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MONITORING REPORTS

YEAR(S):

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GW-49

Prepared for:



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El Paso Field Services 614 Reilly Avenue Farmington, New Mexico 87401

FINAL 2003 BLANCO NORTH FLARE PIT PILOT AIR SPARGING SYSTEM REPORT

SAN JUAN COUNTY, NEW MEXICO

October 2003

Prepared by:

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TABLE OF CONTENTS

<u>Sectio</u>	on No.	<u>Page No.</u>
1.0	INTRODUCTION	1
2.0	REMEDIAL ACTIVITIES	2
2.1 2.2	Air Sparging System Operation Free-product Removal	3
2.3	GROUNDWATER REMEDIATION BY AIR SPARGING	
3.0	RECOMMENDATIONS FOR FUTURE ACTIVITIES	4
4.0	REFERENCES	5

LIST OF TABLES

<u>Table No.</u>	Description
2.1	AS System Operation and Monitoring Data (February – September 2003)
2.2	Free-Product Recovery Data (MW-26)
2.3	Groundwater Monitoring Analytical Data
3.1	Groundwater Monitoring Schedule

LIST OF FIGURES

<u>Figure No.</u>	Description
1	Blanco Plant Site Layout
2	Benzene Concentrations in Groundwater, June 2003
3	Benzene Concentrations in Groundwater, August 2003
4	Benzene Concentrations in Groundwater, September 2003

LIST OF APPENDICIES

<u>No.</u>	Description
А	SW-1 Geologic Borelog and Well Installation Report
В	AS System Operation and Monitoring Reports
С	Groundwater Analytical Data Reports

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LIST OF ACRONYMS

AS	Air Sparging
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene and total xylenes
cfm	cubic feet per minute
EPFS	El Paso Field Services
mg/L	milligrams per liter
NMOCD	New Mexico Oil Conservation Division
NMWQCC	New Mexico Water Quality Control Commission
psi	pounds per square inch

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1.0 INTRODUCTION

This 2003 Blanco North Flare Pit Air Sparging System Report has been prepared for El Paso Field Services (EPFS) to document the performance of the air sparging (AS) system and status of the free-product removal activities at the Blanco Plant North Flare Pit site (Site). This report includes free-product removal data, construction details of the AS system, operation and monitoring data, and groundwater analytical results collected over the period of AS system operation. An evaluation of the AS system and recommendations for future activities are also included in this report.

The purpose of these activities is groundwater remediation downgradient of the North Flare Pit. Constituents of potential concern at the site include free-phase hydrocarbons (i.e., free-product), benzene, ethylbenzene, toluene and total xylenes (BTEX). Regulatory drivers for groundwater remediation at this site include New Mexico Oil Conservation Division's (NMOCD) guidelines and the New Mexico Water Quality Control Commission's (NMWQCC) regulations.

The remediation activities that have been conducted at the Site are described in *the Work Plan for the Blanco North Flare Pit, July 2002* (Work Plan) (MWH, 2002) and *the Blanco North Flare Pit Work Plan Update Technical Memorandum, June 2003* (Work Plan Update) (MWH, 2003). The Work Plan summarizes available information related to the Site, including a summary of previous site activities and investigations, a description of the geology/hydrogeology of the area and historic groundwater quality data. Therefore these discussions will not be reiterated in this report.

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2.0 REMEDIAL ACTIVITIES

2.1 AIR SPARGING SYSTEM OPERATION

As described in the Work Plan (MWH, 2002), EPFS proposed AS in the vicinity of the impacted groundwater to remediate dissolved-phase hydrocarbon contamination and reduce BTEX concentrations to below NMWQCC standards. On December 16, 2002 a new AS well, SW-1, was installed approximately 25 feet upgradient (north) of monitoring well MW-26 as shown on Figure 1, *Blanco Plant Site Layout*. The AS well was drilled through unconsolidated sediments to a depth of approximately 66 feet below ground surface (bgs) and into sandstone bedrock to a total boring depth of 75.5 feet bgs. The well was constructed of two-inch diameter PVC casing with a five-foot long, 0.01-inch slotted well screen. The well screen was installed at the base of the boring from 70.2 to 75.2 feet bgs. The borehole was then backfilled with 10/20 silica sand pack around the screen to 67.5 feet bgs, a hydrated bentonite chip seal to 60.8 feet bgs, and grouted to the surface. The water level in MW-26 is typically between 62 and 64 feet below top of casing, which is indicative of the final water level in the new AS well. The geologic borelog and monitoring well installation report is attached in Appendix A.

