5.00	12.09	0.01944
0.0470	5.00	12.25	0.01918

mean = 0.01936

## Alkalinity Quality Control Results

Date analyzed: August 30, 1997

### LCS SUMMARY

ID	expected alk conc (mg/L)	alk conc found (mg/L)	recovery %	recovery acceptance limit
LCS	100.0	106.6	107	85-115%

### DUPLICATE SUMMARY

ID	sample alk conc (mg/L)	duplic alk conc (mg/L)	RPD %	accept. limits
9708264-1	183.4	185.7	1.3	0-15%

000006

**BROMIDE**

Method 300.0

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: Not Submitted  
Client Project No: S97-0419  
Lab Workorder Number: 9708264

Date Collected: 08/19/97  
Date Analyzed: 09/09-16/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Bromide Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.2
S97-0417	9708263-1	0.5	0.2
S97-0418	9708263-2	ND	0.2

ND = Not Detected

000007

# BROMIDE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9708263-2

Date Analyzed: 09/09/97

Sample Matrix: Water

Sample ID

**S97-0418**

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Bromide	5.00	ND	5.29	106	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Bromide	5.00	5.32	106	1	0-15 %

000008

# CHLORIDE

Method 300.0

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID:  
Client Project No: S97-0417  
Lab Workorder Number: 9708263

Date Collected: 08/19/97  
Date Analyzed: 09/09,11/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Chloride Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.2
S97-0417	9708263-1	100	4
S97-0418	9708263-2	0.2	0.2

ND = Not Detected

000009

# CHLORIDE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9708263-2

Date Analyzed: 09/09/97

Sample Matrix: Water

Sample ID

**S97-0418**

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Chloride	5.00	0.24	5.24	100	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Chloride	5.00	5.64	108	7	0-20 %

000010

# FLUORIDE

Method 340.2

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID:  
Client Project No: S97-0417  
Lab Workorder Number: 9708263

Date Collected: 08/19/97  
Date Analyzed: 09/09/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Fluoride Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.5
S97-0417	9708263-1	1.6	0.5
S97-0418	9708263-2	ND	0.5

ND = Not Detected

000011

# Fluoride in Water Samples Calculations

Date analyzed: Sep 9, 1997

ID	sample aliquot (mg/L)	final vol after dil (mL)	electrode reading (mv)	calc F conc (mg/L)	report F conc (mg/L)	DL (mg/L)
ICV (LCS)	20	20	29	10.22	10.2	0.5
ICB	20	20	166	0.04	0.0	0.5
9708275-1	20	20	75	1.62	1.62	0.5
9708275-1 MS	20	20	38	7.12	7.12	0.5
9708275-1 MSD	20	20	38	7.12	7.12	0.5
9708275-2	20	20	80	1.32	1.3	0.5
9708275-3	20	20	81	1.27	1.3	0.5
9708275-4	20	20	168	0.04	0.0	0.5
9708275-5	20	20	81	1.27	1.3	0.5
9708275-6	20	20	76	1.55	1.6	0.5
9708275-7	20	20	140	0.12	0.1	0.5
9708311-1	20	20	40	6.57	6.6	0.5
CCV	20	20	30	9.81	9.8	0.5
CCB	20	20	141	0.11	0.1	0.5
9708311-2	20	20	40	6.57	6.6	0.5
9708311-3	20	20	40	6.57	6.6	0.5
9708311-4	20	20	46	5.17	5.2	0.5
9708357-1	20	20	73	1.75	1.8	0.5
9708357-2	20	20	74	1.68	1.7	0.5
9708361-6	20	20	109	0.41	0.4	0.5
9708361-7	20	20	70	1.98	2.0	0.5
9708361-8	20	20	74	1.68	1.7	0.5
9708361-9	20	20	80	1.32	1.3	0.5
9708361-10	20	20	109	0.41	0.4	0.5
CCV	20	20	30	9.81	9.8	0.5
CCB	20	20	135	0.15	0.1	0.5
9708361-11	20	20	118	0.29	0.3	0.5
9708361-12	20	20	96	0.70	0.7	0.5
9708361-13	20	20	102	0.55	0.5	0.5
9708361-14	20	20	88	0.96	1.0	0.5
9709094-1	20	20	75	1.62	1.6	0.5
9708278-3	20	20	101	0.57	0.6	0.5
9708263-1	20	20	76	1.55	1.6	0.5
9708263-1 MS	20	20	39	6.84	6.8	0.5
9708263-1 MSD	20	20	39	6.84	6.8	0.5
9708263-2	20	20	157	0.06	0.1	0.5
CCV	20	20	30	9.81	9.8	0.5
CCB	20	20	156	0.06	0.1	0.5
9708264-1	20	20	91	0.85	0.9	0.5
9708264-2	20	20	88	0.96	1.0	0.5
9709093-1	20	20	104	0.51	0.5	0.5
9709093-2	20	20	127	0.20	0.2	0.5
9709093-3	20	20	98	0.64	0.6	0.5
9709093-4	20	20	110	0.40	0.4	0.5
9709093-5	20	20	97	0.67	0.7	0.5
9709093-6	20	20	108	0.43	0.4	0.5
9709093-7	20	20	109	0.41	0.4	0.5
9709093-8	20	20	119	0.28	0.3	0.5
CCV	20	20	30	9.81	9.8	0.5
CCB	20	20	135	0.15	0.1	0.5
9709093-9	20	20	131	0.17	0.2	0.5
9709093-10	20	20	118	0.29	0.3	0.5
9709093-11	20	20	129	0.19	0.2	0.5
9709093-12	20	20	87	1.00	1.0	0.5
CCV	20	20	30	9.81	9.8	0.5
CCB	20	20	140	0.12	0.1	0.5

## STANDARD CURVE

std conc (mg/L)	log conc	mv	calc conc	Regression Output:	
0.5	-0.301	104	0.51	Constant	1.513987
1	0.000	88	0.96	Std Err of Y Est	0.015785
5	0.699	46	5.17	R Squared	0.999707
10	1.000	29	10.22	No. of Observations	5
50	1.699	-10	48.76	Degrees of Freedom	3
				X Coefficient(s)	-0.0174
				Std Err of Coef.	0.000172

000012

# Fluoride Quality Control Results

Date analyzed: Sep 9, 1997

## ICV (LCS) SUMMARY

	spike added F conc (mg/L)	F conc found (mg/L)	recovery %
ICV	10.0	10.2	102

## MATRIX SPIKE SUMMARY

	spike F conc added (mg/L)	sample F conc (mg/L)	spike F conc (mg/L)	recovery %	recovery accept limit	RPD %	RPD accept. limit
9708275-1 MS	5.0	1.6	7.1	110	85-115%		
9708275-1 MSD	5.0	1.6	7.1	110	85-115%	0	< 15%
9708263-1 MS	5.0	1.6	6.8	106	85-115%		
9708263-1 MSD	5.0	1.6	6.8	106	85-115%	0	< 15%

ND = Not Detected

000013

# NITRATE + NITRITE

Method 353.3

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID:  
Client Project No: S97-0417  
Lab Workorder Number: 9708263

Date Collected: 08/19/97  
Date Analyzed: 08/31/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Nitrate + Nitrite as N Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.05
S97-0417	9708263-1	ND	0.05
S97-0418	9708263-2	ND	0.05

ND = Not Detected

000014

# Nitrate + Nitrite Calculations and Quality Control Results

Date analyzed: 08/31/97

NO3-N std (mg/L)	Abs (543 nm)	calc NO3-N conc (mg/L)	Regression Output:		
0.00	0.068	0.005	Constant	-0.06343	
0.05	0.112	0.049	Std Err of Y Est	0.0082	
0.10	0.165	0.102	R Squared	0.999633	
0.20	0.251	0.188	No. of Observations	6	
0.50	0.572	0.509	Degrees of Freedom	4	
1.00	1.059	0.997	X Coefficient(s)	1.001605	
			Std Err of Coef.	0.009601	

ID:	additional DF	Abs (543 nm)	calc instr NO3+NO2-N conc (mg/L)	sample NO3+NO2-N conc (mg/L)	Detection Limit (mg/L)	ICV, CCV recovery %
ICV 226 mg/L	1	0.289	0.226	0.226	0.05	100
ICB	1	0.072	0.01	0.01	0.05	
0.304 ppm NO2	1	0.362	0.299	0.30	0.05	98
9708355-1	1	0.046	-0.02	-0.02	0.05	
9708355-1Dup	1	0.041	-0.02	-0.02	0.05	
9708355-1MS	1	0.532	0.47	0.47	0.05	
9708355-1MSD	1	0.587	0.52	0.52	0.05	
9708355-2	1	0.492	0.43	0.43	0.05	
9708355-3	1	0.066	0.00	0.00	0.05	
9708355-4	5	0.475	0.41	2.06	0.25	
9708057-3	1	0.016	-0.05	-0.05	0.05	
9708159-1	50	0.133	0.07	3.49	2.50	
9708159-2	1	0.490	0.43	0.43	0.05	
CCV	1	0.562	0.50	0.50	0.05	100
CCB	1	0.034	-0.03	-0.03	0.05	
9708160-1	20	0.354	0.29	5.82	1.00	
9708160-2	1	0.027	-0.04	-0.04	0.05	
9708160-3	1	0.632	0.57	0.57	0.05	
9708160-4	1	0.148	0.08	0.08	0.05	
9708263-1	1	0.068	0.00	0.00	0.05	
9708263-2	1	0.068	0.00	0.00	0.05	
9708264-1	2	0.641	0.58	1.16	0.10	
9708264-2	1	0.893	0.83	0.83	0.05	
9708275-1	1	0.999	0.94	0.94	0.05	
9708275-1Dup	1	1.013	0.95	0.95	0.05	
CCV	1	0.584	0.52	0.52	0.05	104
CCB	1	0.065	0.00	0.00	0.05	
9708275-1MS	1	1.528	1.47	1.47	0.05	
9708275-1MSD	1	1.441	1.38	1.38	0.05	
9708275-2	1	0.248	0.18	0.18	0.05	
9708275-3	1	0.317	0.25	0.25	0.05	
9708275-4	1	0.074	0.01	0.01	0.05	
9708275-5	1	1.047	0.99	0.99	0.05	
9708275-6	1	0.053	-0.01	-0.01	0.05	
9708275-7	1	0.161	0.10	0.10	0.05	
CCV	1	0.548	0.49	0.49	0.05	97
CCB	1	0.052	-0.01	-0.01	0.05	
9708275-7dup	1	0.168	0.10	0.10	0.05	
9708275-7MS	1	0.620	0.56	0.56	0.05	
9708275-7MSD	1	0.625	0.56	0.56	0.05	
CCV	1	0.544	0.48	0.48	0.05	96
CCB	1	0.062	-0.00	-0.00	0.05	

## Nitrate + Nitrite Quality Control Results

Date analyzed: 08/31/97

### BLANK SUMMARY

ID	blank conc. (mg/L)	blank reporting limit (mg/L)
ICB	0.01	< 0.05

### LCS / ICV SUMMARY

ID	true conc. (mg/L)	conc. found (mg/L)	recovery %	accept. limits
ICV	0.226	0.226	100	80-120%

### MATRIX SPIKE SUMMARY

ID	spike added conc (mg/L)	sample conc (mg/L)	spiked sample conc (mg/L)	recovery %	recovery accept. limits	RPD %	RPD accept. limits
9708355-1MS	0.50	-0.017	0.469	97	75-125 %		
9708355-1MSD	0.50	-0.017	0.525	108	75-125 %	11	0-20%
9708275-7MS	0.50	0.098	0.558	92	75-125 %		
9708275-7MSD	0.50	0.098	0.563	93	75-125 %	1	0-20%

ND = Not Detected

000015

# SULFATE

Method 300.0

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID:  
Client Project No: S97-0417  
Lab Workorder Number: 9708263

Date Collected: 08/19/97  
Date Analyzed: 09/09/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Sulfate Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	1
S97-0417	9708263-1	56	10
S97-0418	9708263-2	ND	1

ND = Not Detected

000016

# SULFATE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9708263-2

Date Analyzed: 09/09/97

Sample Matrix: Water

Sample ID

**S97-0418**

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Sulfate	20.0	ND	20.4	102	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Sulfate	20.0	21.0	105	3	0-15 %

000017

# TOTAL DISSOLVED SOLIDS

Method 160.1

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID:

Client Project No: S97-0417

Lab Workorder Number: 9708263

Date Collected: 08/19/97

Date Prepared: 08/26/97

Sample Matrix: Water

Client ID	Lab Sample ID	Total Dissolved Solids Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	20
S97-0417	9708263-1	430	20
S97-0418	9708263-2	ND	20

ND = Not Detected

000018

# TDS Calculations and Quality Control Results

Preparation Date: August 26, 1997

ID	sample vol (mL)	empty beaker tare (g)	A beaker + residue gross (g)	A net (mg)	B beaker + residue gross (g)	B net (mg)	gross A vs gross B RPD %	calculated TDS conc (mg/L)	TDS DL (mg/L)
Method Blank	100	66.7622	66.7629	0.7	66.7627	0.5	0.000	5	20
Blank Spike	100	82.4518	82.4926	40.8	82.4924	40.6	0.000	406	20
Blank Spike Dup	100	67.5781	67.6182	40.1	67.6180	39.9	0.000	399	20
9708267-1	100	68.2305	68.2886	58.1	68.2882	57.7	0.001	577	20
9708267-1 dup	100	67.3558	67.4139	58.1	67.4133	57.5	0.001	575	20
9708273-1	100	80.3577	80.4072	49.5	80.4067	49.0	0.001	490	20
9708273-2	100	67.5286	67.5476	19.0	67.5472	18.6	0.001	186	20
9708273-3	100	72.5002	72.5824	82.2	72.5814	81.2	0.001	812	20
9708273-4	100	87.9249	88.0036	78.7	88.0032	78.3	0.000	783	20
9708263-1	100	67.4898	67.5328	43.0	67.5326	42.8	0.000	428	20
9708263-2	100	80.2449	80.2456	0.7	80.2451	0.2	0.001	2	20
9708264-1	100	80.7424	80.7839	41.5	80.7839	41.5	0.000	415	20
9708264-2	100	81.8257	81.8728	47.1	81.8722	46.5	0.001	465	20
9708275-1	100	67.8153	67.8613	46.0	67.8611	45.8	0.000	458	20
9708275-2	100	86.0809	86.1582	77.3	86.1551	74.2	0.004	742	20
9708275-3	100	84.7399	84.8149	75.0	84.8139	74.0	0.001	740	20
9708275-4	100	68.8908	68.8917	0.9	68.8907	-0.1	0.001	-1	20
9708275-5	100	71.5681	71.6127	44.6	71.6119	43.8	0.001	438	20
9708275-6	100	68.4212	68.4631	41.9	68.4626	41.4	0.001	414	20
9708275-7	100	71.8488	71.8494	0.6	71.8493	0.5	0.000	5	20
9708278-3	100	68.1547	68.1722	17.5	68.1719	17.2	0.000	172	20
9708275-1 dup	100	78.8295	78.8794	49.9	78.8790	49.5	0.001	495	20

## BLANK SUMMARY

ID	blank conc (mg/L)	accept. limit (mg/L)
Method Blank	5	< 20

## BLANK SPIKE SUMMARY

ID	spike added mg	spike added conc (mg/L)	spiked sample conc (mg/L)	recovery %	accept. limit	RPD %	RPD accept. limit
Blank Spike	40.0	400	406	101	85-115%		
Blank Spike Dup	40.0	400	399	100	85-115%	1.7	0-15%

## DUPLICATE SUMMARY

ID	sample conc (mg/L)	duplic conc (mg/L)	RPD %	accept. limits
9708267-1	577	575	0.3	0-15%
9708275-1	458	495	7.8	0-15%

97.08.263

## CHAIN OF CUSTODY RECORD

Page 1 of 1

PROJECT NUMBER		PROJECT NAME		DATE		REQUESTED ANALYSIS		CONTRACT LABORATORY P O NUMBER	
SAMPLES (Signature)		DATE		DATE		REQUESTED ANALYSIS		CONTRACT LABORATORY P O NUMBER	
LAB ID	DATE	TIME	MATRIX	SAMPLE NUMBER	TOTAL NUMBER OF CONTAINERS	COMPOSITE OR GRAB	BTEX	TDS	ANIONS
	8/14/15	1500	H2O	S97-0417	5			SPECIFIC CONDUCTANCE	CATIONS
	8/14/15	1500	H2O	S97-0418	5				SEE ATTACHED
REMARKS									
01									
02									
03									
04									
05									
06									
07									
08									
09									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									
43									
44									
45									
46									
47									
48									
49									
50									
51									
52									
53									
54									
55									
56									
57									
58									
59									
60									
61									
62									
63									
64									
65									
66									
67									
68									
69									
70									
71									
72									
73									
74									
75									
76									
77									
78									
79									
80									
81									
82									
83									
84									
85									
86									
87									
88									
89									
90									
91									
92									
93									
94									
95									
96									
97									
98									
99									
100									

## CONDITION OF SAMPLE UPON RECEIPT

CLIENT: Σ PCBSHIPPING CONTAINER #: CocleWORKORDER NO. 9709-203INITIALS: KLDATE: 8/21/94

1. Does this project require special handling according to NEESA, Level 3, or CLP protocols? If yes, complete a. and b. a. Cooler Temperature _____ b. Lot No's. _____ c. Airbill Number _____	Yes	<u>No</u>
2. Are custody seals on the cooler intact? If so, how many	<u>N/A</u>	No
3. Are custody seals on sample containers intact?	<u>N/A</u>	No
4. Is there a Chain of Custody (COC) or other representative documents, letters or shipping memos?	<u>Yes</u>	No
5. Is the COC complete? Relinquished: Yes No <u>✓</u> Requested Analysis: Yes <u>✓</u> No	N/A	<u>No</u>
6. Is the COC in agreement with the samples received? No. of Samples: Yes <u>✓</u> No _____ Sample ID's: Yes <u>✓</u> No _____ Matrix: Yes <u>✓</u> No _____ No. of Containers: Yes <u>✓</u> No _____	<u>Yes</u>	No
7. Are the samples requiring chemical preservation preserved correctly?	N/A	<u>Yes</u>
8. Is there enough sample? If so, are they in the proper containers?	<u>Yes</u>	No
9. Are all samples within holding times for the requested analyses?	Yes	<u>No</u>
10. Were the sample(s) shipped on ice?	N/A	<u>Yes</u>
11. Were all sample containers received intact? (not broken or leaking, etc.)	<u>Yes</u>	No
12. Are samples requiring no headspace, headspace free?	N/A	<u>Yes</u>
13. Do the samples require quarantine?	Yes	<u>No</u>
14. Do samples require Paragon disposal?	<u>Yes</u>	No
15. Did the client return any unused bottles?	Yes	<u>No</u>

Describe "NO" items (except No's 1, 13, & 14): (5) Cocle not relinquished by client (9) - Spec Level.  
out of field upon receipt.

Was the client contacted? Yes \_\_\_\_\_ No \_\_\_\_\_  
 If yes, Date: \_\_\_\_\_ Name of person contacted: \_\_\_\_\_

Describe actions taken or client instructions: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Group Leader's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Cooler Temperature: 9°



# PARAGON ANALYTICS, INC.

225 Commerce Drive ♦ Fort Collins, CO 80524 ♦ (800) 443-1511 ♦ (970) 490-1511 ♦ FAX (970) 490-1522

October 2, 1997

Mr. Darrell Campbell  
El Paso Natural Gas CO.  
8645 Railroad Drive  
El Paso, TX 79904

RE: Paragon Workorder: 97-08-264  
Client Project Name: S97-0419  
Client Project Number: Not Submitted

Dear Mr. Campbell:

Two water samples were received from El Paso Natural Gas Co. on August 21, 1997. The samples were scheduled for the following analyses:

Specific Conductance	pages 1-4
pH	pages 1-4
Aromatic Volatile Organics	pages 1-8
Total Recoverable Metals	pages 1-9
Inorganics	pages 1-19

The results for these analyses are contained in the enclosed reports.

Thank you for your confidence in Paragon Analytics, Inc. Should you have any questions, please call.

Sincerely,

Paragon Analytics, Inc.  
Victoria Bayly  
Project Manager

VB/jjc  
Enclosure: report



# Paragon Analytics, Inc.

## Aromatic Volatile Organics Case Narrative

---

### El Paso Natural Gas Co.

S97-0419

Order Number - 9708264

1. This report consists of 2 water samples and received by Paragon on 08/21/97.
2. These samples were prepared and analyzed according to SW-846, 3rd Edition procedures. Specifically, the water samples were prepared by heating and purging 5 mls using purge and trap procedures based on Method 5030. The calibration curve was also prepared using the heated purge.
3. The samples were analyzed using a GC with a DB-VRX capillary column and a PID detector according to protocols based on SW-846 Method 8020. All positive results were quantitated using the responses from the initial calibration curve using the internal standard technique. Second column confirmation was performed on all samples with positive results on a DB-624 capillary column.
4. All samples were analyzed within the established holding times.
5. The method blank associated with this project was below the reporting limits for all analytes.
6. All matrix spike and matrix spike duplicate recoveries and RPDs were within acceptance criteria.
7. All blank spike and blank spike duplicate recoveries and RPDs were within the acceptance criteria.
8. All surrogate recoveries were within acceptance criteria.



9. All internal standard recoveries were within acceptance criteria.
10. All initial and continuing calibration criteria were within acceptance criteria.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Marty D. Brown  
Marty Brown  
GC Analyst

9-12-97  
Date

RB  
Reviewer's Initials

9-14-97  
Date

**Paragon Analytics, Inc.**

**SAMPLE NUMBER(S) CROSS-REFERENCE TABLE**

**Client Name: El Paso Natural Gas Co.**

**Client Project ID: S97-0419**

PAI-ID	Client ID	MATRIX	DATE
			SAMPLED
9708264-1	S97-0419	Water	08/19/97
9708264-2	S97-0420	Water	08/19/97

000000

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0419

**Reagent Blank**

Lab Sample ID: WRB1 8/26/97

Date Collected: N/A  
Date Extracted: 8/26/97  
Date Analyzed: 8/26/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	93	88 - 119

ND = Not Detected at or above client requested reporting limit.

000004

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0419**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0419

Lab Sample ID: 9708264-1

Date Collected: 8/19/97  
Date Extracted: 8/27/97  
Date Analyzed: 8/27/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	88	88 - 119

ND = Not Detected at or above client requested reporting limit.

000005

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0420**

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0419

Lab Sample ID: 9708264-2

Date Collected: 8/19/97

Date Extracted: 8/27/97

Date Analyzed: 8/27/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

## SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	94	88 - 119

ND = Not Detected at or above client requested reporting limit.

000000

# AROMATIC VOLATILE ORGANICS BLANK SPIKE

Method 8020

Sample ID

**Blank Spike**

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0419

Lab Sample ID: WBS1 8/26/97

Date Extracted: 8/27/97

Date Analyzed: 8/27/97

Sample Matrix: Water

Sample Volume: 5 mL

Analyte	Spike Added (ug/L)	BS Concentration (ug/L)	BS Percent Recovery	QC Limits % Rec
Benzene	40.0	43.1	108	85 - 115
Toluene	40.0	41.5	104	85 - 115
Ethylbenzene	40.0	40.2	101	85 - 115
M,P-Xylene	80.0	80.2	100	85 - 115
O-Xylene	40.0	40.3	101	85 - 115
Total Xylenes	120	121	100	85 - 115

Analyte	Spike Added (ug/L)	BSD Concentration (ug/L)	BSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	44.0	110	2	20
Toluene	40.0	42.3	106	2	20
Ethylbenzene	40.0	40.7	102	1	20
M,P-Xylene	80.0	81.2	102	1	20
O-Xylene	40.0	41.3	103	2	20
Total Xylenes	120	122	102	2	20

## SURROGATE RECOVERY BS/BSD

Analyte	% Recovery BS	% Recovery BSD	% Rec Limits
2,3,4-Trifluorotoluene	93	95	88 - 119

D = Detected

000007

# AROMATIC VOLATILE ORGANICS MATRIX SPIKE

Method 8020

Sample ID

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0419

In House

Lab Sample ID: 97008275-1MS

Date Collected: 8/20/97

Date Extracted: 8/27/97

Date Analyzed: 8/27/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Spike Added (ug/L)	Sample Concentration (ug/L)	MS Concentration (ug/L)	MS Percent Recovery	QC Limits % Rec
Benzene	40.0	ND	41.3	103	85 - 115
Toluene	40.0	ND	39.5	99	85 - 115
Ethylbenzene	40.0	ND	37.8	95	85 - 115
M,P-Xylene	80.0	ND	78.0	98	85 - 115
O-Xylene	40.0	ND	40.5	101	85 - 115
Total Xylenes	120	ND	119	99	85 - 115

Analyte	Spike Added (ug/L)	MSD Concentration (ug/L)	MSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	41.4	104	0	20
Toluene	40.0	40.5	101	2	20
Ethylbenzene	40.0	39.2	98	4	20
M,P-Xylene	80.0	80.1	100	3	20
O-Xylene	40.0	40.9	102	1	20
Total Xylenes	120	121	101	2	20

## SURROGATE RECOVERY MS/MSD

Analyte	% Recovery MS	% Recovery MSD	% Rec Limits
2,3,4-Trifluorotoluene	88	92	88 - 119

ND = Not Detected

000002

# Paragon Analytics, Inc.



## PH ANALYSIS CASE NARRATIVE

---

**El Paso Natural Gas Co.**

**S97-0419**

**Order Number - 9708264**

1. This report consists of two water samples.
2. The samples were received intact at a temperature of 9° C. on August 21, 1997.
3. The samples were prepared for analysis based on SW-846, 3<sup>rd</sup> Edition procedures. Specifically, the water samples were analyzed following Method 9040.
4. All standards and solutions were used within their recommended shelf life.  
All in house quality control procedures were followed, as described below.
5. General quality control procedures.
  - All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analyte. This indicates a valid calibration and stable instrument conditions.
6. A sample from another Order Number was used for the matrix QC sample for this batch.
  - A duplicate was prepared and analyzed with this batch. All acceptance criteria were met.

000001

The data contained in the following report have been reviewed and approved by the personnel listed below:



Krista Mobley  
Krista Mobley  
Inorganic Technician

9.4.97  
Date

SW  
Reviewer's Initials

9/5/97  
Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Paragon Analytics, Inc.

SAMPLE NUMBER(S) CROSS-REFERENCE TABLE

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0419

PAI-ID	Client ID	MATRIX	DATE
			SAMPLED
9708264-1	S97-0419	Water	08/19/97
9708264-2	S97-0420	Water	08/19/97

# pH Water

Method SW846 9040

## Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

ClientName: El Paso Natural Gas Co.

Client Project ID: S97-0419

Work Order Number: 9708264

Reporting Basis: AS RECEIVED

Reported on: Thursday, September 04, 1997

Final Volume: N/A

Matrix: Water

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Units	Detection Limit	Flag	Sample Aliquot
S97-0419	9708264-1	8/19/97	N/A	9/1/97	N/A	1	7.9	PH			N/A
S97-0420	9708264-2	8/19/97	N/A	9/1/97	N/A	1	7.8	PH			N/A

Comments:

000004

# Paragon Analytics, Inc.



## SPECIFIC CONDUCTANCE CASE NARRATIVE

### **El Paso Natural Gas Co.**

S97-0419

**Order Number - 9708264**

1. This report consists of two water samples.
2. The samples were received intact at a temperature of 9<sup>0</sup> C. on August 21, 1997.
3. The samples were prepared for analysis based on EPA Method 120.1.
4. All standards and solutions are NIST traceable and were used within their recommended shelf life.

All in house quality control procedures were followed, as described below.

5. General quality control procedures.
  - All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analyte. This indicates a valid calibration and stable instrument conditions.
6. A sample from another Order Number was used for the matrix QC sample for this batch.
  - A duplicate was prepared and analyzed with this batch. All acceptance criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below:



Krista Mobley  
Krista Mobley  
Inorganic Technician

9-4-97  
Date

SW  
Reviewer's Initials

9/5/97  
Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

**Paragon Analytics, Inc.**

**SAMPLE NUMBER(S) CROSS-REFERENCE TABLE**

**Client Name: El Paso Natural Gas Co.**

**Client Project ID: S97-0419**

<u>PAI-ID</u>	<u>Client ID</u>	<u>MATRIX</u>	<u>DATE SAMPLED</u>
9708264-1	S97-0419	Water	08/19/97
9708264-2	S97-0420	Water	08/19/97

# Specific Conductance In Water

Method EPA 120.1

## Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

ClientName: El Paso Natural Gas Co.

Client Project ID: S97-0419

Work Order Number: 9708264

Reporting Basis: AS RECEIVED

Reported on: Thursday, September 04, 1997

Final Volume: N/A

Matrix: Water

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Units	Detection Limit	Flag	Sample Aliquot
S97-0419	9708264-1	8/19/97	N/A	8/1/97	N/A	1	593	umhos/cm			N/A
S97-0420	9708264-2	8/19/97	N/A	8/1/97	N/A	1	719	umhos/cm			N/A

Comments:

000004 *km*



# Paragon Analytics, Inc.

## INORGANICS CASE NARRATIVE

---

### El Paso Natural Gas Co.

S97-0419

Order Number - 9708264

1. This report consists of data for 2 water samples analyzed for total alkalinity, bromide, chloride, fluoride, nitrate/nitrite, sulfate and total dissolved solids (TDS).
2. The samples were received cool and intact on 08/21/97.
3. The samples had been correctly preserved for the requested analyses.
4. The samples were analyzed using procedures based on the following methods from the USEPA or *Standard Methods for the Examination of Water and Wastewater*, 17th Ed.:

<u>Analyte</u>	<u>Method</u>
Total Alkalinity	4500-CO <sub>2</sub>
Bromide	300.0
Chloride	300.0
Fluoride	300.0
Nitrate/Nitrite	353.3
Sulfate	300.0
Total Dissolved Solids	160.1

5. All standards and reagents were used within their recommended shelf life.
6. The samples were prepared and analyzed within the established hold times.
7. Sample results which are below the reporting limit are reported as "ND" on the enclosed report.



All in house quality control procedures were followed, as described below.

8. General quality control procedures.

- The method blank results were below the reporting limits for all analyses.
- The LCS results were within acceptance limits for all analyses.
- The MS and MSD results were within acceptance limits for all analyses
- The matrix duplicate results were within acceptance limits for total alkalinity, nitrate/nitrite, and total dissolved solids.

The data contained in the following report have been reviewed and approved by the personnel listed below:

Jm  
Reporter's Initials

9/19/97  
Date

RJ  
Reviewer's Initials

10-1-97  
Date

CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# TOTAL ALKALINITY

Method 4500-CO2

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID:  
Client Project No. S97-0419  
Lab Workorder Number: 9708264

Date Collected: 08/19/97  
Date Analyzed: 08/30/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Total Alkalinity as CaCO3 Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	5
S97-0419	9708264-1	180	5
S97-0420	9708264-2	140	5

ND = Not Detected

000003

# BICARBONATE ALKALINITY

Method 4500-CO2

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID:

Client Project No. S97-0419

Lab Workorder Number: 9708264

Date Collected: 08/19/97

Date Analyzed: 08/30/97

Sample Matrix: Water

Client ID	Lab Sample ID	Bicarbonate Alkalinity as CaCO3 Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	5
S97-0419	9708264-1	180	5
S97-0420	9708264-2	140	5

ND = Not Detected

000004

# CARBONATE ALKALINITY

Method 4500-CO2

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID:

Client Project No. S97-0419

Lab Workorder Number: 9708264

Date Collected: 08/19/97

Date Analyzed: 08/30/97

Sample Matrix: Water

Client ID	Lab Sample ID	Carbonate Alkalinity as CaCO3 Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	5
S97-0419	9708264-1	ND	5
S97-0420	9708264-2	ND	5

ND = Not Detected

000005

## Alkalinity Calculations and Quality Control Results

Date analyzed: August 30, 1997

ID	aliquot titrated (mL)	titrant normality N	vol to pH 8.3 (mL)	vol to pH 4.5 (mL)	total vol (mL)	HCO3	CO3	OH	Total	DL (mg/L)
						mg/L as CaCO3				
R Blank	100	0.0194	0	0.36	0.36	3	0	0	3.5	5
LCS	100	0.0194	10.38	0.63	11.01	0	12	94	106.6	5
9708263-1	100	0.0194	0	14.34	14.34	139	0	0	138.8	5
9708263-2	100	0.0194	0	1.04	1.04	10	0	0	10.1	5
9708264-1	100	0.0194	0	18.95	18.95	183	0	0	183.4	5
9708264-1 dup	100	0.0194	0	19.19	19.19	186	0	0	185.7	5
9708264-2	100	0.0194	0	14.92	14.92	144	0	0	144.4	5
9708275-1	100	0.0194	0	15.39	15.39	149	0	0	149.0	5
9708275-2	100	0.0194	0	13.63	13.63	132	0	0	131.9	5
9708275-3	100	0.0194	0	12.66	12.66	123	0	0	122.5	5
9708275-4	100	0.0194	0	0.41	0.41	4	0	0	4.0	5
9708275-5	100	0.0194	0	16.18	16.18	157	0	0	156.6	5
9708275-6	100	0.0194	0	13.52	13.52	131	0	0	130.9	5
9708275-7	100	0.0194	0	0.16	0.16	2	0	0	1.5	5
9708278-3	100	0.0194	0	10.83	10.83	105	0	0	104.8	5
9708215-1	100	0.0194	0	16.98	16.98	164	0	0	164.4	5
9708215-2	100	0.0194	0	17.65	17.65	171	0	0	170.8	5

### Standardization of titrant

Conc Na <sub>2</sub> CO <sub>3</sub> std	Na <sub>2</sub> CO <sub>3</sub> aliquot	HCl vol	HCl conc
0.0470	5.00	12.08	0.01945
0.0470	5.00	12.09	0.01944
0.0470	5.00	12.25	0.01918

mean = 0.01936

## Alkalinity Quality Control Results

Date analyzed: August 30, 1997

### LCS SUMMARY

ID	expected alk conc (mg/L)	alk conc found (mg/L)	recovery %	recovery acceptance limit
LCS	100.0	106.6	107	85-115%

### DUPLICATE SUMMARY

ID	sample alk conc (mg/L)	duplic alk conc (mg/L)	RPD %	accept. limits
9708264-1	183.4	185.7	1.3	0-15%

000006

# BROMIDE

Method 300.0

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: Not Submitted  
Client Project No: S97-0419  
Lab Workorder Number: 9708264

Date Collected: 08/19/97  
Date Analyzed: 09/11/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Bromide Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.2
S97-0419	9708264-1	0.3	0.2
S97-0420	9708264-2	0.6	0.2

ND = Not Detected

000007

# BROMIDE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9708263-2

Date Analyzed: 09/09/97

Sample Matrix: Water

Sample ID

**S97-0418**

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Bromide	5.00	ND	5.29	106	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Bromide	5.00	5.32	106	1	0-15 %

000008

# CHLORIDE

Method 300.0

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: Not Submitted  
Client Project No: S97-0419  
Lab Workorder Number: 9708264

Date Collected: 08/19/97  
Date Analyzed: 09/09,11/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Chloride Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.2
S97-0419	9708264-1	33	2
S97-0420	9708264-2	100	4

ND = Not Detected

000009

# CHLORIDE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9708263-2

Date Analyzed: 09/09/97

Sample Matrix: Water

Sample ID

In House

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Chloride	5.00	0.24	5.24	100	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Chloride	5.00	5.64	108	7	0-20 %

000010

# FLUORIDE

Method 340.2

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID:  
Client Project No: S97-0419  
Lab Workorder Number: 9708264

Date Collected: 08/19/97  
Date Analyzed: 09/09/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Fluoride Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.5
S97-0419	9708264-1	0.9	0.5
S97-0420	9708264-2	1.0	0.5

ND = Not Detected

000011

# Fluoride in Water Samples Calculations

Date analyzed: Sep 9, 1997

ID	sample aliquot (mg/L)	final vol after dil (mL)	electrode reading (mv)	calc F conc (mg/L)	report F conc (mg/L)	DL (mg/L)
ICV (LCS)	20	20	29	10.22	10.2	0.5
ICB	20	20	166	0.04	0.0	0.5
9708275-1	20	20	75	1.62	1.62	0.5
9708275-1 MS	20	20	38	7.12	7.12	0.5
9708275-1 MSD	20	20	38	7.12	7.12	0.5
9708275-2	20	20	80	1.32	1.3	0.5
9708275-3	20	20	81	1.27	1.3	0.5
9708275-4	20	20	168	0.04	0.0	0.5
9708275-5	20	20	81	1.27	1.3	0.5
9708275-6	20	20	76	1.55	1.6	0.5
9708275-7	20	20	140	0.12	0.1	0.5
9708311-1	20	20	40	6.57	6.6	0.5
CCV	20	20	30	9.81	9.8	0.5
CCB	20	20	141	0.11	0.1	0.5
9708311-2	20	20	40	6.57	6.6	0.5
9708311-3	20	20	40	6.57	6.6	0.5
9708311-4	20	20	46	5.17	5.2	0.5
9708357-1	20	20	73	1.75	1.8	0.5
9708357-2	20	20	74	1.68	1.7	0.5
9708361-6	20	20	109	0.41	0.4	0.5
9708361-7	20	20	70	1.98	2.0	0.5
9708361-8	20	20	74	1.68	1.7	0.5
9708361-9	20	20	80	1.32	1.3	0.5
9708361-10	20	20	109	0.41	0.4	0.5
CCV	20	20	30	9.81	9.8	0.5
CCB	20	20	135	0.15	0.1	0.5
9708361-11	20	20	118	0.29	0.3	0.5
9708361-12	20	20	96	0.70	0.7	0.5
9708361-13	20	20	102	0.55	0.5	0.5
9708361-14	20	20	88	0.96	1.0	0.5
9709094-1	20	20	75	1.62	1.6	0.5
9708278-3	20	20	101	0.57	0.6	0.5
9708263-1	20	20	76	1.55	1.6	0.5
9708263-1 MS	20	20	39	6.84	6.8	0.5
9708263-1 MSD	20	20	39	6.84	6.8	0.5
9708263-2	20	20	157	0.06	0.1	0.5
CCV	20	20	30	9.81	9.8	0.5
CCB	20	20	156	0.06	0.1	0.5
9708264-1	20	20	91	0.85	0.9	0.5
9708264-2	20	20	88	0.96	1.0	0.5
9709093-1	20	20	104	0.51	0.5	0.5
9709093-2	20	20	127	0.20	0.2	0.5
9709093-3	20	20	98	0.64	0.6	0.5
9709093-4	20	20	110	0.40	0.4	0.5
9709093-5	20	20	97	0.67	0.7	0.5
9709093-6	20	20	108	0.43	0.4	0.5
9709093-7	20	20	109	0.41	0.4	0.5
9709093-8	20	20	119	0.28	0.3	0.5
CCV	20	20	30	9.81	9.8	0.5
CCB	20	20	135	0.15	0.1	0.5
9709093-9	20	20	131	0.17	0.2	0.5
9709093-10	20	20	118	0.29	0.3	0.5
9709093-11	20	20	129	0.19	0.2	0.5
9709093-12	20	20	87	1.00	1.0	0.5
CCV	20	20	30	9.81	9.8	0.5
CCB	20	20	140	0.12	0.1	0.5

## STANDARD CURVE

std conc (mg/L)	log conc	mv	calc conc	Regression Output:	
0.5	-0.301	104	0.51	Constant	1.513987
1	0.000	88	0.96	Std Err of Y Est	0.015785
5	0.699	46	5.17	R Squared	0.999707
10	1.000	29	10.22	No. of Observations	5
50	1.699	-10	48.76	Degrees of Freedom	3
				X Coefficient(s)	-0.0174
				Std Err of Coef.	0.000172

000012

# Fluoride Quality Control Results

Date analyzed: Sep 9, 1997

## ICV (LCS) SUMMARY

	spike added F conc (mg/L)	F conc found (mg/L)	recovery %
ICV	10.0	10.2	102

## MATRIX SPIKE SUMMARY

	spike F conc added (mg/L)	sample F conc (mg/L)	spike F conc (mg/L)	recovery %	recovery accept limit	RPD %	RPD accept. limit
9708275-1 MS	5.0	1.6	7.1	110	85-115%		
9708275-1 MSD	5.0	1.6	7.1	110	85-115%	0	< 15%
9708263-1 MS	5.0	1.6	6.8	106	85-115%		
9708263-1 MSD	5.0	1.6	6.8	106	85-115%	0	< 15%

ND = Not Detected

000013

# NITRATE + NITRITE

Method 353.3

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co  
Client Project ID:  
Client Project No: S97-0419  
Lab Workorder Number: 9708264

Date Collected: 08/19/97  
Date Analyzed: 08/31/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Nitrate + Nitrite as N Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.05
S97-0419	9708264-1	1.2	0.10
S97-0420	9708264-2	0.9	0.05

ND = Not Detected

000014

# Nitrate + Nitrite Calculations and Quality Control Results

Date analyzed: 08/31/97

NO3-N std (mg/L)	Abs (543 nm)	calc NO3-N conc (mg/L)	Regression Output:			
0.00	0.068	0.005	Constant	-0.06343		
0.05	0.112	0.049	Std Err of Y Est	0.0082		
0.10	0.165	0.102	R Squared	0.999633		
0.20	0.251	0.188	No. of Observations	6		
0.50	0.572	0.509	Degrees of Freedom	4		
1.00	1.059	0.997	X Coefficient(s)	1.001605		
			Std Err of Coef.	0.009601		

ID	additional DF	Abs (543 nm)	calc instr NO3+NO2-N conc (mg/L)	sample NO3+NO2-N conc (mg/L)	Detection Limit (mg/L)	ICV, CCV recovery %
ICV 226 mg/L	1	0.289	0.226	0.226	0.05	100
ICB	1	0.072	0.01	0.01	0.05	
0.304 ppm NO2	1	0.362	0.299	0.30	0.05	98
9708355-1	1	0.046	-0.02	-0.02	0.05	
9708355-1Dup	1	0.041	-0.02	-0.02	0.05	
9708355-1MS	1	0.532	0.47	0.47	0.05	
9708355-1MSD	1	0.587	0.52	0.52	0.05	
9708355-2	1	0.492	0.43	0.43	0.05	
9708355-3	1	0.066	0.00	0.00	0.05	
9708355-4	5	0.475	0.41	2.06	0.25	
9708057-3	1	0.016	-0.05	-0.05	0.05	
9708159-1	50	0.133	0.07	3.49	2.50	
9708159-2	1	0.490	0.43	0.43	0.05	
CCV	1	0.562	0.50	0.50	0.05	100
CCB	1	0.034	-0.03	-0.03	0.05	
9708160-1	20	0.354	0.29	5.82	1.00	
9708160-2	1	0.027	-0.04	-0.04	0.05	
9708160-3	1	0.632	0.57	0.57	0.05	
9708160-4	1	0.148	0.08	0.08	0.05	
9708263-1	1	0.068	0.00	0.00	0.05	
9708263-2	1	0.068	0.00	0.00	0.05	
9708264-1	2	0.641	0.58	1.16	0.10	
9708264-2	1	0.893	0.83	0.83	0.05	
9708275-1	1	0.999	0.94	0.94	0.05	
9708275-1Dup	1	1.013	0.95	0.95	0.05	
CCV	1	0.584	0.52	0.52	0.05	104
CCB	1	0.065	0.00	0.00	0.05	
9708275-1MS	1	1.528	1.47	1.47	0.05	
9708275-1MSD	1	1.441	1.38	1.38	0.05	
9708275-2	1	0.248	0.18	0.18	0.05	
9708275-3	1	0.317	0.25	0.25	0.05	
9708275-4	1	0.074	0.01	0.01	0.05	
9708275-5	1	1.047	0.99	0.99	0.05	
9708275-6	1	0.053	-0.01	-0.01	0.05	
9708275-7	1	0.161	0.10	0.10	0.05	
CCV	1	0.548	0.49	0.49	0.05	97
CCB	1	0.052	-0.01	-0.01	0.05	
9708275-7dup	1	0.168	0.10	0.10	0.05	
9708275-7MS	1	0.620	0.56	0.56	0.05	
9708275-7MSD	1	0.625	0.56	0.56	0.05	
CCV	1	0.544	0.48	0.48	0.05	96
CCB	1	0.062	-0.00	-0.00	0.05	

## Nitrate + Nitrite Quality Control Results

Date analyzed: 08/31/97

### BLANK SUMMARY

ID	blank conc. (mg/L)	blank reporting limit (mg/L)
ICB	0.01	< 0.05

### LCS /ICV SUMMARY

ID	true conc. (mg/L)	conc. found (mg/L)	recovery %	accept. limits
ICV	0.226	0.226	100	80-120%

### MATRIX SPIKE SUMMARY

ID	spike added conc (mg/L)	sample conc (mg/L)	spiked sample conc (mg/L)	recovery %	recovery accept. limits	RPD %	RPD accept. limits
9708355-1MS	0.50	-0.017	0.469	97	75-125 %		
9708355-1MSD	0.50	-0.017	0.525	108	75-125 %	11	0-20%
9708275-7MS	0.50	0.098	0.558	92	75-125 %		
9708275-7MSD	0.50	0.098	0.563	93	75-125 %	1	0-20%

ND = Not Detected

000015

**SULFATE**  
Method 300.0

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: Not Submitted  
Client Project No: S97-0419  
Lab Workorder Number: 9708264

Date Collected: 08/19/97  
Date Analyzed: 09/09/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Sulfate Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	1
S97-0419	9708264-1	84	10
S97-0420	9708264-2	63	10

ND = Not Detected

000016

# SULFATE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9708263-2

Date Analyzed: 09/09/97

Sample Matrix: Water

Sample ID

**S97-0418**

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Sulfate	20.0	ND	20.4	102	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Sulfate	20.0	21.0	105	3	0-15 %

000017

# TOTAL DISSOLVED SOLIDS

Method 160.1

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID:

Client Project No: S97-0419

Lab Workorder Number: 9708264

Date Collected: 08/19/97

Date Prepared: 08/31/97

Sample Matrix: Water

Client ID	Lab Sample ID	Total Dissolved Solids Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	20
S97-0419	9708264-1	420	20
S97-0420	9708264-2	170	20

ND = Not Detected

000018

# TDS Calculations and Quality Control Results

Preparation Date: August 26, 1997

ID	sample vol (mL)	empty beaker tare (g)	A beaker + residue gross (g)	A net (mg)	B beaker + residue gross (g)	B net (mg)	gross A vs gross B RPD %	calculated TDS conc (mg/L)	TDS DL (mg/L)
Method Blank	100	66.7622	66.7629	0.7	66.7627	0.5	0.000	5	20
Blank Spike	100	82.4518	82.4926	40.8	82.4924	40.6	0.000	406	20
Blank Spike Dup	100	67.5781	67.6182	40.1	67.6180	39.9	0.000	399	20
9708267-1	100	68.2305	68.2886	58.1	68.2882	57.7	0.001	577	20
9708267-1 dup	100	67.3558	67.4139	58.1	67.4133	57.5	0.001	575	20
9708273-1	100	80.3577	80.4072	49.5	80.4067	49.0	0.001	490	20
9708273-2	100	67.5286	67.5476	19.0	67.5472	18.6	0.001	186	20
9708273-3	100	72.5002	72.5824	82.2	72.5814	81.2	0.001	812	20
9708273-4	100	87.9249	88.0036	78.7	88.0032	78.3	0.000	783	20
9708263-1	100	67.4898	67.5328	43.0	67.5326	42.8	0.000	428	20
9708263-2	100	80.2449	80.2456	0.7	80.2451	0.2	0.001	2	20
9708264-1	100	80.7424	80.7839	41.5	80.7839	41.5	0.000	415	20
9708264-2	100	81.8257	81.8728	47.1	81.8722	46.5	0.001	465	20
9708275-1	100	67.8153	67.8613	46.0	67.8611	45.8	0.000	458	20
9708275-2	100	86.0809	86.1582	77.3	86.1551	74.2	0.004	742	20
9708275-3	100	84.7399	84.8149	75.0	84.8139	74.0	0.001	740	20
9708275-4	100	68.8908	68.8917	0.9	68.8907	-0.1	0.001	-1	20
9708275-5	100	71.5681	71.6127	44.6	71.6119	43.8	0.001	438	20
9708275-6	100	68.4212	68.4631	41.9	68.4626	41.4	0.001	414	20
9708275-7	100	71.8488	71.8494	0.6	71.8493	0.5	0.000	5	20
9708278-3	100	68.1547	68.1722	17.5	68.1719	17.2	0.000	172	20
9708275-1 dup	100	78.8295	78.8794	49.9	78.8790	49.5	0.001	495	20

## BLANK SUMMARY

ID	blank conc (mg/L)	accept. limit (mg/L)
Method Blank	5	< 20

## BLANK SPIKE SUMMARY

ID	spike added mg	spike added conc (mg/L)	spiked sample conc (mg/L)	recovery %	accept. limit	RPD %	RPD accept. limit
Blank Spike	40.0	400	406	101	85-115%		
Blank Spike Dup	40.0	400	399	100	85-115%	1.7	0-15%

## DUPLICATE SUMMARY

ID	sample conc (mg/L)	duplic conc (mg/L)	RPD %	accept. limits
9708267-1	577	575	0.3	0-15%
9708275-1	458	495	7.8	0-15%

000019



# Paragon Analytics, Inc.

## TOTAL RECOVERABLE METALS CASE NARRATIVE

---

### El Paso Natural Gas Co.

S97-0419

Order Number - 9708264

1. This report consists of 2 water samples.
2. The samples were received intact on 08/21/97. The temperature of the samples upon receipt was 9° Celsius.
3. The samples had been correctly preserved for the requested analyses.
4. The samples were prepared for analysis based on SW-846, 3<sup>rd</sup> Edition procedures.  
For analysis by conventional ICP, the samples were digested following method 3005A.
5. The samples were analyzed following SW846 protocols by conventional ICP (Method 6010A).
6. All standards and solutions are NIST traceable and were used within their recommended shelf life.
7. The samples were prepared and analyzed within the established hold times.
8. Sample results which are below PAI's standard reporting limits are reported as "ND" on the enclosed report.

All in house quality control procedures were followed, as described below.

9. General quality control procedures.
  - A preparation (method) blank and laboratory control sample were digested and analyzed with the samples in this digestion batch. There were not more than 20 samples in the digestion batch.
  - The preparation (method) blank results associated with this batch were below the reporting limits for the requested analytes. This indicates that no contaminants were introduced to the samples during the digestion procedure.



- The laboratory control sample associated with this batch was within acceptance limits. This indicates complete digestion according to the method.
- All initial and continuing calibration blanks associated with this batch were below the reporting limits for the requested analytes. This indicates a valid calibration and stable instrument conditions.
- All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analytes. This indicates a valid calibration and stable instrument conditions.
- The interference check samples, and high standard readbacks associated with Method 6010A analyses were within acceptance criteria.

10. A sample from this Order Number was used as the QC sample for this batch.

- A matrix spike and matrix spike duplicate were digested and analyzed with this batch. All acceptance criteria for accuracy were met with the following exception.

Analyte  
Silicon

Sample ID  
9708264-1S & DS

The concentration of silicon in the native sample was greater than 4 times the concentration of matrix spike added during the digestion. When sample concentration is that much greater than the spike added, spike recoveries may not be accurate. The Laboratory Control Sample is included to show that the digestion and analysis were in control.

- A sample duplicate and spike duplicate were digested and analyzed with this batch. All acceptance criteria for precision were met.
- A serial dilution was analyzed with this batch. All acceptance criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below:

Darryl Patrick

Darryl Patrick  
Senior Inorganic Chemist

9/5/97

Date

SW

Reviewer's Initials

9/5/97

Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

**Paragon Analytics, Inc.**

**SAMPLE NUMBER(S) CROSS-REFERENCE TABLE**

**Client Name: El Paso Natural Gas Co.**

**Client Project ID: S97-0419**

PAI-ID	Client ID	MATRIX	DATE
			SAMPLED
9708264-1	S97-0419	Water	08/19/97
9708264-2	S97-0420	Water	08/19/97

000003

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0419  
Lab Sample ID: RB 9708264

Sample ID

**Reagent Blank**

Date Collected: N/A  
Prep Date: 08/29/97  
Date Analyzed: 09/02/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	ND	0.1
Calcium	ND	1
Copper	ND	0.01
Iron	ND	0.1
Magnesium	ND	1
Manganese	ND	0.01
Potassium	ND	1
Silicon	ND	0.05
Sodium	ND	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

000004 DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0419  
Lab Sample ID: 9708264-1

Sample Matrix: Water

Sample ID

**S97-0419**

Date Collected: 08/19/97

Prep Date: 08/29/97

Date Analyzed: 09/02/97

Hardness (in mg/L CaCO<sub>3</sub>) = 181 mg/L

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.2	0.1
Calcium	46	1
Copper	ND	0.01
Iron	ND	0.1
Magnesium	16	1
Manganese	ND	0.01
Potassium	4	1
Silicon	24	0.05
Sodium	64	1
Zinc	0.05	0.02

ND = Not detected at or above the reporting limit.

000005

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0419  
Lab Sample ID: 9708264-2

Sample ID

**S97-0420**

Sample Matrix: Water

Date Collected: 08/19/97

Prep Date: 08/29/97

Date Analyzed: 09/02/97

Hardness (in mg/L CaCO<sub>3</sub>) = 222 mg/L

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.1	0.1
Calcium	60	1
Copper	ND	0.01
Iron	0.7	0.1
Magnesium	18	1
Manganese	0.01	0.01
Potassium	4	1
Silicon	25	0.05
Sodium	60	1
Zinc	0.14	0.02

ND = Not detected at or above the reporting limit.

000006

DP

# TOTAL RECOVERABLE METALS MATRIX SPIKE

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Lab Sample ID: 9708264-1

Sample ID

**S97-0419**

Sample Matrix: Water

Prep Date: 08/29/97

Date Analyzed: 09/02/97

Analyte	Spike Added mg/L	Sample Conc. mg/L	MS Conc. mg/L	% Rec (limits 80-120%)	Flags
Boron	1.0	0.2	1.2	100	See note
Calcium	40	46	88	105	
Copper	0.25	< 0.01	0.25	100	
Iron	1.0	< 0.1	1.0	100	
Magnesium	40	16	58	105	
Manganese	0.50	< 0.01	0.49	98	
Potassium	40	4	45	103	
Silicon	0.5	23.9	24.4	100	
Sodium	40	64	106	105	
Zinc	0.50	0.05	0.52	94	

See note on following page.

000007

DP

# TOTAL RECOVERABLE METALS MATRIX SPIKE DUPLICATE

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Lab Sample ID: 9708264-1

Sample ID
<b>S97-0419</b>

Sample Matrix: Water

Prep Date: 08/29/97  
Date Analyzed: 09/02/97

Analyte	MSD Conc. mg/L	MSD % Rec (limits 80-120%)	Relative % Difference (limits 0-20%)	Flags
Boron	1.2	100	0	See note
Calcium	87	103	1	
Copper	0.24	96	4	
Iron	1.0	100	0	
Magnesium	57	103	2	
Manganese	0.48	96	2	
Potassium	45	103	0	
Silicon	21.6	-460	12	
Sodium	105	103	1	
Zinc	0.51	92	2	

Note: Due to the large concentration of analyte in the sample, matrix spike recoveries may not be accurate. The Laboratory Control Sample (LCS) is included on a separate page to show that the digestion and analysis were in control.

000008 DP

**TOTAL RECOVERABLE METALS  
LABORATORY CONTROL SAMPLE**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0419  
Order Number: 9708264

Date Analyzed: 09/02/97

Analyte	LCS Result mg/L	LCS True Value mg/L	LCS % Recovery	Limits
Silicon	0.51	0.50	102	80 - 120%

000009

DP

CHAIN OF CUSTODY RECORD

9708264 Page 1 of 1

PROJECT NUMBER		PROJECT NAME		DATE		TOTAL NUMBER OF CONTAINERS		COMPOSITE OR GRAB		REQUESTED ANALYSIS				REMARKS	
SAMPLERS (Signature)		SAMPLER		DATE		TOTAL NUMBER OF CONTAINERS		COMPOSITE OR GRAB		REQUESTED ANALYSIS				REMARKS	
LAB ID	DATE	TIME	MATRIX	SAMPLE NUMBER						BTEX	TDS	specific conductance	Anions + Cations	SEE ATTACHED	
01	8/19/97	1730	H <sub>2</sub> O	SQT-0419			5								01
02	8/19/97	1815	H <sub>2</sub> O	SQT-0420			5								02
[Diagonal line across the table]															
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)		DATE/TIME		RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)		DATE/TIME	
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)		DATE/TIME		RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)		DATE/TIME	
REQUESTED TURNAROUND TIME:		ROUTINE		RUSH		SAMPLE RECEIPT REMARKS		CHARGE CODE		RESULTS & INVOICES TO:					
CARRIER CO.						Request Relinquished by client				TRANSMISSION OPERATIONS LABORATORY EL PASO NATURAL GAS COMPANY 8645 RAILROAD DRIVE EL PASO, TEXAS 79904 915-759-2229 FAX: 915-759-2335					

## CONDITION OF SAMPLE UPON RECEIPT

CLIENT: Σ 706SHIPPING CONTAINER #: CoolerWORKORDER NO. 9709204INITIALS: KJDATE: 3/2/94

1. Does this project require special handling according to NEESA, Level 3, or CLP protocols? If yes, complete a. and b. a. Cooler Temperature _____ b. Lot No's. _____ c. Airbill Number _____	Yes	<u>No</u>
2. Are custody seals on the cooler intact? If so, how many	<u>N/A</u>	No
3. Are custody seals on sample containers intact?	<u>N/A</u>	No
4. Is there a Chain of Custody (COC) or other representative documents, letters or shipping memos?	<u>Yes</u>	No
5. Is the COC complete? Relinquished: Yes _____ No <u>✓</u> Requested Analysis: Yes <u>✓</u> No _____	N/A	<u>No</u>
6. Is the COC in agreement with the samples received? No. of Samples: Yes <u>✓</u> No _____ Sample ID's: Yes <u>✓</u> No _____ Matrix: Yes <u>✓</u> No _____ No. of Containers: Yes <u>✓</u> No _____	<u>Yes</u>	No
7. Are the samples requiring chemical preservation preserved correctly?	N/A	<u>Yes</u>
8. Is there enough sample? If so, are they in the proper containers?	<u>Yes</u>	No
9. Are all samples within holding times for the requested analyses?	Yes	<u>No</u>
10. Were the sample(s) shipped on ice?	N/A	<u>Yes</u>
11. Were all sample containers received intact? (not broken or leaking, etc.)	<u>Yes</u>	No
12. Are samples requiring no headspace, headspace free?	N/A	<u>Yes</u>
13. Do the samples require quarantine?	Yes	<u>No</u>
14. Do samples require Paragon disposal?	<u>Yes</u>	No
15. Did the client return any unused bottles?	Yes	<u>No</u>

Describe "NO" items (except No's 1, 13, & 14): (5) - COC not relinquished by client (9) - Spec cond. out of hold upon Receipt.

Was the client contacted? Yes \_\_\_\_\_ No \_\_\_\_\_  
If yes, Date: \_\_\_\_\_ Name of person contacted: \_\_\_\_\_

Describe actions taken or client instructions: \_\_\_\_\_

Group Leader's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Cooler Temperature: 9°



# PARAGON ANALYTICS, INC.

225 Commerce Drive ♦ Fort Collins, CO 80524 ♦ (800) 443-1511 ♦ (970) 490-1511 ♦ FAX (970) 490-1522

October 1, 1997

Mr. Darrell Campbell  
El Paso Natural Gas CO.  
8645 Railroad Drive  
El Paso, TX 79904

RE: Paragon Workorder: 97-08-275  
Client Project Name: S97-0421  
Client Project Number: Not Submitted

Dear Mr. Campbell:

Seven water samples were received from El Paso Natural Gas Co. on August 22, 1997. The samples were scheduled for the following analyses:

Inorganics	pages 1-18
Aromatic Volatile Organics	pages 1-13
Total Recoverable Metals	pages 1-15
Specific Conductance	pages 1-4
pH	pages 1-4

The results for these analyses are contained in the enclosed reports.

Thank you for your confidence in Paragon Analytics, Inc. Should you have any questions, please call.

Sincerely,

Paragon Analytics, Inc.  
Victoria Bayly  
Project Manager

VB/nmu  
Enclosure: report

9708275 CHAIN OF CUSTODY RECORD

PROJECT NUMBER		PROJECT NAME		DATE		SAMPLES: (Signature)	
LAB ID		DATE		TIME		MATRIX	
SAMPLE NUMBER		TOTAL NUMBER OF CONTAINERS		COMPOSITE OR GRAB		REQUESTED ANALYSIS	
REMARKS		BTEX		TDS		SPECIFIC CONDUCTANCE AND RESISTIVITY SEE ATTACHED	
01	8180970904	1120	S97-0421	5		X	X
02	8180971208	1120	S97-0422	5		X	X
03	8180971208	1120	S97-0423	5		X	X
04	8180971040	1120	S97-0424	5		X	X
05	8180971440	1120	S97-0425	5		X	X
06	8180971540	1120	S97-0426	5		X	X
07	8180971545	1120	S97-0427	5		X	X
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)		RELINQUISHED BY: (Signature)	
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)		RELINQUISHED BY: (Signature)	
REQUESTED TURNAROUND TIME:		SAMPLE RECEIPT REMARKS		RESULTS & INVOICES TO:		TRANSMISSION OPERATIONS LABORATORY	
ROUTINE <input type="checkbox"/> RUSH <input type="checkbox"/>						EL PASO NATURAL GAS COMPANY	
CARRIER CO.						8645 RAILROAD DRIVE	
BILL NO.:						EL PASO, TEXAS 79904	
						915-759-2229 FAX: 915-759-2335	

## CONDITION OF SAMPLE UPON RECEIPT

CLIENT: 9 PATSHIPPING CONTAINER #: C 006WORKORDER NO. 9708-275INITIALS: HADATE: 8/22/97

1. Does this project require special handling according to NEESA, Level 3, or CLP protocols? If yes, complete a. and b. a. Cooler Temperature _____ b. Lot No's. _____ c. Airbill Number _____	Yes	<u>No</u>
2. Are custody seals on the cooler intact? If so, how many	<u>N/A</u>	No
3. Are custody seals on sample containers intact?	<u>N/A</u>	No
4. Is there a Chain of Custody (COC) or other representative documents, letters or shipping memos?	<u>Yes</u>	No
5. Is the COC complete? Relinquished: Yes <input checked="" type="checkbox"/> No Requested Analysis: Yes <input checked="" type="checkbox"/> No	<u>N/A</u>	No
6. Is the COC in agreement with the samples received? No. of Samples: Yes <input checked="" type="checkbox"/> No Sample ID's: Yes <input checked="" type="checkbox"/> No Matrix: Yes <input checked="" type="checkbox"/> No No. of Containers: Yes <input checked="" type="checkbox"/> No	<u>Yes</u>	No
7. Are the samples requiring chemical preservation preserved correctly?	<u>N/A</u>	No
8. Is there enough sample? If so, are they in the proper containers?	<u>Yes</u>	No
9. Are all samples within holding times for the requested analyses?	<u>Yes</u>	<u>No</u>
10. Were the sample(s) shipped on ice?	<u>N/A</u>	No
11. Were all sample containers received intact? (not broken or leaking, etc.)	<u>Yes</u>	No
12. Are samples requiring no headspace, headspace free?	<u>N/A</u>	No
13. Do the samples require quarantine?	<u>Yes</u>	<u>No</u>
14. Do samples require Paragon disposal?	<u>Yes</u>	No
15. Did the client return any unused bottles?	<u>Yes</u>	<u>No</u>

Describe "NO" items (except No's 1, 13, & 14): Gr Spec cond. out of hold upon receipt  
(10) - ICE expired

Was the client contacted? Yes \_\_\_\_\_ No \_\_\_\_\_  
 If yes, Date: \_\_\_\_\_ Name of person contacted: \_\_\_\_\_

Describe actions taken or client instructions: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Group Leader's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Cooler Temperature: 15°C

# Paragon Analytics, Inc.



## INORGANICS CASE NARRATIVE

### El Paso Natural Gas Co.

S97-0421 MW-15

Order Number - 9708275

1. This report consists of data for 7 water samples analyzed for total alkalinity, bicarbonate, carbonate, bromide, chloride, fluoride, nitrate/nitrite, sulfate and total dissolved solids (TDS).
2. The samples were received cool and intact on 08/22/97.
3. The samples had been correctly preserved for the requested analyses.
4. The samples were analyzed using procedures based on the following methods from the USEPA or *Standard Methods for the Examination of Water and Wastewater*, 17th Ed.:

<u>Analyte</u>	<u>Method</u>
Total Alkalinity	4500-CO <sub>2</sub>
Bicarbonate	4500-CO <sub>2</sub>
Carbonate	4500-CO <sub>2</sub>
Bromide	300.0
Chloride	300.0
Fluoride	340.2
Nitrate/Nitrite	353.3
Sulfate	300.0
Total Dissolved Solids	160.1

5. All standards and reagents were used within their recommended shelf life.
6. The samples were prepared and analyzed within the established hold times.
7. Sample results which are below the reporting limit are reported as "ND" on the enclosed report.

All in house quality control procedures were followed, as described below.



8. General quality control procedures.

- The method blank results were below the reporting limits for all analyses.
- The LCS results were within acceptance limits for all analyses.
- The MS and MSD results were within acceptance limits for all analyses
- The matrix duplicate results were within acceptance limits for total alkalinity, nitrate/nitrite, and total dissolved solids.

The data contained in the following report have been reviewed and approved by the personnel listed below:

Jm  
Reporter's Initials

9/19/97  
Date

Bj  
Reviewer's Initials

9-25-97  
Date

CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# TOTAL ALKALINITY

Method 4500-CO2

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID:  
Client Project No. S97-0421  
Lab Workorder Number: 9708275

Date Collected: 08/20/97  
Date Analyzed: 08/30/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Total Alkalinity as CaCO3 Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	5
S97-0421 MW-14	9708275-1	150	5
S97-0422 MW-12	9708275-2	130	5
S97-0423 MW-12D	9708275-3	120	5
S97-0424 Field Blank	9708275-4	ND	5
S97-0425 MW-13	9708275-5	160	5
S97-0426 Pump blank	9708275-6	130	5
S97-0427 Boiler blank	9708275-7	ND	5

ND = Not Detected

000003

# BICARBONATE ALKALINITY

Method 4500-CO2

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID:  
Client Project No. S97-0421  
Lab Workorder Number: 9708275

Date Collected: 08/20/97  
Date Analyzed: 08/30/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Bicarbonate Alkalinity as CaCO3 Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	5
S97-0421 14	9708275-1	150	5
S97-0422 12	9708275-2	130	5
S97-0423 120	9708275-3	120	5
S97-0424	9708275-4	ND	5
S97-0425 13	9708275-5	160	5
S97-0426	9708275-6	130	5
S97-0427	9708275-7	ND	5

ND = Not Detected

000004

# CARBONATE ALKALINITY

Method 4500-CO2

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID:  
Client Project No. S97-0421  
Lab Workorder Number: 9708275

Date Collected: 08/20/97  
Date Analyzed: 08/30/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Carbonate Alkalinity as CaCO3 Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	5
S97-0421 <sup>14</sup>	9708275-1	ND	5
S97-0422 <sup>12</sup>	9708275-2	ND	5
S97-0423 <sup>12D</sup>	9708275-3	ND	5
S97-0424	9708275-4	ND	5
S97-0425 <sup>13</sup>	9708275-5	ND	5
S97-0426	9708275-6	ND	5
S97-0427	9708275-7	ND	5

ND = Not Detected

000005

## Alkalinity Calculations and Quality Control Results

Date analyzed: August 30, 1997

ID	aliquot titrated (mL)	titrant normality N	vol to pH 8.3 (mL)	vol to pH 4.5 (mL)	total vol (mL)	HCO3CO3OHTotal				DL (mg/L)
						mg/L as CaCO3				
R Blank	100	0.0194	0	0.36	0.36	3	0	0	3.5	5
LCS	100	0.0194	10.38	0.63	11.01	0	12	94	106.6	5
9708263-1	100	0.0194	0	14.34	14.34	139	0	0	138.8	5
9708263-2	100	0.0194	0	1.04	1.04	10	0	0	10.1	5
9708264-1	100	0.0194	0	18.95	18.95	183	0	0	183.4	5
9708264-1 dup	100	0.0194	0	19.19	19.19	186	0	0	185.7	5
9708264-2	100	0.0194	0	14.92	14.92	144	0	0	144.4	5
9708275-1	100	0.0194	0	15.39	15.39	149	0	0	149.0	5
9708275-2	100	0.0194	0	13.63	13.63	132	0	0	131.9	5
9708275-3	100	0.0194	0	12.66	12.66	123	0	0	122.5	5
9708275-4	100	0.0194	0	0.41	0.41	4	0	0	4.0	5
9708275-5	100	0.0194	0	16.18	16.18	157	0	0	156.6	5
9708275-6	100	0.0194	0	13.52	13.52	131	0	0	130.9	5
9708275-7	100	0.0194	0	0.16	0.16	2	0	0	1.5	5
9708278-3	100	0.0194	0	10.83	10.83	105	0	0	104.8	5
9708215-1	100	0.0194	0	16.98	16.98	164	0	0	164.4	5
9708215-2	100	0.0194	0	17.65	17.65	171	0	0	170.8	5

### Standardization of titrant

Conc Na <sub>2</sub> CO <sub>3</sub> std	Na <sub>2</sub> CO <sub>3</sub> aliquot	HCl vol	HCl conc
0.0470	5.00	12.08	0.01945
0.0470	5.00	12.09	0.01944
0.0470	5.00	12.25	0.01918

mean = 0.01936

## Alkalinity Quality Control Results

Date analyzed: August 30, 1997

### LCS SUMMARY

ID	expected alk conc (mg/L)	alk conc found (mg/L)	recovery %	recovery acceptance limit
LCS	100.0	106.6	107	85-115%

### DUPLICATE SUMMARY

ID	sample alk conc (mg/L)	duplic alk conc (mg/L)	RPD %	accept. limits
9708264-1	183.4	185.7	1.3	0-15%

000006

# BROMIDE

Method 300.0

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID:  
Client Project No: S97-0421  
Lab Workorder Number: 9708275

Date Collected: 08/20/97  
Date Analyzed: 09/09-16/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Bromide Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.2
S97-0421 14	9708275-1	0.4	0.2
S97-0422 12	9708275-2	0.6	0.2
S97-0423 12D	9708275-3	0.7	0.2
S97-0424	9708275-4	ND	0.2
S97-0425 12	9708275-5	0.4	0.2
S97-0426	9708275-6	0.6	0.2
S97-0427	9708275-7	ND	0.2

ND = Not Detected

000007

# BROMIDE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9708263-2

Date Analyzed: 09/09/97

Sample Matrix: Water

Sample ID

**S97-0418**

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Bromide	5.00	ND	5.29	106	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Bromide	5.00	5.32	106	0.6	0-15 %

000008

# CHLORIDE

Method 300.0

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID:  
Client Project No: S97-0421  
Lab Workorder Number: 9708275

Date Collected: 08/20/97  
Date Analyzed: 09/09-11/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Chloride Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.2
S97-0421 <sup>14</sup>	9708275-1	80	2
S97-0422 <sup>12</sup>	9708275-2	260	10
S97-0423 <sup>12D</sup>	9708275-3	280	10
S97-0424	9708275-4	2.8	0.2
S97-0425 <sup>13</sup>	9708275-5	55	2
S97-0426	9708275-6	110	4
S97-0427	9708275-7	ND	0.2

ND = Not Detected

000009

# CHLORIDE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9708263-2

Date Analyzed: 09/09/97

Sample Matrix: Water

Sample ID

**S97-0418**

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Chloride	5.00	0.24	5.24	100	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Chloride	5.00	5.64	108	7	0-20 %

000010

# FLUORIDE

Method 340.2

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID:  
Client Project No: S97-0421  
Lab Workorder Number: 9708275

Date Collected: 08/20/97  
Date Analyzed: 09/09/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Fluoride Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.5
S97-0421 14	9708275-1	1.6	0.5
S97-0422 12	9708275-2	1.3	0.5
S97-0423 12D	9708275-3	1.3	0.5
S97-0424	9708275-4	ND	0.5
S97-0425 13	9708275-5	1.3	0.5
S97-0426	9708275-6	1.6	0.5
S97-0427	9708275-7	ND	0.5

ND = Not Detected

000011

# Fluoride in Water Samples Calculations

Date analyzed: Sep 9, 1997

ID	sample aliquot (mg/L)	final vol after dil (mL)	electrode reading (mv)	calc F conc (mg/L)	report F conc (mg/L)	DL (mg/L)
ICV (LCS)	20	20	29	10.22	10.2	0.5
ICB	20	20	166	0.04	0.0	0.5
9708275-1	20	20	75	1.62	1.62	0.5
9708275-1 MS	20	20	38	7.12	7.12	0.5
9708275-1 MSD	20	20	38	7.12	7.12	0.5
9708275-2	20	20	80	1.32	1.3	0.5
9708275-3	20	20	81	1.27	1.3	0.5
9708275-4	20	20	168	0.04	0.0	0.5
9708275-5	20	20	81	1.27	1.3	0.5
9708275-6	20	20	76	1.55	1.6	0.5
9708275-7	20	20	140	0.12	0.1	0.5
9708311-1	20	20	40	6.57	6.6	0.5
CCV	20	20	30	9.81	9.8	0.5
CCB	20	20	141	0.11	0.1	0.5
9708311-2	20	20	40	6.57	6.6	0.5
9708311-3	20	20	40	6.57	6.6	0.5
9708311-4	20	20	46	5.17	5.2	0.5
9708357-1	20	20	73	1.75	1.8	0.5
9708357-2	20	20	74	1.68	1.7	0.5
9708361-6	20	20	109	0.41	0.4	0.5
9708361-7	20	20	70	1.98	2.0	0.5
9708361-8	20	20	74	1.68	1.7	0.5
9708361-9	20	20	80	1.32	1.3	0.5
9708361-10	20	20	109	0.41	0.4	0.5
CCV	20	20	30	9.81	9.8	0.5
CCB	20	20	135	0.15	0.1	0.5
9708361-11	20	20	118	0.29	0.3	0.5
9708361-12	20	20	96	0.70	0.7	0.5
9708361-13	20	20	102	0.55	0.5	0.5
9708361-14	20	20	88	0.96	1.0	0.5
9709094-1	20	20	75	1.62	1.6	0.5
9708278-3	20	20	101	0.57	0.6	0.5
9708263-1	20	20	76	1.55	1.6	0.5
9708263-1 MS	20	20	39	6.84	6.8	0.5
9708263-1 MSD	20	20	39	6.84	6.8	0.5
9708263-2	20	20	157	0.06	0.1	0.5
CCV	20	20	30	9.81	9.8	0.5
CCB	20	20	156	0.06	0.1	0.5
9708264-1	20	20	91	0.85	0.9	0.5
9708264-2	20	20	88	0.96	1.0	0.5
9709093-1	20	20	104	0.51	0.5	0.5
9709093-2	20	20	127	0.20	0.2	0.5
9709093-3	20	20	98	0.64	0.6	0.5
9709093-4	20	20	110	0.40	0.4	0.5
9709093-5	20	20	97	0.67	0.7	0.5
9709093-6	20	20	108	0.43	0.4	0.5
9709093-7	20	20	109	0.41	0.4	0.5
9709093-8	20	20	119	0.28	0.3	0.5
CCV	20	20	30	9.81	9.8	0.5
CCB	20	20	135	0.15	0.1	0.5
9709093-9	20	20	131	0.17	0.2	0.5
9709093-10	20	20	118	0.29	0.3	0.5
9709093-11	20	20	129	0.19	0.2	0.5
9709093-12	20	20	87	1.00	1.0	0.5
CCV	20	20	30	9.81	9.8	0.5
CCB	20	20	140	0.12	0.1	0.5

## STANDARD CURVE

std conc (mg/L)	log conc	mv	calc conc	Regression Output:	
0.5	-0.301	104	0.51	Constant	1.513987
1	0.000	88	0.96	Std Err of Y Est	0.015785
5	0.699	46	5.17	R Squared	0.999707
10	1.000	29	10.22	No. of Observations	5
50	1.699	-10	48.76	Degrees of Freedom	3
				X Coefficient(s)	-0.0174
				Std Err of Coef.	0.000172

## Fluoride Quality Control Results

Date analyzed: Sep 9, 1997

### ICV (LCS) SUMMARY

	spike added F conc (mg/L)	F conc found (mg/L)	recovery %
ICV	10.0	10.2	102

### MATRIX SPIKE SUMMARY

	spike F conc added (mg/L)	sample F conc (mg/L)	spike F conc (mg/L)	recovery %	recovery accept limit	RPD %	RPD accept. limit
9708275-1 MS	5.0	1.6	7.1	110	85-115%		
9708275-1 MSD	5.0	1.6	7.1	110	85-115%	0	< 15%
9708263-1 MS	5.0	1.6	6.8	106	85-115%		
9708263-1 MSD	5.0	1.6	6.8	106	85-115%	0	< 15%

ND = Not Detected

000012

# NITRATE + NITRITE

Method 353.3

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID:  
Client Project No: S97-0421  
Lab Workorder Number: 9708275

Date Collected: 08/20/97  
Date Analyzed: 08/31/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Nitrate + Nitrite as N Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.05
S97-0421 14	9708275-1	0.94	0.05
S97-0422 12	9708275-2	0.20	0.05
S97-0423 120	9708275-3	0.30	0.05
S97-0424	9708275-4	ND	0.05
S97-0425 13	9708275-5	0.99	0.05
S97-0426	9708275-6	ND	0.05
S97-0427	9708275-7	0.10	0.05

ND = Not Detected

000013

# Nitrate + Nitrite Calculations and Quality Control Results

Date analyzed: 08/31/97

NO3-N std (mg/L)	Abs (543 nm)	calc NO3-N conc (mg/L)	Regression Output:	
0.00	0.068	0.005	Constant	-0.06343
0.05	0.112	0.049	Std Err of Y Est	0.0082
0.10	0.165	0.102	R Squared	0.999633
0.20	0.251	0.188	No. of Observations	6
0.50	0.572	0.509	Degrees of Freedom	4
1.00	1.059	0.997	X Coefficient(s)	1.001605
			Std Err of Coef.	0.009601

ID:	additional DF	Abs (543 nm)	calc instr NO3+NO2-N conc (mg/L)	sample NO3+NO2-N conc (mg/L)	Detection Limit (mg/L)	ICV, CCV recovery %
ICV 226 mg/L	1	0.289	0.226	0.226	0.05	100
ICB	1	0.072	0.01	0.01	0.05	
0.304 ppm NO2	1	0.362	0.299	0.30	0.05	98
9708355-1	1	0.046	-0.02	-0.02	0.05	
9708355-1Dup	1	0.041	-0.02	-0.02	0.05	
9708355-1MS	1	0.532	0.47	0.47	0.05	
9708355-1MSD	1	0.587	0.52	0.52	0.05	
9708355-2	1	0.492	0.43	0.43	0.05	
9708355-3	1	0.066	0.00	0.00	0.05	
9708355-4	5	0.475	0.41	2.06	0.25	
9708057-3	1	0.016	-0.05	-0.05	0.05	
9708159-1	50	0.133	0.07	3.49	2.50	
9708159-2	1	0.490	0.43	0.43	0.05	
CCV	1	0.562	0.50	0.50	0.05	100
CCB	1	0.034	-0.03	-0.03	0.05	
9708160-1	20	0.354	0.29	5.82	1.00	
9708160-2	1	0.027	-0.04	-0.04	0.05	
9708160-3	1	0.632	0.57	0.57	0.05	
9708160-4	1	0.148	0.08	0.08	0.05	
9708263-1	1	0.068	0.00	0.00	0.05	
9708263-2	1	0.068	0.00	0.00	0.05	
9708264-1	2	0.641	0.58	1.16	0.10	
9708264-2	1	0.893	0.83	0.83	0.05	
9708275-1	1	0.999	0.94	0.94	0.05	
9708275-1Dup	1	1.013	0.95	0.95	0.05	
CCV	1	0.584	0.52	0.52	0.05	104
CCB	1	0.065	0.00	0.00	0.05	
9708275-1MS	1	1.528	1.47	1.47	0.05	
9708275-1MSD	1	1.441	1.38	1.38	0.05	
9708275-2	1	0.248	0.18	0.18	0.05	
9708275-3	1	0.317	0.25	0.25	0.05	
9708275-4	1	0.074	0.01	0.01	0.05	
9708275-5	1	1.047	0.99	0.99	0.05	
9708275-6	1	0.053	-0.01	-0.01	0.05	
9708275-7	1	0.161	0.10	0.10	0.05	
CCV	1	0.548	0.49	0.49	0.05	97
CCB	1	0.052	-0.01	-0.01	0.05	
9708275-7dup	1	0.168	0.10	0.10	0.05	
9708275-7MS	1	0.620	0.56	0.56	0.05	
9708275-7MSD	1	0.625	0.56	0.56	0.05	
CCV	1	0.544	0.48	0.48	0.05	96
CCB	1	0.062	-0.00	-0.00	0.05	

## Nitrate + Nitrite Quality Control Results

Date analyzed: 08/31/97

### BLANK SUMMARY

ID	blank conc. (mg/L)	blank reporting limit (mg/L)
ICB	0.01	< 0.05

### LCS / ICV SUMMARY

ID	true conc. (mg/L)	conc. found (mg/L)	recovery %	accept. limits
ICV	0.226	0.226	100	80-120%

### MATRIX SPIKE SUMMARY

ID	spike added conc (mg/L)	sample conc (mg/L)	spiked sample conc (mg/L)	recovery %	recovery accept. limits	RPD %	RPD accept. limits
9708355-1MS	0.50	-0.017	0.469	97	75-125 %		
9708355-1MSD	0.50	-0.017	0.525	108	75-125 %	11	0-20%
9708275-7MS	0.50	0.098	0.558	92	75-125 %		
9708275-7MSD	0.50	0.098	0.563	93	75-125 %	1	0-20%

ND = Not Detected

000014

**SULFATE**  
Method 300.0

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID:  
Client Project No: S97-0421  
Lab Workorder Number: 9708275

Date Collected: 08/20/97  
Date Analyzed: 09/11/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Sulfate Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	1
S97-0421 14	9708275-1	82	10
S97-0422 12	9708275-2	85	20
S97-0423 120	9708275-3	90	20
S97-0424	9708275-4	ND	1
S97-0425 13	9708275-5	96	10
S97-0426	9708275-6	56	10
S97-0427	9708275-7	ND	1

ND = Not Detected

# SULFATE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9708263-2

Date Analyzed: 09/09/97

Sample Matrix: Water

Sample ID

**S97-0418**

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Sulfate	20.0	ND	20.4	102	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Sulfate	20.0	21.0	105	3	0-15 %

000016

# TOTAL DISSOLVED SOLIDS

Method 160.1

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID:  
Client Project No: S97-0421  
Lab Workorder Number: 9708275

Date Collected: 08/20/97  
Date Prepared: 08/26/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Total Dissolved Solids Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	20
S97-0421 14	9708275-1	460	20
S97-0422 12	9708275-2	740	20
S97-0423 120	9708275-3	740	20
S97-0424	9708275-4	ND	20
S97-0425 13	9708275-5	440	20
S97-0426	9708275-6	410	20
S97-0427	9708275-7	ND	20

ND = Not Detected

000017

# TDS Calculations and Quality Control Results

Preparation Date: August 26, 1997

ID	sample vol (mL)	empty beaker tare (g)	A beaker + residue gross (g)	A net (mg)	B beaker + residue gross (g)	B net (mg)	gross A vs gross B RPD %	calculated TDS conc (mg/L)	TDS DL (mg/L)
Method Blank	100	66.7622	66.7629	0.7	66.7627	0.5	0.000	5	20
Blank Spike	100	82.4518	82.4926	40.8	82.4924	40.6	0.000	406	20
Blank Spike Dup	100	67.5781	67.6182	40.1	67.6180	39.9	0.000	399	20
9708267-1	100	68.2305	68.2886	58.1	68.2882	57.7	0.001	577	20
9708267-1 dup	100	67.3558	67.4139	58.1	67.4133	57.5	0.001	575	20
9708273-1	100	80.3577	80.4072	49.5	80.4067	49.0	0.001	490	20
9708273-2	100	67.5286	67.5476	19.0	67.5472	18.6	0.001	186	20
9708273-3	100	72.5002	72.5824	82.2	72.5814	81.2	0.001	812	20
9708273-4	100	87.9249	88.0036	78.7	88.0032	78.3	0.000	783	20
9708263-1	100	67.4898	67.5328	43.0	67.5326	42.8	0.000	428	20
9708263-2	100	80.2449	80.2456	0.7	80.2451	0.2	0.001	2	20
9708264-1	100	80.7424	80.7839	41.5	80.7839	41.5	0.000	415	20
9708264-2	100	81.8257	81.8728	47.1	81.8722	46.5	0.001	465	20
9708275-1	100	67.8153	67.8613	46.0	67.8611	45.8	0.000	458	20
9708275-2	100	86.0809	86.1582	77.3	86.1551	74.2	0.004	742	20
9708275-3	100	84.7399	84.8149	75.0	84.8139	74.0	0.001	740	20
9708275-4	100	68.8908	68.8917	0.9	68.8907	-0.1	0.001	-1	20
9708275-5	100	71.5681	71.6127	44.6	71.6119	43.8	0.001	438	20
9708275-6	100	68.4212	68.4631	41.9	68.4626	41.4	0.001	414	20
9708275-7	100	71.8488	71.8494	0.6	71.8493	0.5	0.000	5	20
9708278-3	100	68.1547	68.1722	17.5	68.1719	17.2	0.000	172	20
9708275-1 dup	100	78.8295	78.8794	49.9	78.8790	49.5	0.001	495	20

## BLANK SUMMARY

ID	blank conc (mg/L)	accept. limit (mg/L)
Method Blank	5	< 20

## BLANK SPIKE SUMMARY

ID	spike added mg	spike added conc (mg/L)	spiked sample conc (mg/L)	recovery %	accept. limit	RPD %	RPD accept. limit
Blank Spike	40.0	400	406	101	85-115%		
Blank Spike Dup	40.0	400	399	100	85-115%	1.7	0-15%

## DUPLICATE SUMMARY

ID	sample conc (mg/L)	duplic conc (mg/L)	RPD %	accept. limits
9708267-1	577	575	0.3	0-15%
9708275-1	458	495	7.8	0-15%

000018



# Paragon Analytics, Inc.

## Aromatic Volatile Organics Case Narrative

---

### El Paso Natural Gas Co.

S97-0421

Order Number - 9708275

1. This report consists of 7 water samples and received by Paragon on 08/22/97.
2. These samples were prepared and analyzed according to SW-846, 3rd Edition procedures. Specifically, the water samples were prepared by heating and purging 5 mls using purge and trap procedures based on Method 5030. The calibration curve was also prepared using the heated purge.
3. The samples were analyzed using a GC with a DB-VRX capillary column and a PID detector according to protocols based on SW-846 Method 8020. All positive results were quantitated using the responses from the initial calibration curve using the internal standard technique. Second column confirmation was performed on all samples with positive results on a DB-624 capillary column.
4. All samples were analyzed within the established holding times.
5. The method blank associated with this project was below the reporting limits for all analytes.
6. All matrix spike and matrix spike duplicate recoveries and RPDs were within acceptance criteria.
7. All blank spike and blank spike duplicate recoveries and RPDs were within the acceptance criteria.
8. All surrogate recoveries were within acceptance criteria.



9. All internal standard recoveries were within acceptance criteria.
10. All initial and continuing calibration criteria were within acceptance criteria.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Marty D. Brown  
Marty Brown  
GC Analyst

9-12-97  
Date

RB  
Reviewer's Initials

9-14-97  
Date

**Paragon Analytics, Inc.**

**SAMPLE NUMBER(S) CROSS-REFERENCE TABLE**

**Client Name: El Paso Natural Gas Co.**

**Client Project ID: S97-0421**

PAI-ID	Client ID	MATRIX	DATE
			SAMPLED
9708275-1	S97-0421	Water	08/20/97
9708275-2	S97-0422	Water	08/20/97
9708275-3	S97-0423	Water	08/20/97
9708275-4	S97-0424	Water	08/20/97
9708275-5	S97-0425	Water	08/20/97
9708275-6	S97-0426	Water	08/20/97
9708275-7	S97-0427	Water	08/20/97

000003

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0421

**Reagent Blank**

Lab Sample ID: WRB1 8/26/97

Date Collected: N/A  
Date Extracted: 8/26/97  
Date Analyzed: 8/26/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	93	88 - 119

ND = Not Detected at or above client requested reporting limit.

000004

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0421**

14

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0421

Lab Sample ID: 9708275-1

Date Collected: 8/20/97

Date Extracted: 8/26/97

Date Analyzed: 8/26/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	91	88 - 119

ND = Not Detected at or above client requested reporting limit.

000005

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0422**

12

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0421

Lab Sample ID: 9708275-2

Date Collected: 8/20/97

Date Extracted: 8/27/97

Date Analyzed: 8/27/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	1.2	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	92	88 - 119

ND = Not Detected at or above client requested reporting limit.

000006

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0421

**S97-0423**

Lab Sample ID: 9708275-3

Date Collected: 8/20/97

Date Extracted: 8/27/97

Date Analyzed: 8/27/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	1.4	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

## SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	94	88 - 119

ND = Not Detected at or above client requested reporting limit.

000007

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0424**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0421

Lab Sample ID: 9708275-4

Date Collected: 8/20/97  
Date Extracted: 8/27/97  
Date Analyzed: 8/27/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	91	88 - 119

ND = Not Detected at or above client requested reporting limit.

000008

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0425**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0421

Lab Sample ID: 9708275-5

Date Collected: 8/20/97  
Date Extracted: 8/27/97  
Date Analyzed: 8/27/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	91	88 - 119

ND = Not Detected at or above client requested reporting limit.

000009

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0426**

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0421

Lab Sample ID: 9708275-6

Date Collected: 8/20/97

Date Extracted: 8/27/97

Date Analyzed: 8/27/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

## SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	94	88 - 119

ND = Not Detected at or above client requested reporting limit.

000010

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0427**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0421

Lab Sample ID: 9708275-7

Date Collected: 8/20/97

Date Extracted: 8/27/97

Date Analyzed: 8/27/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	92	88 - 119

ND = Not Detected at or above client requested reporting limit.

000011

# AROMATIC VOLATILE ORGANICS BLANK SPIKE

Method 8020

Sample ID

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0421

**Blank Spike**

Lab Sample ID: WBS1 8/26/97

Date Extracted: 8/27/97

Date Analyzed: 8/27/97

Sample Matrix: Water

Sample Volume: 5 mL

Analyte	Spike Added (ug/L)	BS Concentration (ug/L)	BS Percent Recovery	QC Limits % Rec
Benzene	40.0	43.1	108	85 - 115
Toluene	40.0	41.5	104	85 - 115
Ethylbenzene	40.0	40.2	101	85 - 115
M,P-Xylene	80.0	80.2	100	85 - 115
O-Xylene	40.0	40.3	101	85 - 115
Total Xylenes	120	121	100	85 - 115

Analyte	Spike Added (ug/L)	BSD Concentration (ug/L)	BSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	44.0	110	2	20
Toluene	40.0	42.3	106	2	20
Ethylbenzene	40.0	40.7	102	1	20
M,P-Xylene	80.0	81.2	102	1	20
O-Xylene	40.0	41.3	103	2	20
Total Xylenes	120	122	102	2	20

## SURROGATE RECOVERY BS/BS

Analyte	% Recovery BS	% Recovery BSD	% Rec Limits	
2,3,4-Trifluorotoluene	93	95	88 - 119	

D = Detected

000012

# AROMATIC VOLATILE ORGANICS MATRIX SPIKE

Method 8020

Sample ID

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0421

**S97-0421**

Date Collected: 8/20/97  
Date Extracted: 8/27/97  
Date Analyzed: 8/27/97

Lab Sample ID: 9708275-1MS

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Spike Added (ug/L)	Sample Concentration (ug/L)	MS Concentration (ug/L)	MS Percent Recovery	QC Limits % Rec
Benzene	40.0	ND	41.3	103	85 - 115
Toluene	40.0	ND	39.5	99	85 - 115
Ethylbenzene	40.0	ND	37.8	95	85 - 115
M,P-Xylene	80.0	ND	78.0	98	85 - 115
O-Xylene	40.0	ND	40.5	101	85 - 115
Total Xylenes	120	ND	119	99	85 - 115

Analyte	Spike Added (ug/L)	MSD Concentration (ug/L)	MSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	41.4	104	0	20
Toluene	40.0	40.5	101	2	20
Ethylbenzene	40.0	39.2	98	4	20
M,P-Xylene	80.0	80.1	100	3	20
O-Xylene	40.0	40.9	102	1	20
Total Xylenes	120	121	101	2	20

## SURROGATE RECOVERY MS/MSD

Analyte	% Recovery MS	% Recovery MSD	% Rec Limits
2,3,4-Trifluorotoluene	88	92	88 - 119

ND = Not Detected

000013



# Paragon Analytics, Inc.

## TOTAL RECOVERABLE METALS CASE NARRATIVE

---

### El Paso Natural Gas Co.

S97-0421

Order Number - 9708275

1. This report consists of 7 water samples.
2. The samples were received intact on 08/22/97. The temperature of the samples upon receipt was 15° Celsius.
3. The samples had been correctly preserved for the requested analyses.
4. The samples were prepared for analysis based on SW-846, 3<sup>rd</sup> Edition procedures. For analysis by conventional ICP, the samples were digested following method 3005A.
5. The samples were analyzed following SW846 protocols by conventional ICP (Method 6010A).
6. All standards and solutions are NIST traceable and were used within their recommended shelf life.
7. The samples were prepared and analyzed within the established hold times.
8. Sample results which are below PAI's standard reporting limits are reported as "ND" on the enclosed report.

All in house quality control procedures were followed, as described below.

9. General quality control procedures.
  - A preparation (method) blank and laboratory control sample were digested and analyzed with the samples in this digestion batch. There were not more than 20 samples in the digestion batch.
  - The preparation (method) blank results associated with this batch were below the reporting limits for the requested analytes. This indicates that no contaminants were introduced to the samples during the digestion procedure.



- The laboratory control sample associated with this batch was within acceptance limits. This indicates complete digestion according to the method.
- All initial and continuing calibration blanks associated with this batch were below the reporting limits for the requested analytes. This indicates a valid calibration and stable instrument conditions.
- All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analytes. This indicates a valid calibration and stable instrument conditions.
- The interference check samples, and high standard readbacks associated with Method 6010A analyses were within acceptance criteria.

10. A sample from another Order Number was used as the QC sample for this batch.

- A matrix spike and matrix spike duplicate were digested and analyzed with this batch. All acceptance criteria for accuracy were met with the following exceptions.

<u>Analyte</u>	<u>Sample ID</u>
Silicon	9708326-1S & DS
Sodium	9708326-1S & DS

The concentration of silicon and sodium in the native sample was greater than 4 times the concentration of matrix spike added during the digestion. When sample concentration is that much greater than the spike added, spike recoveries may not be accurate. The Laboratory Control Sample is included to show that the digestion and analysis were in control.

- A sample duplicate and spike duplicate were digested and analyzed with each batch. All acceptance criteria for precision were met.
- A serial dilution was analyzed with each batch. All acceptance criteria were met.



The data contained in the following report have been reviewed and approved by the personnel listed below:

Darryl Patrick

Darryl Patrick  
Senior Inorganic Chemist

9/8/97

Date

SW

Reviewer's Initials

9/8/97

Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

**Paragon Analytics, Inc.**

**SAMPLE NUMBER(S) CROSS-REFERENCE TABLE**

**Client Name: El Paso Natural Gas Co.**

**Client Project ID: S97-0421**

PAI-ID	Client ID	MATRIX	DATE
			SAMPLED
9708275-1	S97-0421	Water	08/20/97
9708275-2	S97-0422	Water	08/20/97
9708275-3	S97-0423	Water	08/20/97
9708275-4	S97-0424	Water	08/20/97
9708275-5	S97-0425	Water	08/20/97
9708275-6	S97-0426	Water	08/20/97
9708275-7	S97-0427	Water	08/20/97

000004

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0421  
Lab Sample ID: RB 9708275

Sample ID

**Reagent Blank**

Date Collected: N/A  
Prep Date: 09/04/97  
Date Analyzed: 09/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	ND	0.1
Calcium	ND	1
Copper	ND	0.01
Iron	ND	0.1
Magnesium	ND	1
Manganese	ND	0.01
Potassium	ND	1
Silicon	ND	0.05
Sodium	ND	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

000005

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0421  
Lab Sample ID: 9708275-1

Sample ID

**S97-0421**

14

Sample Matrix: Water

Date Collected: 08/20/97

Prep Date: 09/04/97

Date Analyzed: 09/04/97

Hardness (in mg/L CaCO<sub>3</sub>) = 180 mg/L

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.2	0.1
Calcium	45	1
Copper	ND	0.01
Iron	0.5	0.1
Magnesium	15	1
Manganese	0.03	0.01
Potassium	5	1
Silicon	20	0.05
Sodium	81	1
Zinc	0.03	0.02

ND = Not detected at or above the reporting limit.