The AS system was instrumented and prepared for operation and testing during January and February 2003. An AS system operation test was performed in February 2003 and based in part on the results of the test, the Work Plan Update was prepared and submitted to NMOCD on June 6, 2003, as an addendum to the Work Plan, to outline the operation, monitoring and maintenance plan for the AS system and product removal activities. Operation of the AS system was delayed during skimmer installation and initiation of free-product removal in April and May 2003, as described further below. AS system operation was initiated on June 5, 2003, following baseline groundwater sampling (as described in Section 2.3). The system has been continuously operating since start-up, with the exception of minor periods of down-time due to system failure, and scheduled shut-downs for the purpose of groundwater monitoring.

Air injection has been conducted on a 12-hour off/on cycle with 5 to 8 cubic feet per minute (cfm) of air injection into the well at 14 to 16 pounds per square inch (psi) of pressure. During the initial phase of operation, weekly maintenance checks on the skimmer and AS systems were conducted. Free-product accumulation was monitored, air pressure measurements were measured at each well head using magnehelic gages, and field parameters (including water levels, pH, temperature, specific conductance and dissolved oxygen) were monitored. After the first six weeks of operation, maintenance visits were reduced to bi-weekly. Following each visit, a field report was prepared that summarized all operation and monitoring data and reported any problems. Field operation and monitoring Data (February 2003 – September 2003). As shown in this table, the air pressure and dissolved oxygen content data indicate that there has been good communication between the AS well (SW-1) and wells MW-26 and MW-19.

2.2 FREE-PRODUCT REMOVAL

During drilling and installation of the AS well, free-product was discovered in well MW-26. The nearby monitoring wells were checked for the presence of free-product; none was encountered in any of the other existing wells or the new AS well. In December 2002, a total of approximately 4.5 gallons of water/free-product was hand bailed from the well. On April 22, 2003, approximately 2 feet of free-product was measured, and in mid-April a skimmer pump was installed in MW-26 for free-product removal. Between April and June 2003, the skimmer pump removed an additional 3.1 gallons of free-product. A summary of free-product recovery is presented in Table 2.2, *Free Product Recovery Data (MW-26)*.

2.3 GROUNDWATER REMEDIATION BY AIR SPARGING

In June 2003, prior to AS system start-up, baseline groundwater monitoring was conducted at each of the six monitoring wells in the North Flare Pit area (which includes MW-2, MW-19, MW-23, MW-24, MW-26 and MW-27). Groundwater samples were collected from each of the monitoring wells again in August 2003 and September 2003 to evaluate the effectiveness of the AS system on groundwater hydrocarbon remediation. Forty-eight hours prior to sample collection the AS system was shut-down to ensure natural groundwater conditions were being evaluated. During each sampling event, groundwater levels and field parameters (pH, temperature, specific conductance and dissolved oxygen) were measured, and samples were analyzed for BTEX concentrations. Samples were not collected from MW-2 or MW-24 during any of the sampling rounds because the wells were dry or bailed dry. Samples were not collected from MW-26 during the first two sampling rounds because free-product was present during June and the well bailed dry in August; a sample was collected from MW-26 in September. Analytical results from these three sampling rounds are presented with historic data in Table 2.3, Groundwater Monitoring Analytical Data, and laboratory analytical reports are attached in Appendix C. Benzene concentrations in groundwater for each of the sampling events are presented on site maps in Figures 2 through 4, Benzene Concentrations in Groundwater. These maps also present the groundwater flow direction based on water levels measured during each event.