000006

15

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0421  
Lab Sample ID: 9708275-2

Sample ID

**S97-0422**

12

Sample Matrix: Water

Date Collected: 08/20/97

Prep Date: 09/04/97

Date Analyzed: 09/04/97

Hardness (in mg/L CaCO<sub>3</sub>) = 230 mg/L

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.2	0.1
Calcium	84	1
Copper	ND	0.01
Iron	0.5	0.1
Magnesium	31	1
Manganese	0.05	0.01
Potassium	23	1
Silicon	18	0.05
Sodium	100	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

000007

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0421  
Lab Sample ID: 9708275-3

Sample ID

**S97-0423**

12D

Sample Matrix: Water

Date Collected: 08/20/97

Prep Date: 09/04/97

Date Analyzed: 09/04/97

Hardness (in mg/L CaCO<sub>3</sub>) = 340 mg/L

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.2	0.1
Calcium	91	1
Copper	ND	0.01
Iron	0.4	0.1
Magnesium	34	1
Manganese	0.05	0.01
Potassium	22	1
Silicon	19	0.05
Sodium	100	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

000008

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0421  
Lab Sample ID: 9708275-4

Sample Matrix: Water

Sample ID

**S97-0424**

Date Collected: 08/20/97

Prep Date: 09/04/97

Date Analyzed: 09/04/97

Hardness (in mg/L CaCO<sub>3</sub>) = < 3 mg/L

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	ND	0.1
Calcium	ND	1
Copper	ND	0.01
Iron	ND	0.1
Magnesium	ND	1
Manganese	ND	0.01
Potassium	ND	1
Silicon	ND	0.05
Sodium	ND	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

000009

NP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0421  
Lab Sample ID: 9708275-5

Sample ID

**S97-0425**

13

Sample Matrix: Water

Date Collected: 08/20/97

Prep Date: 09/04/97

Date Analyzed: 09/04/97

Hardness (in mg/L CaCO<sub>3</sub>) = 160 mg/L

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.2	0.1
Calcium	39	1
Copper	ND	0.01
Iron	0.3	0.1
Magnesium	14	1
Manganese	0.02	0.01
Potassium	10	1
Silicon	20	0.05
Sodium	79	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

000010

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0421  
Lab Sample ID: 9708275-6

Sample ID

**S97-0426**

Sample Matrix: Water

Date Collected: 08/20/97

Prep Date: 09/04/97

Date Analyzed: 09/04/97

Hardness (in mg/L CaCO<sub>3</sub>) = 170 mg/L

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.2	0.1
Calcium	45	1
Copper	ND	0.01
Iron	0.5	0.1
Magnesium	13	1
Manganese	0.05	0.01
Potassium	4	1
Silicon	16	0.05
Sodium	72	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

000011

SP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0421  
Lab Sample ID: 9708275-7

Sample ID

**S97-0427**

Sample Matrix: Water

Date Collected: 08/20/97

Prep Date: 09/04/97

Date Analyzed: 09/04/97

Hardness (in mg/L CaCO<sub>3</sub>) = < 3 mg/L

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	ND	0.1
Calcium	ND	1
Copper	ND	0.01
Iron	ND	0.1
Magnesium	ND	1
Manganese	ND	0.01
Potassium	ND	1
Silicon	ND	0.05
Sodium	ND	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

000012

ND

# TOTAL RECOVERABLE METALS MATRIX SPIKE

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Lab Sample ID: 9708326-1

Sample ID

In House

Sample Matrix: Water

Prep Date: 09/04/97

Date Analyzed: 09/04/97

Analyte	Spike Added mg/L	Sample Conc. mg/L	MS Conc. mg/L	% Rec (limits 80-120%)	Flags
Boron	1.0	0.2	1.2	100	
Calcium	40	1	41	100	
Copper	0.25	0.02	0.26	96	
Iron	1.0	0.4	1.4	100	
Magnesium	40	< 1	41	103	
Manganese	0.50	0.02	0.50	96	
Potassium	40	3	47	110	
Silicon	0.5	6.7	7.3	120	See note
Sodium	40	711	748	93	See note
Zinc	0.50	0.04	0.52	96	

See note on following page.

000013

DP

# TOTAL RECOVERABLE METALS MATRIX SPIKE DUPLICATE

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Lab Sample ID: 9708326-1

Sample ID

**In House**

Sample Matrix: Water

Prep Date: 09/04/97

Date Analyzed: 09/04/97

Analyte	MSD Conc. mg/L	MSD % Rec (limits 80-120%)	Relative % Difference (limits 0-20%)	Flags
Boron	1.1	90	9	
Calcium	41	100	0	
Copper	0.26	96	0	
Iron	1.4	100	0	
Magnesium	41	103	0	
Manganese	0.50	96	0	
Potassium	47	110	0	
Silicon	7.3	120	0	See note
Sodium	741	75	1	See note
Zinc	0.51	94	2	

Note: Due to the large concentration of analyte in the sample, matrix spike recoveries may not be accurate. The Laboratory Control Sample (LCS) is included on a separate page to show that the digestion and analysis were in control.

000014

DP

**TOTAL RECOVERABLE METALS  
LABORATORY CONTROL SAMPLE**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0421  
Order Number: 9708275

Date Analyzed: 09/02/97

Analyte	LCS Result mg/L	LCS True Value mg/L	LCS % Recovery	Limits
Silicon	0.50	0.50	100	80 - 120%
Sodium	41	40	103	80 - 120%

000015

DP

# Paragon Analytics, Inc.



## SPECIFIC CONDUCTANCE CASE NARRATIVE

### **El Paso Natural Gas Co.**

S97-0421

**Order Number - 9708275**

1. This report consists of seven water samples.
2. The samples were received intact at a temperature of 15<sup>0</sup> C. on August 22, 1997.
3. The samples were prepared for analysis based on EPA Method 120.1.
4. All standards and solutions are NIST traceable and were used within their recommended shelf life.

All in house quality control procedures were followed, as described below.

5. General quality control procedures.
  - All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analyte. This indicates a valid calibration and stable instrument conditions.
6. PAI sample ID 9708275-1 (S97-0421) was used for the matrix QC sample for this batch.
  - A duplicate was prepared and analyzed with this batch. All acceptance criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below:



Krista Mobley  
Krista Mobley  
Inorganic Technician

9-4-97  
Date

SW  
Reviewer's Initials

9/5/97  
Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

**Paragon Analytics, Inc.**

**SAMPLE NUMBER(S) CROSS-REFERENCE TABLE**

**Client Name: El Paso Natural Gas Co.**

**Client Project ID: S97-0421**

PAI-ID	Client ID	MATRIX	DATE
			SAMPLED
9708275-1	S97-0421	Water	08/20/97
9708275-2	S97-0422	Water	08/20/97
9708275-3	S97-0423	Water	08/20/97
9708275-4	S97-0424	Water	08/20/97
9708275-5	S97-0425	Water	08/20/97
9708275-6	S97-0426	Water	08/20/97
9708275-7	S97-0427	Water	08/20/97

000003

# Specific Conductance In Water

Method EPA 120.1

## Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

ClientName: El Paso Natural Gas Co.

Client Project ID: S97-0421

Work Order Number: 9708275

Reporting Basis: AS RECEIVED

Reported on: Thursday, September 04, 1997

Final Volume: N/A

Matrix: Water

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Units	Detection Limit	Flag	Sample Aliquot
S97-0421 14	9708275-1	8/20/97	N/A	8/1/97	N/A	1	691	umhos/cm			N/A
S97-0422 12	9708275-2	8/20/97	N/A	8/1/97	N/A	1	1120	umhos/cm			N/A
S97-0423 120	9708275-3	8/20/97	N/A	8/1/97	N/A	1	1150	umhos/cm			N/A
S97-0424	9708275-4	8/20/97	N/A	8/1/97	N/A	1	14.8	umhos/cm			N/A
S97-0425 13	9708275-5	8/20/97	N/A	8/1/97	N/A	1	654	umhos/cm			N/A
S97-0426	9708275-6	8/20/97	N/A	8/1/97	N/A	1	674	umhos/cm			N/A
S97-0427	9708275-7	8/20/97	N/A	8/1/97	N/A	1	1.08	umhos/cm			N/A

Comments:

9708275-1 KM

# Paragon Analytics, Inc.



## PH ANALYSIS CASE NARRATIVE

---

### El Paso Natural Gas Co.

S97-0421

**Order Number - 9708275**

1. This report consists of seven water samples.
2. The samples were received intact at a temperature of 15<sup>0</sup> C. on August 22, 1997.
3. The samples were prepared for analysis based on SW-846, 3<sup>rd</sup> Edition procedures. Specifically, the water samples were analyzed following Method 9040.
4. All standards and solutions were used within their recommended shelf life.  
All in house quality control procedures were followed, as described below.
5. General quality control procedures.
  - All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analyte. This indicates a valid calibration and stable instrument conditions.
6. PAI sample ID 9708275-1 (S97-0421) was used for the matrix QC sample for this batch.
  - A duplicate was prepared and analyzed with this batch. All acceptance criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below:



Krista Mobley  
Krista Mobley  
Inorganic Technician

9-4-97  
Date

SW  
Reviewer's Initials

9/5/97  
Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# pH Water

Method SW846 9040

## Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

ClientName: El Paso Natural Gas Co.

Client Project ID: S97-0421

Work Order Number: 9708275

Reporting Basis: AS RECEIVED

Reported on: Thursday, September 04, 1997

Final Volume: N/A

Matrix: Water

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Units	Detection Limit	Flag	Sample Aliquot
S97-0421 14	9708275-1	8/20/97	N/A	9/1/97	N/A	1	7.8	PH			N/A
S97-0422 12	9708275-2	8/20/97	N/A	9/1/97	N/A	1	8.1	PH			N/A
S97-0423 120	9708275-3	8/20/97	N/A	9/1/97	N/A	1	8.1	PH			N/A
S97-0424	9708275-4	8/20/97	N/A	9/1/97	N/A	1	5.3	PH			N/A
S97-0425 13	9708275-5	8/20/97	N/A	9/1/97	N/A	1	8.3	PH			N/A
S97-0426	9708275-6	8/20/97	N/A	9/1/97	N/A	1	8.2	PH			N/A
S97-0427	9708275-7	8/20/97	N/A	9/1/97	N/A	1	6.1	PH			N/A

Comments:

0000004

-KM

**SAMPLE KEY**

SAMPLE NUMBER: S97-0533 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: PUMP BLANK BEFORE SAMPLING EMP#3  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 09:20 SAMPLE DATE: 10/20/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0534 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: BAILER BLANK BEFORE SAMPLING  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 09:30 SAMPLE DATE: 10/20/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0535 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW#3  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 11:10 SAMPLE DATE: 10/20/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0536 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW#2A  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 13:47 SAMPLE DATE: 10/20/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0537 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW#4  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 16:10 SAMPLE DATE: 10/20/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0538 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ENSR#2  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 17:20 SAMPLE DATE: 10/20/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0539 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ENSR#1  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 08:15 SAMPLE DATE: 10/21/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0540 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: FIELD BLANK  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 08:20 SAMPLE DATE: 10/21/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0543 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL #PTP1  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 12:40 SAMPLE DATE: 10/21/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0544 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ENSR#3  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 13:48 SAMPLE DATE: 10/21/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0546 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: PUMP BLANK MIDDLE OF SAMPLING  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 16:45 SAMPLE DATE: 10/21/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0548 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: BAILER BLANK MIDDLE OF SAMPLING  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 17:45 SAMPLE DATE: 10/21/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0549 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW#6  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 09:20 SAMPLE DATE: 10/22/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0550 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW#6 DUP.  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 09:20 SAMPLE DATE: 10/22/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0551 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: DOOM'S WATER WELL  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 10:15 SAMPLE DATE: 10/22/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0552 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW#7  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 13:33 SAMPLE DATE: 10/22/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0553 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW#5  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 15:32 SAMPLE DATE: 10/22/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0554 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW#15/4  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 17:00 SAMPLE DATE: 10/22/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0555 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: PRODUCTION WELL OXY  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 19:00 SAMPLE DATE: 10/22/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0556 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW#9  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 07:55 SAMPLE DATE: 10/23/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0557 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL #ACW12  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 07:55 SAMPLE DATE: 10/23/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0558 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL #ACW10  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 12:50 SAMPLE DATE: 10/23/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0559 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL #ACW13  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 15:23 SAMPLE DATE: 10/23/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0560 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: PUMP BLANK AFTER SAMPLING EMP#3  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 15:35 SAMPLE DATE: 10/23/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0606 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: BAILER BLANK AFTER SAMPLING  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 17:05 SAMPLE DATE: 10/23/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0607 LOCATION: JAL #4 PLANT  
MATRIX: WATER  
SAMPLE DESCRIPTION: PRODUCTION WELL #1  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 18:30 SAMPLE DATE: 10/23/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0797 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW#8  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 09:30 SAMPLE DATE: 11/21/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0798 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW#11  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 13:00 SAMPLE DATE: 11/21/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0799 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW#1  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 14:20 SAMPLE DATE: 11/21/97

**SAMPLE KEY**

SAMPLE NUMBER: S97-0800 LOCATION: JAL #4  
MATRIX: WATER  
SAMPLE DESCRIPTION: MONITOR WELL ACW#1 DUP.  
S D CONTINUED:  
S D CONTINUED:  
SAMPLE TIME: 14:20 SAMPLE DATE: 11/21/97



# PARAGON ANALYTICS, INC.

225 Commerce Drive ♦ Fort Collins, CO 80524 ♦ (800) 443-1511 ♦ (970) 490-1511 ♦ FAX (970) 490-1522

November 10, 1997

Mr. Darrell Campbell  
El Paso Natural Gas Co.  
8645 Railroad Drive  
El Paso, TX 79904

RE: Paragon Workorder: 97-10-214  
Client Project Name: S97-0533  
Client Project Number: Not Submitted

Dear Mr. Campbell:

Four water samples were received from El Paso Natural Gas Co. on October 22, 1997. The samples were scheduled for the following analyses:

pH	pages 1-5
Specific Conductance	pages 1-5
Aromatic Volatile Organics	pages 1-10
Total Recoverable Metals	pages 1-10
Inorganics	pages 1-16

The results for these analyses are contained in the enclosed reports.

Thank you for your confidence in Paragon Analytics, Inc. Should you have any questions, please call.

Sincerely,

Paragon Analytics, Inc.  
Victoria Bayly  
Project Manager

VB/jjc  
Enclosure: report

# Paragon Analytics, Inc.



## PH ANALYSIS CASE NARRATIVE

---

**El Paso Natural Gas Co.**

S97-0533

**Order Number - 9710195**

1. This report consists of four water samples.
2. The samples were received intact at a temperature of 22<sup>o</sup> C. on October 22, 1997.
3. The samples were prepared for analysis based on SW-846, 3<sup>rd</sup> Edition procedures. Specifically, the water samples were analyzed following Method 9040.
4. All standards and solutions were used within their recommended shelf life.

All in house quality control procedures were followed, as described below.

5. General quality control procedures.
  - All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analyte. This indicates a valid calibration and stable instrument conditions.
6. PAI sample ID 9710195-1 was used as the matrix QC sample for this batch.
  - A duplicate was prepared and analyzed with this batch, all acceptance criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below:



Krista Mobley  
Krista Mobley  
Inorganic Technician

11-7-97  
Date

SW  
Reviewer's Initials

11/7/97  
Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# Paragon Analytics, Incorporated

## Sample Number(s) Cross-Reference Table

---

Paragon OrderNum: 9710195

Client Name: El Paso Natural Gas Co.

Client Project Name: S97-0533

Client Project Number: None Submitted

Client PO Number:

---

Client Sample	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
S97-0533	9710195-1		Water	10/20/97	9:20
S97-0534	9710195-2		Water	10/20/97	9:30
S97-0536	9710195-3		Water	10/20/97	9:30
S97-0537	9710195-4		Water	10/20/97	9:30

# pH in Water

Method SW9040

## Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: None Submitted S97-0533

Work Order Number: 9710195

Reporting Basis: As Received

Printed on: Thursday, November 06, 1997

Final Volume: 50 ML

Matrix: Water

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Units	Detection Limit	Flag	Sample Aliquot
S97-0533	9710195-1	10/20/97	11/4/97	11/4/97		1	8.3	PH			50 ML
S97-0534	9710195-2	10/20/97	11/4/97	11/4/97		1	6.7	PH			50 ML
S97-0536 2A	9710195-3	10/20/97	11/4/97	11/4/97		1	9.2	PH			50 ML
S97-0537 4	9710195-4	10/20/97	11/4/97	11/4/97		1	7.3	PH			50 ML

### Comments:

1 ND = Not Detected at or above the client requested detection limit.

000004

# pH in Water

Method SW9040

## Duplicate Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

ClientName: El Paso Natural Gas Co.

Client Project ID: None Submitted S97-0533

Work Order Number: 9710195

Reporting Basis: As Received

Sample Aliquot: 50 ML

Final Volume: 50ML

Matrix: Water

Reported on: Thursday, November 06, 1997

Client Sample ID	Lab ID	Date Prepared	Date Analyzed	Dilution Factor	Duplicate Result	Units	Sample Result	Detection Limit	Flag	RPD	RPD Limit
S97-0533	9710195-1	11/4/97	11/4/97	1	8.2	PH	8.3			1	

### Comments:

1. ND = Not Detected at or above the client requested detection limit.

000005

# Paragon Analytics, Inc.



## SPECIFIC CONDUCTANCE CASE NARRATIVE

### **El Paso Natural Gas Co.**

S97-0533

**Order Number - 9710195**

1. This report consists of four water samples.
2. The samples were received intact at a temperature of 22<sup>0</sup> C. on October 22, 1997.
3. The samples were prepared for analysis based on SW-846 Method 9050.
4. All standards and solutions are NIST traceable and were used within their recommended shelf life.

All in house quality control procedures were followed, as described below.

5. General quality control procedures.
  - All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analyte. This indicates a valid calibration and stable instrument conditions.
6. PAI sample ID 9710195-1 was used as the matrix QC sample for this batch.
  - A duplicate was prepared and analyzed with this batch, all acceptance criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below:



Krista Mobley  
Krista Mobley  
Inorganic Technician

11-7-97  
Date

SW  
Reviewer's Initials

11/7/97  
Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# Paragon Analytics, Incorporated

## Sample Number(s) Cross-Reference Table

---

Paragon OrderNum: 9710195

Client Name: El Paso Natural Gas Co.

Client Project Name: S97-0533

Client Project Number: None Submitted

Client PO Number:

---

Client Sample	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
S97-0533	9710195-1		Water	10/20/97	9:20
S97-0534	9710195-2		Water	10/20/97	9:30
S97-0536	9710195-3		Water	10/20/97	9:30
S97-0537	9710195-4		Water	10/20/97	9:30

# Specific Conductance in Water

Method SW9050

## Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: None Submitted S97-0533

Work Order Number: 9710195

Reporting Basis: As Received

Printed on: Friday, November 07, 1997

Final Volume: 20 ML

Matrix: Water

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Units	Detection Limit	Flag	Sample Aliquot
S97-0533	9710195-1	10/20/97	11/4/97	11/4/97		1	656	umhos/cm			20 ML
S97-0534	9710195-2	10/20/97	11/4/97	11/4/97		1	1.82	umhos/cm			20 ML
S97-0536 <i>2A</i>	9710195-3	10/20/97	11/4/97	11/4/97		1	24400	umhos/cm			20 ML
S97-0537 <i>4</i>	9710195-4	10/20/97	11/4/97	11/4/97		10	172000	umhos/cm			20 ML

### Comments:

1. ND = Not Detected at or above the client requested detection limit.

000004

# Specific Conductance in Water

Method SW9050

## Duplicate Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

ClientName: El Paso Natural Gas Co.

Client Project ID: None Submitted S97-0533

Work Order Number: 9710195

Reporting Basis: As Received

Reported on: Friday, November 07, 1997

Sample Aliquot: 20 ML

Final Volume: 20ML

Matrix: Water

Client Sample ID	Lab ID	Date Prepared	Date Analyzed	Dilution Factor	Duplicate Result	Units	Sample Result	Detection Limit	Flag	RPD	RPD Limit
S97-0533	9710195-1	11/4/97	11/4/97	1	656	umhos/cm	656			0	

### Comments:

1 ND = Not Detected at or above the client requested detection limit.

000005



# Paragon Analytics, Inc.

## Aromatic Volatile Organics Case Narrative

---

**El Paso Natural Gas Co.**

**S97-0533**

**Order Number - 9710195**

1. This report consists of 4 water samples received by Paragon on 10/22/97.
2. These samples were prepared and analyzed according to SW-846, 3rd Edition procedures. Specifically, the water samples were prepared by heating and purging 5 mls using purge and trap procedures based on Method 5030. The calibration curve was also prepared using the heated purge.
3. The samples were analyzed using a GC with a DB-VRX capillary column and a PID detector according to protocols based on SW-846 Method 8020. All positive results were quantitated using the responses from the initial calibration curve using the internal standard technique. Second column confirmation was performed on all samples with positive results on a DB-624 capillary column.
4. All samples were analyzed within the established holding times.
5. The method blank associated with this project was below the reporting limits for all analytes.
6. All matrix spike and matrix spike duplicate recoveries and RPDs were within acceptance criteria.
7. All blank spike and blank spike duplicate recoveries and RPDs were within the acceptance criteria.
8. All surrogate recoveries were within acceptance criteria.



9. All internal standard recoveries were within acceptance criteria.
10. Samples 3 and 4 were analyzed at a higher dilution in order to get target analytes within the calibration range of the instrument and due to matrix interferences. The reporting limits have been adjusted accordingly.
11. All initial and continuing calibration criteria were within acceptance criteria.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Marty Brown  
Marty Brown  
GC Analyst

11-7-97  
Date

G. H. H.  
Reviewer's Initials

11-8-97  
Date

# Paragon Analytics, Incorporated

## Sample Number(s) Cross-Reference Table

---

Paragon OrderNum: 9710195

Client Name: El Paso Natural Gas Co.

Client Project Name: S97-0533

Client Project Number: None Submitted

Client PO Number:

---

Client Sample	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
S97-0533	9710195-1		Water	10/20/97	9:20
S97-0534	9710195-2		Water	10/20/97	9:30
S97-0536	9710195-3		Water	10/20/97	9:30
S97-0537	9710195-4		Water	10/20/97	9:30

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**Reagent Blank**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0533

Lab Sample ID: WRB1 10/29/97

Date Collected: N/A  
Date Extracted: 10/29/97  
Date Analyzed: 10/29/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	97	88 - 119

ND = Not Detected at or above client requested reporting limit.

000004

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0533**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0533

Lab Sample ID: 9710195-1

Date Collected: 10/20/97

Date Extracted: 10/29/97

Date Analyzed: 10/29/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	0.60	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	99	88 - 119

ND = Not Detected at or above client requested reporting limit.

000005

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0534**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0533

Lab Sample ID: 9710195-2

Date Collected: 10/20/97  
Date Extracted: 10/29/97  
Date Analyzed: 10/29/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	93	88 - 119

ND = Not Detected at or above client requested reporting limit.

000006

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0533

**S97-0536**

2A

Lab Sample ID: 9710195-3

Date Collected: 10/20/97

Date Extracted: 10/29/97

Date Analyzed: 10/29/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 10

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	89	5.0
Toluene	100	5.0
Ethylbenzene	13	5.0
M,P-Xylene	16	10
O-Xylene	9.6	5.0
Total Xylenes	26	10

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	97	88 - 119

ND = Not Detected at or above client requested reporting limit.

000007

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0537**

4

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0533

Lab Sample ID: 9710195-4

Date Collected: 10/20/97  
Date Extracted: 10/29/97  
Date Analyzed: 10/29/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 10

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	170	5.0
Toluene	150	5.0
Ethylbenzene	ND	5.0
M,P-Xylene	57	10
O-Xylene	53	5.0
Total Xylenes	110	10

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	93	88 - 119

ND = Not Detected at or above client requested reporting limit.

000008

# AROMATIC VOLATILE ORGANICS BLANK SPIKE

Method 8020

Sample ID

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0533

**Blank Spike**

Lab Sample ID: WBS1 10/29/97

Date Extracted: 10/29/97

Date Analyzed: 10/29/97

Sample Matrix: Water

Sample Volume: 5 mL

Analyte	Spike Added (ug/L)	BS Concentration (ug/L)	BS Percent Recovery	QC Limits % Rec
Benzene	40.0	38.9	97	85 - 115
Toluene	40.0	39.7	99	85 - 115
Ethylbenzene	40.0	40.2	101	85 - 115
M,P-Xylene	80.0	82.6	103	85 - 115
O-Xylene	40.0	40.5	101	85 - 115
Total Xylenes	120	123	103	85 - 115

Analyte	Spike Added (ug/L)	BSD Concentration (ug/L)	BSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	38.4	96	1	20
Toluene	40.0	38.8	97	2	20
Ethylbenzene	40.0	39.3	98	2	20
M,P-Xylene	80.0	80.4	101	3	20
O-Xylene	40.0	39.4	99	3	20
Total Xylenes	120	120	100	3	20

## SURROGATE RECOVERY BS/BS

Analyte	% Recovery BS	% Recovery BSD	% Rec Limits
2,3,4-Trifluorotoluene	96	96	88 - 119

D = Detected

000009

# AROMATIC VOLATILE ORGANICS MATRIX SPIKE

Method 8020

Sample ID

In House

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0533

Date Collected: 10/23/97

Date Extracted: 10/29/97

Date Analyzed: 10/29/97

Lab Sample ID: 9710251-01MS

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Spike Added (ug/L)	Sample Concentration (ug/L)	MS Concentration (ug/L)	MS Percent Recovery	QC Limits % Rec
Benzene	40.0	ND	38.5	96	85 - 115
Toluene	40.0	ND	39.1	98	85 - 115
Ethylbenzene	40.0	ND	39.1	98	85 - 115
M,P-Xylene	80.0	ND	79.6	100	85 - 115
O-Xylene	40.0	ND	39.3	98	85 - 115
Total Xylenes	120	ND	119	99	85 - 115

Analyte	Spike Added (ug/L)	MSD Concentration (ug/L)	MSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	37.8	94	2	20
Toluene	40.0	39.0	98	0	20
Ethylbenzene	40.0	39.1	98	0	20
M,P-Xylene	80.0	79.8	100	0	20
O-Xylene	40.0	39.4	99	0	20
Total Xylenes	120	119	99	0	20

## SURROGATE RECOVERY MS/MSD

Analyte	% Recovery MS	% Recovery MSD	% Rec Limits
2,3,4-Trifluorotoluene	94	95	88 - 119

ND = Not Detected

000010



# Paragon Analytics, Inc.

## TOTAL RECOVERABLE METALS CASE NARRATIVE

---

### El Paso Natural Gas Co.

S97-0533

Order Number - 9710195

1. This report consists of 4 water samples.
2. The samples were received intact on 10/22/97. The temperature of the samples upon receipt was 22° Celsius.
3. The samples had been correctly preserved for the requested analyses.
4. The samples were prepared for analysis based on SW-846, 3<sup>rd</sup> Edition procedures.  
For analysis by conventional ICP, the samples were digested following method 3005A.
5. The samples were analyzed following SW846 protocols by conventional ICP (Method 6010A).
6. All standards and solutions are NIST traceable and were used within their recommended shelf life.
7. The samples were prepared and analyzed within the established hold times.
8. Sample results which are below PAI's standard reporting limits are reported as "ND" on the enclosed report.

All in house quality control procedures were followed, as described below.

9. General quality control procedures.
  - A preparation (method) blank and laboratory control sample were digested and analyzed with the samples in this digestion batch. There were not more than 20 samples in the digestion batch.
  - The preparation (method) blank results associated with this batch were below the reporting limits for the requested analytes. This indicates that no contaminants were introduced to the samples during the digestion procedure.



- The laboratory control sample associated with this batch was within acceptance limits. This indicates complete digestion according to the method.
- All initial and continuing calibration blanks associated with this batch were below the reporting limits for the requested analytes. This indicates a valid calibration and stable instrument conditions.
- All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analytes. This indicates a valid calibration and stable instrument conditions.
- The interference check samples, and high standard readbacks associated with Method 6010A analyses were within acceptance criteria.

10. A sample from another Order Number was used as the QC sample for this batch.

- A matrix spike and matrix spike duplicate were digested and analyzed with this batch. All acceptance criteria for accuracy were met.
- A sample duplicate and spike duplicate were digested and analyzed with this batch. All acceptance criteria for precision were met.
- A serial dilution was analyzed with this batch. All acceptance criteria were met.

11 Hardness was determined from calcium and magnesium values determined by Trace ICP and calculated using the following formula.

$$\text{mg CaCO}_3/\text{L} = (2.497 * \text{Ca conc. (mg/L)}) + (4.118 * \text{Mg conc. (mg/L)})$$

PAI Sample ID: 9710195-1 - 154  
9710195-2 - < 2.5  
9710195-3 - 6.5  
9710195-4 - 3100

The data contained in the following report have been reviewed and approved by the personnel listed below:

Darryl Patrick

Darryl Patrick  
Senior Inorganic Chemist

11/6/97  
Date

SW  
Reviewer's Initials

11/6/97  
Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# Paragon Analytics, Incorporated

## Sample Number(s) Cross-Reference Table

Paragon OrderNum: 9710195

Client Name: El Paso Natural Gas Co.

Client Project Name: S97-0533

Client Project Number: None Submitted

Client PO Number:

Client Sample	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
S97-0533	9710195-1		Water	10/20/97	9:20
S97-0534	9710195-2		Water	10/20/97	9:30
S97-0536	9710195-3		Water	10/20/97	9:30
S97-0537	9710195-4		Water	10/20/97	9:30

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0533  
Lab Sample ID: RB 9710195

Sample ID

**Reagent Blank**

Date Collected: N/A  
Prep Date: 10/29/97  
Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	ND	0.1
Calcium	ND	1
Copper	ND	0.01
Iron	ND	0.1
Magnesium	ND	1
Manganese	ND	0.01
Potassium	ND	1
Silicon	ND	0.05
Sodium	ND	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

000004

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0533  
Lab Sample ID: 9710195-1

Sample Matrix: Water

Sample ID

**S97-0533**

Date Collected: 10/20/97

Prep Date: 10/29/97

Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.2	0.1
Calcium	41	1
Copper	ND	0.01
Iron	0.8	0.1
Magnesium	13	1
Manganese	0.06	0.01
Potassium	4	1
Silicon	12	0.05
Sodium	69	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

000005

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0533  
Lab Sample ID: 9710195-2

Sample Matrix: Water

Sample ID

**S97-0534**

Date Collected: 10/20/97

Prep Date: 10/29/97

Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	ND	0.1
Calcium	ND	1
Copper	ND	0.01
Iron	ND	0.1
Magnesium	ND	1
Manganese	ND	0.01
Potassium	ND	1
Silicon	ND	0.05
Sodium	ND	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

000006

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0533  
Lab Sample ID: 9710195-3

Sample Matrix: Water

Sample ID

**S97-0536**

2A

Date Collected: 10/20/97

Prep Date: 10/29/97

Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	1.1	0.1
Calcium	3	1
Copper	ND	0.01
Iron	0.2	0.1
Magnesium	ND	1
Manganese	ND	0.01
Potassium	12	1
Silicon	10	0.05
Sodium *	6000	50
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

\* Detection limit raised. Dilution required due to analyte concentration.

000007

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0533  
Lab Sample ID: 9710195-4

Sample Matrix: Water

Sample ID

**S97-0537**

4

Date Collected: 10/20/97

Prep Date: 10/29/97

Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.7	0.1
Calcium *	580	100
Copper	ND	0.01
Iron	0.2	0.1
Magnesium ^	360	100
Manganese	6.1	0.01
Potassium	250	1
Silicon	13	0.05
Sodium *	33000	100
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

\* Detection limit raised. Dilution required due to analyte concentration.

^ Detection limit raised. Sample diluted to reduce matrix interferences.

000008

18

**TOTAL RECOVERABLE METALS  
MATRIX SPIKE**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Lab Sample ID: 9710215-1

Sample ID

**In House**

Sample Matrix: Water

Prep Date: 10/29/97

Date Analyzed: 11/04/97

Analyte	Spike Added mg/L	Sample Conc. mg/L	MS Conc. mg/L	% Rec (limits 80-120%)	Flags
Boron	1.0	< 0.1	0.9	90	
Calcium	40	< 1	41	103	
Copper	0.25	< 0.01	0.25	100	
Iron	1.0	< 0.1	1.0	100	
Magnesium	40	< 1	41	103	
Manganese	0.50	< 0.01	0.49	98	
Potassium	40	< 1	40	100	
Silicon	0.5	< 0.1	0.5	100	
Sodium	40	< 1	41	103	
Zinc	0.50	< 0.02	0.49	98	

000009

DP

# TOTAL RECOVERABLE METALS MATRIX SPIKE DUPLICATE

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Lab Sample ID: 9710215-1

Sample ID

**In House**

Sample Matrix: Water

Prep Date: 10/29/97

Date Analyzed: 11/04/97

Analyte	MSD Conc. mg/L	MSD % Rec (limits 80-120%)	Relative % Difference (limits 0-20%)	Flags
Boron	0.9	90	0	
Calcium	41	103	0	
Copper	0.24	96	4	
Iron	0.9	90	11	
Magnesium	41	103	0	
Manganese	0.49	98	0	
Potassium	40	100	0	
Silicon	0.5	100	0	
Sodium	41	103	0	
Zinc	0.50	100	2	

000010 DP



# Paragon Analytics, Inc.

## INORGANICS CASE NARRATIVE

---

### El Paso Natural Gas Co.

S97-0533

Order Number - 9710195

1. This report consists of data for 4 water samples analyzed for total alkalinity, bromide, chloride, fluoride, nitrate/nitrite, sulfate and total dissolved solids (TDS).
2. The samples were received cool and intact on 10/22/97.
3. The samples had been correctly preserved for the requested analyses.
4. The samples were analyzed using procedures based on the following methods from the USEPA or *Standard Methods for the Examination of Water and Wastewater*, 17th Ed.:

<u>Analyte</u>	<u>Method</u>
Total Alkalinity	4500-CO <sub>2</sub>
Bromide	300.0
Chloride	300.0
Fluoride	340.2
Nitrate/Nitrite	353.3
Sulfate	300.0
Total Dissolved Solids	160.1

The samples were analyzed for fluoride using an ion selective electrode (Method 340.2) instead of ion chromatography (Method 300.0). The high concentration of chloride in some of the samples interfered with the chromatography for fluoride.

5. All standards and reagents were used within their recommended shelf life.
6. The samples were prepared and analyzed within the established hold times.
7. Sample results which are below the reporting limit are reported as "ND" on the enclosed report.



All in house quality control procedures were followed, as described below.

8. General quality control procedures.

- The method blank results were below the reporting limits for all analyses.
- The LCS results were within acceptance limits for all analyses.
- The MS/MSD results were within acceptance limits for bromide, chloride, fluoride, and sulfate.
- The matrix duplicate results were within acceptance limits for total alkalinity, and TDS.

The data contained in the following report have been reviewed and approved by the personnel listed below:

Jim  
Reporter's Initials

11-5-97  
Date

BS  
Reviewer's Initials

11-5-97  
Date

CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# TOTAL ALKALINITY

Method 4500-CO2

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0533  
Client Project No:  
Lab Workorder Number: 9710195

Date Collected: 10/20/97  
Date Analyzed: 10/27/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Total Alkalinity as CaCO3 Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	5
S97-0533	9710195-1	140	25
S97-0534	9710195-2	ND	5
S97-0536 <i>2A</i>	9710195-3	2200	25
S97-0537 <i>4</i>	9710195-4	500	25

ND = Not Detected

000003

## Alkalinity Calculations and Quality Control Results

Date analyzed: 10/27/97

ID	aliquot titrated (mL)	titrant normality N	vol to pH 8.3 (mL)	vol to pH 4.5 (mL)	total vol (mL)	HCO <sub>3</sub>	CO <sub>3</sub>	OH	Total	DL
						-----mg/L as CaCO <sub>3</sub> -----				(mg/L)
R Blank	100	0.0175	0	0.00	0.00	0	0	0	0.0	5
LCS	100	0.0175	0	11.57	11.57	101	0	0	101.0	5
9710195-1	20	0.0175	0	3.17	3.17	138	0	0	138.4	25
9710195-2	100	0.0175	0	0.00	0.00	0	0	0	0.0	5
9710195-2 dup	100	0.0175	0	0.00	0.00	0	0	0	0.0	5
9710195-3	20	0.0175	8.61	42.23	50.84	1467	752	0	2219.1	25
9710195-4	20	0.0175	0	11.45	11.45	500	0	0	499.8	25
9710215-1	100	0.0175	0	0.00	0.00	0	0	0	0.0	5
9710215-2	100	0.0175	0	88.94	88.94	776	0	0	776.4	5
9710215-3	20	0.0175	0	18.01	18.01	786	0	0	786.1	25
9710215-4	20	0.0175	0	13.23	13.23	577	0	0	577.5	25
9710215-5	20	0.0175	0	3.36	3.36	147	0	0	146.7	25
9710215-6	20	0.0175	0	3.28	3.28	143	0	0	143.2	25
9710215-7	100	0.0175	0	0.00	0.00	0	0	0	0.0	5

### Standardization of titrant

Conc Na <sub>2</sub> CO <sub>3</sub> std	Na <sub>2</sub> CO <sub>3</sub> aliquot	HCl vol	HCl conc
0.0470	5.00	13.58	0.01730
0.0470	5.00	13.41	0.01752
0.0470	5.00	13.39	0.01755

mean = 0.01746

## Alkalinity Quality Control Results

Date analyzed: 10/27/97

### LCS SUMMARY

ID	expected alk conc (mg/L)	alk conc found (mg/L)	recovery %	recovery acceptance limit
LCS	100.0	101.0	101	85-115%

### DUPLICATE SUMMARY

ID	sample alk conc (mg/L)	duplic alk conc (mg/L)	RPD %	accept. limits
9710195-2 dup	ND	ND	NA	0-15%

000004

# BROMIDE

Method 300.0

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0533  
Client Project No:  
Lab Workorder Number: 9710195

Date Collected: 10/20/97  
Date Analyzed: 10/28-29/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Bromide Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.2
S97-0533	9710195-1	ND	0.2
S97-0534	9710195-2	ND	0.2
S97-0536 <i>2A</i>	9710195-3	5	2
S97-0537 <i>4</i>	9710195-4	33	20

ND = Not Detected

000005

# BROMIDE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9710195-1

Date Analyzed: 10/28/97

Sample Matrix: Water

Sample ID

**S97-0533**

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Bromide	5.00	ND	5.42	108	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Bromide	5.00	5.57	111	3	0-15 %

000006

# CHLORIDE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0533

Client Project No:

Lab Workorder Number: 9710195

Date Collected: 10/20/97

Date Analyzed: 10/28-29/97

Sample Matrix: Water

Client ID	Lab Sample ID	Chloride Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.2
S97-0533	9710195-1	97	4
S97-0534	9710195-2	ND	0.2
S97-0536 <i>2A</i>	9710195-3	8600	200
S97-0537 <i>4</i>	9710195-4	58000	2000

ND = Not Detected

000007

# CHLORIDE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9710195-1

Date Analyzed: 10/29/97

Sample Matrix: Water

Sample ID

**S97-0533**

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Chloride	100	97	188	91	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Chloride	100	191	94	2	0-20 %

000008

# FLUORIDE

Method 340.2

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0533  
Client Project No:  
Lab Workorder Number: 9710195

Date Collected: 10/20/97  
Date Analyzed: 11/03/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Fluoride Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.5
S97-0533	9710195-1	1.5	0.5
S97-0534	9710195-2	ND	0.5
S97-0536 2A	9710195-3	7.6	0.5
S97-0537 4	9710195-4	ND	0.5

ND = Not Detected

000009

# NITRATE + NITRITE

Method 353.3

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0533  
Client Project No:  
Lab Workorder Number: 9710195

Date Collected: 10/20/97  
Date Analyzed: 11/01/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Nitrate + Nitrite as N Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.05
S97-0533	9710195-1	ND	0.05
S97-0534	9710195-2	0.06	0.05
S97-0536 2A	9710195-3	ND	0.05
S97-0537 4	9710195-4	ND	0.05

ND = Not Detected

000011

**SULFATE**  
Method 300.0

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0533  
Client Project No:  
Lab Workorder Number: 9710195

Date Collected: 10/20/97  
Date Analyzed: 10/28-29/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Sulfate Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	1
S97-0533	9710195-1	52	20
S97-0534	9710195-2	ND	1
S97-0536 2A	9710195-3	ND	10
S97-0537 4	9710195-4	2100	100

ND = Not Detected

000013

# TOTAL DISSOLVED SOLIDS

Method 160.1

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0533  
Client Project No:  
Lab Workorder Number: 9710195

Date Collected: 10/20/97  
Date Prepared: 10/27/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Total Dissolved Solids Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	20
S97-0533	9710195-1	390	20
S97-0534	9710195-2	ND	20
S97-0536 2A	9710195-3	16000	20
S97-0537 4	9710195-4	94000	20

ND = Not Detected

000015

# TDS Calculations and Quality Control Results

Preparation Date: October 27, 1997

ID	sample vol (mL)	empty beaker tare (g)	A beaker + residue gross (g)	A net (mg)	B beaker + residue gross (g)	B net (mg)	gross A vs gross B RPD %	calculated TDS conc (mg/L)	TDS DL (mg/L)
Method Blank	100	72.7136	72.7144	0.8	72.7139	0.3	0.001	3	20
Blank Spike	100	82.7307	82.7721	41.4	82.7714	40.7	0.001	407	20
9710195-1	100	82.2171	82.2573	40.2	82.2559	38.8	0.002	388	20
9710195-1 dup	100	67.5279	67.5697	41.8	67.5684	40.5	0.002	405	20
9710195-2	100	73.1626	73.1638	1.2	73.1631	0.5	0.001	5	20
9710195-3	100	87.9245	89.5378	1613.3	89.5363	1611.8	0.002	16118	20
9710195-4	100	71.7991	81.2196	9420.5	81.2083	9409.2	0.014	94092	20
9710196-1	100	67.3554	68.7107	1355.3	68.6945	1339.1	0.024	13391	20
9710196-2	100	82.2309	85.2451	3014.2	85.2440	3013.1	0.001	30131	20
9710214-1	100	82.4509	83.2251	774.2	83.2125	761.6	0.015	7616	20
9710214-2	100	80.2440	80.3872	143.2	80.3795	135.5	0.010	1355	20
9710214-3	100	87.4784	87.6140	135.6	87.6049	126.5	0.010	1265	20
9710215-1	100	71.8507	71.8514	0.7	71.8507	0.0	0.001	0	20
9710215-2	100	85.8427	87.0942	1251.5	87.0930	1250.3	0.001	12503	20
9710215-2 dup	100	75.0607	76.3023	1241.6	76.2993	1238.6	0.004	12386	20
9710215-3	100	66.0091	67.1444	1135.3	67.1432	1134.1	0.002	11341	20
9710215-4	100	70.5097	73.3172	2807.5	73.3052	2795.5	0.016	27955	20
9710215-5	100	71.9382	71.9887	50.5	71.9886	50.4	0.000	504	20
9710215-6	100	67.8628	69.2880	1525.2	69.3647	1501.9	0.034	15019	20
9710215-7	100	73.2535	73.2655	12.0	73.2644	10.9	0.002	109	20
9710216-2	100	65.3109	65.3691	58.2	65.3679	57.0	0.002	570	20

## BLANK SUMMARY

ID	blank conc (mg/L)	accept. limit (mg/L)
Method Blank	3	< 20

## BLANK SPIKE SUMMARY

ID	spike added (g)	spike added conc (mg/L)	spiked sample conc (mg/L)	recovery %	accept. limits
Blank Spike	40.0	400	407	102	85-115%

## DUPLICATE SUMMARY

ID	sample conc (mg/L)	duplic conc (mg/L)	RPD %	accept. limits
9710195-1 dup	388	405	4.3	0-15%
9710215-2 dup	12503	12386	0.9	0-15%

ND = Not Detected

NA = Not Applicable

000016

[illegible]

## CONDITION OF SAMPLE UPON RECEIPT

CLIENT: EPNGSHIPPING CONTAINER #: CoolerWORKORDER NO. 9710-55INITIALS: LDDATE: 10/22/97

1. Does this project require special handling according to NEESA, Level 3, or CLP protocols? If yes, complete a. and b. a. Cooler Temperature _____ b. Lot No's. _____ c. Airbill Number _____	Yes	<u>No</u>
2. Are custody seals on the cooler intact? If so, how many _____	<u>N/A</u>	No
3. Are custody seals on sample containers intact? _____	<u>N/A</u>	No
4. Is there a Chain of Custody (COC) or other representative documents, letters or shipping memos?	<u>Yes</u>	No
5. Is the COC complete? Relinquished: Yes / No Requested Analysis: Yes / No	<u>N/A</u>	<u>Yes</u>
6. Is the COC in agreement with the samples received? No. of Samples: Yes / No Sample ID's: Yes / No Matrix: Yes / No No. of Containers: Yes / No	<u>Yes</u>	No
7. Are the samples requiring chemical preservation preserved correctly?	<u>N/A</u>	<u>Yes</u>
8. Is there enough sample? If so, are they in the proper containers?	<u>Yes</u>	No
9. Are all samples within holding times for the requested analyses?	Yes	<u>No</u>
10. Were the sample(s) shipped on ice?	<u>N/A</u>	<u>Yes</u>
11. Were all sample containers received intact? (not broken or leaking, etc.)	<u>Yes</u>	No
12. Are samples requiring no headspace, headspace free?	<u>N/A</u>	<u>Yes</u>
13. Do the samples require quarantine?	Yes	<u>No</u>
14. Do samples require Paragon disposal?	<u>Yes</u>	No
15. Did the client return any unused bottles?	Yes	<u>No</u>

Describe "NO" items (except No's 1, 13, & 14) 10 - ICE EXPIRED 9 - PA & Spec Cond out  
of total upon receipt.

Was the client contacted? Yes \_\_\_\_\_ No \_\_\_\_\_  
 If yes, Date: \_\_\_\_\_ Name of person contacted: \_\_\_\_\_  
 Describe actions taken or client instructions: \_\_\_\_\_

Group Leader's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Cooler Temperature: 22°



# PARAGON ANALYTICS, INC.

225 Commerce Drive ♦ Fort Collins, CO 80524 ♦ (800) 443-1511 ♦ (970) 490-1511 ♦ FAX (970) 490-1522

November 10, 1997

Mr. Darrell Campbell  
El Paso Natural Gas Co.  
8645 Railroad Drive  
El Paso, TX 79904

RE: Paragon Workorder: 97-10-196  
Client Project Name: Not Submitted  
Client Project Number: S97-0535

Dear Mr. Campbell:

Two water samples were received from El Paso Natural Gas Co. on October 22, 1997. The samples were scheduled for the following analyses:

Specific Conductance	pages 1-5
Aromatic Volatile Organics	pages 1-8
Inorganics	pages 1-6

The results for these analyses are contained in the enclosed reports.

Thank you for your confidence in Paragon Analytics, Inc. Should you have any questions, please call.

Sincerely,

Paragon Analytics, Inc.  
Victoria Bayly  
Project Manager

VB/jjc  
Enclosure: report

# Paragon Analytics, Inc.



## SPECIFIC CONDUCTANCE CASE NARRATIVE

### **El Paso Natural Gas Co.**

**Order Number - 9710196**

1. This report consists of two water samples.
2. The samples were received intact at a temperature of 22<sup>0</sup> C. on October 22, 1997.
3. The samples were prepared for analysis based on SW-846 Method 9050.
4. All standards and solutions are NIST traceable and were used within their recommended shelf life.

All in house quality control procedures were followed, as described below.

5. General quality control procedures.
  - All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analyte. This indicates a valid calibration and stable instrument conditions.
6. PAI sample ID 9710196-1 was used as the matrix QC sample for this batch.
  - A duplicate was prepared and analyzed with this batch, all acceptance criteria were met.

# Specific Conductance in Water

Method SW9050

## Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: None Submitted S97-0535

Work Order Number: 9710196

Reporting Basis: As Received

Printed on: Friday, November 07, 1997

Final Volume: 20 ML

Matrix: Water

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Units	Detection Limit	Flag	Sample Aliquot
S97-0535 3	9710196-1	10/20/97	11/5/97	11/5/97		1	23000	umhos/cm			20 ML
S97-0538 ENGR#2	9710196-2	10/20/97	11/5/97	11/5/97		10	57900	umhos/cm			20 ML

### Comments:

1. ND = Not Detected at or above the client requested detection limit.

# Specific Conductance in Water

Method SW9050

## Duplicate Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

ClientName: El Paso Natural Gas Co.

Client Project ID: None Submitted S97-0535

Work Order Number: 9710196

Reporting Basis: As Received

Reported on: Friday, November 07, 1997

Sample Aliquot: 20 ML

Final Volume: 20ML

Matrix: Water

Client Sample ID	Lab ID	Date Prepared	Date Analyzed	Dilution Factor	Duplicate Result	Units	Sample Result	Detection Limit	Flag	RPD	RPD Limit
S97-0535	9710196-1	11/5/97	11/5/97	1	23000	umhos/cm	23000			0	

### Comments:

1. ND = Not Detected at or above the client requested detection limit.



# Paragon Analytics, Inc.

## Aromatic Volatile Organics Case Narrative

---

### El Paso Natural Gas Co.

Order Number - 9710196

1. This report consists of 2 water samples received by Paragon on 10/22/97.
2. These samples were prepared and analyzed according to SW-846, 3rd Edition procedures. Specifically, the water samples were prepared by heating and purging 5 mls using purge and trap procedures based on Method 5030. The calibration curve was also prepared using the heated purge.
3. The samples were analyzed using a GC with a DB-VRX capillary column and a PID detector according to protocols based on SW-846 Method 8020. All positive results were quantitated using the responses from the initial calibration curve using the internal standard technique. Second column confirmation was performed on all samples with positive results on a DB-624 capillary column.
4. All samples were analyzed within the established holding times.
5. The method blank associated with this project was below the reporting limits for all analytes.
6. All matrix spike and matrix spike duplicate recoveries and RPDs were within acceptance criteria.
7. All blank spike and blank spike duplicate recoveries and RPDs were within the acceptance criteria.
8. All surrogate recoveries were within acceptance criteria.



9. All internal standard recoveries were within acceptance criteria.
10. Samples 1 and 2 were analyzed at a higher dilution in order to get target analytes within the calibration range of the instrument and due to matrix interferences. The reporting limits have been adjusted accordingly.
11. All initial and continuing calibration criteria were within acceptance criteria.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Marty O Brown  
Marty Brown  
GC Analyst

11-7-97  
Date

G. D. Wood  
Reviewer's Initials

11-9-97  
Date

# Paragon Analytics, Incorporated

## Sample Number(s) Cross-Reference Table

---

Paragon OrderNum: 9710196

Client Name: El Paso Natural Gas Co.

Client Project Name: S97-0535

Client Project Number: None Submitted

Client PO Number:

---

Client Sample	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
S97-0535	9710196-1		Water	10/20/97	11:10
S97-0538	9710196-2		Water	10/20/97	17:20

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**Reagent Blank**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: None Submitted

Lab Sample ID: WRB1 10/29/97

Date Collected: N/A  
Date Extracted: 10/29/97  
Date Analyzed: 10/29/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

## SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	97	88 - 119

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0535**

3

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: None Submitted

Lab Sample ID: 9710196-1

Date Collected: 10/20/97

Date Extracted: 10/29/97

Date Analyzed: 10/29/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 10

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	160	5.0
Toluene	8.2	5.0
Ethylbenzene	69	5.0
M,P-Xylene	25	10
O-Xylene	7.3	5.0
Total Xylenes	32	10

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	99	88 - 119

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0538**

ENR#2

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: None Submitted

Lab Sample ID: 9710196-2

Date Collected: 10/20/97

Date Extracted: 10/29/97

Date Analyzed: 10/29/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 100

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	130	50
Toluene	160	50
Ethylbenzene	77	50
M,P-Xylene	120	100
O-Xylene	ND	50
Total Xylenes	120	100

## SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	95	88 - 119

ND = Not Detected at or above client requested reporting limit.

# AROMATIC VOLATILE ORGANICS BLANK SPIKE

Method 8020

Sample ID

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: None Submitted

**Blank Spike**

Lab Sample ID: WBS1 10/29/97

Date Extracted: 10/29/97

Date Analyzed: 10/29/97

Sample Matrix: Water

Sample Volume: 5 mL

Analyte	Spike Added (ug/L)	BS Concentration (ug/L)	BS Percent Recovery	QC Limits % Rec
Benzene	40.0	38.9	97	85 - 115
Toluene	40.0	39.7	99	85 - 115
Ethylbenzene	40.0	40.2	101	85 - 115
M,P-Xylene	80.0	82.6	103	85 - 115
O-Xylene	40.0	40.5	101	85 - 115
Total Xylenes	120	123	103	85 - 115

Analyte	Spike Added (ug/L)	BSD Concentration (ug/L)	BSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	38.4	96	1	20
Toluene	40.0	38.8	97	2	20
Ethylbenzene	40.0	39.3	98	2	20
M,P-Xylene	80.0	80.4	101	3	20
O-Xylene	40.0	39.4	99	3	20
Total Xylenes	120	120	100	3	20

## SURROGATE RECOVERY BS/BSD

Analyte	% Recovery BS	% Recovery BSD	% Rec Limits
2,3,4-Trifluorotoluene	96	96	88 - 119

D = Detected

# AROMATIC VOLATILE ORGANICS MATRIX SPIKE

Method 8020

Sample ID

In House

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: None Submitted

Date Collected: 10/23/97  
Date Extracted: 10/29/97  
Date Analyzed: 10/29/97

Lab Sample ID: 9710251-01MS

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Spike Added (ug/L)	Sample Concentration (ug/L)	MS Concentration (ug/L)	MS Percent Recovery	QC Limits % Rec
Benzene	40.0	ND	38.5	96	85 - 115
Toluene	40.0	ND	39.1	98	85 - 115
Ethylbenzene	40.0	ND	39.1	98	85 - 115
M,P-Xylene	80.0	ND	79.6	100	85 - 115
O-Xylene	40.0	ND	39.3	98	85 - 115
Total Xylenes	120	ND	119	99	85 - 115

Analyte	Spike Added (ug/L)	MSD Concentration (ug/L)	MSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	37.8	94	2	20
Toluene	40.0	39.0	98	0	20
Ethylbenzene	40.0	39.1	98	0	20
M,P-Xylene	80.0	79.8	100	0	20
O-Xylene	40.0	39.4	99	0	20
Total Xylenes	120	119	99	0	20

## SURROGATE RECOVERY MS/MSD

Analyte	% Recovery MS	% Recovery MSD	% Rec Limits
2,3,4-Trifluorotoluene	94	95	88 - 119

ND = Not Detected



# Paragon Analytics, Inc.

## INORGANICS CASE NARRATIVE

---

### El Paso Natural Gas Co.

Order Number - 9710196

1. This report consists of data for 2 water samples analyzed for chloride and total dissolved solids (TDS).
2. The samples were received cool and intact on 10/22/97.
3. The samples had been correctly preserved for the requested analyses.
4. The samples were analyzed using procedures based on the following methods from the USEPA:

<u>Analyte</u>	<u>Method</u>
Chloride	300.0
Total Dissolved Solids	160.1

5. All standards and reagents were used within their recommended shelf life.
6. The samples were prepared and analyzed within the established hold times.
7. Sample results which are below the reporting limit are reported as "ND" on the enclosed report.

All in house quality control procedures were followed, as described below.

8. General quality control procedures.
  - The method blank results were below the reporting limits for all analyses.
  - The LCS results were within acceptance limits for all analyses.
  - The MS and MSD results were within acceptance limits.
  - The matrix duplicate results were within acceptance limits for total dissolved solids.



The data contained in the following report have been reviewed and approved by the personnel listed below:

Jm  
Reporter's Initials

11-4-97  
Date

B  
Reviewer's Initials

11-5-97  
Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# CHLORIDE

Method 300.0

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID:  
Client Project No:  
Lab Workorder Number: 9710196

Date Collected: 10/20/97  
Date Analyzed: 11/01/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Chloride Conc (mg/L)	Detection Limit (mg/L)
S97-0535 #3	Method Blank	ND	0.2
S97-0538 El Paso N.G.	9710196-1	7800	200
	9710196-2	17000	400

ND = Not Detected

# CHLORIDE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9710283-3

Date Analyzed: 11/01/97

Sample Matrix: Water

Sample ID

IN HOUSE

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Chloride	125	100	223	98	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Chloride	125	223	98	0	0-20 %

# TOTAL DISSOLVED SOLIDS

Method 160.1

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID:

Client Project No:

Lab Workorder Number: 9710196

Date Collected: 10/20/97

Date Prepared: 10/27/97

Sample Matrix: Water

Client ID	Lab Sample ID	Total Dissolved Solids Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	20
S97-0535	9710196-1	13000	20
S97-0538	9710196-2	30000	20

ND = Not Detected

# TDS Calculations and Quality Control Results

Preparation Date: October 27, 1997

ID	sample vol (mL)	empty beaker tare (g)	A beaker + residue gross (g)	A net (mg)	B beaker + residue gross (g)	B net (mg)	gross A vs gross B RPD %	calculated TDS conc (mg/L)	TDS DL (mg/L)
Method Blank	100	72.7136	72.7144	0.8	72.7139	0.3	0.001	3	20
Blank Spike	100	82.7307	82.7721	41.4	82.7714	40.7	0.001	407	20
9710195-1	100	82.2171	82.2573	40.2	82.2559	38.8	0.002	388	20
9710195-1 dup	100	67.5279	67.5697	41.8	67.5684	40.5	0.002	405	20
9710195-2	100	73.1626	73.1638	1.2	73.1631	0.5	0.001	5	20
9710195-3	100	87.9245	89.5378	1613.3	89.5363	1611.8	0.002	16118	20
9710195-4	100	71.7991	81.2196	9420.5	81.2083	9409.2	0.014	94092	20
9710196-1	100	67.3554	68.7107	1355.3	68.6945	1339.1	0.024	13391	20
9710196-2	100	82.2309	85.2451	3014.2	85.2440	3013.1	0.001	30131	20
9710214-1	100	82.4509	83.2251	774.2	83.2125	761.6	0.015	7616	20
9710214-2	100	80.2440	80.3872	143.2	80.3795	135.5	0.010	1355	20
9710214-3	100	87.4784	87.6140	135.6	87.6049	126.5	0.010	1265	20
9710215-1	100	71.8507	71.8514	0.7	71.8507	0.0	0.001	0	20
9710215-2	100	85.8427	87.0942	1251.5	87.0930	1250.3	0.001	12503	20
9710215-2 dup	100	75.0607	76.3023	1241.6	76.2993	1238.6	0.004	12386	20
9710215-3	100	66.0091	67.1444	1135.3	67.1432	1134.1	0.002	11341	20
9710215-4	100	70.5097	73.3172	2807.5	73.3052	2795.5	0.016	27955	20
9710215-5	100	71.9382	71.9887	50.5	71.9886	50.4	0.000	504	20
9710215-6	100	67.8628	69.3880	1525.2	69.3647	1501.9	0.034	15019	20
9710215-7	100	73.2535	73.2655	12.0	73.2644	10.9	0.002	109	20
9710216-2	100	65.3109	65.3691	58.2	65.3679	57.0	0.002	570	20

## BLANK SUMMARY

ID	blank conc (mg/L)	accept. limit (mg/L)
Method Blank	3	< 20

## BLANK SPIKE SUMMARY

ID	spike added (g)	spike added conc (mg/L)	spiked sample conc (mg/L)	recovery %	accept. limits
Blank Spike	40.0	400	407	102	85-115%

## DUPLICATE SUMMARY

ID	sample conc (mg/L)	duplic conc (mg/L)	RPD %	accept. limits
9710195-1 dup	388	405	4.3	0-15%
9710215-2 dup	12503	12386	0.9	0-15%

ND = Not Detected

NA = Not Applicable

FM-Q8-0566 (Rev 5)

## CONDITION OF SAMPLE UPON RECEIPT

CLIENT: EPNGSHIPPING CONTAINER #: CooleWORKORDER NO. 9710-196INITIALS: ELDATE: 10/22/97

1.	Does this project require special handling according to NEESA, Level 3, or CLP protocols? If yes, complete a. and b. a. Cooler Temperature _____ b. Lot No's. _____ c. Airbill Number _____	Yes	<u>No</u>
2.	Are custody seals on the cooler intact? If so, how many	<u>N/A</u>	No
3.	Are custody seals on sample containers intact?	<u>N/A</u>	No
4.	Is there a Chain of Custody (COC) or other representative documents, letters or shipping memos?	<u>Yes</u>	No
5.	Is the COC complete? Relinquished: Yes / No      Requested Analysis: Yes / No	<u>N/A</u>	<u>Yes</u>
6.	Is the COC in agreement with the samples received? No. of Samples: Yes / <u>No</u> Sample ID's: Yes / <u>No</u> Matrix: Yes / <u>No</u> No. of Containers: Yes / <u>No</u>	<u>Yes</u>	No
7.	Are the samples requiring chemical preservation preserved correctly?	<u>N/A</u>	<u>No</u>
8.	Is there enough sample? If so, are they in the proper containers?	<u>Yes</u>	No
9.	Are all samples within holding times for the requested analyses?	<u>Yes</u>	<u>No</u>
10.	Were the sample(s) shipped on ice?	<u>N/A</u>	<u>Yes</u>
11.	Were all sample containers received intact? (not broken or leaking, etc.)	<u>Yes</u>	No
12.	Are samples requiring no headspace. headspace free?	<u>N/A</u>	<u>Yes</u>
13.	Do the samples require quarantine?	<u>Yes</u>	<u>No</u>
14.	Do samples require Paragon disposal?	<u>Yes</u>	No
15.	Did the client return any unused bottles?	<u>Yes</u>	<u>No</u>

Describe "NO" items (except No's 1, 13, & 14) PC-ICE EXPIRED (7) BTEX Butts not preserved (9) Spc. and out of cold

Was the client contacted? Yes \_\_\_\_\_ No \_\_\_\_\_  
If yes, Date: \_\_\_\_\_ Name of person contacted: \_\_\_\_\_

Describe actions taken or client instructions: \_\_\_\_\_

Group Leader's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Cooler Temperature: 22°C



# PARAGON ANALYTICS, INC.

225 Commerce Drive ♦ Fort Collins, CO 80524 ♦ (800) 443-1511 ♦ (970) 490-1511 ♦ FAX (970) 490-1522

November 10, 1997

Mr. Darrell Campbell  
El Paso Natural Gas Co.  
8645 Railroad Drive  
El Paso, TX 79904

RE: Paragon Workorder: 97-10-214  
Client Project Name: S97-0539  
Client Project Number: Not Submitted

Dear Mr. Campbell:

Three water samples were received from El Paso Natural Gas Co. on October 23, 1997. The samples were scheduled for the following analyses:

Specific Conductance	pages 1-5
Aromatic Volatile Organics	pages 1-11
Inorganics	pages 1-6

The results for these analyses are contained in the enclosed reports.

Thank you for your confidence in Paragon Analytics, Inc. Should you have any questions, please call.

Sincerely,

Paragon Analytics, Inc.  
Victoria Bayly  
Project Manager

VB/jjc  
Enclosure: report



# Paragon Analytics, Inc.

## Aromatic Volatile Organics Case Narrative

---

### **El Paso Natural Gas Co.**

S97-0539

**Order Number - 9710214**

1. This report consists of 3 water samples received by Paragon on 10/23/97.
2. The samples were prepared and analyzed according to SW-846, 3rd Edition procedures. Specifically, the water samples were prepared by heating and purging 5 mls using purge and trap procedures based on Method 5030. The calibration curve was also prepared using the heated purge.
3. The samples were analyzed using a GC with a DB-VRX capillary column and a PID detector according to protocols based on SW-846 Method 8020. All positive results were quantitated using the responses from the initial calibration curve using the internal standard technique. Second column confirmation was performed on all samples with positive results on a DB-624 capillary column.
4. All samples were analyzed within the established holding times.
5. The method blanks associated with this project were below the reporting limits for all analytes.
6. All matrix spike and matrix spike duplicate recoveries and RPDs were within acceptance criteria.
7. All blank spike and blank spike duplicate recoveries and RPDs were within the acceptance criteria.
8. All surrogate recoveries were within acceptance criteria.



9. All internal standard recoveries were within acceptance criteria.
10. All initial and continuing calibration criteria were within acceptance criteria.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

*Roland P. Bruggeman*

Roland P. Bruggeman  
Organics Manager

11-7-97

Date

MB  
Reviewer's Initials

11-9-97

Date

# Paragon Analytics, Incorporated

## Sample Number(s) Cross-Reference Table

---

Paragon OrderNum: 9710214

Client Name: El Paso Natural Gas Co.

Client Project Name: S97-0539

Client Project Number: None Submitted

Client PO Number:

---

Client Sample	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
S97-0539	9710214-1		Water	10/21/97	8:15
S97-0543	9710214-2		Water	10/21/97	12:40
S97-0544	9710214-3		Water	10/21/97	13:48

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0539

**Reagent Blank**

Lab Sample ID: WRB1 10/29/97

Date Collected: N/A  
Date Extracted: 10/29/97  
Date Analyzed: 10/29/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	97	88 - 119

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0543**

*PTP1*

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0539

Lab Sample ID: 9710214-2

Date Collected: 10/20/97

Date Extracted: 10/29/97

Date Analyzed: 10/29/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	7.9	0.50
Toluene	ND	0.50
Ethylbenzene	18	0.50
M,P-Xylene	3.1	1.0
O-Xylene	ND	0.50
Total Xylenes	3.1	1.0

## SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	98	88 - 119

ND = Not Detected at or above client requested reporting limit.

# AROMATIC VOLATILE ORGANICS BLANK SPIKE

Method 8020

Sample ID

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0539

**Blank Spike**

Lab Sample ID: WBS1 10/29/97

Date Extracted: 10/29/97

Date Analyzed: 10/29/97

Sample Matrix: Water

Sample Volume: 5 mL

Analyte	Spike Added (ug/L)	BS Concentration (ug/L)	BS Percent Recovery	QC Limits % Rec
Benzene	40.0	38.9	97	85 - 115
Toluene	40.0	39.7	99	85 - 115
Ethylbenzene	40.0	40.2	101	85 - 115
M,P-Xylene	80.0	82.6	103	85 - 115
O-Xylene	40.0	40.5	101	85 - 115
Total Xylenes	120	123	103	85 - 115

Analyte	Spike Added (ug/L)	BSD Concentration (ug/L)	BSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	38.4	96	1	20
Toluene	40.0	38.8	97	2	20
Ethylbenzene	40.0	39.3	98	2	20
M,P-Xylene	80.0	80.4	101	3	20
O-Xylene	40.0	39.4	99	3	20
Total Xylenes	120	120	100	3	20

## SURROGATE RECOVERY BS/BSD

Analyte	% Recovery BS	% Recovery BSD	% Rec Limits
2,3,4-Trifluorotoluene	96	96	88 - 119

D = Detected

# AROMATIC VOLATILE ORGANICS MATRIX SPIKE

Method 8020

Sample ID

In House

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0539

Date Collected: 10/23/97  
Date Extracted: 10/29/97  
Date Analyzed: 10/29/97

Lab Sample ID: 9710251-01MS

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Spike Added (ug/L)	Sample Concentration (ug/L)	MS Concentration (ug/L)	MS Percent Recovery	QC Limits % Rec
Benzene	40.0	ND	38.5	96	85 - 115
Toluene	40.0	ND	39.1	98	85 - 115
Ethylbenzene	40.0	ND	39.1	98	85 - 115
M,P-Xylene	80.0	ND	79.6	100	85 - 115
O-Xylene	40.0	ND	39.3	98	85 - 115
Total Xylenes	120	ND	119	99	85 - 115

Analyte	Spike Added (ug/L)	MSD Concentration (ug/L)	MSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	37.8	94	2	20
Toluene	40.0	39.0	98	0	20
Ethylbenzene	40.0	39.1	98	0	20
M,P-Xylene	80.0	79.8	100	0	20
O-Xylene	40.0	39.4	99	0	20
Total Xylenes	120	119	99	0	20

## SURROGATE RECOVERY MS/MSD

Analyte	% Recovery MS	% Recovery MSD	% Rec Limits
2,3,4-Trifluorotoluene	94	95	88 - 119

ND = Not Detected

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**Reagent Blank**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0539

Lab Sample ID: WRB1 10/31/97

Date Collected: N/A  
Date Extracted: 10/31/97  
Date Analyzed: 10/31/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	96	88 - 119

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0539**

CNSR#1

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0539

Lab Sample ID: 9710214-1

Date Collected: 10/21/97  
Date Extracted: 10/31/97  
Date Analyzed: 10/31/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	13	0.50
Toluene	6.3	0.50
Ethylbenzene	4.2	0.50
M,P-Xylene	3.8	1.0
O-Xylene	1.9	0.50
Total Xylenes	5.6	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	95	88 - 119

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0544**

ENSE # 3

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0539

Lab Sample ID: 9710214-3

Date Collected: 10/21/97

Date Extracted: 10/31/97

Date Analyzed: 10/31/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	5.0	0.50
Toluene	2.5	0.50
Ethylbenzene	3.0	0.50
M,P-Xylene	3.1	1.0
O-Xylene	0.93	0.50
Total Xylenes	4.1	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	98	88 - 119

ND = Not Detected at or above client requested reporting limit.

# Paragon Analytics, Inc.



## SPECIFIC CONDUCTANCE CASE NARRATIVE

### **El Paso Natural Gas Co.**

S97-0539

**Order Number - 9710214**

1. This report consists of three water samples.
2. The samples were received intact at a temperature of 15<sup>0</sup> C. on October 23, 1997.
3. The samples were prepared for analysis based on SW-846 Method 9050.
4. All standards and solutions are NIST traceable and were used within their recommended shelf life.

All in house quality control procedures were followed, as described below.

5. General quality control procedures.
  - All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analyte. This indicates a valid calibration and stable instrument conditions.
6. A sample from another Order Number was used as the matrix QC sample for this batch.
  - A duplicate was prepared and analyzed with this batch, all acceptance criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below:



Krista Mobley  
Krista Mobley  
Inorganic Technician

11-7-97  
Date

SW  
Reviewer's Initials

11/7/97  
Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# Paragon Analytics, Incorporated

## Sample Number(s) Cross-Reference Table

---

Paragon OrderNum: 9710214

Client Name: El Paso Natural Gas Co.

Client Project Name: S97-0539

Client Project Number: None Submitted

Client PO Number:

---

Client Sample	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
S97-0539	9710214-1		Water	10/21/97	8:15
S97-0543	9710214-2		Water	10/21/97	12:40
S97-0544	9710214-3		Water	10/21/97	13:48

# Specific Conductance in Water

Method SW9050

## Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: None Submitted S97-0539

Work Order Number: 9710214

Reporting Basis: As Received

Printed on: Friday, November 07, 1997

Final Volume: 20 ML

Matrix: Water

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Units	Detection Limit	Flag	Sample Aliquot
S97-0539 <i>ENSE 1</i>	9710214-1	10/21/97	11/5/97	11/5/97		1	13800	umhos/cm			20 ML
S97-0543 <i>PTH 1</i>	9710214-2	10/21/97	11/5/97	11/5/97		1	2250	umhos/cm			20 ML
S97-0544 <i>ENSE 3</i>	9710214-3	10/21/97	11/5/97	11/5/97		1	2230	umhos/cm			20 ML

### Comments:

1 ND = Not Detected at or above the client requested detection limit.

# Specific Conductance in Water

Method SW9050

## Duplicate Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

ClientName: El Paso Natural Gas Co.

Client Project ID: None Submitted S97-0539

Work Order Number: 9710214

Reporting Basis: As Received

Reported on: Friday, November 07, 1997

Sample Aliquot: 20 ML

Final Volume: 20ML

Matrix: Water

Client Sample ID	Lab ID	Date Prepared	Date Analyzed	Dilution Factor	Duplicate Result	Units	Sample Result	Detection Limit	Flag	RPD	RPD Limit
SHARED QC	9710196-1	11/5/97	11/5/97	1	23000	umhos/cm	23000			0	

### Comments:

1 ND = Not Detected at or above the client requested detection limit.



# Paragon Analytics, Inc.

## INORGANICS CASE NARRATIVE

---

### El Paso Natural Gas Co.

S97-0539

Order Number - 9710214

1. This report consists of data for 3 water samples analyzed for chloride and total dissolved solids (TDS).
2. The samples were received cool and intact on 10/23/97.
3. The samples had been correctly preserved for the requested analyses.
4. The samples were analyzed using procedures based on the following methods from the USEPA:

<u>Analyte</u>	<u>Method</u>
Chloride	300.0
Total Dissolved Solids	160.1

5. All standards and reagents were used within their recommended shelf life.
6. The samples were prepared and analyzed within the established hold times.
7. Sample results which are below the reporting limit are reported as "ND" on the enclosed report.

All in house quality control procedures were followed, as described below.

8. General quality control procedures.
  - The method blank results were below the reporting limits for all analyses.
  - The LCS results were within acceptance limits for all analyses.
  - The MS and MSD results were within acceptance limits.
  - The matrix duplicate results were within acceptance limits for total dissolved solids.



The data contained in the following report have been reviewed and approved by the personnel listed below:

JM  
Reporter's Initials

11-4-97  
Date

BS  
Reviewer's Initials

11-5-97  
Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# CHLORIDE

Method 300.0

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0539  
Client Project No:  
Lab Workorder Number: 9710214

Date Collected: 10/21/97  
Date Analyzed: 11/01/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Chloride Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.2
S97-0539 <i>ENSE1</i>	9710214-1	4400	100
S97-0543 <i>FTPI</i>	9710214-2	470	200
S97-0544 <i>ENSE3</i>	9710214-3	580	200

ND = Not Detected

# CHLORIDE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9710283-3

Date Analyzed: 11/01/97

Sample Matrix: Water

Sample ID

IN HOUSE

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Chloride	125	100	223	98	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Chloride	125	223	98	0	0-20 %

# TOTAL DISSOLVED SOLIDS

Method 160.1

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0539

Client Project No:

Lab Workorder Number: 9710214

Date Collected: 10/21/97

Date Prepared: 10/27/97

Sample Matrix: Water

Client ID	Lab Sample ID	Total Dissolved Solids Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	20
S97-0539 <i>ENSR1</i>	9710214-1	7600	20
S97-0543 <i>PTP1</i>	9710214-2	1400	20
S97-0544 <i>ENSR2</i>	9710214-3	1300	20

ND = Not Detected

# TDS Calculations and Quality Control Results

Preparation Date: October 27, 1997

ID	sample vol (mL)	empty beaker tare (g)	A beaker + residue gross (g)	A net (mg)	B beaker + residue gross (g)	B net (mg)	gross A vs gross B RPD %	calculated TDS conc (mg/L)	TDS DL (mg/L)
Method Blank	100	72.7136	72.7144	0.8	72.7139	0.3	0.001	3	20
Blank Spike	100	82.7307	82.7721	41.4	82.7714	40.7	0.001	407	20
9710195-1	100	82.2171	82.2573	40.2	82.2559	38.8	0.002	388	20
9710195-1 dup	100	67.5279	67.5697	41.8	67.5684	40.5	0.002	405	20
9710195-2	100	73.1626	73.1638	1.2	73.1631	0.5	0.001	5	20
9710195-3	100	87.9245	89.5378	1613.3	89.5363	1611.8	0.002	16118	20
9710195-4	100	71.7991	81.2196	9420.5	81.2083	9409.2	0.014	94092	20
9710196-1	100	67.3554	68.7107	1355.3	68.6945	1339.1	0.024	13391	20
9710196-2	100	82.2309	85.2451	3014.2	85.2440	3013.1	0.001	30131	20
9710214-1	100	82.4509	83.2251	774.2	83.2125	761.6	0.015	7616	20
9710214-2	100	80.2440	80.3872	143.2	80.3795	135.5	0.010	1355	20
9710214-3	100	87.4784	87.6140	135.6	87.6049	126.5	0.010	1265	20
9710215-1	100	71.8507	71.8514	0.7	71.8507	0.0	0.001	0	20
9710215-2	100	85.8427	87.0942	1251.5	87.0930	1250.3	0.001	12503	20
9710215-2 dup	100	75.0607	76.3023	1241.6	76.2993	1238.6	0.004	12386	20
9710215-3	100	66.0091	67.1444	1135.3	67.1432	1134.1	0.002	11341	20
9710215-4	100	70.5097	73.3172	2807.5	73.3052	2795.5	0.016	27955	20
9710215-5	100	71.9382	71.9887	50.5	71.9886	50.4	0.000	504	20
9710215-6	100	67.8628	69.3880	1525.2	69.3647	1501.9	0.034	15019	20
9710215-7	100	73.2535	73.2655	12.0	73.2644	10.9	0.002	109	20
9710216-2	100	65.3109	65.3691	58.2	65.3679	57.0	0.002	570	20

## BLANK SUMMARY

ID	blank conc (mg/L)	accept. limit (mg/L)
Method Blank	3	< 20

## BLANK SPIKE SUMMARY

ID	spike added (g)	spike added conc (mg/L)	spiked sample conc (mg/L)	recovery %	accept. limits
Blank Spike	40.0	400	407	102	85-115%

## DUPLICATE SUMMARY

ID	sample conc (mg/L)	duplic conc (mg/L)	RPD %	accept. limits
9710195-1 dup	388	405	4.3	0-15%
9710215-2 dup	12503	12386	0.9	0-15%

ND = Not Detected

NA = Not Applicable

PROJECT NUMBER		PROJECT NAME	
SAMPLES (Signature)		DATE:	
LAB ID		DATE	TIME
		MATRIX	SAMPLE NUMBER
		TOTAL NUMBER OF CONTAINERS	COMPOSITE OR GRAB
		REQUESTED ANALYSIS	
		CONTRACT LABORATORY P. O. NUMBER	

LAB ID	DATE	TIME	MATRIX	SAMPLE NUMBER	TOTAL NUMBER OF CONTAINERS	COMPOSITE OR GRAB	REQUESTED ANALYSIS
C1	10/16/97	0815	H <sub>2</sub> O	SGT-0539	3	X	BTEX
C2	10/16/97	1840	H <sub>2</sub> O	SGT-0543	3	X	C1
C3	10/16/97	1348	H <sub>2</sub> O	SGT-0544	3	X	SCS
							REMARKS
							2x46ml H <sub>2</sub> L
							1x1L poly C

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME
[Signature]	10/16/97 0500	Fdx		Fdx		[Signature]	10/21/97 145

REQUESTED TURNAROUND TIME:	SAMPLE RECEIPT REMARKS	RESULTS & INVOICES TO:
<input type="checkbox"/> ROUTINE <input type="checkbox"/> RUSH		TRANSMISSION OPERATIONS LABORATORY EL PASO NATURAL GAS COMPANY 8645 RAILROAD DRIVE EL PASO, TEXAS 79904 915-759-2229 FAX 915-759-2335

CARRIER CO.	BILL NO.:

## CONDITION OF SAMPLE UPON RECEIPT

CLIENT: EPACSHIPPING CONTAINER #: C 61101WORKORDER NO. 9710214INITIALS: JADATE: 10/23/92

1. Does this project require special handling according to NEESA, Level 3, or CLP protocols? If yes, complete a. and b. a. Cooler Temperature _____ b. Lot No's. _____ c. Airbill Number _____	Yes	<u>No</u>
2. Are custody seals on the cooler intact? If so, how many	<u>N/A</u>	<u>Yes</u> No
3. Are custody seals on sample containers intact?	<u>N/A</u>	Yes No
4. Is there a Chain of Custody (COC) or other representative documents, letters or shipping memos?	<u>Yes</u>	Yes No
5. Is the COC complete? Relinquished: Yes <u>✓</u> No Requested Analysis: Yes <u>✓</u> No	N/A	<u>Yes</u> No
6. Is the COC in agreement with the samples received? No. of Samples: Yes <u>✓</u> No Sample ID's: Yes <u>✓</u> No Matrix: Yes <u>✓</u> No No. of Containers: Yes No <u>✓</u>	Yes	<u>No</u>
7. Are the samples requiring chemical preservation preserved correctly?	N/A	<u>Yes</u> No
8. Is there enough sample? If so, are they in the proper containers?	<u>Yes</u>	Yes No
9. Are all samples within holding times for the requested analyses?	Yes	<u>No</u>
10. Were the sample(s) shipped on ice?	N/A	<u>Yes</u> No
11. Were all sample containers received intact? (not broken or leaking, etc.)	<u>Yes</u>	Yes No
12. Are samples requiring no headspace, headspace free?	N/A	<u>Yes</u> No
13. Do the samples require quarantine?	Yes	<u>No</u>
14. Do samples require Paragon disposal?	<u>Yes</u>	Yes No
15. Did the client return any unused bottles?	Yes	<u>No</u>

Describe "NO" items (except No's 1, 13, & 14): 9- Spec cool out of hold upon Receipt. (C) It is Expired. (C) # of containers Added to COC upon Receipt.

Was the client contacted? Yes \_\_\_\_\_ No \_\_\_\_\_  
If yes, Date: \_\_\_\_\_ Name of person contacted: \_\_\_\_\_

Describe actions taken or client instructions: \_\_\_\_\_

Group Leader's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Cooler Temperature: 15°C



# PARAGON ANALYTICS, INC.

225 Commerce Drive ♦ Fort Collins, CO 80524 ♦ (800) 443-1511 ♦ (970) 490-1511 ♦ FAX (970) 490-1522

December 12, 1997

Mr. Darrell Campbell  
El Paso Natural Gas Co.  
8645 Railroad Drive  
El Paso, TX 79904

RE: Paragon Workorder: 97-10-215  
Client Project Name: S97-0540  
Client Project Number: Not Submitted

Dear Mr. Campbell:

Seven water samples were received from El Paso Natural Gas Co. on October 23, 1997. The samples were scheduled for the following analyses:

pH	pages 1-5
Specific Conductance	pages 1-5
Aromatic Volatile Organics	pages 1-8
GC/MS Semivolatiles	pages 1-11
Total Recoverable Metals	pages 1-14
Inorganics	pages 1-16

The results for these analyses are contained in the enclosed reports.

Thank you for your confidence in Paragon Analytics, Inc. Should you have any questions, please call.

Sincerely,

Paragon Analytics, Inc.  
Victoria Bayly  
Project Manager

VB/jjc  
Enclosure: report



# Paragon Analytics, Inc.

## Aromatic Volatile Organics Case Narrative

---

### **El Paso Natural Gas Co.**

S97-0540

**Order Number - 9710215**

1. This report consists of 3 water samples received by Paragon on 10/23/97.
2. These samples were prepared and analyzed according to SW-846, 3rd Edition procedures. Specifically, the water samples were prepared by heating and purging 5 mls using purge and trap procedures based on Method 5030. The calibration curve was also prepared using the heated purge.
3. The samples were analyzed using a GC with a DB-VRX capillary column and a PID detector according to protocols based on SW-846 Method 8021. All positive results were quantitated using the responses from the initial calibration curve using the internal standard technique. Second column confirmation was performed on all samples with positive results on a DB-624 capillary column.
4. Due to a laboratory error, all samples were analyzed outside the established holding times.
5. The method blank associated with this project was below the reporting limits for all analytes.
6. Matrix spikes and matrix spike duplicates were not requested by the client. A blank spike and blank spike duplicate were performed instead. See Item 7 for details on recoveries.
7. All blank spike and blank spike duplicate recoveries and RPDs were within the acceptance criteria.

8. All surrogate recoveries were within acceptable limits.
9. All internal standard recoveries were within acceptance criteria.
10. All initial and continuing calibration criteria were within acceptance criteria.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

*for* Richard P. Buzyn  
Mark R. Hayes  
Fuels Chemist

12-10-97  
Date

G. W. Welch  
Reviewer's Initials

12-10-97  
Date

# Paragon Analytics, Incorporated

## Sample Number(s) Cross-Reference Table

---

Paragon OrderNum: 9710215

Client Name: El Paso Natural Gas Co.

Client Project Name: S97-0540

Client Project Number: None Submitted

Client PO Number:

---

Client Sample	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
S97-0540	9710215-1		Water	10/21/97	8:20
S97-0541	9710215-2		Water	10/21/97	10:35
S97-0542	9710215-3		Water	10/21/97	10:35
S97-0545	9710215-4		Water	10/21/97	16:30
S97-0546	9710215-5		Water	10/21/97	16:45
S97-0547	9710215-6		Water	10/21/97	18:17
S97-0548	9710215-7		Water	10/21/97	17:45

## AROMATIC VOLATILE ORGANICS

Method 8021

Sample ID

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0540

**Reagent Blank**

Lab Sample ID: WRB1 12/01/97

Date Collected: N/A  
Date Extracted: 12/01/97  
Date Analyzed: 12/01/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	98	88 - 119

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8021

Sample ID

**S97-0540**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0540

Lab Sample ID: 9710215-1

Date Collected: 10/21/97  
Date Extracted: 12/01/97  
Date Analyzed: 12/01/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	0.86	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	98	88 - 119

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8021

Sample ID

**S97-0546**

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0540

Lab Sample ID: 9710215-5

Date Collected: 10/21/97

Date Extracted: 12/01/97

Date Analyzed: 12/01/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	8.4	0.50
Toluene	4.3	0.50
Ethylbenzene	2.6	0.50
M,P-Xylene	2.4	1.0
O-Xylene	3.4	0.50
Total Xylenes	5.8	1.0

## SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	99	88 - 119

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8021

Sample ID

**S97-0548**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0540

Lab Sample ID: 9710215-7

Date Collected: 10/21/97  
Date Extracted: 12/01/97  
Date Analyzed: 12/01/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	99	88 - 119

ND = Not Detected at or above client requested reporting limit.

# AROMATIC VOLATILE ORGANICS BLANK SPIKE

Method 8021

Sample ID

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0540

**Blank Spike**

Lab Sample ID: WBS1 12/01/97

Date Extracted: 12/01/97

Date Analyzed: 12/01/97

Sample Matrix: Water

Sample Volume: 5 mL

Analyte	Spike Added (ug/L)	BS Concentration (ug/L)	BS Percent Recovery	QC Limits % Rec
Benzene	40.0	41.1	103	85 - 115
Toluene	40.0	42.2	105	85 - 115
Ethylbenzene	40.0	39.7	99	85 - 115
M,P-Xylene	80.0	79.3	99	85 - 115
O-Xylene	40.0	38.2	95	85 - 115
Total Xylenes	120	117	98	85 - 115

Analyte	Spike Added (ug/L)	BSD Concentration (ug/L)	BSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	41.6	104	1	20
Toluene	40.0	43.4	108	3	20
Ethylbenzene	40.0	40.3	101	1	20
M,P-Xylene	80.0	80.7	101	2	20
O-Xylene	40.0	39.1	98	3	20
Total Xylenes	120	120	100	2	20

## SURROGATE RECOVERY BS/BSD

Analyte	% Recovery BS	% Recovery BSD	% Rec Limits
2,3,4-Trifluorotoluene	98	99	88 - 119

ID = Detected



# Paragon Analytics, Inc.

## GC/MS Semivolatiles Case Narrative

### **Triple Point Labs, Inc.**

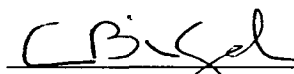
9711165

**Order Number - 9711255**


1. This report consists of 3 leachate samples received by Paragon on November 22, 1997.
2. These samples were prepared and analyzed according to SW-846, 3rd Edition procedures. Specifically, the leachates were extracted using continuous liquid-liquid extractors, based on Method 3520.
3. The samples were analyzed using GC/MS with a DB-5.625 capillary column according to protocols based on SW-846 Method 8270B for TCLP compounds only. All positive results were quantitated against the initial calibration standards using the internal standard technique. The identification of positive results was achieved by a comparison of the retention time and mass spectrum of the sample versus the daily calibration standard.
4. All samples were extracted and analyzed in the established holding times.
5. The method blank associated with this project was below the reporting limits for all analytes.
6. A matrix spike was performed but not analyzed as the associated sample had to be analyzed at a dilution at which the spike compounds would be diluted below the reporting limits. A blank spike was performed instead.
7. The blank spike duplicate was lost during the extraction process. All blank spike recoveries were within the acceptance criteria.

- c
8. The surrogates in sample 3 were diluted out. The surrogates in samples 1 and 2 were diluted below the reporting limits. All quality control sample surrogate recoveries were within acceptance criteria.
  9. Perylene-D12 was outside the acceptance criteria in samples 1 and 3. There are no TCLP compounds which quantitate against this internal standard. The data was not affected.
  10. Due to the viscous nature of the extracts samples 1 and 3 were brought to an elevated final volume. Due to high levels of non-target analytes, samples 2 and 3 were analyzed at a higher dilution. The detection limits have been adjusted accordingly.
  11. All initial calibration criteria were met. Method 8270B states any compound exceeding 15% RSD is to be quantitated with a higher order curve. Several compounds from the curve that was analyzed on November 19, 1997, were within the acceptance limit but exceeded the 15% RSD criteria and should be analyzed with a higher curve such as quadratic. We quantitated these compounds using the average response factor due to a software programming problem associated with Hewlett-Packard MSDs. The manufacturer is now aware of the problem and is working on a solution.
  12. All continuing calibration criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

  
\_\_\_\_\_  
Ann Biegelsen  
Organic Chemist

12-11-97  
Date

  
\_\_\_\_\_  
Reviewer's Initials

12-11-97  
Date

# Paragon Analytics, Incorporated

## Sample Number(s) Cross-Reference Table

---

Paragon OrderNum: 9711255

Client Name: Triple Point Labs, Inc.

Client Project Name: 9711165

Client Project Number:

Client PO Number: 1405

---

Client Sample	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
11165-01	9711255-1		Leachate	11/18/97	
11165-02	9711255-2		Leachate	11/18/97	
11165-03	9711255-3		Leachate	11/18/97	

PARAGOL

# CHAIN OF CUSTODY RECORD

Triple Point 97.255

LABORATORIES

3737-B East Broadway Road ∞ Phoenix AZ 85040

602-437-1080 • fax 602-437-8706

CLIENT	ADDRESS	
TRIPLE POINT LABS	3737-B Broadway Road	
CONTACT PERSON	PHOENIX, AZ 85040	
Claudia Blanton	PROJECT	JOB / P.O. NO
	9711165	
TELEPHONE	QUOTE / CONTRACT NO	
(602) 437-1080		
FAX		
(602) 437-8706		

[illegible]

## CONDITION OF SAMPLE UPON RECEIPT

CLIENT: Triple Pt.SHIPPING CONTAINER #: CoilaWORKORDER NO. 97-11-255INITIALS: SLDATE: 11/22/98

1. Does this project require special handling according to NEESA, Level 3, or CLP protocols? If yes, complete a. and b. a. Cooler Temperature _____ b. Lot No's. _____ c. Airbill Number _____	Yes	<u>No</u>
2. Are custody seals on the cooler intact? If so, how many	<u>N/A</u>	Yes <u>No</u>
3. Are custody seals on sample containers intact?	<u>N/A</u>	Yes <u>No</u>
4. Is there a Chain of Custody (COC) or other representative documents, letters or shipping memos?	<u>Yes</u>	Yes <u>No</u>
5. Is the COC complete? Relinquished: Yes <u>✓</u> No _____ Requested Analysis: Yes <u>✓</u> No _____	<u>N/A</u>	<u>Yes</u> <u>No</u>
6. Is the COC in agreement with the samples received? No. of Samples: Yes <u>✓</u> No _____ Sample ID's: Yes <u>✓</u> No _____ Matrix: Yes <u>✓</u> No _____ No. of Containers: Yes _____ No <u>✓</u>	Yes	<u>No</u>
7. Are the samples requiring chemical preservation preserved correctly?	<u>N/A</u>	Yes <u>No</u>
8. Is there enough sample? If so, are they in the proper containers?	<u>Yes</u>	<u>Yes</u> <u>No</u>
9. Are all samples within holding times for the requested analyses?	<u>Yes</u>	<u>Yes</u> <u>No</u>
10. Were the sample(s) shipped on ice?	<u>N/A</u>	<u>Yes</u> <u>No</u>
11. Were all sample containers received intact? (not broken or leaking, etc.)	<u>Yes</u>	<u>Yes</u> <u>No</u>
12. Are samples requiring no headspace, headspace free?	<u>N/A</u>	Yes <u>No</u>
13. Do the samples require quarantine?	Yes	<u>No</u>
14. Do samples require Paragon disposal?	<u>Yes</u>	<u>No</u>
15. Did the client return any unused bottles?	Yes	<u>No</u>

Describe "NO" items (except No's 1, 13, & 14): (6) 1 Bottle missing for 11165-cc.  
Client will ship more sample.

Was the client contacted? Yes \_\_\_\_\_ No \_\_\_\_\_  
 If yes, Date: \_\_\_\_\_ Name of person contacted: \_\_\_\_\_

Describe actions taken or client instructions: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Group Leader's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Cooler Temperature: 5°

# Semi-volatile Organics by GC/MS

Method SW8270

Method Blank

Lab Name: Paragon Analytics, Inc.

Work Order Number: 9711255

Client Name: Triple Point Labs, Inc.

ClientProject ID: 9711165

Reported on: Thursday, December 11, 1997

Field ID: LABQC

Lab ID: L971125-MB

Sample Matrix: liquid

% Moisture: N/A

Cleanup Method: NONE

Report Basis: NA

Date Collected: 25-Nov-97

Date Extracted: 25-Nov-97

Date Analyzed: 03-Dec-97

Prep Batch: sv11056-2

Sample Aliquot: 100

Final Volume: 1

Dilution: 1

CASNO	Target Analyte	Result	Units	Reporting Limit	Result Qualifier	Result Footnote
110-86-1	PYRIDINE	0.1	mg/l	0.1	U	
106-46-7	1,4-DICHLOROBENZENE	0.1	mg/l	0.1	U	
95-48-7	2-METHYLPHENOL	0.1	mg/l	0.1	U	
108-39-4	3+4-METHYLPHENOL	0.1	mg/l	0.1	U	
67-72-1	HEXACHLOROETHANE	0.1	mg/l	0.1	U	
98-95-3	NITROBENZENE	0.1	mg/l	0.1	U	
87-68-3	HEXACHLOROBUTADIENE	0.1	mg/l	0.1	U	
88-06-2	2,4,6-TRICHLOROPHENOL	0.1	mg/l	0.1	U	
95-95-4	2,4,5-TRICHLOROPHENOL	0.5	mg/l	0.5	U	
121-14-2	2,4-DINITROTOLUENE	0.1	mg/l	0.1	U	
118-74-1	HEXACHLOROBENZENE	0.1	mg/l	0.1	U	
87-86-5	PENTACHLOROPHENOL	0.5	mg/l	0.5	U	

## Surrogate Recovery

CASNO	Surrogate Analyte	Result	Units	Spike Amount	Percent Recovery	Control Limits
118-79-6	2,4,6-TRIBROMOPHENOL	0.522	mg/l	0.75	70	23 - 100
321-60-8	2-FLUOROBIPHENYL	0.314	mg/l	0.5	63	21 - 106
367-12-4	2-FLUOROPHENOL	0.543	mg/l	0.75	72	21 - 100
4165-60-0	NITROBENZENE-D5	0.301	mg/l	0.5	60	34 - 111
13127-88-3	PHENOL-D5	0.576	mg/l	0.75	77	15 - 104
1718-51-0	TERPHENYL-D14	0.417	mg/l	0.5	83	33 - 111

U = Less than the Reporting Limit

# Semi-volatile Organics by GC/MS

## Method SW8270--TCLP Leachate

Lab Name: Paragon Analytics, Inc.

Work Order Number: 9711255

Client Name: Triple Point Labs, Inc.

ClientProject ID: 9711165

Reported on: Thursday, December 11, 1997

Field ID: 11165-01

Lab ID: 9711255-1

Sample Matrix: liquid

% Moisture: N/A

Cleanup Method: NONE

Report Basis: AS RECEIVED

Date Collected: 18-Nov-97

Date Extracted: 25-Nov-97

Date Analyzed: 05-Dec-97

Prep Batch: sv11056-2

Sample Aliquot: 100

Final Volume: 10

Dilution: 1

LEACH DATE: 11/19/97

CASNO	Target Analyte	Result	Units	Reporting Limit	Result Qualifier	Result Footnote
110-86-1	PYRIDINE	1	mg/l	1	U	
106-46-7	1,4-DICHLOROBENZENE	1	mg/l	1	U	
95-48-7	2-METHYLPHENOL	1	mg/l	1	U	
108-39-4	3+4-METHYLPHENOL	1	mg/l	1	U	
67-72-1	HEXACHLOROETHANE	1	mg/l	1	U	
98-95-3	NITROBENZENE	1	mg/l	1	U	
87-68-3	HEXACHLOROBUTADIENE	1	mg/l	1	U	
88-06-2	2,4,6-TRICHLOROPHENOL	1	mg/l	1	U	
95-95-4	2,4,5-TRICHLOROPHENOL	5	mg/l	5	U	
121-14-2	2,4-DINITROTOLUENE	1	mg/l	1	U	
118-74-1	HEXACHLOROBENZENE	1	mg/l	1	U	
87-86-5	PENTACHLOROPHENOL	5	mg/l	5	U	

### Surrogate Recovery

CASNO	Surrogate Analyte	Result	Units	Spike Amount	Percent Recovery	Control Limits
118-79-6	2,4,6-TRIBROMOPHENOL	0.624	mg/l	0.75	83	23 - 100
321-60-8	2-FLUOROBIPHENYL	0.387	mg/l	0.5	78	21 - 106
367-12-4	2-FLUOROPHENOL	0.405	mg/l	0.75	54	21 - 100
4165-60-0	NITROBENZENE-D5	0.452	mg/l	0.5	91	34 - 111
13127-88-3	PHENOL-D5	0.626	mg/l	0.75	84	15 - 104
1718-51-0	TERPHENYL-D14	0.43	mg/l	0.5	86	33 - 111

U = Less than the Reporting Limit

# Semi-volatile Organics by GC/MS

## Method SW8270--TCLP Leachate

Lab Name: Paragon Analytics, Inc.