As shown in the data table and presented on the maps, groundwater BTEX concentrations in all of the monitoring wells decreased significantly between the June (baseline) and August sampling events, over the first two months of AS system operation. Analytical results from the September event were generally similar to the August results. The largest decreases in concentrations were seen in MW-19, where the benzene concentration was reduced from 10,100 milligrams per liter (mg/L) in June, to 2,000 mg/L in August (an 80% reduction in concentration), and in MW-26 where free-product was present in June and the benzene concentration declined to 538 mg/L in September. These wells were also the locations where physical effects of the AS system (air flow at the well heads) were most pronounced. BTEX concentration decreases were also observed at MW-23 and MW-27 over this period. These data results indicate that the AS system has been very effective for groundwater remediation at the Site.

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3.0 RECOMMENDATIONS FOR FUTURE ACTIVITIES

EPFS recommends continued operation of the AS system with bi-weekly or monthly operation and monitoring visits. Groundwater sampling will continue on a quarterly basis until four consecutive rounds of groundwater samples indicate BTEX concentrations below NMWQCC standards or until levels reach steady-state values. The groundwater monitoring schedule for 2003/2004 is presented in Table 3.1, *Groundwater Monitoring Schedule*. The next quarterly groundwater sampling event is scheduled for the 4th Quarter 2003. Results of the groundwater monitoring will be transmitted in an annual report, tentatively scheduled for submission to NMOCD in October 2004.

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4.0 **REFERENCES**

MWH, 2002. Work Plan for the Blanco North Flare Pit. Prepared for El Paso Field Services. July 2002.

MWH, 2003. Blanco North Flare Pit Work Plan Update Technical Memorandum. Prepared for El Paso Field Services. June 2003.

Tables



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TABLE 2.1AS SYSTEM OPERATION AND MONITORING DATA (FEBRUARY 2003 - SEPTEMBER 2003)BLANCO NORTH FLARE PIT - SAN JUAN COUNTY, NEW MEXICO

			. Depth to	Water (ft bgs)		
Date	MW-2	MW-19	MW-23	MW-24	MW-26	MW-27
2/3/03	dry	63.64	nm	nm	64.55/63.02	64.05
6/2/03	dry	63.90	57.12	66.38	pump in well	64.41
6/5/03	dry	62.42	57.03	66.96	pump in well	64.48
6/6/03	dry	62.34	57.14	66.97	pump in well	64.44
6/9/03	dry	62.31	57.03	66.81	pump in well	64.41
6/16/03	dry	62.47	57.09	66.74	pump in well	64.46
6/23/03	dry	62.31	56.99	66.71	pump in well	64.45
7/2/03	dry	62.75	57.06	66.68	pump in well	64.50
7/10/03	dry	62.45	57.08	66.68	65.38	64.50
7/15/03	dry	62.75	57.08	66.81	64.35	64.74
7/29/03	dry	62.71	57.06	66.83	64.46	64.68
8/7/03	dry	65.00	57.13	67.09	65.26	64.75
8/21/03	dry	64.84	57.12	67.09	64.59	64.78
9/10/03	dry	64.79	57.04	67.08	64.55	64.81
9/25/03	dry	63.95	57.12	67.07	64.55	64.89

	的名称人的公	State of the second	Dissolved	Oxygen (mg/L)		教会主法 不已经1988
Date	MW-2	MW-19	MW-23	MW-24	MW-26	MW-27
2/3/03	dry	nm	nm	nm	nm	nm
6/2/03	dry	nm	nm	nm	pump in well	nm
6/5/03	dry	nm	nm	nm	pump in well	nm
6/6/03	dry	nm	nm	nm /	pump in well	nm
6/9/03	dry	1.60	1.85	1.51	pump in well	0.88
6/16/03	dry	1.54	1.89	1.34	pump in well	0.80
6/23/03	dry	2.72	0.94	1.54	pump in well	1.44
7/2/03	dry	nm	nm	nm	pump in well	nm
7/10/03	dry	2.98	0.94	1.50	4.44	1.17
7/15/03	dry	1.29	0.75	2.09	6.89	0.96
7/29/03	dry	1.41	0.64	1.55	6.16	0.94
8/7/03	dry	0.60	1.42	nm	0.49	1.00
8/21/03	dry	0.91	1.11	nm	2.23	0.59
9/10/03	dry	1.10	0.64	nm	2.02	0.86
9/25/03	dry	1.10	1.12	1.71	0.50	1.01