Work Order Number: 9711255

Client Name: Triple Point Labs, Inc.

ClientProject ID: 9711165

Reported on: Thursday, December 11, 1997

Field ID: 11165-02

Lab ID: 9711255-2

Sample Matrix: liquid

% Moisture: N/A

Cleanup Method: NONE

Report Basis: AS RECEIVED

Date Collected: 18-Nov-97

Date Extracted: 25-Nov-97

Date Analyzed: 03-Dec-97

Prep Batch: sv11056-2

Sample Aliquot: 100

Final Volume: 1

Dilution: 10

LEACH DATE: 11/19/97

CASNO	Target Analyte	Result	Units	Reporting Limit	Result Qualifier	Result Footnote
110-86-1	PYRIDINE	1	mg/l	1	U	
106-46-7	1,4-DICHLOROBENZENE	1	mg/l	1	U	
95-48-7	2-METHYLPHENOL	1	mg/l	1	U	
108-39-4	3+4-METHYLPHENOL	1	mg/l	1	U	
67-72-1	HEXACHLOROETHANE	1	mg/l	1	U	
98-95-3	NITROBENZENE	1	mg/l	1	U	
87-68-3	HEXACHLOROBUTADIENE	1	mg/l	1	U	
88-06-2	2,4,6-TRICHLOROPHENOL	1	mg/l	1	U	
95-95-4	2,4,5-TRICHLOROPHENOL	5	mg/l	5	U	
121-14-2	2,4-DINITROTOLUENE	1	mg/l	1	U	
118-74-1	HEXACHLOROBENZENE	1	mg/l	1	U	
87-86-5	PENTACHLOROPHENOL	5	mg/l	5	U	

## Surrogate Recovery

CASNO	Surrogate Analyte	Result	Units	Spike Amount	Percent Recovery	Control Limits
118-79-6	2,4,6-TRIBROMOPHENOL	0	mg/l	0.75	0	23 - 100
321-60-8	2-FLUOROBIPHENYL	0.277	mg/l	0.5	55	21 - 106
367-12-4	2-FLUOROPHENOL	0.394	mg/l	0.75	52	21 - 100
4165-60-0	NITROBENZENE-D5	0.263	mg/l	0.5	53	34 - 111
13127-88-3	PHENOL-D5	0.513	mg/l	0.75	68	15 - 104
1718-51-0	TERPHENYL-D14	0.303	mg/l	0.5	61	33 - 111

U = Less than the Reporting Limit

# Semi-volatile Organics by GC/MS

## Method SW8270--TCLP Leachate

Lab Name: Paragon Analytics, Inc.

Work Order Number: 9711255

Client Name: Triple Point Labs, Inc.

ClientProject ID: 9711165

Reported on: Thursday, December 11, 1997

Field ID: 11165-03

Lab ID: 9711255-3

Sample Matrix: liquid

% Moisture: N/A

Cleanup Method: NONE

Report Basis: AS RECEIVED

Date Collected: 18-Nov-97

Date Extracted: 25-Nov-97

Date Analyzed: 05-Dec-97

Prep Batch: sv11056-2

Sample Aliquot: 100

Final Volume: 10

Dilution: 2

LEACH DATE: 11/19/97

CASNO	Target Analyte	Result	Units	Reporting Limit	Result Qualifier	Result Footnote
110-86-1	PYRIDINE	2	mg/l	2	U	
106-46-7	1,4-DICHLOROBENZENE	2	mg/l	2	U	
95-48-7	2-METHYLPHENOL	2	mg/l	2	U	
108-39-4	3+4-METHYLPHENOL	2	mg/l	2	U	
67-72-1	HEXACHLOROETHANE	2	mg/l	2	U	
98-95-3	NITROBENZENE	2	mg/l	2	U	
87-68-3	HEXACHLOROBUTADIENE	2	mg/l	2	U	
88-06-2	2,4,6-TRICHLOROPHENOL	2	mg/l	2	U	
95-95-4	2,4,5-TRICHLOROPHENOL	10	mg/l	10	U	
121-14-2	2,4-DINITROTOLUENE	2	mg/l	2	U	
118-74-1	HEXACHLOROBENZENE	2	mg/l	2	U	
87-86-5	PENTACHLOROPHENOL	10	mg/l	10	U	

### Surrogate Recovery

CASNO	Surrogate Analyte	Result	Units	Spike Amount	Percent Recovery	Control Limits
118-79-6	2,4,6-TRIBROMOPHENOL	0	mg/l	0.75	0	23 - 100
321-60-8	2-FLUOROBIPHENYL	0	mg/l	0.5	0	21 - 106
367-12-4	2-FLUOROPHENOL	0	mg/l	0.75	0	21 - 100
4165-60-0	NITROBENZENE-D5	0	mg/l	0.5	0	34 - 111
13127-88-3	PHENOL-D5	0	mg/l	0.75	0	15 - 104
1718-51-0	TERPHENYL-D14	0	mg/l	0.5	0	33 - 111

U = Less than the Reporting Limit

# Semi-volatile Organics by GC/MS

## Blank Spike

### Method SW8270

Lab Name: Paragon Analytics, Inc.

Work Order Number: 9711255

Client Name: Triple Point Labs, Inc.

ClientProject ID: 9711165

Reported on: Thursday, December 11, 1997

BS ID: L971125-LCS

Sample Matrix: liquid

Date Collected: 25-Nov-97

Sample Aliquot: 100

% Moisture: N/A

Date Extracted: 25-Nov-97

Final Volume: 1

Cleanup Method: NONE

Date Analyzed: 03-Dec-97

Dilution: 1

Report Basis: N/A

Prep Batch: sv11056-2

CASNO	Target Analyte	Spike Added	BS Result	Units	Reporting Limit	Result Qualifier	BS % Rec.	Control Limits
110-86-1	PYRIDINE	0.5	0.203	mg/l	0.1		41	1 - 83
106-46-7	1,4-DICHLOROBENZE	0.5	0.333	mg/l	0.1		67	12 - 88
95-48-7	2-METHYLPHENOL	1	0.828	mg/l	0.1		83	21 - 97
108-39-4	3+4-Methylphenol	2	1.65	mg/l	0.1		82	29 - 92
67-72-1	HEXACHLOROETHAN	0.5	0.36	mg/l	0.1		72	18 - 83
98-95-3	NITROBENZENE	0.5	0.309	mg/l	0.1		62	14 - 105
87-68-3	HEXACHLOROBUTADI	0.5	0.342	mg/l	0.1		68	16 - 82
88-06-2	2,4,6-TRICHLOROPHE	1	0.67	mg/l	0.1		67	24 - 84
95-95-4	2,4,5-TRICHLOROPHE	1	0.717	mg/l	0.5		72	19 - 96
121-14-2	2,4-DINITROTOLUENE	0.5	0.362	mg/l	0.1		72	1 - 104
118-74-1	HEXACHLOROBENZE	0.5	0.351	mg/l	0.1		70	22 - 101
87-86-5	PENTACHLOROPHEN	1	0.651	mg/l	0.5		65	22 - 111

## Surrogate Recovery

CASNO	Target Analyte	Spike Added	BS % Rec.	Control Limits
118-79-6	2,4,6-TRIBROMOPHENOL	0.75	78	23 - 100
321-60-8	2-FLUOROBIPHENYL	0.5	69	21 - 106
367-12-4	2-FLUOROPHENOL	0.75	80	21 - 100
4165-60-0	NITROBENZENE-D5	0.5	68	34 - 111
13127-88-3	PHENOL-D5	0.75	85	15 - 104
1718-51-0	TERPHENYL-D14	0.5	84	33 - 111

3520  
CLE

XOS

SURROGATE CODE A: ~~1283-66-011~~

MATRIX SPIKE A: 1283-68-01

DCM Lot #: 37233

RECEIVED BY/DATE:

ATIFRM609FC



PARAGON  
ANALYTICS, INC.

AN EMPLOYEE OWNED SMALL BUSINESS, APPROX

148034

# Paragon Analytics, Inc.



## PH ANALYSIS CASE NARRATIVE

---

### **El Paso Natural Gas Co.**

S97-0540

**Order Number - 9710215**

1. This report consists of seven water samples.
2. The samples were received intact at a temperature of 15<sup>0</sup> C. on October 23, 1997.
3. The samples were prepared for analysis based on SW-846, 3<sup>rd</sup> Edition procedures. Specifically, the water samples were analyzed following Method 9040.
4. All standards and solutions were used within their recommended shelf life.

All in house quality control procedures were followed, as described below.

5. General quality control procedures.
  - All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analyte. This indicates a valid calibration and stable instrument conditions.
6. A sample from another Order Number was used as the matrix QC sample for this batch.
  - A duplicate was prepared and analyzed with this batch, all acceptance criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below:



Krista Mobley  
Krista Mobley  
Inorganic Technician

11-7-97  
Date

SW  
Reviewer's Initials

11/7/97  
Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# Paragon Analytics, Incorporated

## Sample Number(s) Cross-Reference Table

---

Paragon OrderNum: 9710215

Client Name: El Paso Natural Gas Co.

Client Project Name: S97-0540

Client Project Number: None Submitted

Client PO Number:

---

Client Sample	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
S97-0540	9710215-1		Water	10/21/97	8:20
S97-0541	9710215-2		Water	10/21/97	10:35
S97-0542	9710215-3		Water	10/21/97	10:35
S97-0545	9710215-4		Water	10/21/97	16:30
S97-0546	9710215-5		Water	10/21/97	16:45
S97-0547	9710215-6		Water	10/21/97	18:17
S97-0548	9710215-7		Water	10/21/97	17:45

# pH in Water

Method SW9040

## Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: None Submitted S97-0540

Work Order Number: 9710215

Reporting Basis: As Received

Printed on: Thursday, November 06, 1997

Final Volume: 50 ML

Matrix: Water

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Units	Detection Limit	Flag	Sample Aliquot
S97-0540	9710215-1	10/21/97	11/4/97	11/4/97		1	6	PH			50 ML
S97-0541	9710215-2	10/21/97	11/4/97	11/4/97		1	8.2	PH			50 ML
S97-0542	9710215-3	10/21/97	11/4/97	11/4/97		1	8.1	PH			50 ML
S97-0545	9710215-4	10/21/97	11/4/97	11/4/97		1	7.2	PH			50 ML
S97-0546	9710215-5	10/21/97	11/4/97	11/4/97		1	8.2	PH			50 ML
S97-0547	9710215-6	10/21/97	11/4/97	11/4/97		1	7.2	PH			50 ML
S97-0548	9710215-7	10/21/97	11/4/97	11/4/97		1	6.2	PH			50 ML

### Comments:

1. ND = Not Detected at or above the client requested detection limit.

# pH in Water

Method SW9040

## Duplicate Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

ClientName: El Paso Natural Gas Co.

Client Project ID: None Submitted S97-0540

Work Order Number: 9710215

Reporting Basis: As Received

Sample Aliquot: 50 ML

Final Volume: 50ML

Matrix: Water

Reported on: Thursday, November 06, 1997

Client Sample ID	Lab ID	Date Prepared	Date Analyzed	Dilution Factor	Duplicate Result	Units	Sample Result	Detection Limit	Flag	RPD	RPD Limit
SHARED QC	9710195-1	11/4/97	11/4/97	1	8.2	PH	8.3			1	

### Comments:

1. ND = Not Detected at or above the client requested detection limit.

# Paragon Analytics, Inc.



## SPECIFIC CONDUCTANCE CASE NARRATIVE

### **El Paso Natural Gas Co.**

S97-0540

**Order Number - 9710215**

1. This report consists of seven water samples.
2. The samples were received intact at a temperature of 15<sup>0</sup> C. on October 23, 1997.
3. The samples were prepared for analysis based on SW-846 Method 9050.
4. All standards and solutions are NIST traceable and were used within their recommended shelf life.

All in house quality control procedures were followed, as described below.

5. General quality control procedures.
  - All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analyte. This indicates a valid calibration and stable instrument conditions.
6. A sample from another Order Number was used as the matrix QC sample for this batch.
  - A duplicate was prepared and analyzed with this batch, all acceptance criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below:



Krista Mobley  
Krista Mobley  
Inorganic Technician

11-7-97  
Date

SW  
Reviewer's Initials

11/7/97  
Date

### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# Paragon Analytics, Incorporated

## Sample Number(s) Cross-Reference Table

---

Paragon OrderNum: 9710215

Client Name: El Paso Natural Gas Co.

Client Project Name: S97-0540

Client Project Number: None Submitted

Client PO Number:

---

Client Sample	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
S97-0540	9710215-1		Water	10/21/97	8:20
S97-0541	9710215-2		Water	10/21/97	10:35
S97-0542	9710215-3		Water	10/21/97	10:35
S97-0545	9710215-4		Water	10/21/97	16:30
S97-0546	9710215-5		Water	10/21/97	16:45
S97-0547	9710215-6		Water	10/21/97	18:17
S97-0548	9710215-7		Water	10/21/97	17:45

# Specific Conductance in Water

Method SW9050

## Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: None Submitted S97-0540

Work Order Number: 9710215

Reporting Basis: As Received

Printed on: Friday, November 07, 1997

Final Volume: 20 ML

Matrix: Water

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Units	Detection Limit	Flag	Sample Aliquot
S97-0540	9710215-1	10/21/97	11/4/97	11/4/97		1	2.06	umhos/cm			20 ML
S97-0541	9710215-2	10/21/97	11/4/97	11/4/97		1	20400	umhos/cm			20 ML
S97-0542	9710215-3	10/21/97	11/4/97	11/4/97		1	19000	umhos/cm			20 ML
S97-0545	9710215-4	10/21/97	11/4/97	11/4/97		10	54400	umhos/cm			20 ML
S97-0546	9710215-5	10/21/97	11/4/97	11/4/97		1	684	umhos/cm			20 ML
S97-0547	9710215-6	10/21/97	11/4/97	11/4/97		1	23600	umhos/cm			20 ML
S97-0548	9710215-7	10/21/97	11/4/97	11/4/97		1	8.02	umhos/cm			20 ML

### Comments:

1. ND = Not Detected at or above the client requested detection limit.

# Specific Conductance in Water

Method SW9050

## Duplicate Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

ClientName: El Paso Natural Gas Co.

Client Project ID: None Submitted S97-0540

Work Order Number: 9710215

Reporting Basis: As Received

Sample Aliquot: 20 ML

Final Volume: 20ML

Matrix: Water

Reported on: Friday, November 07, 1997

Client Sample ID	Lab ID	Date Prepared	Date Analyzed	Dilution Factor	Duplicate Result	Units	Sample Result	Detection Limit	Flag	RPD	RPD Limit
SHARED QC	9710195-1	11/4/97	11/4/97	1	656	umhos/cm	656			0	

### Comments:

1. ND = Not Detected at or above the client requested detection limit.



# Paragon Analytics, Inc.

## TOTAL RECOVERABLE METALS CASE NARRATIVE

---

### El Paso Natural Gas Co.

S97-0540

Order Number - 9710215

1. This report consists of 7 water samples.
2. The samples were received intact on 10/23/97. The temperature of the samples upon receipt was 15° Celsius.
3. The samples had been correctly preserved for the requested analyses.
4. The samples were prepared for analysis based on SW-846, 3<sup>rd</sup> Edition procedures.  
For analysis by conventional ICP, the samples were digested following method 3005A.
5. The samples were analyzed following SW846 protocols by conventional ICP (Method 6010A).
6. All standards and solutions are NIST traceable and were used within their recommended shelf life.
7. The samples were prepared and analyzed within the established hold times.
8. Sample results which are below PAI's standard reporting limits are reported as "ND" on the enclosed report.

All in house quality control procedures were followed, as described below.

9. General quality control procedures.
  - A preparation (method) blank and laboratory control sample were digested and analyzed with the samples in this digestion batch. There were not more than 20 samples in the digestion batch.
  - The preparation (method) blank results associated with this batch were below the reporting limits for the requested analytes. This indicates that no contaminants were introduced to the samples during the digestion procedure.



- The laboratory control sample associated with this batch was within acceptance limits. This indicates complete digestion according to the method.
- All initial and continuing calibration blanks associated with this batch were below the reporting limits for the requested analytes. This indicates a valid calibration and stable instrument conditions.
- All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analytes. This indicates a valid calibration and stable instrument conditions.
- The interference check samples, and high standard readbacks associated with Method 6010A analyses were within acceptance criteria.

10. A sample from this Order Number was used as the QC sample for this batch.

- A matrix spike and matrix spike duplicate were digested and analyzed with this batch. All acceptance criteria for accuracy were met.
- A sample duplicate and spike duplicate were digested and analyzed with this batch. All acceptance criteria for precision were met.
- A serial dilution was analyzed with this batch. All acceptance criteria were met.

11. Hardness was determined from calcium and magnesium values determined by Trace ICP and calculated using the following formula.

$$\text{mg CaCO}_3/\text{L} = (2.497 * \text{Ca conc. (mg/L)}) + (4.118 * \text{Mg conc. (mg/L)})$$

PAI Sample ID: 9710215-1 - < 2.5  
9710215-2 - 680  
9710215-3 - 700  
9710215-4 - 1900  
9710215-5 - 160  
9710215-6 - 3000  
9710215-7 - < 2.5



The data contained in the following report have been reviewed and approved by the personnel listed below.

Darryl Patrick

Darryl Patrick  
Senior Inorganic Chemist

11/6/97

Date

SW

Reviewer's Initials

11/6/97

Date

### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# Paragon Analytics, Incorporated

## Sample Number(s) Cross-Reference Table

---

**Paragon OrderNum:** 9710215

**Client Name:** El Paso Natural Gas Co.

**Client Project Name:** S97-0540

**Client Project Number:** None Submitted

**Client PO Number:**

---

Client Sample	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
S97-0540	9710215-1		Water	10/21/97	8:20
S97-0541	9710215-2		Water	10/21/97	10:35
S97-0542	9710215-3		Water	10/21/97	10:35
S97-0545	9710215-4		Water	10/21/97	16:30
S97-0546	9710215-5		Water	10/21/97	16:45
S97-0547	9710215-6		Water	10/21/97	18:17
S97-0548	9710215-7		Water	10/21/97	17:45

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0540  
Lab Sample ID: RB 9710215

Sample ID

**Reagent Blank**

Date Collected: N/A  
Prep Date: 10/29/97  
Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	ND	0.1
Calcium	ND	1
Copper	ND	0.01
Iron	ND	0.1
Magnesium	ND	1
Manganese	ND	0.01
Potassium	ND	1
Silicon	ND	0.05
Sodium	ND	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

NP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0540  
Lab Sample ID: 9710215-1

Sample ID

**S97-0540**

Sample Matrix: Water

Date Collected: 10/21/97

Prep Date: 10/29/97

Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	ND	0.1
Calcium	ND	1
Copper	ND	0.01
Iron	ND	0.1
Magnesium	ND	1
Manganese	ND	0.01
Potassium	ND	1
Silicon	ND	0.05
Sodium	ND	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

18

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0540  
Lab Sample ID: 9710215-2

Sample Matrix: Water

Sample ID

**S97-0541**

Date Collected: 10/21/97  
Prep Date: 10/29/97  
Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	1.0	0.1
Calcium	79	1
Copper	ND	0.01
Iron	0.4	0.1
Magnesium	120	1
Manganese	0.06	0.01
Potassium	18	1
Silicon	15	0.05
Sodium *	3800	10
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

\* Detection limit raised. Dilution required due to analyte concentration.

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0540  
Lab Sample ID: 9710215-3

Sample Matrix: Water

Sample ID

**S97-0542**

Date Collected: 10/21/97

Prep Date: 10/29/97

Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	1.0	0.1
Calcium	85	1
Copper	ND	0.01
Iron	0.5	0.1
Magnesium	120	1
Manganese	0.06	0.01
Potassium	17	1
Silicon	15	0.05
Sodium *	3500	10
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

\* Detection limit raised. Dilution required due to analyte concentration.

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0540  
Lab Sample ID: 9710215-4

Sample Matrix: Water

Sample ID

**S97-0545**

Date Collected: 10/21/97

Prep Date: 10/29/97

Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.6	0.1
Calcium	400	1
Copper	ND	0.01
Iron	2.6	0.1
Magnesium	210	1
Manganese	2.2	0.01
Potassium	52	1
Silicon	19	0.05
Sodium *	9400	50
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

\* Detection limit raised. Dilution required due to analyte concentration.

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0540  
Lab Sample ID: 9710215-5

Sample Matrix: Water

Sample ID

**S97-0546**

Date Collected: 10/21/97

Prep Date: 10/29/97

Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.2	0.1
Calcium	42	1
Copper	ND	0.01
Iron	0.8	0.1
Magnesium	13	1
Manganese	0.05	0.01
Potassium	4	1
Silicon	13	0.05
Sodium	70	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0540  
Lab Sample ID: 9710215-6

Sample Matrix: Water

Sample ID

**S97-0547**

Date Collected: 10/21/97

Prep Date: 10/29/97

Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.2	0.1
Calcium *	780	10
Copper	ND	0.01
Iron	0.4	0.1
Magnesium ^	250	10
Manganese	0.13	0.01
Potassium	26	1
Silicon	15	0.05
Sodium *	2500	10
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

\* Detection limit raised. Dilution required due to analyte concentration.

^ Detection limit raised. Sample diluted to reduce matrix interferences.

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0540  
Lab Sample ID: 9710215-7

Sample Matrix: Water

Sample ID

**S97-0548**

Date Collected: 10/21/97  
Prep Date: 10/29/97  
Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	ND	0.1
Calcium	ND	1
Copper	ND	0.01
Iron	ND	0.1
Magnesium	ND	1
Manganese	ND	0.01
Potassium	ND	1
Silicon	ND	0.05
Sodium	ND	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

DP

# TOTAL RECOVERABLE METALS MATRIX SPIKE

Lab Name: Paragon Analytics, Inc.  
 Client Name: El Paso Natural Gas Co.  
 Lab Sample ID: 9710215-1

Sample ID

**S97-0540**

Sample Matrix: Water

Prep Date: 10/29/97

Date Analyzed: 11/04/97

Analyte	Spike Added mg/L	Sample Conc. mg/L	MS Conc. mg/L	% Rec (limits 80-120%)	Flags
Boron	1.0	< 0.1	0.9	90	
Calcium	40	< 1	41	103	
Copper	0.25	< 0.01	0.25	100	
Iron	1.0	< 0.1	1.0	100	
Magnesium	40	< 1	41	103	
Manganese	0.50	< 0.01	0.49	98	
Potassium	40	< 1	40	100	
Silicon	0.5	< 0.1	0.5	100	
Sodium	40	< 1	41	103	
Zinc	0.50	< 0.02	0.49	98	

DP

# TOTAL RECOVERABLE METALS MATRIX SPIKE DUPLICATE

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Lab Sample ID: 9710215-1

Sample ID

**S97-0540**

Sample Matrix: Water

Prep Date: 10/29/97

Date Analyzed: 11/04/97

Analyte	MSD Conc. mg/L	MSD % Rec (limits 80-120%)	Relative % Difference (limits 0-20%)	Flags
Boron	0.9	90	0	
Calcium	41	103	0	
Copper	0.24	96	4	
Iron	0.9	90	11	
Magnesium	41	103	0	
Manganese	0.49	98	0	
Potassium	40	100	0	
Silicon	0.5	100	0	
Sodium	41	103	0	
Zinc	0.50	100	2	

DP



# Paragon Analytics, Inc.

## INORGANICS CASE NARRATIVE

---

### El Paso Natural Gas Co.

S97-0540

Order Number - 9710215

1. This report consists of data for 7 water samples analyzed for total alkalinity, bromide, chloride, fluoride, nitrate/nitrite, sulfate and total dissolved solids (TDS).
2. The samples were received cool and intact on 10/23/97.
3. The samples had been correctly preserved for the requested analyses.
4. The samples were analyzed using procedures based on the following methods from the USEPA or *Standard Methods for the Examination of Water and Wastewater*, 17th Ed.:

<u>Analyte</u>	<u>Method</u>
Total Alkalinity	4500-CO <sub>2</sub>
Bromide	300.0
Chloride	300.0
Fluoride	340.2
Nitrate/Nitrite	353.3
Sulfate	300.0
Total Dissolved Solids	160.1

The samples were analyzed for fluoride using an ion selective electrode (Method 340.2) instead of ion chromatography (Method 300.0). The high concentration of chloride in some of the samples interfered with the chromatography for fluoride.

5. All standards and reagents were used within their recommended shelf life.
6. The samples were prepared and analyzed within the established hold times.
7. Sample results which are below the reporting limit are reported as "ND" on the enclosed report.



All in-house quality control procedures were followed, as described below.

8. General quality control procedures.

- The method blank results were below the reporting limits for all analyses.
- The LCS results were within acceptance limits for all analyses.
- The MS/MSD results were within acceptance limits for bromide, chloride, fluoride, nitrate/nitrite and sulfate.
- The matrix duplicate results were within acceptance limits for total alkalinity, and TDS.

The data contained in the following report have been reviewed and approved by the personnel listed below:

Jm  
Reporter's Initials

11-5-97  
Date

B5  
Reviewer's Initials

11-5-97  
Date

CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# TOTAL ALKALINITY

Method 4500-CO2

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0540  
Client Project No:  
Lab Workorder Number: 9710215

Date Collected: 10/21/97  
Date Analyzed: 10/27/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Total Alkalinity as CaCO3 Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	5
S97-0540	9710215-1	ND	5
S97-0541	9710215-2	780	5
S97-0542	9710215-3	790	25
S97-0545	9710215-4	580	25
S97-0546	9710215-5	150	25
S97-0547	9710215-6	140	25
S97-0548	9710215-7	ND	5

ND = Not Detected

# Alkalinity Calculations and Quality Control Results

Date analyzed: 10/27/97

ID	aliquot titrated (mL)	titrant normality N	vol to pH 8.3 (mL)	vol to pH 4.5 (mL)	total vol (mL)	HCO <sub>3</sub>	CO <sub>3</sub>	OH	Total	DL
						mg/L as CaCO <sub>3</sub>				(mg/L)
R Blank	100	0.0175	0	0.00	0.00	0	0	0	0.0	5
LCS	100	0.0175	0	11.57	11.57	101	0	0	101.0	5
9710195-1	20	0.0175	0	3.17	3.17	138	0	0	138.4	25
9710195-2	100	0.0175	0	0.00	0.00	0	0	0	0.0	5
9710195-2 dup	100	0.0175	0	0.00	0.00	0	0	0	0.0	5
9710195-3	20	0.0175	8.61	42.23	50.84	1467	752	0	2219.1	25
9710195-4	20	0.0175	0	11.45	11.45	500	0	0	499.8	25
9710215-1	100	0.0175	0	0.00	0.00	0	0	0	0.0	5
9710215-2	100	0.0175	0	88.94	88.94	776	0	0	776.4	5
9710215-3	20	0.0175	0	18.01	18.01	786	0	0	786.1	25
9710215-4	20	0.0175	0	13.23	13.23	577	0	0	577.5	25
9710215-5	20	0.0175	0	3.36	3.36	147	0	0	146.7	25
9710215-6	20	0.0175	0	3.28	3.28	143	0	0	143.2	25
9710215-7	100	0.0175	0	0.00	0.00	0	0	0	0.0	5

## Standardization of titrant

Conc Na <sub>2</sub> CO <sub>3</sub> std	Na <sub>2</sub> CO <sub>3</sub> aliquot	HCl vol	HCl conc
0.0470	5.00	13.58	0.01730
0.0470	5.00	13.41	0.01752
0.0470	5.00	13.39	0.01755

mean = 0.01746

## Alkalinity Quality Control Results

Date analyzed: 10/27/97

### LCS SUMMARY

ID	expected alk conc (mg/L)	alk conc found (mg/L)	recovery %	recovery acceptance limit
LCS	100.0	101.0	101	85-115%

### DUPLICATE SUMMARY

ID	sample alk conc (mg/L)	duplic alk conc (mg/L)	RPD %	accept. limits
9710195-2 dup	ND	ND	NA	0-15%

# BROMIDE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0540

Client Project No:

Lab Workorder Number: 9710215

Date Collected: 10/21/97

Date Analyzed: 10/28-29/97

Sample Matrix: Water

Client ID	Lab Sample ID	Bromide Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.2
S97-0540	9710215-1	ND	0.2
S97-0541	9710215-2	5	2
S97-0542	9710215-3	5	2
S97-0545	9710215-4	11	4
S97-0546	9710215-5	ND	0.2
S97-0547	9710215-6	ND	2
S97-0548	9710215-7	ND	0.2

ND = Not Detected

# BROMIDE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9710195-1

Date Analyzed: 10/28/97

Sample Matrix: Water

Sample ID

IN HOUSE

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Bromide	5.00	ND	5.42	108	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Bromide	5.00	5.57	111	3	0-15 %

# CHLORIDE

Method 300.0

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0540  
Client Project No:  
Lab Workorder Number: 9710215

Date Collected: 10/21/97  
Date Analyzed: 10/28-29/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Chloride Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.2
S97-0540	9710215-1	ND	0.2
S97-0541	9710215-2	6800	200
S97-0542	9710215-3	7000	200
S97-0545	9710215-4	17000	400
S97-0546	9710215-5	110	4
S97-0547	9710215-6	8900	200
S97-0548	9710215-7	1.7	0.2

ND = Not Detected

# CHLORIDE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9710195-1

Date Analyzed: 10/29/97

Sample Matrix: Water

Sample ID

IN HOUSE

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Chloride	100.0	97.1	187.7	91	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Chloride	100.0	190.9	94	2	0-20 %

# FLUORIDE

Method 340.2

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0540  
Client Project No:  
Lab Workorder Number: 9710215

Date Collected: 10/21/97  
Date Analyzed: 11/03/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Fluoride Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.5
S97-0540	9710215-1	ND	0.5
S97-0541	9710215-2	2.3	0.5
S97-0542	9710215-3	2.3	0.5
S97-0545	9710215-4	0.6	0.5
S97-0546	9710215-5	1.6	0.5
S97-0547	9710215-6	0.6	0.5
S97-0548	9710215-7	ND	0.5

ND = Not Detected

## Fluoride in Liquid Samples Calculations

Date analyzed: 11/03/97

ID	sample aliquot (mg/L)	final vol after dil (mL)	electrode reading (mv)	calc F conc (mg/L)	report F conc (mg/L)	DL (mg/L)
ICV (LCS)	20	20	27	10.12	10.1	0.5
ICB	20	20	152	0.06	0.1	0.5
9710215-1	20	20	161	0.04	0.0	0.5
9710215-1 MS	20	20	26	10.54	10.5	0.5
9710215-1 MSD	20	20	26	10.54	10.5	0.5
9710215-2	20	20	63	2.33	2.3	0.5
9710215-3	20	20	63	2.33	2.3	0.5
9710215-4	20	20	97	0.58	0.6	0.5
9710215-5	20	20	73	1.55	1.6	0.5
9710215-6	20	20	95	0.63	0.6	0.5
9710215-7	20	20	148	0.07	0.1	0.5
CCV	20	20	27	10.12	10.1	0.5
CCB	20	20	150	0.07	0.1	0.5
9710195-1	20	20	74	1.49	1.5	0.5
9710195-2	20	20	149	0.07	0.1	0.5
9710195-3	20	20	34	7.61	7.6	0.5
9710195-4	20	20	110	0.34	0.3	0.5
9710253-1	20	20	79	1.22	1.2	0.5
9710253-2	20	20	84	0.99	1.0	0.5
9710253-3	20	20	83	1.03	1.0	0.5
9710253-4	20	20	77	1.32	1.3	0.5
9710253-5	20	20	73	1.55	1.6	0.5
9710253-6	20	20	148	0.07	0.1	0.5
CCV	20	20	27	10.12	10.1	0.5
CCB	20	20	149	0.07	0.1	0.5
9710243-1	20	20	15	16.51	16.5	0.5
9710243-2	20	20	14	17.20	17.2	0.5
9710243-3	20	20	88	0.84	0.8	0.5
9710243-3 MS	20	20	24	11.44	11.4	0.5
9710243-3 MSD	20	20	24	11.44	11.4	0.5
9710243-4	20	20	50	3.96	4.0	0.5
9710243-5	20	20	95	0.63	0.6	0.5
9710243-6	20	20	74	1.49	1.5	0.5
9710243-7	20	20	84	0.99	1.0	0.5
CCV	20	20	27	10.12	10.1	0.5
CCB	20	20	145	0.08	0.1	0.5

### STANDARD CURVE

std conc (mg/L)	log conc	mv	calc conc
0.5	-0.301	100	0.52
1	0.000	85	0.95
5	0.699	44	5.06
10	1.000	27	10.12
50	1.699	-12	49.62

### Regression Output:

Constant	1.483267
Std Err of Y Est	0.015546
R Squared	0.999715
No. of Observations	5
Degrees of Freedom	3
X Coefficient(s)	-0.0177
Std Err of Coef.	0.000172

## Fluoride Quality Control Results

Date analyzed: 11/03/97

### ICV (LCS) SUMMARY

	spike added F conc (mg/L)	F conc found (mg/L)	recovery %	recovery accpt. limit
ICV (LCS)	10.0	10.1	101	85-115%

### MATRIX SPIKE SUMMARY

	spike F conc added (mg/L)	sample F conc (mg/L)	spike F conc (mg/L)	recovery %	recovery accpt. limit	RPD %	RPD accept. limit
9710215-1 MS	10.0	0.0	10.5	105	85-115%		
9710215-1 MSD	10.0	0.0	10.5	105	85-115%	0.0	< 15%
9710243-3 MS	10.0	0.8	11.4	106	85-115%		
9710243-3 MSD	10.0	0.8	11.4	106	85-115%	0.0	< 15%

ND = Not Detected

# NITRATE + NITRITE

Method 353.3

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0540  
Client Project No:  
Lab Workorder Number: 9710215

Date Collected: 10/21/97  
Date Analyzed: 11/01/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Nitrate + Nitrite as N Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.05
S97-0540	9710215-1	ND	0.05
S97-0541	9710215-2	ND	0.05
S97-0542	9710215-3	ND	0.05
S97-0545	9710215-4	ND	0.05
S97-0546	9710215-5	ND	0.05
S97-0547	9710215-6	0.16	0.05
S97-0548	9710215-7	0.06	0.05

ND = Not Detected

# Nitrate + Nitrite Calculations and Quality Control Results

Date analyzed: 11/01/97

NO3-N std (mg/L)	Abs (543 nm)	calc NO3-N conc (mg/L)	Regression Output:	
0.00	0.036	0.005	Constant	-0.03007
0.05	0.080	0.048	Std Err of Y Est	0.004851
0.10	0.134	0.101	R Squared	0.999871
0.20	0.229	0.19	No. of Observations	6
0.50	0.548	0.50	Degrees of Freedom	4
1.00	1.056	1.00	X Coefficient(s)	0.974762
			Std Err of Coef.	0.005527

ID:	additional DF	Abs (543 nm)	calc instr NO3+NO2-N conc (mg/L)	sample NO3+NO2-N conc (mg/L)	Detection Limit (mg/L)	ICV, CCV recovery %
0.2 ppm NO2	1	0.573	0.53	0.53	0.05	174
ICV 0.5 mg/L	1	0.538	0.49	0.494	0.05	219
ICB	1	0.032	0.00	0.00	0.05	
9710215-1	1	0.027	-0.00	-0.00	0.05	
9710215-2	1	0.026	-0.00	-0.00	0.05	
9710215-3	1	0.028	-0.00	-0.00	0.05	
9710215-4	1	0.039	0.01	0.01	0.05	
9710215-5	1	0.031	0.00	0.00	0.05	
9710215-6	1	0.200	0.16	0.16	0.05	
9710215-7	1	0.091	0.06	0.06	0.05	
9710195-1	1	0.039	0.01	0.01	0.05	
9710195-2	1	0.091	0.06	0.06	0.05	
9710195-3	1	0.056	0.02	0.02	0.05	
CCV	1	0.514	0.47	0.47	0.05	94
CCB	1	0.034	0.00	0.00	0.05	
9710195-4	1	0.039	0.01	0.01	0.05	
9710253-1	1	0.030	-0.00	-0.00	0.05	
9710253-2	1	0.382	0.34	0.34	0.05	
9710253-3	1	0.397	0.36	0.36	0.05	
9710253-4	1	OR	-0.03	-0.03	0.05	
9710253-5	1	0.034	0.00	0.00	0.05	
9710253-6	1	0.093	0.06	0.06	0.05	
9710215-1MS	1	0.533	0.49	0.49	0.05	
9710215-1MSD	1	0.531	0.49	0.49	0.05	
9710243-1MS	1	0.526	0.48	0.48	0.05	
CCV	1	0.507	0.46	0.46	0.05	93
CCB	1	0.035	0.00	0.00	0.05	
9710243-1MSD	1	0.521	0.48	0.48	0.05	
9710121-3	20	0.272	0.24	4.70	1.00	
9710243-5	20	0.350	0.31	6.22	1.00	
9710243-1	1	0.027	-0.00	-0.00	0.05	
9710253-4	2	0.555	0.51	1.02	0.10	
CCV	1	0.500	0.46	0.46	0.05	91
CCB	1	0.035	0.00	0.00	0.05	

ND = Not Detected

## Nitrate + Nitrite Quality Control Results

Date analyzed: 11/01/97

### BLANK SUMMARY

ID	blank conc. (mg/L)	blank reporting limit (mg/L)
ICB	0.00	< 0.05

### LCS / ICV SUMMARY

ID	true conc. (mg/L)	conc. found (mg/L)	recovery %	accept. limits
ICV	0.500	0.494	99	80-120%

### MATRIX SPIKE SUMMARY

ID	spike added conc (mg/L)	sample conc (mg/L)	spiked sample conc (mg/L)	recovery %	recovery accept. limits	RPD %	RPD accept. limits
9710215-1MS	0.50	-0.004	0.489	99	75-125 %		
9710215-1MSD	0.50	-0.004	0.488	98	75-125 %	0	0-20%
ID	spike added conc (mg/L)	sample conc (mg/L)	spiked sample conc (mg/L)	recovery %	recovery accept. limits	RPD %	RPD accept. limits
9710243-1MS	0.50	-0.004	0.483	97	75-125 %		
9710243-1MSD	0.50	-0.004	0.483	97	75-125 %	0	0-20%

ND = Not Detected

# SULFATE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0540

Client Project No:

Lab Workorder Number: 9710215

Date Collected: 10/21/97

Date Analyzed: 10/28-29/97

Sample Matrix: Water

Client ID	Lab Sample ID	Sulfate Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	1
S97-0540	9710215-1	ND	1
S97-0541	9710215-2	320	10
S97-0542	9710215-3	310	10
S97-0545	9710215-4	790	20
S97-0546	9710215-5	60	20
S97-0547	9710215-6	410	10
S97-0548	9710215-7	ND	1

ND = Not Detected

# SULFATE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.  
Paragon Sample ID: 9710195-1  
Date Analyzed: 10/29/97  
Sample Matrix: Water

Sample ID

**IN HOUSE**

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Sulfate	400.0	52	435.5	96	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Sulfate	400	443	98	2	0-15 %

# TOTAL DISSOLVED SOLIDS

Method 160.1

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0540

Client Project No:

Lab Workorder Number: 9710215

Date Collected: 10/21/97

Date Prepared: 10/27/97

Sample Matrix: Water

Client ID	Lab Sample ID	Total Dissolved Solids Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	20
S97-0540	9710215-1	ND	20
S97-0541	9710215-2	13000	20
S97-0542	9710215-3	11000	20
S97-0545	9710215-4	28000	20
S97-0546	9710215-5	500	20
S97-0547	9710215-6	15000	20
S97-0548	9710215-7	110	20

ND = Not Detected

# TDS Calculations and Quality Control Results

Preparation Date: October 27, 1997

ID	sample vol (mL)	empty beaker tare (g)	A beaker + residue gross (g)	A net (mg)	B beaker + residue gross (g)	B net (mg)	gross A vs gross B RPD %	calculated TDS conc (mg/L)	TDS DL (mg/L)
Method Blank	100	72.7136	72.7144	0.8	72.7139	0.3	0.001	3	20
Blank Spike	100	82.7307	82.7721	41.4	82.7714	40.7	0.001	407	20
9710195-1	100	82.2171	82.2573	40.2	82.2559	38.8	0.002	388	20
9710195-1 dup	100	67.5279	67.5697	41.8	67.5684	40.5	0.002	405	20
9710195-2	100	73.1626	73.1638	1.2	73.1631	0.5	0.001	5	20
9710195-3	100	87.9245	89.5378	1613.3	89.5363	1611.8	0.002	16118	20
9710195-4	100	71.7991	81.2196	9420.5	81.2083	9409.2	0.014	94092	20
9710196-1	100	67.3554	68.7107	1355.3	68.6945	1339.1	0.024	13391	20
9710196-2	100	82.2309	85.2451	3014.2	85.2440	3013.1	0.001	30131	20
9710214-1	100	82.4509	83.2251	774.2	83.2125	761.6	0.015	7616	20
9710214-2	100	80.2440	80.3872	143.2	80.3795	135.5	0.010	1355	20
9710214-3	100	87.4784	87.6140	135.6	87.6049	126.5	0.010	1265	20
9710215-1	100	71.8507	71.8514	0.7	71.8507	0.0	0.001	0	20
9710215-2	100	85.8427	87.0942	1251.5	87.0930	1250.3	0.001	12503	20
9710215-2 dup	100	75.0607	76.3023	1241.6	76.2993	1238.6	0.004	12386	20
9710215-3	100	66.0091	67.1444	1135.3	67.1432	1134.1	0.002	11341	20
9710215-4	100	70.5097	73.3172	2807.5	73.3052	2795.5	0.016	27955	20
9710215-5	100	71.9382	71.9887	50.5	71.9886	50.4	0.000	504	20
9710215-6	100	67.8628	69.3880	1525.2	69.3647	1501.9	0.034	15019	20
9710215-7	100	73.2535	73.2655	12.0	73.2644	10.9	0.002	109	20
9710216-2	100	65.3109	65.3691	58.2	65.3679	57.0	0.002	570	20

## BLANK SUMMARY

ID	blank conc (mg/L)	accept. limit (mg/L)
Method Blank	3	< 20

## BLANK SPIKE SUMMARY

ID	spike added (g)	spike added conc (mg/L)	spiked sample conc (mg/L)	recovery %	accept. limits
Blank Spike	40.0	400	407	102	85-115%

## DUPLICATE SUMMARY

ID	sample conc (mg/L)	duplic conc (mg/L)	RPD %	accept. limits
9710195-1 dup	388	405	4.3	0-15%
9710215-2 dup	12503	12386	0.9	0-15%

ND = Not Detected

NA = Not Applicable

PROJECT NUMBER		PROJECT NAME		DATE		SAMPLE NUMBER		TOTAL NUMBER OF CONTAINERS		COMPOSITE OR GRAB		REQUESTED ANALYSIS				REMARKS	
LAB ID	DATE	TIME	MATRIX	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME
01	10/21/97	0830	H <sub>2</sub> O	10/21/97	1012197			5									1 x 500 ml poly Run BETX
02	10/21/97	1035	H <sub>2</sub> O					5									
03	10/21/97	1035	H <sub>2</sub> O					5									
04	10/21/97	1630	H <sub>2</sub> O					5									
05	10/21/97	1645	H <sub>2</sub> O					5									Run BETX
06	10/21/97	1817	H <sub>2</sub> O					5									Run BETX
07	10/21/97	1745	H <sub>2</sub> O					5									
(A diagonal line is drawn across the remaining empty rows of the table.)																	
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)		DATE/TIME		RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)	
[Signature]		10/21/97 0500		[Signature]		10/21/97 0500		[Signature]		10/21/97 0500		[Signature]		10/21/97 0500		10/21/97 0500	
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)		DATE/TIME		RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)	
[Signature]				[Signature]				[Signature]				[Signature]				[Signature]	
<p>REQUESTED TURNAROUND TIME: <input type="checkbox"/> ROUTINE <input type="checkbox"/> RUSH</p> <p>CARRIER CO.:</p> <p>BILL NO.:</p>																	
<p>RESULTS &amp; INVOICES TO:</p> <p>TRANSMISSION OPERATIONS LABORATORY EL PASO NATURAL GAS COMPANY 8645 RAILROAD DRIVE EL PASO, TEXAS 79904</p> <p>915-759-2229 FAX: 915-759-2335</p>																	

## CONDITION OF SAMPLE UPON RECEIPT

CLIENT: EPOLSHIPPING CONTAINER #: C 014WORKORDER NO. 9710215INITIALS: NYDATE: 10/23/97

1. Does this project require special handling according to NEESA, Level 3, or CLP protocols? If yes, complete a. and b. a. Cooler Temperature _____ b. Lot No's. _____ c. Airbill Number _____	Yes	<u>No</u>
2. Are custody seals on the cooler intact? If so, how many	<u>N/A</u>	<u>Yes</u> No
3. Are custody seals on sample containers intact?	<u>N/A</u>	Yes No
4. Is there a Chain of Custody (COC) or other representative documents, letters or shipping memos?	<u>Yes</u>	No
5. Is the COC complete? Relinquished: Yes <u>✓</u> No Requested Analysis: Yes <u>✓</u> No	N/A	<u>Yes</u> No
6. Is the COC in agreement with the samples received? No. of Samples: Yes <u>✓</u> No Sample ID's: Yes <u>✓</u> No Matrix: Yes <u>✓</u> No No. of Containers: Yes <u>✓</u> No	<u>Yes</u>	<u>No</u>
7. Are the samples requiring chemical preservation preserved correctly?	N/A	<u>Yes</u> No
8. Is there enough sample? If so, are they in the proper containers?	<u>Yes</u>	No
9. Are all samples within holding times for the requested analyses?	Yes	<u>No</u>
10. Were the sample(s) shipped on ice?	N/A	<u>Yes</u> No
11. Were all sample containers received intact? (not broken or leaking, etc.)	<u>Yes</u>	No
12. Are samples requiring no headspace, headspace free?	N/A	<u>Yes</u> No
13. Do the samples require quarantine?	Yes	<u>No</u>
14. Do samples require Paragon disposal?	<u>Yes</u>	No
15. Did the client return any unused bottles?	Yes	<u>No</u>

Describe "NO" items (except No's 1, 13, & 14): Spec cool out of hold upon receipt (COC) - 11.2  
ExpiredWas the client contacted? Yes \_\_\_\_\_ No \_\_\_\_\_  
If yes, Date: \_\_\_\_\_ Name of person contacted: \_\_\_\_\_Describe actions taken or client instructions: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Group Leader's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Cooler Temperature: 15°C



# PARAGON ANALYTICS, INC.

225 Commerce Drive ♦ Fort Collins, CO 80524 ♦ (800) 443-1511 ♦ (970) 490-1511 ♦ FAX (970) 490-1522

November 11, 1997

Mr. Darrell Campbell  
El Paso Natural Gas Co.  
8645 Railroad Drive  
El Paso, TX 79904

RE: Paragon Workorder: 97-10-243  
Client Project Name: S97-0549  
Client Project Number: Not Submitted

Dear Mr. Campbell:

Seven water samples were received from El Paso Natural Gas Co. on October 24, 1997. The samples were scheduled for the following analyses:

pH	pages 1-5
Specific Conductance	pages 1-5
Aromatic Volatile Organics	pages 1-13
Total Recoverable Metals	pages 1-14
Inorganics	pages 1-17

The results for these analyses are contained in the enclosed reports.

Thank you for your confidence in Paragon Analytics, Inc. Should you have any questions, please call.