	Induced Air Pressure at Well (inches H2O):						
Date	MW-2	MW-19	MW-23	MW-24	MW-26	MW-27	
2/3/03	dry	3.80	nm	nm	5.50	0.02	
6/2/03	dry	NA	nm	nm	pump in well	nm	
6/5/03	dry	4.50	0.00	0.00	pump in well	0.00	
6/6/03	dry	5.80	0.00	0.00	pump in well	0.00	
6/9/03	dry	6.10	0.00	0.09	pump in well	0.07	
6/16/03	dry	6.00	0.00	0.10	pump in well	0.07	
6/23/03	dry	6.15	0.00	0.09	pump in well	0.05	
7/2/03	dry	7.40	0.00	0.10	pump in well	0.10	
7/10/03	dry	5.20	0.00	0.02	>10	0.04	
7/15/03	dry	6.10	0.00	0.04	>10	0.07	
7/29/03	dry	6.60	0.00	0.09	>10.	0.05	
8/7/03	dry	0.00	0.00	0.00	0.00	0.00	
8/21/03	dry	3.60	0.00	0.07	6.80	0.06	
9/10/03	dry	6.40	0.00	0.03	<10	0.90	
9/25/03	dry	3.10	0.00	0.06	3.90	0.04	

dry - well was dry

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nm - not measured

bgs - below ground surface

TABLE 2.2FREE PRODUCT RECOVERY DATA (MW-26)BLANCO NORTH FLARE PIT - SAN JUAN COUNTY, NEW MEXICO

	Product thickness	Depth to product	Volume of produ		
<u>Date</u>	in MW-26 (feet)	in drum (ft BTOD)	Incremental	Cummulative	
12/17/2002	1.39	na	2	2	(water and product)
12/18/2002	1.39	na	2.5	4.5	(water and product)
2/3/2003	1.53	na	Total collected by bai	ling =4.5 gallons of w	ater/product
2/6/2003	1.33	na	Skimmer system insta	alled during week 23	Apr 2003.
4/22/2003	1.98	nm	0.81	0.81	
4/28/2003	nm	2.57	0.82	1.63	
5/6/2003	0.03	nm	0.00	1.63	
5/12/2003	0.36	nm	0.23	1.86	
5/16/2003	nm	2.54	0.00	1.86	
5/19/2003	nm	2.54	0.00	1.86	
5/23/2003	nm	2.53	0.20	2.06	
5/27/2003	nm	2.525	0.10	2.17	
6/5/2003	nm	2.505	0.41	2.57	
6/6/2003	nm	2.50	0.10	2.67	
6/9/2003	nm	2.50	0.00	2.67	
6/16/2003	nm	2.48	0.41	3.08	
6/23/2003	nm	2.48	0.00	3.08	
7/2/2003	nm	2.48	Skimmer system dow	n - pump has not cyc	led since 7/1/03.
7/10/2003	0		Total collected by Ski	immer system = 3.08	gallons of product
7/15/2003	0				
7/29/2003	0				
8/7/2003	0				
8/21/2003	0				
9/10/2003	0				
9/25/2003	0	Total Product Recovery	in MW-26 (bailed/sk	immer pump) = 7.5	8 gallons

TOC = Top of Casing BTOD = Below Top of Drum nm = not measured na = not applicable

J:\EI Paso New Mexico\Blanco\North Flare Pit\2003 NFP AS Report\ Final 2003 NFP AS Tables 15Oct03.xls, Table 2.2