Sincerely,

Paragon Analytics, Inc.  
Victoria Bayly  
Project Manager

VB/jjc  
Enclosure: report

9710-24 CHAIN OF CUSTODY RECORD

Page \_\_\_\_\_ of \_\_\_\_\_

PROJECT NUMBER		PROJECT NAME		DATE:		SAMPLERS: (Signature)	
LAB ID		DATE		TIME		MATRIX	
SAMPLE NUMBER		TOTAL NUMBER OF CONTAINERS		COMPOSITE OR GRAB		REQUESTED ANALYSIS	
Cationic Am. Gels		BTEx		Nitrate		SEE ATTACHED	
REMARKS		RECEIVED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)	
D1	108882-0980	H2O	597-0549	5	X	X	X
D2	108882-0980	H2O	597-0550	5	X	X	X
D3	108882-1015	H2O	597-0551	5	X	X	X
D4	108882-1333	H2O	597-0552	5	X	X	X
D5	108882-1532	H2O	597-0553	5	X	X	X
D6	108882-1700	H2O	597-0554	5	X	X	X
D7	108882-1900	H2O	597-0555	5	X	X	X
<p>RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature) DATE/TIME</p> <p>RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature) DATE/TIME</p>							
REQUESTED TURNAROUND TIME:				SAMPLE RECEIPT REMARKS			
ROUTINE <input type="checkbox"/> RUSH <input type="checkbox"/>				RESULTS & INVOICES TO:			
CARRIER CO.				TRANSMISSION OPERATIONS LABORATORY			
BILL NO.				EL PASO NATURAL GAS COMPANY			
				8645 RAILROAD DRIVE			
				EL PASO, TEXAS 79904			
				915-759-2229 FAX: 915-759-2335			

ANIONS & CATIONS	Preservative	Bottle & Sample Size
pH	none	1000ml Plastic
P Alkalinity	none	1000ml Plastic
T Alkalinity	none	1000ml Plastic
Chloride	none	1000ml Plastic
Sulfate	none	1000ml Plastic
T Hardness	none	1000ml Plastic
Calcium	none	1000ml Plastic
Magnesium	none	1000ml Plastic
Sodium	none	1000ml Plastic
Silica	none	1000ml Plastic
Fluoride	none	1000ml Plastic
Potassium	none	1000ml Plastic
Bromide	none	1000ml Plastic
Nitrate	Preserved With H2SO4	500ml Plastic
Total Dissolved Solids	none	1000ml Plastic
Specific Conductance	none	1000ml Plastic
Iron	Preserved With HNO3	1000ml Plastic
Manganese	Preserved With HNO3	1000ml Plastic
Copper	Preserved With HNO3	1000ml Plastic
Zinc	Preserved With HNO3	1000ml Plastic
Boron	Preserved With HNO3	1000ml Plastic
BTEX	Preserved With HCL	2X VOA

Handwritten notes and groupings:

- A bracket groups the first 12 rows (pH to Bromide) with the number "3" next to it.
- A bracket groups the next 4 rows (Nitrate to Zinc) with the number "2" next to it.
- A bracket groups the last 2 rows (Boron to BTEX) with the number "1" next to it.
- Other handwritten notes include "4 ml", "100", "1000", and "B&I".

## CONDITION OF SAMPLE UPON RECEIPT

CLIENT: EP06SHIPPING CONTAINER #:  coolerWORKORDER NO. 9710243INITIALS: ScDATE: 10/24/03

1.	Does this project require special handling according to NEESA, Level 3, or CLP protocols? If yes, complete a. and b. a. Cooler Temperature _____ b. Lot No's. _____ c. Airbill Number _____	Yes	<u>No</u>
2.	Are custody seals on the cooler intact? If so, how many	<u>N/A</u>	Yes No
3.	Are custody seals on sample containers intact?	<u>N/A</u>	Yes No
4.	Is there a Chain of Custody (COC) or other representative documents, letters or shipping memos?	<u>Yes</u>	Yes No
5.	Is the COC complete? Relinquished: Yes / No Requested Analysis: Yes / No	<u>N/A</u>	<u>Yes</u> No
6.	Is the COC in agreement with the samples received? No. of Samples: Yes / No Sample ID's: Yes / No Matrix: Yes / No No. of Containers: Yes / No	<u>Yes</u>	Yes No
7.	Are the samples requiring chemical preservation preserved correctly?	<u>N/A</u>	Yes <u>No</u>
8.	Is there enough sample? If so, are they in the proper containers?	<u>Yes</u>	Yes No
9.	Are all samples within holding times for the requested analyses?	<u>Yes</u>	Yes No
10.	Were the sample(s) shipped on ice?	<u>N/A</u>	<u>Yes</u> No
11.	Were all sample containers received intact? (not broken or leaking, etc.)	<u>Yes</u>	Yes No
12.	Are samples requiring no headspace, headspace free?	<u>N/A</u>	<u>Yes</u> No
13.	Do the samples require quarantine?	Yes	<u>No</u>
14.	Do samples require Paragon disposal?	<u>Yes</u>	Yes No
15.	Did the client return any unused bottles?	Yes	<u>No</u>

Describe "NO" items (except No's 1, 13, & 14): 7 BTEX sample # 04 (0552) not preservedWas the client contacted? Yes \_\_\_\_\_ No \_\_\_\_\_  
If yes, Date: \_\_\_\_\_ Name of person contacted: \_\_\_\_\_

Describe actions taken or client instructions: \_\_\_\_\_

Group Leader's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Cooler Temperature: 15°C



# Paragon Analytics, Inc.

## INORGANICS CASE NARRATIVE

---

### El Paso Natural Gas Co.

S97-0549

Order Number - 9710243

1. This report consists of data for 7 water samples analyzed for total alkalinity, bromide, chloride, fluoride, nitrate/nitrite, sulfate and total dissolved solids (TDS).
2. The samples were received cool and intact on 10/24/97.
3. The samples had been correctly preserved for the requested analyses.
4. The samples were analyzed using procedures based on the following methods from the USEPA or *Standard Methods for the Examination of Water and Wastewater*, 17th Ed.:

<u>Analyte</u>	<u>Method</u>
Total Alkalinity	4500-CO <sub>2</sub>
Bromide	300.0
Chloride	300.0
Fluoride	340.2
Nitrate/Nitrite	353.3
Sulfate	300.0
Total Dissolved Solids	160.1

The samples were analyzed for fluoride using an ion selective electrode (Method 340.2) instead of ion chromatography (Method 300.0). The high concentration of chloride in some of the samples interfered with the chromatography for fluoride.

5. All standards and reagents were used within their recommended shelf life.
6. The samples were prepared and analyzed within the established hold times.
7. Sample results which are below the reporting limit are reported as "ND" on the enclosed report.



All in house quality control procedures were followed, as described below.

8. General quality control procedures.

- The method blank results were below the reporting limits for all analyses.
- The LCS results were within acceptance limits for all analyses.
- The MS/MSD results were within acceptance limits for bromide, chloride, fluoride, nitrate/nitrite and sulfate.
- The matrix duplicate results were within acceptance limits for total alkalinity, and TDS.

The data contained in the following report have been reviewed and approved by the personnel listed below:

JM  
Reporter's Initials

11-5-97  
Date

JS  
Reviewer's Initials

11-5-97  
Date

CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# TOTAL ALKALINITY

Method 4500-CO2

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0549  
Client Project No:  
Lab Workorder Number: 9710243

Date Collected: 10/22/97  
Date Analyzed: 10/28/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Total Alkalinity as CaCO3 Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	5
S97-0549 ACW-6	9710243-1	1400	25
S97-0550 ACW-6D	9710243-2	1400	25
S97-0551	9710243-3	200	50
S97-0552 ACW-7	9710243-4	730	50
S97-0553 ACW-5	9710243-5	320	50
S97-0554 ACW-14	9710243-6	180	50
S97-0555	9710243-7	150	50

ND = Not Detected

000003

# Alkalinity Calculations and Quality Control Results

Date analyzed: 10/28/97

ID	aliquot (mL)	titrant normality N	vol to pH 8.3 (mL)	vol to pH 4.5 (mL)	total vol (mL)	HCO <sub>3</sub>	CO <sub>3</sub>	OH	Total	DL (mg/L)
						mg/L as CaCO <sub>3</sub>				
R Blank	100	0.0173	0	0.00	0.00	0	0	0	0.0	5
LCS	100	0.0173	0	11.42	11.42	99	0	0	98.8	5
9710220-1	20	0.0173	0	3.53	3.53	153	0	0	152.7	25
9710220-2	20	0.0173	0	3.68	3.68	159	0	0	159.2	25
9710220-2 dup	20	0.0173	0	3.74	3.74	162	0	0	161.8	25
9710220-3	20	0.0173	0	4.24	4.24	183	0	0	183.4	25
9710220-4	20	0.0173	0	3.71	3.71	161	0	0	160.5	25
9710220-5	20	0.0173	0	3.51	3.51	152	0	0	151.9	25
9710220-6	20	0.0173	0	3.58	3.58	155	0	0	154.9	25
9710220-7	20	0.0173	0	3.66	3.66	158	0	0	158.3	25
9710226-21	20	0.0173	0	3.59	3.59	155	0	0	155.3	25
9710226-22	20	0.0173	0	3.62	3.62	157	0	0	156.6	25
9710226-23	100	0.0173	0	17.76	17.76	154	0	0	153.7	5
9710226-24	100	0.0173	0	0.00	0.00	0	0	0	0.0	5
9710226-25	20	0.0173	0	3.53	3.53	153	0	0	152.7	25
9710226-25 dup	20	0.0173	0	3.70	3.70	160	0	0	160.1	25
9710226-26	20	0.0173	0	3.78	3.78	164	0	0	163.5	25
9710226-27	20	0.0173	0	3.53	3.53	153	0	0	152.7	25
9710243-1	20	0.0173	0	32.23	32.23	1394	0	0	1394.4	25
9710243-2	20	0.0173	0.56	32.20	32.76	1369	48	0	1417.3	25
9710243-3	10	0.0173	0	2.28	2.28	197	0	0	197.3	50
9710243-4	10	0.0173	0	8.39	8.39	726	0	0	726.0	50
9710243-5	10	0.0173	0	3.66	3.66	317	0	0	316.7	50
LCS	100	0.0173	0	11.52	11.52	100	0	0	99.7	5
BLK	100	0.0173	0	0.00	0.00	0	0	0	0.0	5
9710243-6	10	0.0173	0	2.11	2.11	183	0	0	182.6	50
9710243-7	10	0.0173	0	1.71	1.71	148	0	0	148.0	50
9710253-1	10	0.0173	0	2.31	2.31	200	0	0	199.9	50
9710253-1 dup	10	0.0173	0	2.41	2.41	209	0	0	208.5	50
9710253-2	10	0.0173	0	1.88	1.88	163	0	0	162.7	50
9710253-3	10	0.0173	0	2.26	2.26	196	0	0	195.5	50
9710253-4	10	0.0173	0	1.94	1.94	168	0	0	167.9	50
9710253-5	10	0.0173	0	1.73	1.73	150	0	0	149.7	50
9710253-6	100	0.0173	0	0.02	0.02	0	0	0	0.2	5

## Standardization of titrant

Conc Na <sub>2</sub> CO <sub>3</sub> std	Na <sub>2</sub> CO <sub>3</sub>	HCl	HCl
	aliquot	vol	conc
0.0470	5.00	13.56	0.01733
0.0470	5.00	13.66	0.01720
0.0470	5.00	13.52	0.01738

mean = 0.01731

## Alkalinity Quality Control Results

Date analyzed: 10/28/97

### LCS SUMMARY

ID	expected alk conc (mg/L)	alk conc found (mg/L)	recovery %	recovery acceptance limit
LCS	100.0	98.8	99	85-115%
LCS	100.0	99.7	100	85-115%

### DUPLICATE SUMMARY

ID	sample alk conc (mg/L)	duplic alk conc (mg/L)	RPD %	accept. limits
9710220-2 dup	159.2	161.8	1.6	0-15%
9710226-25 dup	152.7	160.1	4.7	0-15%
9710253-1 dup	199.9	208.5	4.2	0-15%

000004

**BROMIDE**

Method 300.0

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0549

Client Project No:

Lab Workorder Number: 9710243

Date Collected: 10/22/97

Date Analyzed: 10/28-29/97

Sample Matrix: Water

Client ID	Lab Sample ID	Bromide Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.2
S97-0549 ACW-6	9710243-1	3	1
S97-0550 ACW-6D	9710243-2	3	1
S97-0551	9710243-3	0.3	0.2
S97-0552 ACW-7	9710243-4	4	1
S97-0553 ACW-5	9710243-5	1.7	0.2
S97-0554 ACW-14	9710243-6	0.5	0.2
S97-0555	9710243-7	0.7	0.2

ND = Not Detected

000005

# BROMIDE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9710195-1

Date Analyzed: 10/28/97

Sample Matrix: Water

Sample ID

**IN HOUSE**

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Bromide	5.00	ND	5.42	108	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Bromide	5.00	5.57	111	3	0-15 %

000006

# CHLORIDE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0549

Client Project No:

Lab Workorder Number: 9710243

Date Collected: 10/22/97

Date Analyzed: 10/29/97

Sample Matrix: Water

Client ID	Lab Sample ID	Chloride Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.2
S97-0549 ACW-6	9710243-1	2900	100
S97-0550 ACW-6D	9710243-2	2900	100
S97-0551	9710243-3	31	1
S97-0552 ACW-7	9710243-4	4400	100
S97-0553 ACW-5	9710243-5	470	10
S97-0554 ACW-14	9710243-6	71	2
S97-0555	9710243-7	10	2

ND = Not Detected

000007

# CHLORIDE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9710195-1

Date Analyzed: 10/29/97

Sample Matrix: Water

Sample ID

IN HOUSE

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Chloride	100	97	188	91	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Chloride	100	191	94	2	0-20 %

000008

# FLUORIDE

Method 340.2

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0549

Client Project No:

Lab Workorder Number: 9710243

Date Collected: 10/22/97

Date Analyzed: 11/03/97

Sample Matrix: Water

Client ID	Lab Sample ID	Fluoride Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.5
S97-0549 6	9710243-1	16.5	0.5
S97-0550 6D	9710243-2	17.2	0.5
S97-0551	9710243-3	0.8	0.5
S97-0552 7	9710243-4	4.0	0.5
S97-0553 5	9710243-5	0.6	0.5
S97-0554 1d	9710243-6	1.5	0.5
S97-0555	9710243-7	1.0	0.5

ND = Not Detected

000009

# Fluoride in Liquid Samples Calculations

Date analyzed: 11/03/97

ID	sample aliquot (mg/L)	final vol after dil (mL)	electrode reading (mv)	calc F conc (mg/L)	report F conc (mg/L)	DL (mg/L)
ICV (LCS)	20	20	27	10.12	10.1	0.5
ICB	20	20	152	0.06	0.1	0.5
9710215-1	20	20	161	0.04	0.0	0.5
9710215-1MS	20	20	26	10.54	10.5	0.5
9710215-1MSD	20	20	26	10.54	10.5	0.5
9710215-2	20	20	63	2.33	2.3	0.5
9710215-3	20	20	63	2.33	2.3	0.5
9710215-4	20	20	97	0.58	0.6	0.5
9710215-5	20	20	73	1.55	1.6	0.5
9710215-6	20	20	95	0.63	0.6	0.5
9710215-7	20	20	148	0.07	0.1	0.5
CCV	20	20	27	10.12	10.1	0.5
CCB	20	20	150	0.07	0.1	0.5
9710195-1	20	20	74	1.49	1.5	0.5
9710195-2	20	20	149	0.07	0.1	0.5
9710195-3	20	20	34	7.61	7.6	0.5
9710195-4	20	20	110	0.34	0.3	0.5
9710253-1	20	20	79	1.22	1.2	0.5
9710253-2	20	20	84	0.99	1.0	0.5
9710253-3	20	20	83	1.03	1.0	0.5
9710253-4	20	20	77	1.32	1.3	0.5
9710253-5	20	20	73	1.55	1.6	0.5
9710253-6	20	20	148	0.07	0.1	0.5
CCV	20	20	27	10.12	10.1	0.5
CCB	20	20	149	0.07	0.1	0.5
9710243-1	20	20	15	16.51	16.5	0.5
9710243-2	20	20	14	17.20	17.2	0.5
9710243-3	20	20	88	0.84	0.8	0.5
9710243-3 MS	20	20	24	11.44	11.4	0.5
9710243-3 MSD	20	20	24	11.44	11.4	0.5
9710243-4	20	20	50	3.96	4.0	0.5
9710243-5	20	20	95	0.63	0.6	0.5
9710243-6	20	20	74	1.49	1.5	0.5
9710243-7	20	20	84	0.99	1.0	0.5
CCV	20	20	27	10.12	10.1	0.5
CCB	20	20	145	0.08	0.1	0.5

## STANDARD CURVE

## Regression Output:

std conc (mg/L)	log conc	mv	calc conc	Constant	Std Err of Y Est	R Squared	No. of Observations	Degrees of Freedom
0.5	-0.301	100	0.52	1.483267	0.015546	0.999715	5	3
1	0.000	85	0.95					
5	0.699	44	5.06	X Coefficient(s)	-0.0177			
10	1.000	27	10.12	Std Err of Coef.	0.000172			
50	1.699	-12	49.62					

# Fluoride Quality Control Results

Date analyzed: 11/03/97

## ICV (LCS) SUMMARY

	spike added F conc (mg/L)	F conc found (mg/L)	recovery %	recovery accpt. limit
ICV (LCS)	10.0	10.1	101	85-115%

## MATRIX SPIKE SUMMARY

	spike F conc added (mg/L)	sample F conc (mg/L)	spike F conc (mg/L)	recovery %	recovery accpt. limit	RPD %	RPD accept. limit
9710215-1MS	10.0	0.0	10.5	105	85-115%		
9710215-1MSD	10.0	0.0	10.5	105	85-115%	0.0	< 15%
9710243-3 MS	10.0	0.8	11.4	106	85-115%		
9710243-3 MSD	10.0	0.8	11.4	106	85-115%	0.0	< 15%

ND = Not Detected

000010

# NITRATE + NITRITE

Method 353.3

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0549  
Client Project No:  
Lab Workorder Number: 9710243

Date Collected: 10/22/97  
Date Analyzed: 10/31-11/01/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Nitrate + Nitrite as N Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.05
S97-0549 6	9710243-1	ND	0.05
S97-0550 60	9710243-2	ND	0.05
S97-0551	9710243-3	0.9	0.05
S97-0552 7	9710243-4	ND	0.05
S97-0553 5	9710243-5	6	1
S97-0554 12	9710243-6	0.9	0.05
S97-0555	9710243-7	0.6	0.05

ND = Not Detected

000011

# Nitrate + Nitrite Calculations and Quality Control Results

Date analyzed: 10/31/97

NO3-N std (mg/L)	Abs (543 nm)	calc NO3-N conc (mg/L)
0.00	0.068	0.015
0.05	0.109	0.060
0.10	0.138	0.092
0.20	0.226	0.19
0.50	0.493	0.48
1.00	0.967	1.01

Regression Output:

Constant	-0.06064
Std Err of Y Est	0.014176
R Squared	0.998902
No. of Observations	6
Degrees of Freedom	4
X Coefficient(s)	1.106365
Std Err of Coef.	0.01834

ID:	additional DF	Abs (543 nm)	calc instr NO3+NO2-N conc (mg/L)	sample NO3+NO2-N conc (mg/L)	Detection Limit (mg/L)	ICV, CCV recovery %
0.2 ppm NO2	1	0.528	0.52	0.52	0.05	105
ICV 0.5 mg/L	1	0.496	0.49	0.488	0.05	98
ICB	1	0.064	0.01	0.01	0.05	
MDL-1	1	0.088	0.04	0.04	0.05	
MDL-2	1	0.082	0.03	0.03	0.05	
MDL-3	1	0.083	0.03	0.03	0.05	
MDL-4	1	0.086	0.03	0.03	0.05	
MDL-5	1	0.080	0.03	0.03	0.05	
MDL-6	1	0.088	0.04	0.04	0.05	
MDL-7	1	0.082	0.03	0.03	0.05	
MDL-8	1	0.086	0.03	0.03	0.05	
9710121-1	1	0.346	0.32	0.32	0.05	
CCV	1	0.498	0.49	0.49	0.05	98
CCB	1	0.042	-0.01	-0.01	0.05	
9710121-2	1	0.029	-0.03	-0.03	0.05	
9710121-3	1	PEG	-0.06	-0.06	0.05	
9710121-4	1	0.033	-0.02	-0.02	0.05	
9710243-1	1	0.028	-0.03	-0.03	0.05	
9710243-2	1	0.036	-0.02	-0.02	0.05	
9710243-3	1	0.860	0.89	0.89	0.05	
9710243-4	1	0.041	-0.02	-0.02	0.05	
9710243-5	1	PEG	-0.06	-0.06	0.05	
9710243-6	1	0.907	0.94	0.94	0.05	
9710243-7	1	0.617	0.62	0.62	0.05	
CCV	1	0.467	0.46	0.46	0.05	91
CCB	1	0.046	-0.01	-0.01	0.05	

ND = Not Detected

## Nitrate + Nitrite Quality Control Results

Date analyzed: 10/31/97

### BLANK SUMMARY

ID	blank conc. (mg/L)	blank reporting limit (mg/L)
ICB	0.01	< 0.05

### LCS / ICV SUMMARY

ID	true conc. (mg/L)	conc. found (mg/L)	recovery %	accept. limits
ICV	0.500	0.488	98	80-120%

000012

# Nitrate + Nitrite Calculations and Quality Control Results

Date analyzed: 11/01/97

NO3-N std (mg/L)	Abs (543 nm)	calc NO3-N conc (mg/L)
0.00	0.036	0.005
0.05	0.080	0.048
0.10	0.134	0.101
0.20	0.229	0.19
0.50	0.548	0.50
1.00	1.056	1.00

Regression Output:

Constant	-0.03007
Std Err of Y Est	0.004851
R Squared	0.999871
No. of Observations	6
Degrees of Freedom	4
X Coefficient(s)	0.974762
Std Err of Coef.	0.005527

ID:	additional DF	Abs (543 nm)	calc instr NO3+NO2-N conc (mg/L)	sample NO3+NO2-N conc (mg/L)	Detection Limit (mg/L)	ICV, CCV recovery %
0.2 ppm NO2	1	0.573	0.53	0.53	0.05	174
ICV 0.5 mg/L	1	0.538	0.49	0.494	0.05	219
ICB	1	0.032	0.00	0.00	0.05	
9710215-1	1	0.027	-0.00	-0.00	0.05	
9710215-2	1	0.026	-0.00	-0.00	0.05	
9710215-3	1	0.028	-0.00	-0.00	0.05	
9710215-4	1	0.039	0.01	0.01	0.05	
9710215-5	1	0.031	0.00	0.00	0.05	
9710215-6	1	0.200	0.16	0.16	0.05	
9710215-7	1	0.091	0.06	0.06	0.05	
9710195-1	1	0.039	0.01	0.01	0.05	
9710195-2	1	0.091	0.06	0.06	0.05	
9710195-3	1	0.056	0.02	0.02	0.05	
CCV	1	0.514	0.47	0.47	0.05	94
CCB	1	0.034	0.00	0.00	0.05	
9710195-4	1	0.039	0.01	0.01	0.05	
9710253-1	1	0.030	-0.00	-0.00	0.05	
9710253-2	1	0.382	0.34	0.34	0.05	
9710253-3	1	0.397	0.36	0.36	0.05	
9710253-4	1	OR	-0.03	-0.03	0.05	
9710253-5	1	0.034	0.00	0.00	0.05	
9710253-6	1	0.093	0.06	0.06	0.05	
9710215-1MS	1	0.533	0.49	0.49	0.05	
9710215-1MSD	1	0.531	0.49	0.49	0.05	
9710243-1MS	1	0.526	0.48	0.48	0.05	
CCV	1	0.507	0.46	0.46	0.05	93
CCB	1	0.035	0.00	0.00	0.05	
9710243-1MSD	1	0.521	0.48	0.48	0.05	
9710121-3	20	0.272	0.24	4.70	1.00	
9710243-5	20	0.350	0.31	6.22	1.00	
9710243-1	1	0.027	-0.00	-0.00	0.05	
9710253-4	2	0.555	0.51	1.02	0.10	
CCV	1	0.500	0.46	0.46	0.05	91
CCB	1	0.035	0.00	0.00	0.05	

ND = Not Detected

## Nitrate + Nitrite Quality Control Results

Date analyzed: 11/01/97

### BLANK SUMMARY

ID	blank conc. (mg/L)	blank reporting limit (mg/L)
ICB	0.00	< 0.05

### LCS / ICV SUMMARY

ID	true conc. (mg/L)	conc. found (mg/L)	recovery %	accept. limits
ICV	0.500	0.494	99	80-120%

### MATRIX SPIKE SUMMARY

ID	spike added conc (mg/L)	sample conc (mg/L)	spiked sample conc (mg/L)	recovery %	recovery accept. limits	RPD %	RPD accept. limits
9710215-1MS	0.50	-0.004	0.489	99	75-125 %		
9710215-1MSD	0.50	-0.004	0.488	98	75-125 %	0	0-20%
ID	spike added conc (mg/L)	sample conc (mg/L)	spiked sample conc (mg/L)	recovery %	recovery accept. limits	RPD %	RPD accept. limits
9710243-1MS	0.50	-0.004	0.483	97	75-125 %		
9710243-1MSD	0.50	-0.004	0.483	97	75-125 %	0	0-20%

ND = Not Detected

000013

**SULFATE**  
Method 300.0

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0549  
Client Project No:  
Lab Workorder Number: 9710243

Date Collected: 10/22/97  
Date Analyzed: 10/29/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Sulfate Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	1
S97-0549 <sup>6</sup>	9710243-1	100	5
S97-0550 <sup>60</sup>	9710243-2	98	5
S97-0551	9710243-3	80	5
S97-0552 <sup>7</sup>	9710243-4	50	5
S97-0553 <sup>5</sup>	9710243-5	620	50
S97-0554 <sup>14</sup>	9710243-6	95	10
S97-0555	9710243-7	60	10

ND = Not Detected

# SULFATE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9710195-1

Date Analyzed: 10/29/97

Sample Matrix: Water

Sample ID

IN HOUSE

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Sulfate	400	52	435	96	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Sulfate	400	443	98	2	0-15 %

000015

# TOTAL DISSOLVED SOLIDS

Method 160.1

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0549  
Client Project No:  
Lab Workorder Number: 9710243

Date Collected: 10/22/97  
Date Prepared: 10/28/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Total Dissolved Solids Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	20
S97-0549 <sup>6</sup>	9710243-1	6500	400
S97-0550 <sup>6D</sup>	9710243-2	6200	400
S97-0551	9710243-3	370	20
S97-0552 <sup>7</sup>	9710243-4	7500	400
S97-0553 <sup>5</sup>	9710243-5	2000	100
S97-0554 <sup>14</sup>	9710243-6	440	20
S97-0555	9710243-7	440	20

ND = Not Detected

000016

# TDS Calculations and Quality Control Results

Preparation Date: October 28, 1997

ID	sample vol (mL)	empty beaker tare (g)	A beaker + residue gross (g)	A net (mg)	B beaker + residue gross (g)	B net (mg)	gross A vs gross B RPD %	calculated TDS conc (mg/L)	TDS DL (mg/L)
Method Blank	100	67.5775	67.5765	-1.0	67.5763	-1.2	0.000	-12	20
Blank Spike	100	66.3878	66.4272	39.4	66.4268	39.0	0.001	390	20
9710243-1	5	79.3073	79.3406	33.3	79.3396	32.3	0.001	6460	400
9710243-2	5	80.9100	80.9420	32.0	80.9411	31.1	0.001	6220	400
9710243-3	100	81.4346	81.4723	37.7	81.4716	37.0	0.001	370	20
9710243-3 dup	100	67.8177	67.8561	38.4	67.8549	37.2	0.002	372	20
9710243-4	5	73.7667	73.8053	38.6	73.8042	37.5	0.001	7500	400
9710243-5	20	80.4937	80.5346	40.9	80.5331	39.4	0.002	1970	100
9710243-6	100	66.5543	66.6000	45.7	66.5985	44.2	0.002	442	20
9710243-7	100	81.2807	81.3270	46.3	81.3247	44.0	0.003	440	20
9710253-1	20	72.8400	72.8768	36.8	72.8728	32.8	0.005	1640	100
9710253-2	20	78.8339	78.8541	20.2	78.8509	17.0	0.004	850	100
9710253-3	20	68.1549	68.1888	33.9	68.1843	29.4	0.007	1470	100
9710253-4	100	80.7447	80.7866	41.9	80.7847	40.0	0.002	400	20
9710253-5	100	72.9564	72.9969	40.5	72.9952	38.8	0.002	388	20
9710253-6	100	85.5572	85.5573	0.1	85.5559	-1.3	0.002	-13	20
9710253-6 dup	100	79.8285	79.8286	0.1	79.8272	-1.3	0.002	-13	20

## BLANK SUMMARY

ID	blank conc (mg/L)	accept. limit (mg/L)
Method Blank	-12	< 20

## BLANK SPIKE SUMMARY

ID	spike added (g)	spike added conc (mg/L)	spiked sample conc (mg/L)	recovery %	accept. limits
Blank Spike	40.0	400	390	98	85-115%

## DUPLICATE SUMMARY

ID	sample conc (mg/L)	duplic conc (mg/L)	RPD %	accept. limits
9710243-3 dup	370	372	0.5	0-15%
9710253-6 dup	ND	ND	NA	0-15%

ND = Not Detected  
NA = Not Applicable

000017



# Paragon Analytics, Inc.

## TOTAL RECOVERABLE METALS CASE NARRATIVE

---

### El Paso Natural Gas Co.

S97-0549

Order Number - 9710243

1. This report consists of 7 water samples.
  2. The samples were received intact on 10/24/97. The temperature of the samples upon receipt was 15° Celsius.
  3. The samples had been correctly preserved for the requested analyses.
  4. The samples were prepared for analysis based on SW-846, 3<sup>rd</sup> Edition procedures. For analysis by conventional ICP, the samples were digested following method 3005A.
  5. The samples were analyzed following SW846 protocols by conventional ICP (Method 6010A).
  6. All standards and solutions are NIST traceable and were used within their recommended shelf life.
  7. The samples were prepared and analyzed within the established hold times.
  8. Sample results which are below PAI's standard reporting limits are reported as "ND" on the enclosed report.
- All in house quality control procedures were followed, as described below.
9. General quality control procedures.
    - A preparation (method) blank and laboratory control sample were digested and analyzed with the samples in this digestion batch. There were not more than 20 samples in the digestion batch.
    - The preparation (method) blank results associated with this batch were below the reporting limits for the requested analytes. This indicates that no contaminants were introduced to the samples during the digestion procedure.



- The laboratory control sample associated with this batch was within acceptance limits. This indicates complete digestion according to the method.
- All initial and continuing calibration blanks associated with this batch were below the reporting limits for the requested analytes. This indicates a valid calibration and stable instrument conditions.
- All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analytes. This indicates a valid calibration and stable instrument conditions.
- The interference check samples, and high standard readbacks associated with Method 6010A analyses were within acceptance criteria.

10. A sample from another Order Number was used as the QC sample for this batch.

- A matrix spike and matrix spike duplicate were digested and analyzed with this batch. All acceptance criteria for accuracy were met.
- A sample duplicate and spike duplicate were digested and analyzed with this batch. All acceptance criteria for precision were met.
- A serial dilution was analyzed with this batch. All acceptance criteria were met.

11. Hardness was determined from calcium and magnesium values determined by Trace ICP and calculated using the following formula.

$$\text{mg CaCO}_3/\text{L} = (2.497 * \text{Ca conc. (mg/L)}) + (4.118 * \text{Mg conc. (mg/L)})$$

PAI Sample ID: 9710243-1 - 240  
9710243-2 - 250  
9710243-3 - 170  
9710243-4 - 820  
9710243-5 - 520  
9710243-6 - 180  
9710243-7 - 220



The data contained in the following report have been reviewed and approved by the personnel listed below:

Darryl Patrick

Darryl Patrick

Senior Inorganic Chemist

11/6/97

Date

SW

Reviewer's Initials

11/6/97

Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# Paragon Analytics, Incorporated

## Sample Number(s) Cross-Reference Table

---

Paragon OrderNum: 9710243

Client Name: El Paso Natural Gas Co.

Client Project Name: S97-0549

Client Project Number:

Client PO Number:

---

Client Sample	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
S97-0549	9710243-1		Water	10/22/97	9:20
S97-0550	9710243-2		Water	10/22/97	9:20
S97-0551	9710243-3		Water	10/22/97	10:15
S97-0552	9710243-4		Water	10/22/97	13:33
S97-0553	9710243-5		Water	10/22/97	15:32
S97-0554	9710243-6		Water	10/22/97	17:00
S97-0555	9710243-7		Water	10/22/97	19:00

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0549  
Lab Sample ID: RB 9710243

Sample ID

**Reagent Blank**

Date Collected: N/A  
Prep Date: 10/29/97  
Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	ND	0.1
Calcium	ND	1
Copper	ND	0.01
Iron	ND	0.1
Magnesium	ND	1
Manganese	ND	0.01
Potassium	ND	1
Silicon	ND	0.05
Sodium	ND	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

000005

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0549  
Lab Sample ID: 9710243-1

Sample ID

**S97-0549**

6

Sample Matrix: Water

Date Collected: 10/22/97

Prep Date: 10/29/97

Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.9	0.1
Calcium	68	1
Copper	ND	0.01
Iron	2.6	0.1
Magnesium	19	1
Manganese	0.11	0.01
Potassium	3	1
Silicon	21	0.05
Sodium *	2200	10
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

\* Detection limit raised. Dilution required due to analyte concentration.

000006

JP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0549  
Lab Sample ID: 9710243-2

Sample Matrix: Water

Sample ID

**S97-0550**

Date Collected: 10/22/97

Prep Date: 10/29/97

Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.9	0.1
Calcium	68	1
Copper	ND	0.01
Iron	2.3	0.1
Magnesium	19	1
Manganese	0.11	0.01
Potassium	3	1
Silicon	21	0.05
Sodium *	2200	10
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

\* Detection limit raised. Dilution required due to analyte concentration.

0000078

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0549  
Lab Sample ID: 9710243-3

Sample Matrix: Water

Sample ID

**S97-0551**

Date Collected: 10/22/97

Prep Date: 10/29/97

Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.2	0.1
Calcium	44	1
Copper	ND	0.01
Iron	ND	0.1
Magnesium	15	1
Manganese	ND	0.01
Potassium	3	1
Silicon	23	0.05
Sodium	60	1
Zinc	0.09	0.02

ND = Not detected at or above the reporting limit.

000008

SP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0549  
Lab Sample ID: 9710243-4

Sample Matrix: Water

Sample ID

**S97-0552**

7

Date Collected: 10/22/97

Prep Date: 10/29/97

Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.6	0.1
Calcium	200	1
Copper	ND	0.01
Iron	14.4	0.1
Magnesium	80	1
Manganese	0.2	0.01
Potassium	3	1
Silicon	18	0.05
Sodium *	2500	10
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

\* Detection limit raised. Dilution required due to analyte concentration.

000009

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0549  
Lab Sample ID: 9710243-5

Sample Matrix: Water

Sample ID

**S97-0553**

5

Date Collected: 10/22/97

Prep Date: 10/29/97

Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	1.3	0.1
Calcium	170	1
Copper	ND	0.01
Iron	0.5	0.1
Magnesium	24	1
Manganese	ND	0.01
Potassium	5	1
Silicon	26	0.05
Sodium	480	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

000010

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0549  
Lab Sample ID: 9710243-6

Sample Matrix: Water

Sample ID

**S97-0554**

Date Collected: 10/22/97

Prep Date: 10/29/97

Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.2	0.1
Calcium	46	1
Copper	ND	0.01
Iron	0.3	0.1
Magnesium	16	1
Manganese	0.01	0.01
Potassium	5	1
Silicon	20	0.05
Sodium	81	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

000011

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0549  
Lab Sample ID: 9710243-7

Sample Matrix: Water

Sample ID

**S97-0555**

Date Collected: 10/22/97  
Prep Date: 10/29/97  
Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.1	0.1
Calcium	59	1
Copper	ND	0.01
Iron	1.4	0.1
Magnesium	18	1
Manganese	0.02	0.01
Potassium	4	1
Silicon	24	0.05
Sodium	57	1
Zinc	0.24	0.02

ND = Not detected at or above the reporting limit.

# TOTAL RECOVERABLE METALS MATRIX SPIKE

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Lab Sample ID: 9710215-1

Sample ID

**In House**

Sample Matrix: Water

Prep Date: 10/29/97

Date Analyzed: 11/04/97

Analyte	Spike Added mg/L	Sample Conc. mg/L	MS Conc. mg/L	% Rec (limits 80-120%)	Flags
Boron	1.0	< 0.1	0.9	90	
Calcium	40	< 1	41	103	
Copper	0.25	< 0.01	0.25	100	
Iron	1.0	< 0.1	1.0	100	
Magnesium	40	< 1	41	103	
Manganese	0.50	< 0.01	0.49	98	
Potassium	40	< 1	40	100	
Silicon	0.5	< 0.1	0.5	100	
Sodium	40	< 1	41	103	
Zinc	0.50	< 0.02	0.49	98	

000013 DP

# TOTAL RECOVERABLE METALS MATRIX SPIKE DUPLICATE

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Lab Sample ID: 9710215-1

Sample ID

**In House**

Sample Matrix: Water

Prep Date: 10/29/97

Date Analyzed: 11/04/97

Analyte	MSD Conc. mg/L	MSD % Rec (limits 80-120%)	Relative % Difference (limits 0-20%)	Flags
Boron	0.9	90	0	
Calcium	41	103	0	
Copper	0.24	96	4	
Iron	0.9	90	11	
Magnesium	41	103	0	
Manganese	0.49	98	0	
Potassium	40	100	0	
Silicon	0.5	100	0	
Sodium	41	103	0	
Zinc	0.50	100	2	

900014

DP



# Paragon Analytics, Inc.

## Aromatic Volatile Organics Case Narrative

---

### El Paso Natural Gas Co.

S97-0549

Order Number - 9710243

1. This report consists of 7 water samples received by Paragon on 10/24/97.
2. These samples were prepared and analyzed according to SW-846, 3rd Edition procedures. Specifically, the water samples were prepared by heating and purging 5 mls using purge and trap procedures based on Method 5030. The calibration curve was also prepared using the heated purge.
3. The samples were analyzed using a GC with a DB-VRX capillary column and a PID detector according to protocols based on SW-846 Method 8020. All positive results were quantitated using the responses from the initial calibration curve using the internal standard technique. Second column confirmation was performed on all samples with positive results on a DB-624 capillary column.
4. All samples were analyzed within the established holding times.
5. The method blank associated with this project was below the reporting limits for all analytes.
6. All matrix spike and matrix spike duplicate recoveries and RPDs were within acceptance criteria.
7. All blank spike and blank spike duplicate recoveries and RPDs were within the acceptance criteria.
8. All surrogate recoveries were within acceptance criteria.



9. All internal standard recoveries were within acceptance criteria.
10. All initial and continuing calibration criteria were within acceptance criteria.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Marty D Brown

Marty Brown  
GC Analyst

11-7-97

Date

RSB

Reviewer's Initials

11/9/97

Date

# Paragon Analytics, Incorporated

## Sample Number(s) Cross-Reference Table

---

Paragon OrderNum: 9710243

Client Name: El Paso Natural Gas Co.

Client Project Name: S97-0549

Client Project Number:

Client PO Number:

---

Client Sample	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
S97-0549	9710243-1		Water	10/22/97	9:20
S97-0550	9710243-2		Water	10/22/97	9:20
S97-0551	9710243-3		Water	10/22/97	10:15
S97-0552	9710243-4		Water	10/22/97	13:33
S97-0553	9710243-5		Water	10/22/97	15:32
S97-0554	9710243-6		Water	10/22/97	17:00
S97-0555	9710243-7		Water	10/22/97	19:00

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0549

**Reagent Blank**

Lab Sample ID: WRB1 10/29/97

Date Collected: N/A  
Date Extracted: 10/29/97  
Date Analyzed: 10/29/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	97	88 - 119

ND = Not Detected at or above client requested reporting limit.

000004

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0549**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0549

Lab Sample ID: 9710243-1

Date Collected: 10/22/97

Date Extracted: 10/29/97

Date Analyzed: 10/29/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	10	0.50
Toluene	3.8	0.50
Ethylbenzene	1.4	0.50
M,P-Xylene	ND	1.0
O-Xylene	1.2	0.50
Total Xylenes	1.2	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	93	88 - 119

ND = Not Detected at or above client requested reporting limit.

000005

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0549

**S97-0550**

LD

Lab Sample ID: 9710243-2

Date Collected: 10/22/97

Date Extracted: 10/29/97

Date Analyzed: 10/29/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	9.5	0.50
Toluene	3.1	0.50
Ethylbenzene	1.2	0.50
M,P-Xylene	ND	1.0
O-Xylene	1.2	0.50
Total Xylenes	1.2	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	93	88 - 119

ND = Not Detected at or above client requested reporting limit.

000006

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0551**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0549

Lab Sample ID: 9710243-3

Date Collected: 10/22/97  
Date Extracted: 10/29/97  
Date Analyzed: 10/29/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	97	88 - 119

ND = Not Detected at or above client requested reporting limit.

000007

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0552**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0549

Lab Sample ID: 9710243-4

Date Collected: 10/22/97  
Date Extracted: 10/29/97  
Date Analyzed: 10/29/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	6.4	0.50
Toluene	3.4	0.50
Ethylbenzene	3.0	0.50
M,P-Xylene	2.1	1.0
O-Xylene	0.89	0.50
Total Xylenes	3.0	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	96	88 - 119

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0553**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0549

Lab Sample ID: 9710243-5

Date Collected: 10/22/97  
Date Extracted: 10/29/97  
Date Analyzed: 10/30/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	0.90	0.50
Toluene	1.6	0.50
Ethylbenzene	0.80	0.50
M,P-Xylene	1.3	1.0
O-Xylene	0.62	0.50
Total Xylenes	1.9	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	97	88 - 119

ND = Not Detected at or above client requested reporting limit.

000009

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0554**

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0549

Lab Sample ID: 9710243-6

Date Collected: 10/22/97

Date Extracted: 10/29/97

Date Analyzed: 10/29/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	1.2	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	1.0	1.0
O-Xylene	0.54	0.50
Total Xylenes	1.5	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	95	88 - 119

ND = Not Detected at or above client requested reporting limit.

000010

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0555**

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0549

Lab Sample ID: 9710243-7

Date Collected: 10/22/97

Date Extracted: 10/29/97

Date Analyzed: 10/29/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	96	88 - 119

ND = Not Detected at or above client requested reporting limit.

000011

# AROMATIC VOLATILE ORGANICS BLANK SPIKE

Method 8020

Sample ID

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0549

**Blank Spike**

Lab Sample ID: WBS1 10/29/97

Date Extracted: 10/29/97

Date Analyzed: 10/29/97

Sample Matrix: Water

Sample Volume: 5 mL

Analyte	Spike Added (ug/L)	BS Concentration (ug/L)	BS Percent Recovery	QC Limits % Rec
Benzene	40.0	38.9	97	85 - 115
Toluene	40.0	39.7	99	85 - 115
Ethylbenzene	40.0	40.2	101	85 - 115
M,P-Xylene	80.0	82.6	103	85 - 115
O-Xylene	40.0	40.5	101	85 - 115
Total Xylenes	120	123	103	85 - 115

Analyte	Spike Added (ug/L)	BSD Concentration (ug/L)	BSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	38.4	96	1	20
Toluene	40.0	38.8	97	2	20
Ethylbenzene	40.0	39.3	98	2	20
M,P-Xylene	80.0	80.4	101	3	20
O-Xylene	40.0	39.4	99	3	20
Total Xylenes	120	120	100	3	20

## SURROGATE RECOVERY BS/BS

Analyte	% Recovery BS	% Recovery BSD	% Rec Limits
2,3,4-Trifluorotoluene	96	96	88 - 119

D = Detected

000010

# AROMATIC VOLATILE ORGANICS MATRIX SPIKE

Method 8020

Sample ID

In House

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0549

Date Collected: 10/23/97  
Date Extracted: 10/29/97  
Date Analyzed: 10/29/97

Lab Sample ID: 9710251-1MS

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Spike Added (ug/L)	Sample Concentration (ug/L)	MS Concentration (ug/L)	MS Percent Recovery	QC Limits % Rec
Benzene	40.0	ND	38.5	96	85 - 115
Toluene	40.0	ND	39.1	98	85 - 115
Ethylbenzene	40.0	ND	39.1	98	85 - 115
M,P-Xylene	80.0	ND	79.6	100	85 - 115
O-Xylene	40.0	ND	39.3	98	85 - 115
Total Xylenes	120	ND	119	99	85 - 115

Analyte	Spike Added (ug/L)	MSD Concentration (ug/L)	MSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	37.8	94	2	20
Toluene	40.0	39.0	98	0	20
Ethylbenzene	40.0	39.1	98	0	20
M,P-Xylene	80.0	79.8	100	0	20
O-Xylene	40.0	39.4	99	0	20
Total Xylenes	120	119	99	0	20

## SURROGATE RECOVERY MS/MSD

Analyte	% Recovery MS	% Recovery MSD	% Rec Limits
2,3,4-Trifluorotoluene	94	95	88 - 119

ND = Not Detected

000013

# Paragon Analytics, Inc.



## SPECIFIC CONDUCTANCE CASE NARRATIVE

### **El Paso Natural Gas Co.**

S97-0549

**Order Number - 9710243**

1. This report consists of seven water samples.
2. The samples were received intact at a temperature of 15° C. on October 24, 1997.
3. The samples were prepared for analysis based on SW-846 Method 9050.
4. All standards and solutions are NIST traceable and were used within their recommended shelf life.

All in house quality control procedures were followed, as described below.

5. General quality control procedures.
  - All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analyte. This indicates a valid calibration and stable instrument conditions.
6. PAI sample ID 9710243-4 was used as the matrix QC sample for this batch.
  - A duplicate was prepared and analyzed with this batch, all acceptance criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below:



Krista Mobley  
Krista Mobley  
Inorganic Technician

11-10-97  
Date

SW  
Reviewer's Initials

11/10/97  
Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# Paragon Analytics, Incorporated

## Sample Number(s) Cross-Reference Table

---

Paragon OrderNum: 9710243

Client Name: El Paso Natural Gas Co.

Client Project Name: S97-0549

Client Project Number:

Client PO Number:

---

Client Sample	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
S97-0549	9710243-1		Water	10/22/97	9:20
S97-0550	9710243-2		Water	10/22/97	9:20
S97-0551	9710243-3		Water	10/22/97	10:15
S97-0552	9710243-4		Water	10/22/97	13:33
S97-0553	9710243-5		Water	10/22/97	15:32
S97-0554	9710243-6		Water	10/22/97	17:00
S97-0555	9710243-7		Water	10/22/97	19:00

# Specific Conductance in Water

Method SW9050

## Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0549

Work Order Number: 9710243

Reporting Basis: As Received

Printed on: Monday, November 10, 1997

Final Volume: 20 ML

Matrix: Water

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Units	Detection Limit	Flag	Sample Aliquot
S97-0549 6	9710243-1	10/22/97	11/4/97	11/4/97		1	10200	umhos/cm			20 ML
S97-0550 6D	9710243-2	10/22/97	11/4/97	11/4/97		1	10700	umhos/cm			20 ML
S97-0551	9710243-3	10/22/97	11/4/97	11/4/97		1	630	umhos/cm			20 ML
S97-0552 7	9710243-4	10/22/97	11/4/97	11/4/97		1	13800	umhos/cm			20 ML
S97-0553 5	9710243-5	10/22/97	11/4/97	11/4/97		1	3160	umhos/cm			20 ML
S97-0554 11	9710243-6	10/22/97	11/4/97	11/4/97		1	747	umhos/cm			20 ML
S97-0555	9710243-7	10/22/97	11/4/97	11/4/97		1	742	umhos/cm			20 ML

### Comments:

1. ND = Not Detected at or above the client requested detection limit.

000004

# Specific Conductance in Water

Method SW9050

## Duplicate Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

ClientName: El Paso Natural Gas Co.

Client Project ID: S97-0549

Work Order Number: 9710243

Reporting Basis: As Received

Sample Aliquot: 20 ML

Final Volume: 20ML

Matrix: Water

Reported on: Monday, November 10, 1997

Client Sample ID	Lab ID	Date Prepared	Date Analyzed	Dilution Factor	Duplicate Result	Units	Sample Result	Detection Limit	Flag	RPD	RPD Limit
S97-0552	9710243-4	11/4/97	11/4/97	1	13900	umhos/cm	13800			1	

### Comments:

1. ND = Not Detected at or above the client requested detection limit.

900005

# Paragon Analytics, Inc.



## PH ANALYSIS CASE NARRATIVE

---

### **El Paso Natural Gas Co.**

S97-0549

**Order Number - 9710243**

1. This report consists of seven water samples.
  2. The samples were received intact at a temperature of 15<sup>0</sup> C. on October 24, 1997.
  3. The samples were prepared for analysis based on SW-846, 3<sup>rd</sup> Edition procedures. Specifically, the water samples were analyzed following Method 9040.
  4. All standards and solutions were used within their recommended shelf life.
- All in house quality control procedures were followed, as described below.
5. General quality control procedures.
    - All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analyte. This indicates a valid calibration and stable instrument conditions.
  6. PAI sample ID 9710243-4 was used as the matrix QC sample for this batch.
    - A duplicate was prepared and analyzed with this batch, all acceptance criteria were met.

000001

The data contained in the following report have been reviewed and approved by the personnel listed below:



Krista Mobley  
Krista Mobley  
Inorganic Technician

11-7-97  
Date

SW  
Reviewer's Initials

11/7/97  
Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# Paragon Analytics, Incorporated

## Sample Number(s) Cross-Reference Table

---

Paragon OrderNum: 9710243

Client Name: El Paso Natural Gas Co.

Client Project Name: S97-0549

Client Project Number:

Client PO Number:

---

Client Sample	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
S97-0549	9710243-1		Water	10/22/97	9:20
S97-0550	9710243-2		Water	10/22/97	9:20
S97-0551	9710243-3		Water	10/22/97	10:15
S97-0552	9710243-4		Water	10/22/97	13:33
S97-0553	9710243-5		Water	10/22/97	15:32
S97-0554	9710243-6		Water	10/22/97	17:00
S97-0555	9710243-7		Water	10/22/97	19:00

# pH in Water

Method SW9040

## Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0549

Work Order Number: 9710243

Reporting Basis: As Received

Printed on: Thursday, November 06, 1997

Final Volume: 50 ML

Matrix: Water

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Units	Detection Limit	Flag	Sample Aliquot
S97-0549 6	9710243-1	10/22/97	11/4/97	11/4/97		1	8.2	PH			50 ML
S97-0550 6D	9710243-2	10/22/97	11/4/97	11/4/97		1	8.3	PH			50 ML
S97-0551	9710243-3	10/22/97	11/4/97	11/4/97		1	8	PH			50 ML
S97-0552 7	9710243-4	10/22/97	11/4/97	11/4/97		1	7.3	PH			50 ML
S97-0553 5	9710243-5	10/22/97	11/4/97	11/4/97		1	7.7	PH			50 ML
S97-0554 ND	9710243-6	10/22/97	11/4/97	11/4/97		1	8.1	PH			50 ML
S97-0555	9710243-7	10/22/97	11/4/97	11/4/97		1	7.9	PH			50 ML

### Comments:

1. ND = Not Detected at or above the client requested detection limit

000004

# pH in Water

Method SW9040

## Duplicate Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

ClientName: El Paso Natural Gas Co.

Client Project ID: S97-0549

Work Order Number: 9710243

Reporting Basis: As Received

Sample Aliquot: 50 ML

Final Volume: 50ML

Matrix: Water

Reported on: Thursday, November 06, 1997

Client Sample ID	Lab ID	Date Prepared	Date Analyzed	Dilution Factor	Duplicate Result	Units	Sample Result	Detection Limit	Flag	RPD	RPD Limit
S97-0552	9710243-4	11/4/97	11/4/97	1	7.2	PH	7.3			1	

### Comments:

1. ND = Not Detected at or above the client requested detection limit.

000005



# PARAGON ANALYTICS, INC.

225 Commerce Drive ♦ Fort Collins, CO 80524 ♦ (800) 443-1511 ♦ (970) 490-1511 ♦ FAX (970) 490-1522

November 13, 1997

Mr. Darrell Campbell  
El Paso Natural Gas Co.  
8645 Railroad Drive  
El Paso, TX 79904

RE: Paragon Workorder: 97-10-253  
Client Project Name: S97-0556  
Client Project Number: Not Submitted

Dear Mr. Campbell:

Six water samples were received from El Paso Natural Gas Co. on October 27, 1997. The samples were scheduled for the following analyses:

Specific Conductance	pages 1-5
Aromatic Volatile Organics	pages 1-11
Inorganics	pages 1-16
pH	pages 1-5
Total Recoverable Metals	pages 1-14

The results for these analyses are contained in the enclosed reports.

Thank you for your confidence in Paragon Analytics, Inc. Should you have any questions, please call.

Sincerely,

Paragon Analytics, Inc.  
Victoria Bayly  
Project Manager

VB/nmu  
Enclosure: report



9710253

Page \_\_\_\_\_ of \_\_\_\_\_

[illegible]

## CONDITION OF SAMPLE UPON RECEIPT

CLIENT: EPNGSHIPPING CONTAINER #: CoolerWORKORDER NO. 9710251, 252, 253INITIALS: BDATE: 10/27/97

1. Does this project require special handling according to NEESA, Level 3, or CLP protocols? If yes, complete a. and b. a. Cooler Temperature _____ b. Lot No's. _____ c. Airbill Number _____	Yes	<u>No</u>
2. Are custody seals on the cooler intact? If so, how many	<u>N/A</u>	No
3. Are custody seals on sample containers intact?	<u>N/A</u>	No
4. Is there a Chain of Custody (COC) or other representative documents, letters or shipping memos?	<u>Yes</u>	No
5. Is the COC complete? Relinquished: Yes <input checked="" type="checkbox"/> No Requested Analysis: Yes <input checked="" type="checkbox"/> No	<u>N/A</u>	No
6. Is the COC in agreement with the samples received? No. of Samples: Yes <input checked="" type="checkbox"/> No Sample ID's: Yes <input checked="" type="checkbox"/> No Matrix: Yes <input checked="" type="checkbox"/> No No. of Containers: Yes <input checked="" type="checkbox"/> No	<u>Yes</u>	No
7. Are the samples requiring chemical preservation preserved correctly?	<u>N/A</u>	No
8. Is there enough sample? If so, are they in the proper containers?	<u>Yes</u>	No
9. Are all samples within holding times for the requested analyses?	<u>Yes</u>	No
10. Were the sample(s) shipped on ice?	<u>N/A</u>	No
11. Were all sample containers received intact? (not broken or leaking, etc.)	<u>Yes</u>	No
12. Are samples requiring no headspace, headspace free?	<u>N/A</u>	No
13. Do the samples require quarantine?	<u>Yes</u>	No
14. Do samples require Paragon disposal?	<u>Yes</u>	No
15. Did the client return any unused bottles?	<u>Yes</u>	No

Describe "NO" items (except No's 1, 13, &amp; 14):

ice expired - samples were not del. on Sat due to snow storm.

Was the client contacted? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, Date: \_\_\_\_\_ Name of person contacted: \_\_\_\_\_

Describe actions taken or client instructions: \_\_\_\_\_

Group Leader's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Cooler Temperature: 12°C

# Paragon Analytics, Inc.



## SPECIFIC CONDUCTANCE CASE NARRATIVE

**El Paso Natural Gas Co.**

**S97-0556**

**Order Number - 9710253**

1. This report consists of six water samples.
2. The samples were received intact at a temperature of 12° C. on October 27, 1997.
3. The samples were prepared for analysis based on SW-846 Method 9050.
4. All standards and solutions are NIST traceable and were used within their recommended shelf life.

All in house quality control procedures were followed, as described below.

5. General quality control procedures.
  - All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analyte. This indicates a valid calibration and stable instrument conditions.
6. A sample from another Order Number was used as the matrix QC sample for this batch.
  - A duplicate was prepared and analyzed with this batch, all acceptance criteria were met.

# Paragon Analytics, Incorporated

## Sample Number(s) Cross-Reference Table

---

Paragon OrderNum: 9710253

Client Name: El Paso Natural Gas Co.

Client Project Name: S97-0556

Client Project Number: None Submitted

Client PO Number:

---

Client Sample	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
S97-0556	9710253-1		Water	10/23/97	7:55
S97-0557	9710253-2		Water	10/23/97	11:00
S97-0558	9710253-3		Water	10/23/97	12:50
S97-0559	9710253-4		Water	10/23/97	15:23
S97-0560	9710253-5		Water	10/23/97	15:35
S97-0606	9710253-6		Water	10/23/97	17:05

# Specific Conductance in Water

Method SW9050

## Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: None Submitted S97-0556

Work Order Number: 9710253

Reporting Basis: As Received

Printed on: Friday, November 07, 1997

Final Volume: 20 ML

Matrix: Water

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Units	Detection Limit	Flag	Sample Aliquot
S97-0556 9	9710253-1	10/23/97	11/5/97	11/5/97		1	3380	umhos/cm			20 ML
S97-0557 12	9710253-2	10/23/97	11/5/97	11/5/97		1	1810	umhos/cm			20 ML
S97-0558 10	9710253-3	10/23/97	11/5/97	11/5/97		1	2870	umhos/cm			20 ML
S97-0559 13	9710253-4	10/23/97	11/5/97	11/5/97		1	728	umhos/cm			20 ML
S97-0560	9710253-5	10/23/97	11/5/97	11/5/97		1	753	umhos/cm			20 ML
S97-0606	9710253-6	10/23/97	11/5/97	11/5/97		1	5.83	umhos/cm			20 ML

### Comments:

1. ND = Not Detected at or above the client requested detection limit.

KM

# Specific Conductance in Water

Method SW9050

## Duplicate Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

ClientName: El Paso Natural Gas Co.

Client Project ID: None Submitted S97-0556

Work Order Number: 9710253

Reporting Basis: As Received

Reported on: Friday, November 07, 1997

Sample Aliquot: 20 ML

Final Volume: 20ML

Matrix: Water

Client Sample ID	Lab ID	Date Prepared	Date Analyzed	Dilution Factor	Duplicate Result	Units	Sample Result	Detection Limit	Flag	RPD	RPD Limit
SHARED QC	9710196-1	11/5/97	11/5/97	1	23000	umhos/cm	23000			0	

### Comments:

1. ND = Not Detected at or above the client requested detection limit.

KM



# Paragon Analytics, Inc.

## Aromatic Volatile Organics Case Narrative

---

**El Paso Natural Gas Co.**

**S97-0556**

**Order Number - 9710253**

1. This report consists of 5 water samples received by Paragon on 10/27/97.
2. These samples were prepared and analyzed according to SW-846, 3rd Edition procedures. Specifically, the water samples were prepared by heating and purging 5 mls using purge and trap procedures based on Method 5030. The calibration curve was also prepared using the heated purge.
3. The samples were analyzed using a GC with a DB-VRX capillary column and a PID detector according to protocols based on SW-846 Method 8020. All positive results were quantitated using the responses from the initial calibration curve using the internal standard technique. Second column confirmation was performed on all samples with positive results on a DB-624 capillary column.
4. All samples were analyzed within the established holding times.
5. The method blank associated with this project was below the reporting limits for all analytes.
6. All matrix spike and matrix spike duplicate recoveries and RPDs were within acceptance criteria.
7. All blank spike and blank spike duplicate recoveries and RPDs were within the acceptance criteria.
8. All surrogate recoveries were within acceptance criteria.



9. All internal standard recoveries were within acceptance criteria.
10. All initial and continuing calibration criteria were within acceptance criteria.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Marty D Brown  
Marty Brown  
GC Analyst

11-12-97  
Date

RRB  
Reviewer's Initials

11/13/97  
Date

# Paragon Analytics, Incorporated

## Sample Number(s) Cross-Reference Table

---

**Paragon OrderNum:** 9710253

**Client Name:** El Paso Natural Gas Co.

**Client Project Name:** S97-0556

**Client Project Number:** None Submitted

**Client PO Number:**

---

Client Sample	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
S97-0556	9710253-1		Water	10/23/97	7:55
S97-0557	9710253-2		Water	10/23/97	11:00
S97-0558	9710253-3		Water	10/23/97	12:50
S97-0559	9710253-4		Water	10/23/97	15:23
S97-0560	9710253-5		Water	10/23/97	15:35
S97-0606	9710253-6		Water	10/23/97	17:05

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**Reagent Blank**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co  
Client Project ID: S97-0556

Lab Sample ID: WRB1 11/6/97

Date Collected: N/A  
Date Extracted: 11/06/97  
Date Analyzed: 11/06/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	97	88 - 119

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0556**

9

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co  
Client Project ID: S97-0556

Lab Sample ID: 9710253-1

Date Collected: 10/23/97

Date Extracted: 11/06/97

Date Analyzed: 11/06/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	96	88 - 119

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0557**

12

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co  
Client Project ID: S97-0556

Lab Sample ID: 9710253-2

Date Collected: 10/23/97  
Date Extracted: 11/06/97  
Date Analyzed: 11/06/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	1.4	0.50
Toluene	0.58	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

## SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	96	88 - 119

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0558**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co  
Client Project ID: S97-0556

Lab Sample ID: 9710253-3

Date Collected: 10/23/97

Date Extracted: 11/06/97

Date Analyzed: 11/06/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	1.14	0.50
Toluene	1.17	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	0.58	0.50
Total Xylenes	0.58	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	95	88 - 119

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0559**

13

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co

Client Project ID: S97-0556

Lab Sample ID: 9710253-4

Date Collected: 10/23/97

Date Extracted: 11/06/97

Date Analyzed: 11/06/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	0.59	0.50
Toluene	0.76	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	94	88 - 119

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0606**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co  
Client Project ID: S97-0556

Lab Sample ID: 9710253-6

Date Collected: 10/23/97

Date Extracted: 11/06/97

Date Analyzed: 11/06/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	0.69	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	96	88 - 119

ND = Not Detected at or above client requested reporting limit.

# AROMATIC VOLATILE ORGANICS BLANK SPIKE

Method 8020

Sample ID

**Blank Spike**

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co

Client Project ID: S97-0556

Lab Sample ID: WBS1 11/6/97

Date Extracted: 11/06/97

Date Analyzed: 11/06/97

Sample Matrix: Water

Sample Volume: 5 mL

Analyte	Spike Added (ug/L)	BS Concentration (ug/L)	BS Percent Recovery	QC Limits % Rec
Benzene	40.0	37.1	93	85 - 115
Toluene	40.0	38.5	96	85 - 115
Ethylbenzene	40.0	39.2	98	85 - 115
M,P-Xylene	80.0	81.5	102	85 - 115
O-Xylene	40.0	39.9	100	85 - 115
Total Xylenes	120	121	101	85 - 115

Analyte	Spike Added (ug/L)	BSD Concentration (ug/L)	BSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	36.6	92	1	20
Toluene	40.0	37.8	94	2	20
Ethylbenzene	40.0	38.8	97	1	20
M,P-Xylene	80.0	80.0	100	2	20
O-Xylene	40.0	39.4	99	1	20
Total Xylenes	120	119	100	2	20

## SURROGATE RECOVERY BS/BSD

Analyte	% Recovery BS	% Recovery BSD	% Rec Limits
2,3,4-Trifluorotoluene	97	96	88 - 119

D = Detected

# AROMATIC VOLATILE ORGANICS MATRIX SPIKE

Method 8020

Sample ID

**S97-0606**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co  
Client Project ID: S97-0556

Date Collected: 10/23/97  
Date Extracted: 11/06/97  
Date Analyzed: 11/06/97

Lab Sample ID: 9710253-6MS

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Spike Added (ug/L)	Sample Concentration (ug/L)	MS Concentration (ug/L)	MS Percent Recovery	QC Limits % Rec
Benzene	40.0	0.69	37.6	92	85 - 115
Toluene	40.0	ND	38.3	96	85 - 115
Ethylbenzene	40.0	ND	39.4	99	85 - 115
M,P-Xylene	80.0	ND	80.5	101	85 - 115
O-Xylene	40.0	ND	39.7	99	85 - 115
Total Xylenes	120	ND	120	100	85 - 115

Analyte	Spike Added (ug/L)	MSD Concentration (ug/L)	MSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	36.9	91	2	20
Toluene	40.0	38.0	95	1	20
Ethylbenzene	40.0	38.9	97	1	20
M,P-Xylene	80.0	79.8	100	1	20
O-Xylene	40.0	39.4	98	1	20
Total Xylenes	120	119	99	1	20

## SURROGATE RECOVERY MS/MSD

Analyte	% Recovery MS	% Recovery MSD	% Rec Limits
2,3,4-Trifluorotoluene	97	96	88 - 119

ND = Not Detected



# Paragon Analytics, Inc.

## INORGANICS CASE NARRATIVE

---

### El Paso Natural Gas Co.

S97-0556

Order Number - 9710253

1. This report consists of data for 6 water samples analyzed for total alkalinity, bromide, chloride, fluoride, nitrate/nitrite, sulfate and total dissolved solids (TDS).
2. The samples were received cool and intact on 10/27/97.
3. The samples had been correctly preserved for the requested analyses.
4. The samples were analyzed using procedures based on the following methods from the USEPA or *Standard Methods for the Examination of Water and Wastewater*, 17th Ed.:

<u>Analyte</u>	<u>Method</u>
Total Alkalinity	4500-CO <sub>2</sub>
Bromide	300.0
Chloride	300.0
Fluoride	340.2
Nitrate/Nitrite	353.3
Sulfate	300.0
Total Dissolved Solids	160.1

The samples were analyzed for fluoride using an ion selective electrode (Method 340.2) instead of ion chromatography (Method 300.0). The high concentration of chloride in some of the samples interfered with the chromatography for fluoride.

5. All standards and reagents were used within their recommended shelf life.
6. The samples were prepared and analyzed within the established hold times.
7. Sample results which are below the reporting limit are reported as "ND" on the enclosed report.



All in house quality control procedures were followed, as described below.

8. General quality control procedures.

- The method blank results were below the reporting limits for all analyses.
- The LCS results were within acceptance limits for all analyses.
- The MS/MSD results were within acceptance limits for bromide, chloride, fluoride, nitrate/nitrite and sulfate.
- The matrix duplicate results were within acceptance limits for total alkalinity, and TDS.

The data contained in the following report have been reviewed and approved by the personnel listed below:

Jm  
Reporter's Initials

11-7-97  
Date

B5  
Reviewer's Initials

11-7-97  
Date

CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# TOTAL ALKALINITY

Method 4500-CO2

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0556  
Client Project No:  
Lab Workorder Number: 9710253

Date Collected: 10/23/97  
Date Analyzed: 10/28/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Total Alkalinity as CaCO3 Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	5
S97-0556 9	9710253-1	200	50
S97-0557 12	9710253-2	160	50
S97-0558 10	9710253-3	200	50
S97-0559 15	9710253-4	170	50
S97-0560	9710253-5	150	50
S97-0606	9710253-6	ND	5

ND = Not Detected

## Alkalinity Calculations and Quality Control Results

Date analyzed: 10/28/97

ID	aliquot titrated (mL)	titrant normality N	vol to pH 8.3 (mL)	vol to pH 4.5 (mL)	total vol (mL)	HCO <sub>3</sub>	CO <sub>3</sub>	OH	Total	DL
						mg/L as CaCO <sub>3</sub>				(mg/L)
R Blank	100	0.0173	0	0.00	0.00	0	0	0	0.0	5
LCS	100	0.0173	0	11.42	11.42	99	0	0	98.8	5
9710220-1	20	0.0173	0	3.53	3.53	153	0	0	152.7	25
9710220-2	20	0.0173	0	3.68	3.68	159	0	0	159.2	25
9710220-2 dup	20	0.0173	0	3.74	3.74	162	0	0	161.8	25
9710220-3	20	0.0173	0	4.24	4.24	183	0	0	183.4	25
9710220-4	20	0.0173	0	3.71	3.71	161	0	0	160.5	25
9710220-5	20	0.0173	0	3.51	3.51	152	0	0	151.9	25
9710220-6	20	0.0173	0	3.58	3.58	155	0	0	154.9	25
9710220-7	20	0.0173	0	3.66	3.66	158	0	0	158.3	25
9710226-21	20	0.0173	0	3.59	3.59	155	0	0	155.3	25
9710226-22	20	0.0173	0	3.62	3.62	157	0	0	156.6	25
9710226-23	100	0.0173	0	17.76	17.76	154	0	0	153.7	5
9710226-24	100	0.0173	0	0.00	0.00	0	0	0	0.0	5
9710226-25	20	0.0173	0	3.53	3.53	153	0	0	152.7	25
9710226-25 dup	20	0.0173	0	3.70	3.70	160	0	0	160.1	25
9710226-26	20	0.0173	0	3.78	3.78	164	0	0	163.5	25
9710226-27	20	0.0173	0	3.53	3.53	153	0	0	152.7	25
9710243-1	20	0.0173	0	32.23	32.23	1394	0	0	1394.4	25
9710243-2	20	0.0173	0.56	32.20	32.76	1369	48	0	1417.3	25
9710243-3	10	0.0173	0	2.28	2.28	197	0	0	197.3	50
9710243-4	10	0.0173	0	8.39	8.39	726	0	0	726.0	50
9710243-5	10	0.0173	0	3.66	3.66	317	0	0	316.7	50
LCS	100	0.0173	0	11.52	11.52	100	0	0	99.7	5
BLK	100	0.0173	0	0.00	0.00	0	0	0	0.0	5
9710243-6	10	0.0173	0	2.11	2.11	183	0	0	182.6	50
9710243-7	10	0.0173	0	1.71	1.71	148	0	0	148.0	50
9710253-1	10	0.0173	0	2.31	2.31	200	0	0	199.9	50
9710253-1 dup	10	0.0173	0	2.41	2.41	209	0	0	208.5	50
9710253-2	10	0.0173	0	1.88	1.88	163	0	0	162.7	50
9710253-3	10	0.0173	0	2.26	2.26	196	0	0	195.5	50
9710253-4	10	0.0173	0	1.94	1.94	168	0	0	167.9	50
9710253-5	10	0.0173	0	1.73	1.73	150	0	0	149.7	50
9710253-6	100	0.0173	0	0.02	0.02	0	0	0	0.2	5

### Standardization of titrant

Conc Na <sub>2</sub> CO <sub>3</sub> std	Na <sub>2</sub> CO <sub>3</sub>	HCl	HCl
	aliquot	vol	conc
0.0470	5.00	13.56	0.01733
0.0470	5.00	13.66	0.01720
0.0470	5.00	13.52	0.01738

mean = 0.01731

## Alkalinity Quality Control Results

Date analyzed: 10/28/97

### LCS SUMMARY

ID	expected alk conc (mg/L)	alk conc found (mg/L)	recovery %	recovery acceptance limit
LCS	100.0	98.8	99	85-115%
LCS	100.0	99.7	100	85-115%

### DUPLICATE SUMMARY

ID	sample alk conc (mg/L)	duplic alk conc (mg/L)	RPD %	accept. limits
9710220-2 dup	159.2	161.8	1.6	0-15%
9710226-25 dup	152.7	160.1	4.7	0-15%
9710253-1 dup	199.9	208.5	4.2	0-15%

**BROMIDE**  
Method 300.0

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0556  
Client Project No:  
Lab Workorder Number: 9710253

Date Collected: 10/23/97  
Date Analyzed: 11/04/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Bromide Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.2
S97-0556     9	9710253-1	1.3	0.2
S97-0557     12	9710253-2	1.0	0.2
S97-0558     10	9710253-3	1.2	0.2
S97-0559     13	9710253-4	0.4	0.2
S97-0560	9710253-5	1.0	0.2
S97-0606	9710253-6	ND	0.2

ND = Not Detected

# BROMIDE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9710253-6

Date Analyzed: 11/04/97

Sample Matrix: Water

Sample ID

**S97-0606**

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Bromide	5.00	ND	4.88	98	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Bromide	5.00	4.88	98	0	0-15 %

# CHLORIDE

Method 300.0

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0556  
Client Project No:  
Lab Workorder Number: 9710253

Date Collected: 10/23/97  
Date Analyzed: 11/04/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Chloride Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.2
S97-0556 9	9710253-1	880	40
S97-0557 12	9710253-2	380	20
S97-0558 10	9710253-3	670	20
S97-0559 13	9710253-4	50	4
S97-0560	9710253-5	100	2
S97-0606	9710253-6	ND	0.2

ND = Not Detected

# CHLORIDE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9710253-6

Date Analyzed: 11/04/97

Sample Matrix: Water

Sample ID

**S97-0606**

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Chloride	5.00	ND	5.25	105	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Chloride	5.00	4.87	97	8	0-20 %

# FLUORIDE

Method 340.2

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0556  
Client Project No:  
Lab Workorder Number: 9710253

Date Collected: 10/23/97  
Date Analyzed: 11/03/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Fluoride Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.5
S97-0556 9	9710253-1	1.2	0.5
S97-0557 12	9710253-2	1.0	0.5
S97-0558 10	9710253-3	1.0	0.5
S97-0559 13	9710253-4	1.3	0.5
S97-0560	9710253-5	1.6	0.5
S97-0606	9710253-6	ND	0.5

ND = Not Detected

## Fluoride in Liquid Samples Calculations

Date analyzed: 11/03/97

ID	sample aliquot (mg/L)	final vol after dil (mL)	electrode reading (mv)	calc F conc (mg/L)	report F conc (mg/L)	DL (mg/L)
ICV (LCS)	20	20	27	10.12	10.1	0.5
ICB	20	20	152	0.06	0.1	0.5
9710215-1	20	20	161	0.04	0.0	0.5
9710215-1MS	20	20	26	10.54	10.5	0.5
9710215-1MSD	20	20	26	10.54	10.5	0.5
9710215-2	20	20	63	2.33	2.3	0.5
9710215-3	20	20	63	2.33	2.3	0.5
9710215-4	20	20	97	0.58	0.6	0.5
9710215-5	20	20	73	1.55	1.6	0.5
9710215-6	20	20	95	0.63	0.6	0.5
9710215-7	20	20	148	0.07	0.1	0.5
CCV	20	20	27	10.12	10.1	0.5
CCB	20	20	150	0.07	0.1	0.5
9710195-1	20	20	74	1.49	1.5	0.5
9710195-2	20	20	149	0.07	0.1	0.5
9710195-3	20	20	34	7.61	7.6	0.5
9710195-4	20	20	110	0.34	0.3	0.5
9710253-1	20	20	79	1.22	1.2	0.5
9710253-2	20	20	84	0.99	1.0	0.5
9710253-3	20	20	83	1.03	1.0	0.5
9710253-4	20	20	77	1.32	1.3	0.5
9710253-5	20	20	73	1.55	1.6	0.5
9710253-6	20	20	148	0.07	0.1	0.5
CCV	20	20	27	10.12	10.1	0.5
CCB	20	20	149	0.07	0.1	0.5
9710243-1	20	20	15	16.51	16.5	0.5
9710243-2	20	20	14	17.20	17.2	0.5
9710243-3	20	20	88	0.84	0.8	0.5
9710243-3 MS	20	20	24	11.44	11.4	0.5
9710243-3 MSD	20	20	24	11.44	11.4	0.5
9710243-4	20	20	50	3.96	4.0	0.5
9710243-5	20	20	95	0.63	0.6	0.5
9710243-6	20	20	74	1.49	1.5	0.5
9710243-7	20	20	84	0.99	1.0	0.5
CCV	20	20	27	10.12	10.1	0.5
CCB	20	20	145	0.08	0.1	0.5

### STANDARD CURVE

### Regression Output:

std conc (mg/L)	log conc	mv	calc conc	Constant	Std Err of Y Est	R Squared	No. of Observations	Degrees of Freedom
0.5	-0.301	100	0.52	1.483267	0.015546	0.999715	5	3
1	0.000	85	0.95					
5	0.699	44	5.06					
10	1.000	27	10.12					
50	1.699	-12	49.62					
				X Coefficient(s)	-0.0177			
				Std Err of Coef.	0.000172			

## Fluoride Quality Control Results

Date analyzed: 11/03/97

### ICV (LCS) SUMMARY

	spike added F conc (mg/L)	F conc found (mg/L)	recovery %	recovery accpt. limit
ICV (LCS)	10.0	10.1	101	85-115%

### MATRIX SPIKE SUMMARY

	spike F conc added (mg/L)	sample F conc (mg/L)	spike F conc (mg/L)	recovery %	recovery accpt. limit	RPD %	RPD accept. limit
9710215-1MS	10.0	0.0	10.5	105	85-115%		
9710215-1MSD	10.0	0.0	10.5	105	85-115%	0.0	< 15%
9710243-3 MS	10.0	0.8	11.4	106	85-115%		
9710243-3 MSD	10.0	0.8	11.4	106	85-115%	0.0	< 15%

ND = Not Detected

# NITRATE + NITRITE

Method 353.3

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0556  
Client Project No:  
Lab Workorder Number: 9710253

Date Collected: 10/23/97  
Date Analyzed: 11/01/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Nitrate + Nitrite as N Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.05
S97-0556 9	9710253-1	ND	0.05
S97-0557 12	9710253-2	0.34	0.05
S97-0558 10	9710253-3	0.36	0.05
S97-0559 13	9710253-4	1.0	0.1
S97-0560	9710253-5	ND	0.05
S97-0606	9710253-6	0.06	0.05

ND = Not Detected

**SULFATE**  
Method 300.0

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0556  
Client Project No:  
Lab Workorder Number: 9710253

Date Collected: 10/23/97  
Date Analyzed: 11/04/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Sulfate Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	1
S97-0556 9	9710253-1	130	50
S97-0557 12	9710253-2	120	20
S97-0558 10	9710253-3	210	50
S97-0559 15	9710253-4	95	20
S97-0560	9710253-5	57	10
S97-0606	9710253-6	ND	1

ND = Not Detected

# SULFATE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9710253-6

Date Analyzed: 11/04/97

Sample Matrix: Water

Sample ID

**S97-0606**

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Sulfate	20.0	ND	21.3	106	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Sulfate	20.0	20.3	102	4	0-15 %

# TOTAL DISSOLVED SOLIDS

Method 160.1

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0556  
Client Project No:  
Lab Workorder Number: 9710253

Date Collected: 10/23/97  
Date Prepared: 10/28/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Total Dissolved Solids Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	20
S97-0556 9	9710253-1	1600	100
S97-0557 12	9710253-2	850	100
S97-0558 10	9710253-3	1500	100
S97-0559 13	9710253-4	400	20
S97-0560	9710253-5	390	20
S97-0606	9710253-6	ND	20

ND = Not Detected

# TDS Calculations and Quality Control Results

Preparation Date: October 28, 1997

ID	sample vol (mL)	empty beaker tare (g)	A beaker + residue gross (g)	A net (mg)	B beaker + residue gross (g)	B net (mg)	gross A vs gross B RPD %	calculated TDS conc (mg/L)	TDS DL (mg/L)
Method Blank	100	67.5775	67.5765	-1.0	67.5763	-1.2	0.000	-12	20
Blank Spike	100	66.3878	66.4272	39.4	66.4268	39.0	0.001	390	20
9710243-1	5	79.3073	79.3406	33.3	79.3396	32.3	0.001	6460	400
9710243-2	5	80.9100	80.9420	32.0	80.9411	31.1	0.001	6220	400
9710243-3	100	81.4346	81.4723	37.7	81.4716	37.0	0.001	370	20
9710243-3 dup	100	67.8177	67.8561	38.4	67.8549	37.2	0.002	372	20
9710243-4	5	73.7667	73.8053	38.6	73.8042	37.5	0.001	7500	400
9710243-5	20	80.4937	80.5346	40.9	80.5331	39.4	0.002	1970	100
9710243-6	100	66.5543	66.6000	45.7	66.5985	44.2	0.002	442	20
9710243-7	100	81.2807	81.3270	46.3	81.3247	44.0	0.003	440	20
9710253-1	20	72.8400	72.8768	36.8	72.8728	32.8	0.005	1640	100
9710253-2	20	78.8339	78.8541	20.2	78.8509	17.0	0.004	850	100
9710253-3	20	68.1549	68.1888	33.9	68.1843	29.4	0.007	1470	100
9710253-4	100	80.7447	80.7866	41.9	80.7847	40.0	0.002	400	20
9710253-5	100	72.9564	72.9969	40.5	72.9952	38.8	0.002	388	20
9710253-6	100	85.5572	85.5573	0.1	85.5559	-1.3	0.002	-13	20
9710253-6 dup	100	79.8285	79.8286	0.1	79.8272	-1.3	0.002	-13	20

## BLANK SUMMARY

ID	blank conc (mg/L)	accept. limit (mg/L)
Method Blank	-12	< 20

## BLANK SPIKE SUMMARY

ID	spike added (g)	spike added conc (mg/L)	spiked sample conc (mg/L)	recovery %	accept. limits
Blank Spike	40.0	400	390	98	85-115%

## DUPLICATE SUMMARY

ID	sample conc (mg/L)	duplic conc (mg/L)	RPD %	accept. limits
9710243-3 dup	370	372	0.5	0-15%
9710253-6 dup	ND	ND	NA	0-15%

ND = Not Detected

NA = Not Applicable

# Paragon Analytics, Inc.



## PH ANALYSIS CASE NARRATIVE

---

### **El Paso Natural Gas Co.**

S97-0556

**Order Number - 9710253**

1. This report consists of six water samples.
  2. The samples were received intact at a temperature of 12<sup>0</sup> C. on October 27, 1997.
  3. The samples were prepared for analysis based on EPA Method 150.1.
  4. All standards and solutions were used within their recommended shelf life.
- All in house quality control procedures were followed, as described below.
5. General quality control procedures.
    - All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analyte. This indicates a valid calibration and stable instrument conditions.
  6. A sample from another Order Number was used as the matrix QC sample for this batch.
    - A duplicate was prepared and analyzed with this batch, all acceptance criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below:



Krista Mobley  
Krista Mobley  
Inorganic Technician

11-10-97  
Date

SN  
Reviewer's Initials

11/10/97  
Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# Paragon Analytics, Incorporated

## Sample Number(s) Cross-Reference Table

---

Paragon OrderNum: 9710253

Client Name: El Paso Natural Gas Co.

Client Project Name: S97-0556

Client Project Number: None Submitted

Client PO Number:

---

Client Sample	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
S97-0556	9710253-1		Water	10/23/97	7:55
S97-0557	9710253-2		Water	10/23/97	11:00
S97-0558	9710253-3		Water	10/23/97	12:50
S97-0559	9710253-4		Water	10/23/97	15:23
S97-0560	9710253-5		Water	10/23/97	15:35
S97-0606	9710253-6		Water	10/23/97	17:05

**pH in Water**  
**Method EPA150.1**  
**Sample Results**

Page 1 of 1

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: None Submitted S97-0556  
Work Order Number: 9710253  
Reporting Basis: As Received

Printed on: Thursday, November 06, 1997

Final Volume: 20 ML  
Matrix: Water

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Units	Detection Limit	Flag	Sample Aliquot
S97-0556 9	9710253-1	10/23/97	11/5/97	11/5/97		1	7.2	PH			20 ML
S97-0557 12	9710253-2	10/23/97	11/5/97	11/5/97		1	7.5	PH			20 ML
S97-0558 10	9710253-3	10/23/97	11/5/97	11/5/97		1	7.2	PH			20 ML
S97-0559 13	9710253-4	10/23/97	11/5/97	11/5/97		1	8.3	PH			20 ML
S97-0560	9710253-5	10/23/97	11/5/97	11/5/97		1	8.2	PH			20 ML
S97-0606	9710253-6	10/23/97	11/5/97	11/5/97		1	7	PH			20 ML

**Comments:**

1. ND = Not Detected at or above the client requested detection limit.

*Kim*

**pH in Water**  
**Method EPA150.1**  
**Duplicate Sample Results**

Page 1 of 1

Lab Name: Paragon Analytics, Inc.  
ClientName: El Paso Natural Gas Co.  
Client Project ID: None Submitted S97-0556  
Work Order Number: 9710253  
Reporting Basis: As Received

Reported on: Thursday, November 06, 1997

Sample Aliquot: 20 ML  
Final Volume: 20ML  
Matrix: Water

Client Sample ID	Lab ID	Date Prepared	Date Analyzed	Dilution Factor	Duplicate Result	Units	Sample Result	Detection Limit	Flag	RPD	RPD Limit
SHARED QC	9710217-1	11/5/97	11/5/97	1	7.6	PH	7.6			0	

**Comments:**

1. ND = Not Detected at or above the client requested detection limit

*KM*



# Paragon Analytics, Inc.

## TOTAL RECOVERABLE METALS CASE NARRATIVE

---

### El Paso Natural Gas Co.

S97-0556

Order Number - 9710253

1. This report consists of 6 water samples.
2. The samples were received intact on 10/27/97. The temperature of the samples upon receipt was 12° Celsius.
3. The samples had been correctly preserved for the requested analyses.
4. The samples were prepared for analysis based on SW-846, 3<sup>rd</sup> Edition procedures.  
For analysis by conventional ICP, the samples were digested following method 3005A.
5. The samples were analyzed following SW846 protocols by conventional ICP (Method 6010A).
6. All standards and solutions are NIST traceable and were used within their recommended shelf life.
7. The samples were prepared and analyzed within the established hold times.
8. Sample results which are below PAI's standard reporting limits are reported as "ND" on the enclosed report.

All in house quality control procedures were followed, as described below.

9. General quality control procedures.
  - A preparation (method) blank and laboratory control sample were digested and analyzed with the samples in this digestion batch. There were not more than 20 samples in the digestion batch.
  - The preparation (method) blank results associated with this batch were below the reporting limits for the requested analytes. This indicates that no contaminants were introduced to the samples during the digestion procedure.



- The laboratory control sample associated with this batch was within acceptance limits. This indicates complete digestion according to the method.
- All initial and continuing calibration blanks associated with this batch were below the reporting limits for the requested analytes. This indicates a valid calibration and stable instrument conditions.
- All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analytes. This indicates a valid calibration and stable instrument conditions.
- The interference check samples, and high standard readbacks associated with Method 6010A analyses were within acceptance criteria.

10. A sample from another Order Number was used as the QC sample for this batch.

- A matrix spike and matrix spike duplicate were digested and analyzed with this batch. All acceptance criteria for accuracy were met with the following exception.

<u>Analyte</u>	<u>Sample ID</u>
Silicon	9710247-46S & DS

The concentration of silicon in the native sample was greater than 4 times the concentration of matrix spike added during the digestion. When sample concentration is that much greater than the spike added, spike recoveries may not be accurate. The Laboratory Control Sample is included to show that the digestion and analysis were in control.

- A sample duplicate and spike duplicate were digested and analyzed with this batch. All acceptance criteria for precision were met.
- A serial dilution was analyzed with this batch. All acceptance criteria were met.

11. Hardness was determined from calcium and magnesium values determined by Trace ICP and calculated using the following formula.

$$\text{mg CaCO}_3/\text{L} = (2.497 * \text{Ca conc. (mg/L)}) + (4.118 * \text{Mg conc. (mg/L)})$$

PAI Sample ID: 9710253-1 - 1000  
9710253-2 - 590  
9710253-3 - 840  
9710253-4 - 140  
9710253-5 - 180  
9710253-6 - < 2.5



The data contained in the following report have been reviewed and approved by the personnel listed below:

Darryl Patrick

Darryl Patrick  
Senior Inorganic Chemist

11/6/97

Date

SW

Reviewer's Initials

11/6/97

Date

### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# Paragon Analytics, Incorporated

## Sample Number(s) Cross-Reference Table

---

Paragon OrderNum: 9710253

Client Name: El Paso Natural Gas Co.

Client Project Name: S97-0556

Client Project Number: None Submitted

Client PO Number:

---

Client Sample	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
S97-0556	9710253-1		Water	10/23/97	7:55
S97-0557	9710253-2		Water	10/23/97	11:00
S97-0558	9710253-3		Water	10/23/97	12:50
S97-0559	9710253-4		Water	10/23/97	15:23
S97-0560	9710253-5		Water	10/23/97	15:35
S97-0606	9710253-6		Water	10/23/97	17:05

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0556  
Lab Sample ID: RB 9710253

Sample ID

**Reagent Blank**

Date Collected: N/A  
Prep Date: 11/03/97  
Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	ND	0.1
Calcium	ND	1
Copper	ND	0.01
Iron	ND	0.1
Magnesium	ND	1
Manganese	ND	0.01
Potassium	ND	1
Silicon	ND	0.05
Sodium	ND	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0556  
Lab Sample ID: 9710253-1

Sample ID

**S97-0556**

9

Sample Matrix: Water

Date Collected: 10/23/97

Prep Date: 11/03/97

Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.2	0.1
Calcium	270	1
Copper	ND	0.01
Iron	0.6	0.1
Magnesium	84	1
Manganese	0.31	0.01
Potassium	10	1
Silicon	17	0.05
Sodium	320	1
Zinc	0.05	0.02

ND = Not detected at or above the reporting limit.

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0556  
Lab Sample ID: 9710253-2

Sample ID

**S97-0557**

12

Sample Matrix: Water

Date Collected: 10/23/97

Prep Date: 11/03/97

Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.2	0.1
Calcium	150	1
Copper	ND	0.01
Iron	0.2	0.1
Magnesium	54	1
Manganese	0.03	0.01
Potassium	13	1
Silicon	20	0.05
Sodium	120	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0556  
Lab Sample ID: 9710253-3

Sample ID

**S97-0558**

10

Sample Matrix: Water

Date Collected: 10/23/97

Prep Date: 11/03/97

Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.2	0.1
Calcium	220	1
Copper	ND	0.01
Iron	0.2	0.1
Magnesium	71	1
Manganese	0.02	0.01
Potassium	6	1
Silicon	20	0.05
Sodium	140	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0556  
Lab Sample ID: 9710253-4

Sample Matrix: Water

Sample ID

**S97-0559**

Date Collected: 10/23/97

Prep Date: 11/03/97

Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.2	0.1
Calcium	34	1
Copper	ND	0.01
Iron	0.2	0.1
Magnesium	14	1
Manganese	ND	0.01
Potassium	15	1
Silicon	21	0.05
Sodium	84	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

18

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0556  
Lab Sample ID: 9710253-5

Sample ID

**S97-0560**

Sample Matrix: Water

Date Collected: 10/23/97

Prep Date: 11/03/97

Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.2	0.1
Calcium	47	1
Copper	ND	0.01
Iron	0.8	0.1
Magnesium	14	1
Manganese	0.05	0.01
Potassium	4	1
Silicon	17	0.05
Sodium	72	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

20

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0556  
Lab Sample ID: 9710253-6

Sample Matrix: Water

Sample ID

**S97-0606**

Date Collected: 10/23/97

Prep Date: 11/03/97

Date Analyzed: 11/04/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	ND	0.1
Calcium	ND	1
Copper	ND	0.01
Iron	ND	0.1
Magnesium	ND	1
Manganese	ND	0.01
Potassium	ND	1
Silicon	ND	0.05
Sodium	ND	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

DP

# TOTAL RECOVERABLE METALS MATRIX SPIKE

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Lab Sample ID: 9710247-46

Sample ID

In House

Sample Matrix: Water

Prep Date: 11/03/97

Date Analyzed: 11/04/97

Analyte	Spike Added mg/L	Sample Conc. mg/L	MS Conc. mg/L	% Rec (limits 80-120%)	Flags
Boron	1.0	0.1	1.1	100	See note
Calcium	40	140	184	110	
Copper	0.25	< 0.01	0.26	104	
Iron	1.0	2.8	3.8	100	
Magnesium	40	4	47	108	
Manganese	0.50	0.04	0.55	102	
Potassium	40	1	43	105	
Silicon	0.5	17.5	18.5	200	
Sodium	40	44	86	105	
Zinc	0.50	< 0.02	0.52	104	

See note on next page

17

# TOTAL RECOVERABLE METALS MATRIX SPIKE DUPLICATE

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Lab Sample ID: 9710247-46

Sample ID

**In House**

Sample Matrix: Water

Prep Date: 11/03/97

Date Analyzed: 11/04/97

Analyte	MSD Conc. mg/L	MSD % Rec (limits 80-120%)	Relative % Difference (limits 0-20%)	Flags
Boron	1.1	100	0	See note
Calcium	183	108	1	
Copper	0.25	100	4	
Iron	3.8	100	0	
Magnesium	46	105	2	
Manganese	0.54	100	2	
Potassium	42	103	2	
Silicon	18.3	160	1	
Sodium	85	103	1	
Zinc	0.51	102	2	

Note: Due to the large concentration of analyte in the sample, matrix spike recoveries may not be accurate. The Laboratory Control Sample (LCS) is included on a separate page to show that the digestion and analysis were in control.

**TOTAL RECOVERABLE METALS  
LABORATORY CONTROL SAMPLE**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0556  
Order Number: 9710253

Date Analyzed: 11/04/97

Analyte	LCS Result mg/L	LCS True Value mg/L	LCS % Recovery	Limits
Silicon	0.53	0.50	106	80 - 120%

75



# PARAGON ANALYTICS, INC.

225 Commerce Drive ♦ Fort Collins, CO 80524 ♦ (800) 443-1511 ♦ (970) 490-1511 ♦ FAX (970) 490-1522

November 12, 1997

Mr. Darrell Campbell  
El Paso Natural Gas Co.  
8645 Railroad Drive  
El Paso, TX 79904

RE: Paragon Workorder: 97-10-251  
Client Project Name: S97-0607  
Client Project Number: Not Submitted

Dear Mr. Campbell:

One water sample was received from El Paso Natural Gas Co. on October 27, 1997. The sample was scheduled for the following analyses:

Specific Conductance	pages 1-5
Aromatic Volatile Organics	pages 1-7
Inorganics	pages 1-6

The results for these analyses are contained in the enclosed reports.

Thank you for your confidence in Paragon Analytics, Inc. Should you have any questions, please call.

Sincerely,

Paragon Analytics, Inc.  
Victoria Bayly  
Project Manager

VB/jjc  
Enclosure: report



## CHAIN OF CUSTODY RECORD

Page \_\_\_\_\_ of \_\_\_\_\_

9710251

[illegible]

## CONDITION OF SAMPLE UPON RECEIPT

CLIENT: EPNGSHIPPING CONTAINER #: CoolerWORKORDER NO. 9710251, 252, 253INITIALS: BDATE: 10/27/97

1. Does this project require special handling according to NEESA, Level 3, or CLP protocols? If yes, complete a. and b. a. Cooler Temperature _____ b. Lot No's. _____ c. Airbill Number _____	Yes	<u>No</u>
2. Are custody seals on the cooler intact? If so, how many	<u>N/A</u>	No
3. Are custody seals on sample containers intact?	<u>N/A</u>	No
4. Is there a Chain of Custody (COC) or other representative documents, letters or shipping memos?	<u>Yes</u>	No
5. Is the COC complete? Relinquished: Yes <input checked="" type="checkbox"/> No Requested Analysis: Yes <input checked="" type="checkbox"/> No	<u>N/A</u>	No
6. Is the COC in agreement with the samples received? No. of Samples: Yes <input checked="" type="checkbox"/> No Sample ID's: Yes <input checked="" type="checkbox"/> No Matrix: Yes <input checked="" type="checkbox"/> No No. of Containers: Yes <input checked="" type="checkbox"/> No	<u>Yes</u>	No
7. Are the samples requiring chemical preservation preserved correctly?	<u>N/A</u>	No
8. Is there enough sample? If so, are they in the proper containers?	<u>Yes</u>	No
9. Are all samples within holding times for the requested analyses?	<u>Yes</u>	No
10. Were the sample(s) shipped on ice?	<u>N/A</u>	No
11. Were all sample containers received intact? (not broken or leaking, etc.)	<u>Yes</u>	No
12. Are samples requiring no headspace, headspace free?	<u>N/A</u>	No
13. Do the samples require quarantine?	<u>Yes</u>	No
14. Do samples require Paragon disposal?	<u>Yes</u>	No
15. Did the client return any unused bottles?	<u>Yes</u>	No

Describe "NO" items (except No's 1, 13, &amp; 14):

ice expired - samples were not del. on Sat due to snow storm.

Was the client contacted? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, Date: \_\_\_\_\_ Name of person contacted: \_\_\_\_\_

Describe actions taken or client instructions: \_\_\_\_\_

Group Leader's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Cooler Temperature: 12°C



# Paragon Analytics, Inc.

## INORGANICS CASE NARRATIVE

---

### El Paso Natural Gas Co.

S97-0607

Order Number - 9710251

1. This report consists of data for 1 water sample analyzed for chloride and total dissolved solids (TDS).
2. The sample was received cool and intact on 10/27/97.
3. The sample was correctly preserved for the requested analyses.
4. The sample was analyzed using procedures based on the following methods from the USEPA:

<u>Analyte</u>	<u>Method</u>
Chloride	300.0
Total Dissolved Solids	160.1

5. All standards and reagents were used within their recommended shelf life.
6. The sample was prepared and analyzed within the established hold times.
7. Sample results which are below the reporting limit are reported as "ND" on the enclosed report.

All in house quality control procedures were followed, as described below.

8. General quality control procedures.
  - The method blank results were below the reporting limits for both analyses.
  - The LCS results were within acceptance limits for both analyses.
  - The MS/MSD results were within acceptance limits for chloride.
  - The matrix duplicate results were within acceptance limits for TDS.



The data contained in the following report have been reviewed and approved by the personnel listed below:

Bor SM  
Reporter's Initials

11-11-97  
Date

RS  
Reviewer's Initials

11-11-97  
Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# CHLORIDE

Method 300.0

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0607  
Client Project No:  
Lab Workorder Number: 9710251

Date Collected: 10/23/97  
Date Prepared: 11/10/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Chloride Conc (mg/L)	Detection Limit (mg/L)
S97-0607	Method Blank 9710251-1	ND 91	0.2 10

ND = Not Detected

# CHLORIDE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9710251-1

Date Analyzed: 11/10/97

Sample Matrix: Water

Sample ID

**S97-0607**

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Chloride	250	91	347	102	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Chloride	250	338	99	3	0-20 %

# TOTAL DISSOLVED SOLIDS

Method 160.1

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0607  
Client Project No:  
Lab Workorder Number: 9710251

Date Collected: 10/23/97  
Date Prepared: 10/29/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Total Dissolved Solids Conc (mg/L)	Detection Limit (mg/L)
S97-0607	Method Blank 9710251-1	ND 470	20 20

ND = Not Detected

# TDS Calculations and Quality Control Results

Preparation Date: October 29, 1997

ID	sample vol (mL)	empty beaker tare (g)	A beaker + residue gross (g)	A net (mg)	B beaker + residue gross (g)	B net (mg)	gross A vs gross B RPD %	calculated TDS conc (mg/L)	TDS DL (mg/L)
Method Blank	100	67.7518	67.7516	-0.2	67.7514	-0.4	0.000	-4	20
Blank Spike	100	73.0451	73.0851	40.0	73.0849	39.8	0.000	398	20
9710251-1	100	66.7668	66.8135	46.7	66.8135	46.7	0.000	467	20
9710251-1 dup	100	80.9518	81.0002	48.4	81.0002	48.4	0.000	484	20

## BLANK SUMMARY

ID	blank conc (mg/L)	accept. limit (mg/L)
Method Blank	-4	< 20

## BLANK SPIKE SUMMARY

ID	spike added (g)	spike added conc (mg/L)	spiked sample conc (mg/L)	recovery %	accept. limits
Blank Spike	40.0	400	398	99	85-115%

## DUPLICATE SUMMARY

ID	sample conc (mg/L)	duplic conc (mg/L)	RPD %	accept. limits
9710251-1 dup	467	484	3.6	0-15%

ND = Not Detected

NA = Not Applicable

# Paragon Analytics, Inc.



## SPECIFIC CONDUCTANCE CASE NARRATIVE

### **El Paso Natural Gas Co.**

S97-0607

**Order Number - 9710251**

1. This report consists of one water sample.
2. The sample was received intact at a temperature of 12<sup>0</sup> C. on October 27, 1997.
3. The sample was prepared for analysis based on SW-846 Method 9050.
4. All standards and solutions are NIST traceable and were used within their recommended shelf life.