TABLE 2.3 GROUNDWATER MONITORING ANALYTICAL DATA BLANCO NORTH FLARE PIT - SAN JUAN COUNTY, NEW MEXICO

		1	l	Analytical I	arameters	
Monitoring	Sample	Static Water Level (ft BTOC)	Benzene (ug/l)	Toluene (ug/l)	Ethylbenzene (ug/l)	Total Xylenes (ug/l)
Well	Date		10	750		
South States and States and	المتبند وبرابية الألف ويستعمل البانيان فيتعاد	Th QCC Standard.		<0.5	0.7	0.9
	6/18/91		<0.5			
MW-2	2/23/93		<0.5	<0.5	<0.5	<0.5
	6/8/93		<2.0	<2.0	<2.0	<2.0
	9/29/93		6.2	<2.0	<2.0	<2.0
	2/10/94		<2.0	<2.0	<2.0	<2.0
	5/13/94		<2.0	<2.0	<2.0	<2.0
	8/22/94		<2.0	<2.0	<2.0	<2.0
	11/9/00	dry		Well Dry - No S	ample Collected	
	3/25/01	dry		Well Dry - No S		

	6/2/03	dry		Well Dry - No S		
	8/4/03	dry		Well Dry - No S	ample Collected	
	9/3/03	dry		Well Dry - No S	ample Collected	
	6/19/91		8,600	210	<25.0	4,200
MW-19	2/25/93		14,000	450	3,900	5,100
	6/10/93		9,580	159	928	1,087
	11/13/00	63.45	7,200	<25	3,500	88
		63.37	12,000	<50	4,500	110
	3/26/01		the second		and the second se	
	5/30/02	63.54	12,000	<50	4,300	140
	6/2/03	63.90	10,100	<10	3,900	<30
	8/4/03	62.75	2,000	<10	304	<30
· · · · ·		65.06	3,580	**********************************	1.020	
	9/3/03	00.00		<1.0		<3.0
	9/26/92		<1.0	<1.0	<1.0	<1.0
MW-20	2/24/93		<0.5	<0.5	<0.5	<0.5
	6/10/93		<2.0	<2.0	<2.0	<2.0
	9/29/93		<2.0	<2.0	<2.0	<2.0
	1/27/94		<2.0	<2.0	<2.0	<2.0
	5/13/94		<2.0	<2.0	<2.0	<2.0
	8/22/94		<2.0	<2.0	<2.0	<2.0
	11/13/00	41.00		Well Damaged - No		
	6/2/03	NA		Well Damaged and	abandoned in 2002.	
	9/26/92		2,770	221	7,690	6,090
MW-23	2/1/93		2,900	3,500	190	4,100
	2/25/93		2,900	190	3,500	4,100
	6/8/93		1,680	30	1,850	2,906
				**		and the second se
	9/29/93		2,133	216	1,807	3,823
	2/10/94		2,090	151	1,150	2,660
	5/13/94		3,530	255	852	2,150
	8/22/94		3,270	212	353	1,176
	11/13/00	57.02	3,700	<25	840.	1,400
	3/26/01	57.07	7,200	<25	520	1,300
	5/30/02	57.08	9,300	<50	360	1,500
	6/2/03	57.12	8,920	<10	337	1,450
	8/4/03		2;250	<10	100	337
		57.06	3,860	7.8	208	A CONTRACTOR OF THE OWNER WATER OF THE OWNER OF THE OWNER WATER OF THE OWNER WATER OF THE OWNER WATER OF THE OWNER OWNER OF THE OWNER OF THE OWNER OF THE OWNER OWNE
	9/3/03	57.11	divide lawore a day as the call of cardinal weater. An			
	9/26/92		2,650		<50	······ 1,340
MW-24	2/23/93			71	<12.5	600
1	6/10/93		59	15	7	95
	9/29/93		1,040	63	8	918
	2/10/94		490		<2.0	395
	5/13/94		1,390	69	<2.0	898
	8/22/94		836	60	<2.5	154
			200			
	11/13/00	65.06		<1	5	22
	3/26/01	65.00	1,500	<5.0	18	35
	5/30/02	65.65	2,100	13	29	<25
	6/2/03	66.38		Well Bailed Dry - N	o Sample Collected	
	8/4/03	66.91		Well Bailed Dry - N	o Sample Collected	