All in house quality control procedures were followed, as described below.

5. General quality control procedures.
  - All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analyte. This indicates a valid calibration and stable instrument conditions.
6. A sample from another Order Number was used as the matrix QC sample for this batch.
  - A duplicate was prepared and analyzed with this batch, all acceptance criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below:



Krista Mobley  
Krista Mobley  
Inorganic Technician

11-10-97  
Date

SN  
Reviewer's Initials

11/10/97  
Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# Paragon Analytics, Incorporated

## Sample Number(s) Cross-Reference Table

---

Paragon OrderNum: 9710251

Client Name: El Paso Natural Gas Co.

Client Project Name: S97-0607

Client Project Number: None Submitted

Client PO Number:

---

Client Sample	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
S97-0607	9710251-1		Water	10/23/97	18:30

# Specific Conductance in Water

Method SW9050

## Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: None Submitted S97-0607

Work Order Number: 9710251

Reporting Basis: As Received

Printed on: Friday, November 07, 1997

Final Volume: 20 ML

Matrix: Water

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Units	Detection Limit	Flag	Sample Aliquot
S97-0607	9710251-1	10/23/97	11/5/97	11/5/97		1	890	umhos/cm			20 ML

### Comments:

1. ND = Not Detected at or above the client requested detection limit.

*km*

# Specific Conductance in Water

Method SW9050

## Duplicate Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

ClientName: El Paso Natural Gas Co.

Client Project ID: None Submitted S97-0607

Work Order Number: 9710251

Reporting Basis: As Received

Reported on: Friday, November 07, 1997

Sample Aliquot: 20 ML

Final Volume: 20ML

Matrix: Water

Client Sample ID	Lab ID	Date Prepared	Date Analyzed	Dilution Factor	Duplicate Result	Units	Sample Result	Detection Limit	Flag	RPD	RPD Limit
SHARED QC	9710196-1	11/5/97	11/5/97	1	23000	umhos/cm	23000			0	

### Comments:

1. ND = Not Detected at or above the client requested detection limit.

KM



# Paragon Analytics, Inc.

## Aromatic Volatile Organics Case Narrative

---

### El Paso Natural Gas Co.

S97-0607

Order Number - 9710251

1. This report consists of 1 water sample received by Paragon on 10/27/97.
2. The sample was prepared and analyzed according to SW-846, 3rd Edition procedures. Specifically, the water sample was prepared by heating and purging 5 mls using purge and trap procedures based on Method 5030. The calibration curve was also prepared using the heated purge.
3. The sample was analyzed using a GC with a DB-VRX capillary column and a PID detector according to protocols based on SW-846 Method 8020. All positive results were quantitated using the responses from the initial calibration curve using the internal standard technique. Second column confirmation was performed on all samples with positive results on a DB-624 capillary column.
4. All samples were analyzed within the established holding times.
5. The method blank associated with this project was below the reporting limits for all analytes.
6. All matrix spike and matrix spike duplicate recoveries and RPDs were within acceptance criteria.
7. All blank spike and blank spike duplicate recoveries and RPDs were within the acceptance criteria.
8. All surrogate recoveries were within acceptance criteria.



9. All internal standard recoveries were within acceptance criteria.
10. All initial and continuing calibration criteria were within acceptance criteria.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Roland P. Bruggeman

Roland P. Bruggeman  
Organics Manager

11-9-97

Date

MB

Reviewer's Initials

11-9-97

Date

# Paragon Analytics, Incorporated

## Sample Number(s) Cross-Reference Table

---

Paragon OrderNum: 9710251

Client Name: El Paso Natural Gas Co.

Client Project Name: S97-0607

Client Project Number: None Submitted

Client PO Number:

---

Client Sample	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
S97-0607	9710251-1		Water	10/23/97	18:30

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0607

**Reagent Blank**

Lab Sample ID: WRB1 10/29/97

Date Collected: N/A  
Date Extracted: 10/29/97  
Date Analyzed: 10/29/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	97	88 - 119

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8020

Sample ID

**S97-0607**

*PW#1*

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0607

Lab Sample ID: 9710251-1

Date Collected: 10/23/97

Date Extracted: 10/29/97

Date Analyzed: 10/29/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	96	88 - 119

ND = Not Detected at or above client requested reporting limit.

# AROMATIC VOLATILE ORGANICS BLANK SPIKE

Method 8020

Sample ID

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0607

**Blank Spike**

Lab Sample ID: WBS1 10/29/97

Date Extracted: 10/29/97

Date Analyzed: 10/29/97

Sample Matrix: Water

Sample Volume: 5 mL

Analyte	Spike Added (ug/L)	BS Concentration (ug/L)	BS Percent Recovery	QC Limits % Rec
Benzene	40.0	38.9	97	85 - 115
Toluene	40.0	39.7	99	85 - 115
Ethylbenzene	40.0	40.2	101	85 - 115
M,P-Xylene	80.0	82.6	103	85 - 115
O-Xylene	40.0	40.5	101	85 - 115
Total Xylenes	120	123	103	85 - 115

Analyte	Spike Added (ug/L)	BSD Concentration (ug/L)	BSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	38.4	96	1	20
Toluene	40.0	38.8	97	2	20
Ethylbenzene	40.0	39.3	98	2	20
M,P-Xylene	80.0	80.4	101	3	20
O-Xylene	40.0	39.4	99	3	20
Total Xylenes	120	120	100	3	20

## SURROGATE RECOVERY BS/BSD

Analyte	% Recovery BS	% Recovery BSD	% Rec Limits	
2,3,4-Trifluorotoluene	96	96	88 - 119	

D = Detected

# AROMATIC VOLATILE ORGANICS MATRIX SPIKE

Method 8020

Sample ID

**S97-0607**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0607

Date Collected: 10/23/97  
Date Extracted: 10/29/97  
Date Analyzed: 10/29/97

Lab Sample ID: 9710251-1MS

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Spike Added (ug/L)	Sample Concentration (ug/L)	MS Concentration (ug/L)	MS Percent Recovery	QC Limits % Rec
Benzene	40.0	ND	38.5	96	85 - 115
Toluene	40.0	ND	39.1	98	85 - 115
Ethylbenzene	40.0	ND	39.1	98	85 - 115
M,P-Xylene	80.0	ND	79.6	100	85 - 115
O-Xylene	40.0	ND	39.3	98	85 - 115
Total Xylenes	120	ND	119	99	85 - 115

Analyte	Spike Added (ug/L)	MSD Concentration (ug/L)	MSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	37.8	94	2	20
Toluene	40.0	39.0	98	0	20
Ethylbenzene	40.0	39.1	98	0	20
M,P-Xylene	80.0	79.8	100	0	20
O-Xylene	40.0	39.4	99	0	20
Total Xylenes	120	119	99	0	20

## SURROGATE RECOVERY MS/MSD

Analyte	% Recovery MS	% Recovery MSD	% Rec Limits
2,3,4-Trifluorotoluene	94	95	88 - 119

ND = Not Detected



# PARAGON ANALYTICS, INC.

225 Commerce Drive ♦ Fort Collins, CO 80524 ♦ (800) 443-1511 ♦ (970) 490-1511 ♦ FAX (970) 490-1522

December 12, 1997

Mr. Darrell Campbell  
El Paso Natural Gas Co.  
8645 Railroad Drive  
El Paso, TX 79904

RE: Paragon Workorder: 97-11-251  
Client Project Name: S97-0797  
Client Project Number: Not Submitted

Dear Mr. Campbell:

Four water samples were received from El Paso Natural Gas Co. on November 22, 1997.  
The samples were scheduled for the following analyses:

Specific Conductance	pages 1-4
pH	pages 1-4
Aromatic Volatile Organics	pages 1-11
Total Recoverable Metals	pages 1-12
Inorganics	pages 1-16

The results for these analyses are contained in the enclosed reports.

Thank you for your confidence in Paragon Analytics, Inc. Should you have any questions, please call.

Sincerely,

Paragon Analytics, Inc.  
Victoria Bayly  
Project Manager

VB/jjc  
Enclosure: report



# Paragon Analytics, Inc.

## Aromatic Volatile Organics Case Narrative

---

### **El Paso Natural Gas Co.**

S97-0797

**Order Number - 9711251**

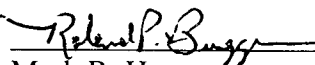
1. This report consists of 4 water samples received by Paragon on 11/22/97.
2. These samples were prepared and analyzed according to SW-846, 3rd Edition procedures. Specifically, the water samples were prepared by heating and purging 5 mls using purge and trap procedures based on Method 5030. The calibration curve was also prepared using the heated purge.
3. The samples were analyzed using a GC with a DB-VRX capillary column and a PID detector according to protocols based on SW-846 Method 8021. All positive results were quantitated using the responses from the initial calibration curve using the internal standard technique. Second column confirmation was performed on all samples with positive results on a DB-624 capillary column.
4. All samples were analyzed within the established holding times.
5. The method blanks associated with this project were below the reporting limits for all analytes.
6. Matrix spikes and matrix spike duplicates were not requested by the client. A blank spike and blank spike duplicate were performed instead. See Item 7 for details on recoveries.
7. All blank spike and blank spike duplicate recoveries and RPDs were within the acceptance criteria.
8. All surrogate recoveries were within acceptable limits with the following exceptions;

<u>Sample</u>	<u>Surrogate</u>
9711251-3,4	2,3,4-TFT

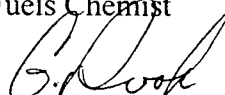
The samples were re-analyzed to evaluate whether the original outlier was due to matrix effects or laboratory performance. The re-analysis also had surrogates outside the control limits, which demonstrated the presence of matrix effects.

9. All internal standard recoveries were within acceptance criteria.
10. All initial and continuing calibration criteria were within acceptance criteria.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

  
for Mark R. Hayes  
Fuels Chemist

12-10-97  
Date

  
Reviewer's Initials

12-10-97  
Date

# Paragon Analytics, Incorporated

## Sample Number(s) Cross-Reference Table

---

Paragon OrderNum: 9711251

Client Name: El Paso Natural Gas Co.

Client Project Name: S97-0797

Client Project Number:

Client PO Number:

---

Client Sample	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
S97-0797	9711251-1		Water	11/21/97	9:30
S97-0798	9711251-2		Water	11/21/97	13:00
S97-0799	9711251-3		Water	11/21/97	14:20
S97-0800	9711251-4		Water	11/21/97	14:20

## AROMATIC VOLATILE ORGANICS

Method 8021

Sample ID

**Reagent Blank**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0797

Lab Sample ID: WRB1 11/26/97

Date Collected: N/A  
Date Extracted: 11/26/97  
Date Analyzed: 11/26/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

## SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	98	88 - 119

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8021

Sample ID

**S97-0798**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0797

Lab Sample ID: 9711251-2

Date Collected: 11/21/97  
Date Extracted: 11/26/97  
Date Analyzed: 11/27/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	28	0.50
Toluene	3.1	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	1.8	1.0
O-Xylene	0.99	0.50
Total Xylenes	2.8	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	99	88 - 119

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8021

Sample ID

**S97-0799**

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0797

Lab Sample ID: 9711251-3

Date Collected: 11/21/97

Date Extracted: 11/26/97

Date Analyzed: 11/27/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	6.1	0.50
Toluene	4.8	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	2.4	0.50
Total Xylenes	2.4	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	85 *	88 - 119

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8021

Sample ID

**S97-0800**

10

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0797

Lab Sample ID: 9711251-4

Date Collected: 11/21/97  
Date Extracted: 11/26/97  
Date Analyzed: 11/27/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	6.7	0.50
Toluene	5.7	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	2.1	0.50
Total Xylenes	2.1	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	86 *	88 - 119

ND = Not Detected at or above client requested reporting limit.

# AROMATIC VOLATILE ORGANICS BLANK SPIKE

Method 8021

Sample ID

Lab Name: Paragon Analytics, Inc.  
 Client Name: El Paso Natural Gas Co.  
 Client Project ID: S97-0797

**Blank Spike**

Lab Sample ID: WBS1 11/26/97

Date Extracted: 11/26/97

Date Analyzed: 11/26/97

Sample Matrix: Water

Sample Volume: 5 mL

Analyte	Spike Added (ug/L)	BS Concentration (ug/L)	BS Percent Recovery	QC Limits % Rec
Benzene	40.0	41.1	103	85 - 115
Toluene	40.0	43.4	108	85 - 115
Ethylbenzene	40.0	39.8	99	85 - 115
M,P-Xylene	80.0	79.6	100	85 - 115
O-Xylene	40.0	38.5	96	85 - 115
Total Xylenes	120	118	98	85 - 115

Analyte	Spike Added (ug/L)	BSD Concentration (ug/L)	BSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	40.8	102	1	20
Toluene	40.0	43.3	108	0	20
Ethylbenzene	40.0	39.5	99	1	20
M,P-Xylene	80.0	79.7	100	0	20
O-Xylene	40.0	38.7	97	1	20
Total Xylenes	120	118	99	0	20

## SURROGATE RECOVERY BS/BSD

Analyte	% Recovery BS	% Recovery BSD	% Rec Limits
2,3,4-Trifluorotoluene	99	99	88 - 119

D = Detected

## AROMATIC VOLATILE ORGANICS

Method 8021

Sample ID

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0797

**Reagent Blank**

Lab Sample ID: WRB1 12/01/97

Date Collected: N/A  
Date Extracted: 12/01/97  
Date Analyzed: 12/01/97

Sample Matrix: Water

Sample Volume: 5 mL  
Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
M,P-Xylene	ND	1.0
O-Xylene	ND	0.50
Total Xylenes	ND	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	98	88 - 119

ND = Not Detected at or above client requested reporting limit.

## AROMATIC VOLATILE ORGANICS

Method 8021

Sample ID

**S97-0797**

8

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0797

Lab Sample ID: 9711251-1

Date Collected: 11/21/97

Date Extracted: 12/01/97

Date Analyzed: 12/01/97

Sample Matrix: Water

Sample Volume: 5 mL

Dilution Factor: 1

Analyte	Conc (ug/L)	Reporting Limit (ug/L)
Benzene	36	0.50
Toluene	3.9	0.50
Ethylbenzene	2.0	0.50
M,P-Xylene	1.7	1.0
O-Xylene	12	0.50
Total Xylenes	14	1.0

### SURROGATE RECOVERY

Analyte	% Recovery	% Rec Limits
2,3,4-Trifluorotoluene	90	88 - 119

ND = Not Detected at or above client requested reporting limit.

# AROMATIC VOLATILE ORGANICS BLANK SPIKE

Method 8021

Sample ID

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0797

**Blank Spike**

Lab Sample ID: WBS1 12/01/97

Date Extracted: 12/01/97

Date Analyzed: 12/01/97

Sample Matrix: Water

Sample Volume: 5 mL

Analyte	Spike Added (ug/L)	BS Concentration (ug/L)	BS Percent Recovery	QC Limits % Rec
Benzene	40.0	41.1	103	85 - 115
Toluene	40.0	42.2	105	85 - 115
Ethylbenzene	40.0	39.7	99	85 - 115
M,P-Xylene	80.0	79.3	99	85 - 115
O-Xylene	40.0	38.2	95	85 - 115
Total Xylenes	120	117	98	85 - 115

Analyte	Spike Added (ug/L)	BSD Concentration (ug/L)	BSD Percent Recovery	RPD	QC Limits RPD
Benzene	40.0	41.6	104	1	20
Toluene	40.0	43.4	108	3	20
Ethylbenzene	40.0	40.3	101	1	20
M,P-Xylene	80.0	80.7	101	2	20
O-Xylene	40.0	39.1	98	3	20
Total Xylenes	120	120	100	2	20

## SURROGATE RECOVERY BS/BS

Analyte	% Recovery BS	% Recovery BSD	% Rec Limits
2,3,4-Trifluorotoluene	98	99	88 - 119

D = Detected



# Paragon Analytics, Inc.

## INORGANICS CASE NARRATIVE

---

### El Paso Natural Gas Co.

S97-0797

Order Number - 9711251

1. This report consists of data for 4 water samples analyzed for total alkalinity, bromide, chloride, fluoride, nitrate/nitrite, sulfate, and total dissolved solids (TDS).
2. The samples were received cool and intact on 11/22/97.
3. The samples had been correctly preserved for the requested analyses.
4. The samples were analyzed using procedures based on the following methods from the USEPA:

<u>Analyte</u>	<u>Method</u>
Total Alkalinity	310.1
Bromide	300.0
Chloride	300.0
Fluoride	340.2
Nitrate/Nitrite	353.3
Sulfate	300.0
Total Dissolved Solids	160.1

5. All standards and reagents were used within their recommended shelf life.
6. The samples were prepared and analyzed within the established hold times.
7. Sample results which are below the reporting limit are reported as "ND" on the enclosed report.

All in house quality control procedures were followed, as described below.

8. General quality control procedures.

- The method blank results were below the reporting limits for all analyses.
- The LCS results were within acceptance limits for all analyses.
- The MS and MSD results were within acceptance limits for all analyses
- The matrix duplicate results were within acceptance limits for total alkalinity and total dissolved solids.

The data contained in the following report have been reviewed and approved by the personnel listed below:

JM  
Reporter's Initials

12-8-97  
Date

BS  
Reviewer's Initials

12-9-97  
Date

CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# TOTAL ALKALINITY

Method 310.1

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project Name:  
Client Project ID: S97-0797  
Lab Workorder Number: 9711251

Date Collected: 11/21/97  
Date Analyzed: 12/03/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Total Alkalinity as CaCO3 Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	5
S97-0797 8	9711251-1	520	25
S97-0798 11	9711251-2	170	25
S97-0799 1	9711251-3	680	25
S97-0800 1D	9711251-4	670	25

ND = Not Detected

# Alkalinity Calculations and Quality Control Results

Date analyzed: 12/03/97

ID	aliq titrated (mL)	titrant normality N	vol to pH 8.3 (mL)	vol to pH 4.5 (mL)	total vol (mL)	HCO3	CO3	OH	Total	DL (mg/L)
						mg/L as CaCO3				
R Blank	100	0.0194	0	0.00	0.00	0	0	0	0.0	5
LCS	100	0.0194	0	9.82	9.82	95	0	0	95.0	5
9711215-2	100	0.0194	0	3.61	3.61	35	0	0	34.9	5
9711249-3	20	0.0194	0	2.19	2.19	106	0	0	106.0	25
9711249-4	20	0.0194	0	40.01	40.01	1936	0	0	1935.8	25
9711249-4 dup	20	0.0194	0	39.34	39.34	1903	0	0	1903.4	25
9711249-7	20	0.0194	0	19.69	19.69	953	0	0	952.6	25
9711249-8	10	0.0194	0	6.96	6.96	673	0	0	673.5	50
9711249-10	10	0.0194	0	2.66	2.66	257	0	0	257.4	50
9711249-11	10	0.0194	0	3.45	3.45	334	0	0	333.8	50
9711251-1	20	0.0194	0	10.75	10.75	520	0	0	520.1	25
9711251-2	20	0.0194	0	3.44	3.44	166	0	0	166.4	25
9711251-2 dup	20	0.0194	0	3.50	3.50	169	0	0	169.3	25
9711251-3	20	0.0194	0.29	13.76	14.05	652	28	0	679.8	25
9711251-4	20	0.0194	0	13.90	13.90	673	0	0	672.5	25

## Standardization of titrant

Conc Na2CO3 std	Na2CO3 aliq	HCl vol	HCl conc
0.0470	5.00	12.18	0.01929
0.0470	5.00	12.04	0.01952
0.0470	5.00	12.21	0.01925

mean = 0.01935

## Alkalinity Quality Control Results

Date analyzed: 12/03/97

### BLANK SUMMARY

ID	blank result (mg/L)	blank accept limit (mg/L)
R Blank	0.0	< 5

### LCS SUMMARY

ID	expected alk conc (mg/L)	alk conc found (mg/L)	recovery %	recovery acceptance limit
LCS	100.0	95.0	95	85-115%

### DUPLICATE SUMMARY

ID	sample alk conc (mg/L)	duplic alk conc (mg/L)	RPD %	accept. limits
9711249-4 dup	1935.8	1903.4	1.7	0-15%
9711251-2 dup	166.4	169.3	1.7	0-15%

# BROMIDE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project Name:

Client Project ID: S97-0797

Lab Workorder Number: 9711251

Date Collected: 11/21/97

Date Analyzed: 11/26/97

Sample Matrix: Water

Client ID	Lab Sample ID	Bromide Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.2
S97-0797 <i>B</i>	9711251-1	ND	5
S97-0798 <i>//</i>	9711251-2	ND	4
S97-0799 <i>'</i>	9711251-3	ND	2
S97-0800 <i>ID</i>	9711251-4	2	2

ND = Not Detected

# BROMIDE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9711251-4

Date Analyzed: 11/26/97

Sample Matrix: Water

Sample ID

**S97-0800**

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Bromide	50.0	2.3	47.8	91	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Bromide	50.0	49.2	94	3	0-15 %

# CHLORIDE

Method 300.0

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project Name:  
Client Project ID: S97-0797  
Lab Workorder Number: 9711251

Date Collected: 11/21/97  
Date Analyzed: 11/26/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Chloride Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.2
S97-0797 5	9711251-1	17000	400
S97-0798 "	9711251-2	9800	200
S97-0799 '	9711251-3	7800	200
S97-0800 10	9711251-4	7500	200

ND = Not Detected

# CHLORIDE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.  
Paragon Sample ID: 9711249-4  
Date Analyzed: 11/26/97  
Sample Matrix: Water

Sample ID

**In House**

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Chloride	4000	3347	7631	107	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Chloride	4000	7729	110	1	0-20 %

# FLUORIDE

Method 340.2

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project Name:  
Client Project ID: S97-0797  
Lab Workorder Number: 9711251

Date Collected: 11/21/97  
Date Analyzed: 12/04/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Fluoride Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.5
S97-0797	9711251-1	0.6	0.5
S97-0798	9711251-2	ND	0.5
S97-0799	9711251-3	2.1	0.5
S97-0800	9711251-4	2.2	0.5

ND = Not Detected

# Fluoride in Water Calculations

Date analyzed: 12/04/97

ID	sample aliquot (mg/L)	final vol after dil (mL)	electrode reading (mv)	calc F conc (mg/L)	report F conc (mg/L)	DL (mg/L)
ICV (LCS)	20	20	25	9.73	9.7	0.5
ICB	20	20	160	0.04	0.0	0.5
9711215-2	20	20	44	4.47	4.5	0.5
9711215-2 MS	20	20	15	14.66	14.7	0.5
9711215-2 MSD	20	20	15	14.66	14.7	0.5
9711214-1	20	20	70	1.54	1.5	0.5
9711251-1	20	20	94	0.58	0.6	0.5
9711251-2	20	20	104	0.38	0.4	0.5
9711251-3	20	20	62	2.14	2.1	0.5
9711251-4	20	20	61	2.23	2.2	0.5
9711292-6	20	20	99	0.47	0.5	0.5
9711292-6 MS	20	20	26	9.34	9.3	0.5
CCV	20	20	23	10.56	10.6	0.5
CCB	20	20	152	0.05	0.1	0.5
9711292-6 MSD	20	20	27	8.97	9.0	0.5
9711292-7	20	20	59	2.42	2.4	0.5
9711292-8	20	20	109	0.31	0.3	0.5
9711292-9	20	20	106	0.35	0.4	0.5
9711292-10	20	20	76	1.20	1.2	0.5
9711292-11	20	20	71	1.48	1.5	0.5
9711292-12	20	20	98	0.49	0.5	0.5
9711292-13	20	20	84	0.87	0.9	0.5
9711292-14	20	20	102	0.42	0.4	0.5
9711314-1	20	20	37	5.95	6.0	0.5
CCV	20	20	22	11.00	11.0	0.5
CCB	20	20	150	0.06	0.1	0.5
9711314-2	20	20	49	3.64	3.6	0.5
9711314-3	20	20	25	9.73	9.7	0.5
9711314-4	20	20	18	12.96	13.0	0.5
CCV	20	20	23	10.56	10.6	0.5
CCB	20	20	150	0.06	0.1	0.5

## STANDARD CURVE

std conc (mg/L)	log conc	mv	calc conc
0.5	-0.301	96	0.53
1	0.000	82	0.94
5	0.699	42	4.85
10	1.000	24	10.14
20	1.301	7	20.34

## Regression Output:

Constant	1.432921
Std Err of Y Est	0.023203
R Squared	0.99911
No. of Observations	5
Degrees of Freedom	3
X Coefficient(s)	-0.01779
Std Err of Coef.	0.000307

# Fluoride Quality Control Results

Date analyzed: 12/04/97

## ICV (LCS) SUMMARY

	spike added F conc (mg/L)	F conc found (mg/L)	recovery %	recovery accpt. limit
ICV (LCS)	10.00	9.73	97	85-115%

## MATRIX SPIKE SUMMARY

	spike F conc added (mg/L)	sample F conc (mg/L)	spike F conc (mg/L)	recovery %	recovery accpt. limit	RPD %	RPD accpt. limit
9711215-2 MS	10.00	4.47	14.66	102	85-115%		
9711215-2 MSD	10.00	4.47	14.66	102	85-115%	0.0	< 15%
9711292-6 MS	10.00	0.47	9.34	89	85-115%		
9711292-6 MSD	10.00	0.47	8.97	85	85-115%	4.1	< 15%

# NITRATE + NITRITE

Method 353.3

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project Name:  
Client Project ID: S97-0797  
Lab Workorder Number: 9711251

Date Collected: 11/21/97  
Date Analyzed: 12/03/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Nitrate + Nitrite as N Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	0.05
S97-0797 8	9711251-1	ND	0.05
S97-0798 "	9711251-2	0.16	0.05
S97-0799 '	9711251-3	ND	0.05
S97-0800 10	9711251-4	ND	0.05

ND = Not Detected

# Nitrate + Nitrite Calculations and Quality Control Results

Date analyzed: 12/03/97

NO3-N std (mg/L)	Abs (543 nm)	calc NO3-N conc (mg/L)
0.00	0.038	0.012
0.05	0.063	0.038
0.10	0.120	0.098
0.20	0.230	0.21
0.50	0.487	0.48
1.00	0.985	1.01

Regression Output:

Constant	-0.02807
Std Err of Y Est	0.014002
R Squared	0.998929
Nc. of Observations	6
Degrees of Freedom	4
X Coefficient(s)	1.049624
Std Err of Coef.	0.017186

ID:	additional DF	Abs (543 nm)	calc instr NO3+NO2-N conc (mg/L)	sample NO3+NO2-N conc (mg/L)	Detection Limit (mg/L)	ICV, CCV recovery %
0.5 mg/L NO2-N	1	0.511	0.51	0.51	0.05	102
ICV 0.5 mg/L	1	0.504	0.50	0.501	0.05	100
ICB	1	0.017	-0.01	-0.01	0.05	
9711251-1	1	0.052	0.03	0.03	0.05	
9711251-2	1	0.177	0.16	0.16	0.05	
9711251-3	1	0.030	0.00	0.00	0.05	
9711251-4	1	0.038	0.01	0.01	0.05	
9711249-3	1	PEG	-0.03	-0.03	0.05	
9711249-4	1	PEG	-0.03	-0.03	0.05	
9711249-7	1	0.034	0.01	0.01	0.05	
9711249-8	1	0.010	-0.02	-0.02	0.05	
9711249-10	1	0.014	-0.01	-0.01	0.05	
9711249-11	1	0.032	0.01	0.01	0.05	
CCV	1	0.498	0.49	0.49	0.05	99
CCB	1	0.034	0.01	0.01	0.05	
9711215-1	1	0.096	0.07	0.07	0.05	
9711215-2	1	0.029	0.00	0.00	0.05	
9711249-3	20	0.186	0.17	3.34	1.00	
9711249-4	100	0.344	0.33	33.30	5.00	
9711249-4MS	100	0.851	0.87	86.52	5.00	
9711249-4MSD	100	0.826	0.84	83.89	5.00	
CCV	1	0.490	0.49	0.49	0.05	97
CCB	1	0.029	0.00	0.00	0.05	

ND = Not Detected

## Nitrate + Nitrite Quality Control Results

Date analyzed: 12/03/97

### BLANK SUMMARY

ID	blank conc. (mg/L)	blank reporting limit (mg/L)
ICB	-0.01	< 0.05

### LCS / ICV SUMMARY

ID	true conc. (mg/L)	conc. found (mg/L)	recovery %	accept. limits
ICV	0.500	0.501	100	80-120%

### MATRIX SPIKE SUMMARY

ID	spike added conc (mg/L)	sample conc (mg/L)	spiked sample conc (mg/L)	recovery %	recovery accept. limits	RPD %	RPD accept. limits
9711249-4MS	50.00	33.30	86.52	106	75-125 %		
9711249-4MSD	50.00	33.30	83.89	101	75-125 %	3	0-20%

ND = Not Detected

# SULFATE

Method 300.0

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project Name:  
Client Project ID: S97-0797  
Lab Workorder Number: 9711251

Date Collected: 11/21/97  
Date Analyzed: 11/26/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Sulfate Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	1
S97-0797 8	9711251-1	800	25
S97-0798 "	9711251-2	520	20
S97-0799 /	9711251-3	320	10
S97-0800 10	9711251-4	320	10

ND = Not Detected

# SULFATE MATRIX SPIKE

Method 300.0

Lab Name: Paragon Analytics, Inc.

Paragon Sample ID: 9711251-4

Date Analyzed: 11/26/97

Sample Matrix: Water

Sample ID

**S97-0800**

Analyte	Spike Added (mg/L)	Sample Concentration (mg/L)	MS Concentration (mg/L)	MS Percent Recovery	MS/MSD Acceptance Limit
Sulfate	200	320	499	90	85-115%

Analyte	Spike Added (mg/L)	MSD Concentration (mg/L)	MSD Percent Recovery	RPD %	RPD Acceptance Limit
Sulfate	200	499	90	0	0-15 %

# TOTAL DISSOLVED SOLIDS

Method 160.1

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project Name:  
Client Project ID: S97-0797  
Lab Workorder Number: 9711251

Date Collected: 11/21/97  
Date Prepared: 11/24/97  
Sample Matrix: Water

Client ID	Lab Sample ID	Total Dissolved Solids Conc (mg/L)	Detection Limit (mg/L)
	Method Blank	ND	20
S97-0797 6	9711251-1	29000	20
S97-0798 "	9711251-2	16000	20
S97-0799 /	9711251-3	12000	20
S97-0800 /D	9711251-4	12000	20

ND = Not Detected

# TDS Calculations and Quality Control Results

Preparation Date: November 24, 1997

ID	sample vol (mL)	empty beaker tare (g)	A beaker + residue gross (g)	A net (mg)	B beaker + residue gross (g)	B net (mg)	gross A vs gross B RPD %	calculated TDS conc (mg/L)	TDS DL (mg/L)
Method Blank	100	82.2296	82.2294	-0.2	82.2293	-0.3	0.000	-3	20
Blank Spike	100	66.0123	66.0534	41.1	66.0536	41.3	0.000	413	20
9711250-1	100	67.5301	67.5854	55.3	67.5852	55.1	0.000	551	20
9711250-1 dup	100	67.8650	67.9212	56.2	67.9212	56.2	0.000	562	20
9711251-1	100	68.4218	71.3251	2903.3	71.3093	2887.5	0.022	28875	20
9711251-2	100	67.7094	69.3268	1617.4	69.3036	1594.2	0.033	15942	20
9711251-3	100	65.7972	66.9942	1197.0	66.9940	1196.8	0.000	11968	20
9711251-4	100	87.4800	88.6504	1170.4	88.6497	1169.7	0.001	11697	20

## BLANK SUMMARY

ID	blank conc (mg/L)	accept. limit (mg/L)
Method Blank	-3	< 20

## BLANK SPIKE SUMMARY

ID	spike added (g)	spike added conc (mg/L)	spiked sample conc (mg/L)	recovery %	accept. limits
Blank Spike	40.0	400	413	103	85-115%

## DUPLICATE SUMMARY

ID	sample conc (mg/L)	duplic conc (mg/L)	RPD %	accept. limits
9711250-1 dup	551	562	2.0	0-15%



# Paragon Analytics, Inc.

## SPECIFIC CONDUCTANCE CASE NARRATIVE

**El Paso Natural Gas Co.**

**S97-0797**

**Order Number - 9711251**

1. This report consists of four water samples.
2. The samples were received intact at a temperature of 11<sup>0</sup> C. on November 22, 1997.
3. The samples were prepared for analysis based on SW-846 Method 9050.
4. *All standards and solutions are NIST traceable and were used within their recommended shelf life.*

All in house quality control procedures were followed, as described below.

5. General quality control procedures.
  - All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analyte. This indicates a valid calibration and stable instrument conditions.
6. PAI sample ID 9711251-1 was used as the matrix QC sample for this batch.
  - A duplicate was prepared and analyzed with this batch, all acceptance criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below:

Krista Mobley  
Krista Mobley  
Inorganic Technician

12/5/97  
Date

SW  
Reviewer's Initials

12/5/97  
Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# Specific Conductance in Water

Method SW9050

## Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0797

Work Order Number: 9711251

Reporting Basis: As Received

Printed on: Friday, December 05, 1997

Final Volume: 20 ML

Matrix: Water

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Units	Detection Limit	Flag	Sample Aliquot
S97-0797	8	9711251-1	11/21/97	12/3/97	12/3/97		2	49200	umhos/cm		20 ML
S97-0798	11	9711251-2	11/21/97	12/3/97	12/3/97		1	27900	umhos/cm		20 ML
S97-0799	1	9711251-3	11/21/97	12/3/97	12/3/97		1	20800	umhos/cm		20 ML
S97-0800	1D	9711251-4	11/21/97	12/3/97	12/3/97		1	20700	umhos/cm		20 ML

### Comments:

1. ND = Not Detected at or above the client requested detection limit.

fm

# Specific Conductance in Water

Method SW9050

## Duplicate Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

ClientName: El Paso Natural Gas Co.

Client Project ID: S97-0797

Work Order Number: 9711251

Reporting Basis: As Received

Sample Aliquot: 20 ML

Final Volume: 20ML

Matrix: Water

Reported on: Friday, December 05, 1997

Client Sample ID	Lab ID	Date Prepared	Date Analyzed	Dilution Factor	Duplicate Result	Units	Sample Result	Detection Limit	Flag	RPD	RPD Limit
S97-0797	9711251-1	12/3/97	12/3/97	2	49000	umhos/cm	49200			0	10

### Comments:

1. ND = Not Detected at or above the client requested detection limit

*Km*

# Paragon Analytics, Inc.



## PH ANALYSIS CASE NARRATIVE

---

### El Paso Natural Gas Co.

S97-0797

**Order Number - 9711251**

1. This report consists of four water samples.
2. The samples were received intact at a temperature of 11° C. on November 22, 1997.
3. The samples were prepared for analysis based on SW-846, 3<sup>rd</sup> Edition procedures. Specifically, the water samples were analyzed following Method 9040.
4. All standards and solutions were used within their recommended shelf life.  
All in house quality control procedures were followed, as described below.
5. General quality control procedures.
  - All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analyte. This indicates a valid calibration and stable instrument conditions.
6. PAI sample ID 9711251-1 was used as the matrix QC sample for this batch.
  - A duplicate was prepared and analyzed with this batch, all acceptance criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below:

Krista Mobley  
Krista Mobley  
Inorganic Technician

12-5-97  
Date

SW  
Reviewer's Initials

12/5/97  
Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# pH in Water

Method SW9040

## Sample Results

Page 1 of 1

Lab Name: Paragon Analytics, Inc.

Client Name: El Paso Natural Gas Co.

Client Project ID: S97-0797

Work Order Number: 9711251

Reporting Basis: As Received

Printed on: Friday, December 05, 1997

Final Volume: 20 ML

Matrix: Water

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Units	Detection Limit	Flag	Sample Aliquot
S97-0797 6	9711251-1	11/21/97	12/3/97	12/3/97		1	7	PH			20 ML
S97-0798 11	9711251-2	11/21/97	12/3/97	12/3/97		1	7.6	PH			20 ML
S97-0799 1	9711251-3	11/21/97	12/3/97	12/3/97		1	8.4	PH			20 ML
S97-0800 1D	9711251-4	11/21/97	12/3/97	12/3/97		1	8.2	PH			20 ML

### Comments:

1. ND = Not Detected at or above the client requested detection limit.

Kim

**pH in Water**  
**Method SW9040**  
**Duplicate Sample Results**

Page 1 of 1

Lab Name: Paragon Analytics, Inc.  
ClientName: El Paso Natural Gas Co.

Client Project ID: S97-0797

Work Order Number: 9711251

Reporting Basis: As Received

Reported on: Friday, December 05, 1997

Sample Aliquot: 20 ML

Final Volume: 20ML

Matrix: Water

Client Sample ID	Lab ID	Date Prepared	Date Analyzed	Dilution Factor	Duplicate Result	Units	Sample Result	Detection Limit	Flag	RPD	RPD Limit
S97-0797	9711251-1	12/3/97	12/3/97	1	7	PH	7			0	

**Comments:**

1. ND = Not Detected at or above the client requested detection limit.

*Km*



# Paragon Analytics, Inc.

## TOTAL RECOVERABLE METALS CASE NARRATIVE

---

### **El Paso Natural Gas Co.**

S97-0797

**Order Number - 9711251**

1. This report consists of 4 water samples.
2. The samples were received intact on 11/22/97. The temperature of the samples upon receipt was 11° Celsius.
3. The samples had been correctly preserved for the requested analyses.
4. The samples were prepared for analysis based on SW-846, 3<sup>rd</sup> Edition procedures.  
For analysis by conventional ICP, the samples were digested following method 3005A.
5. The samples were analyzed following SW846 protocols by conventional ICP (Method 6010A).
6. All standards and solutions are NIST traceable and were used within their recommended shelf life.
7. The samples were prepared and analyzed within the established hold times.
8. Sample results which are below PAI's standard reporting limits are reported as "ND" on the enclosed report.

All in house quality control procedures were followed, as described below.

9. General quality control procedures.
  - A preparation (method) blank and laboratory control sample were digested and analyzed with the samples in this digestion batch. There were not more than 20 samples in the digestion batch.
  - The preparation (method) blank results associated with this batch were below the reporting limits for the requested analytes. This indicates that no contaminants were introduced to the samples during the digestion procedure.



- The laboratory control sample associated with this batch was within acceptance limits. This indicates complete digestion according to the method.
- All initial and continuing calibration blanks associated with this batch were below the reporting limits for the requested analytes. This indicates a valid calibration and stable instrument conditions.
- All initial and continuing calibration verifications associated with this batch were within acceptance criteria for the requested analytes. This indicates a valid calibration and stable instrument conditions.
- The interference check samples, and high standard readbacks associated with Method 6010A analyses were within acceptance criteria.

10. A sample from another Order Number was used as the QC sample for this batch.

- A matrix spike and matrix spike duplicate were digested and analyzed with this batch. All acceptance criteria for accuracy were met with the following exceptions.

<u>Analyte</u>	<u>Sample ID</u>
Magnesium	9711249-4S & DS
Silicon	9711249-4S & DS
Sodium	9711249-4S & DS

The concentrations of magnesium, silicon and sodium in the native sample were greater than 4 times the concentration of matrix spike added during the digestion. When sample concentration is that much greater than the spike added, spike recoveries may not be accurate. The Laboratory Control Sample is included to show that the digestion and analysis were in control.

- A sample duplicate and spike duplicate were digested and analyzed with this batch. All acceptance criteria for precision were met.
- A serial dilution was analyzed with this batch. All acceptance criteria were met with the following exception.

<u>Analyte</u>	<u>Sample ID</u>
Potassium	9711249-4L

Associated sample results for these elements have been flagged in the report.



The data contained in the following report have been reviewed and approved by the personnel listed below:

Darryl Patrick

Darryl Patrick  
Senior Inorganic Chemist

12/4/97

Date

SW

Reviewer's Initials

12/4/97

Date

#### CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

# Paragon Analytics, Incorporated

## Sample Number(s) Cross-Reference Table

---

Paragon OrderNum: 9711251

Client Name: El Paso Natural Gas Co.

Client Project Name: S97-0797

Client Project Number:

Client PO Number:

---

Client Sample	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
S97-0797	9711251-1		Water	11/21/97	9:30
S97-0798	9711251-2		Water	11/21/97	13:00
S97-0799	9711251-3		Water	11/21/97	14:20
S97-0800	9711251-4		Water	11/21/97	14:20

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0797  
Lab Sample ID: RB 9711251

Sample ID

**Reagent Blank**

Date Collected: N/A  
Prep Date: 11/25/97  
Date Analyzed: 12/01/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	ND	0.1
Calcium	ND	1
Copper	ND	0.01
Iron	ND	0.1
Magnesium	ND	1
Manganese	ND	0.01
Potassium	ND	1
Silicon	ND	0.05
Sodium	ND	1
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0797  
Lab Sample ID: 9711251-1

Sample ID

**S97-0797**

8

Sample Matrix: Water

Date Collected: 11/21/97

Prep Date: 11/25/97

Date Analyzed: 12/01/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.6	0.1
Calcium	440	1
Copper	ND	0.01
Iron	1.3	0.1
Magnesium	210	1
Manganese	2.2	0.01
Potassium #	57	1
Silicon	19	0.05
Sodium *	9300	50
Zinc	ND	0.02

ND = Not detected at or above the reporting limit.

\* Detection limit raised. Dilution required due to analyte concentration.

# Serial dilution results suggest possible physical or chemical interference(s).

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0797  
Lab Sample ID: 9711251-2

Sample Matrix: Water

Sample ID

**S97-0798**

//

Date Collected: 11/21/97  
Prep Date: 11/25/97  
Date Analyzed: 12/01/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.3	0.1
Calcium *	1000	10
Copper	ND	0.01
Iron	0.4	0.1
Magnesium ^	330	10
Manganese	0.22	0.01
Potassium #	27	1
Silicon	18	0.05
Sodium *	2700	10
Zinc	0.21	0.02

ND = Not detected at or above the reporting limit.

\* Detection limit raised. Dilution required due to analyte concentration.

^ Detection limit raised. Sample diluted to reduce matrix interferences.

# Serial dilution results suggest possible physical or chemical interference(s).

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0797  
Lab Sample ID: 9711251-3

Sample ID

**S97-0799**

Sample Matrix: Water

Date Collected: 11/21/97  
Prep Date: 11/25/97  
Date Analyzed: 12/01/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	1.0	0.1
Calcium	83	1
Copper	ND	0.01
Iron	0.6	0.1
Magnesium	110	1
Manganese	0.06	0.01
Potassium #	20	1
Silicon	14	0.05
Sodium *	3900	10
Zinc	0.04	0.02

ND = Not detected at or above the reporting limit.

\* Detection limit raised. Dilution required due to analyte concentration.

# Serial dilution results suggest possible physical or chemical interference(s).

DP

## TOTAL RECOVERABLE METALS

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0797  
Lab Sample ID: 9711251-4

Sample Matrix: Water

Sample ID

**S97-0800**

10

Date Collected: 11/21/97  
Prep Date: 11/25/97  
Date Analyzed: 12/01/97

Analyte	Concentration mg/L	Reporting Limit mg/L
Boron	0.9	0.1
Calcium	76	1
Copper	ND	0.01
Iron	0.5	0.1
Magnesium	100	1
Manganese	0.07	0.01
Potassium #	20	1
Silicon	13	0.05
Sodium *	4000	10
Zinc	0.03	0.02

ND = Not detected at or above the reporting limit.

\* Detection limit raised. Dilution required due to analyte concentration.

# Serial dilution results suggest possible physical or chemical interference(s).

DP

# TOTAL RECOVERABLE METALS MATRIX SPIKE

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Lab Sample ID: 9711249-4

Sample ID

**In House**

Sample Matrix: Water

Prep Date: 11/25/97

Date Analyzed: 12/01/97

Analyte	Spike Added mg/L	Sample Conc. mg/L	MS Conc. mg/L	% Rec (limits 80-120%)	Flags
Boron	1.0	1.9	2.8	90	See note
Calcium	40	114	156	105	
Copper	0.25	< 0.01	0.23	92	
Iron	1.0	< 0.1	0.9	90	
Magnesium	40	269	305	90	
Manganese	0.50	0.07	0.53	92	See note
Potassium	40	19	63	110	
Silicon	0.5	17.4	17.9	100	
Sodium	40	2570	2520	-125	See note
Zinc	0.50	< 0.02	0.46	92	

See note on following page.

DP

# TOTAL RECOVERABLE METALS MATRIX SPIKE DUPLICATE

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Lab Sample ID: 9711249-4

Sample ID

In House

Sample Matrix: Water

Prep Date: 11/25/97

Date Analyzed: 12/01/97

Analyte	MSD Conc. mg/L	MSD % Rec (limits 80-120%)	Relative % Difference (limits 0-20%)	Flags
Boron	2.8	90	0	See note
Calcium	156	105	0	
Copper	0.23	92	0	
Iron	0.9	90	0	
Magnesium	305	90	0	
Manganese	0.53	92	0	
Potassium	63	110	0	See note
Silicon	17.9	100	0	
Sodium	2580	25	2	
Zinc	0.47	94	2	

Note: Due to the large concentration of analyte in the sample, matrix spike recoveries may not be accurate. The Laboratory Control Sample (LCS) is included on a separate page to show that the digestion and analysis were in control.

DP

**TOTAL RECOVERABLE METALS  
LABORATORY CONTROL SAMPLE**

Lab Name: Paragon Analytics, Inc.  
Client Name: El Paso Natural Gas Co.  
Client Project ID: S97-0797  
Order Number: 9711251

Date Analyzed: 12/01/97

Analyte	LCS Result mg/L	LCS True Value mg/L	LCS % Recovery	Limits
Magnesium	42	40	105	80 - 120%
Silicon	0.54	0.50	108	80 - 120%
Sodium	42	40	105	80 - 120%

DP

## CONDITION OF SAMPLE UPON RECEIPT

CLIENT: EPGSHIPPING CONTAINER #: CokerWORKORDER NO. 9711251INITIALS: NADATE: 11/22/97

1.	Does this project require special handling according to NEESA, Level 3, or CLP protocols? If yes, complete a. and b. a. Cooler Temperature _____ b. Lot No's. _____ c. Airbill Number _____		Yes	<u>No</u>
2.	Are custody seals on the cooler intact? If so, how many	<u>N/A</u>	Yes	No
3.	Are custody seals on sample containers intact?	<u>N/A</u>	Yes	No
4.	Is there a Chain of Custody (COC) or other representative documents, letters or shipping memos?		<u>Yes</u>	No
5.	Is the COC complete? Relinquished: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Requested Analysis: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A	<u>Yes</u>	No
6.	Is the COC in agreement with the samples received? No. of Samples: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Sample ID's: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Matrix: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> No. of Containers: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		<u>Yes</u>	No
7.	Are the samples requiring chemical preservation preserved correctly?	N/A	<u>Yes</u>	No
8.	Is there enough sample? If so, are they in the proper containers?		<u>Yes</u>	No
9.	Are all samples within holding times for the requested analyses?		<u>Yes</u>	No
10.	Were the sample(s) shipped on ice?	N/A	<u>Yes</u>	No
11.	Were all sample containers received intact? (not broken or leaking, etc.)		<u>Yes</u>	No
12.	Are samples requiring no headspace, headspace free?	N/A	<u>Yes</u>	No
13.	Do the samples require quarantine?		Yes	<u>No</u>
14.	Do samples require Paragon disposal?		<u>Yes</u>	No
15.	Did the client return any unused bottles?		Yes	<u>No</u>

Describe "NO" items (except No's 1, 13, & 14): (10) ICE & RECIWas the client contacted? Yes ☐ No ☐

If yes, Date: \_\_\_\_\_ Name of person contacted: \_\_\_\_\_

Describe actions taken or client instructions: \_\_\_\_\_

Group Leader's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Cooler Temperature: 11°C