	9/3/03	dry			ample Collected	
					9,900	10.000
	2/25/93		11,000		1000 100 100 100 100 100 100 100 100 10	
MW-26	2/25/93 6/10/93		11,000 12,180		TANK T SOLANDARY	Chieros Constraint & UNUC STATE
MW-26	6/10/93	63.26	12,180	470	7,504	
MW-26	6/10/93 3/26/01	62.36	12,180 6,400	470 100	280	1,900
MW-26	6/10/93 3/26/01 5/30/02	63.68	12,180 6,400 6,200	470 100 50	280 270	1,900 1,300
MW-26	6/10/93 3/26/01 5/30/02 6/2/03	63.68 NA	12,180 6,400 6,200	470 100 50	280	1,900 1,300
MW-26	6/10/93 3/26/01 5/30/02	63.68	12,180 6,400 6,200	470 100 50	280 270 in Well - No Sample Col	1,900 1,300
MW-26	6/10/93 3/26/01 5/30/02 6/2/03	63.68 NA	12,180 6,400 6,200	470 100 50 Yroduct Recovery Pump	280 270 in Well - No Sample Col	1,900 1,300
MW-26	6/10/93 3/26/01 5/30/02 6/2/03 8/4/03 9/4/03	63.68 NA 65.19	12,180 6;400 6;200 Free-F	470 100 50 roduct Recovery Pump Well Bailed Dry - N 9.6	280 270 in Well - No Sample Coll o Sample Collected 139	1,900 1,300 lected 466
	6/10/93 3/26/01 5/30/02 6/2/03 8/4/03 9/4/03 2/26/93	63.68 NA 65.19	12,180 6,400 6,200 Free-F 538 9,100	470 100 50 roduct Recovery Pump Well Bailed Dry - N 9.6 470	280 270 in Well - No Sample Col o Sample Collected 139 5,700	1,900 1,300 lected 466 4,900
MW-26 MW-27	6/10/93 3/26/01 5/30/02 6/2/03 8/4/03 9/4/03 2/26/93 6/10/93	63.68 NA 65.19	12,180 6,400 5,200 Free-F 5,38 9,100 8,970	470 100 50 roduct Recovery Pump Well Bailed Dry - N 9.6 470 376	280 270 in Well - No Sample Col o Sample Collected 139 5,700 137	1,900 1,500 lected 466 4,900 5,406
	6/10/93 3/26/01 5/30/02 6/2/03 8/4/03 9/4/03 2/26/93 6/10/93 9/30/93	63.68 NA 65.19	12,180 6,400 5,200 Free-F 538 9,100 8,970 13,200	470 100 50 'roduct Recovery Pump Well Bailed Dry - N 9.6 470 376 402	280 270 in Well - No Sample Col o Sample Collected 139 5,700 137 420	1,900 1,500 lected 466 4,900 5,406 3,100
	6/10/93 3/26/01 5/30/02 6/2/03 8/4/03 9/4/03 2/26/93 6/10/93	63.68 NA 65.19	12,180 6,400 6,200 Free-F 538 9,100 8,970 13,200 9,740	470 100 50 roduct Recovery Pump Well Bailed Dry - N 9.6 470 376 402 212	280 270 in Well - No Sample Col o Sample Collected 139 5,700 137	1,900 1,500 lected 466 4,900 5,406 3,100
	6/10/93 3/26/01 5/30/02 6/2/03 8/4/03 9/4/03 2/26/93 6/10/93 9/30/93	63.68 NA 65.19	12,180 6,400 5,200 Free-F 538 9,100 8,970 13,200	470 100 50 'roduct Recovery Pump Well Bailed Dry - N 9.6 470 376 402	280 270 in Well - No Sample Col o Sample Collected 139 5,700 137 420	1,900 1;500 lected 466 5;406 3,100 1,750
	6/10/93 3/26/01 5/30/02 6/2/03 8/4/03 9/4/03 2/26/93 6/10/93 9/30/93 2/2/94	63.68 NA 65.19	12,180 6,400 6,200 Free-F 538 9,100 8,970 13,200 9,740	470 100 50 roduct Recovery Pump Well Bailed Dry - N 9.6 470 376 402 212	280 270 in Well - No Sample Col o Sample Collected 139 5,700 76445 137 420 209 180	1,900 1;500 lected 4,900 5;406 3,100 1,750 4,500
	6/10/93 3/26/01 5/30/02 6/2/03 8/4/03 9/4/03 2/26/93 6/10/93 9/30/93 2/26/94 5/14/94 11/13/00	63.68 NA 65.19 65.00 63.67	12,180 6,400 6,200 Free-F 538 9,100 8,970 13,200 9,740 10,100 4,400	470 100 50 roduct Recovery Pump Well Bailed Dry - N 9.6 470 376 402 212 358 4700 358	280 270 in Well - No Sample Col o Sample Collected 139 5,700 137 420 209 180 209	1,900 1,360 ected 466 4,900 5,406 3,100 1,750 4,500 60,000
	6/10/93 3/26/01 5/30/02 6/2/03 8/4/03 9/4/03 2/26/93 6/10/93 9/30/93 2/2/94 5/14/94 11/13/00 3/26/01	63.68 NA 65.19 65.00 63.67 63.38	12,180 6,400 5,200 Free-F 5,38 9,100 8,970 13,200 9,740 10,100 4,400 420	470 100 50 roduct Recovery Pump Well Bailed Dry - N 9.6 470 376 402 212 358 402 212 358 27	280 270 in Well - No Sample Col o Sample Collected 139 5,700 137 420 209 180 420 209 180 209	1,900 1,500 ected 466 4,900 5,406 3,100 1,750 4,500 2,60,000 1,600
	6/10/93 3/26/01 5/30/02 6/2/03 8/4/03 9/4/03 2/2/6/93 6/10/93 9/30/93 2/2/94 5/14/94 11/13/00 3/2/6/01 5/30/02	63.68 NA 65.19 65.00 63.67 63.38 63.54	12,180 6,400 5,200 Free-F 538 9,100 8,970 13,200 9,740 10,100 4,400 4,20	470 100 50 roduct Recovery Pump Well Bailed Dry - N 9.6 470 376 402 212 358 27 13	280 270 in Well - No Sample Col o Sample Collected 139 5,700 137 420 209 180 209 180 200 200 170	1,900 1,500 ected 466 5,406 5,406 3,100 1,750 4,500 5,60,000 1,600
	6/10/93 3/26/01 5/30/02 6/2/03 8/4/03 9/4/03 2/26/93 6/10/93 9/30/93 2/2/94 5/14/94 11/13/00 3/26/01	63.68 NA 65.19 65.00 63.67 63.38	12,180 6,400 5,200 Free-F 5,38 9,100 8,970 13,200 9,740 10,100 4,400 420	470 100 50 roduct Recovery Pump Well Bailed Dry - N 9.6 470 376 402 212 358 402 212 358 27	280 270 in Well - No Sample Col o Sample Collected 139 5,700 137 420 209 180 420 209 180 209	1,900 1,500 lected 466

Notes:

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Shaded data indicate exceedance of New Mexico Water Quality Control Commission's (NMWQCC) standards.
 All detected concentrations are shown in **bold type**.
 Analyte detected below the reporting limit (RL). Value shown is the RL.

BTOC = Below Top of Casing NA = Not Applicable

TABLE 3.1 GROUNDWATER MONITORING SCHEDULE BLANCO NORTH FLARE PIT - SAN JUAN COUNTY, NEW MEXICO EL PASO FIELD SERVICES

Monitoring Well	Monitoring Schedule	Analyses
North Flare Pit Area		· ·
MW-2	Quarterly	Field Parameters, BTEX
MW-19	Quarterly	Field Parameters, BTEX
MW-23	Quarterly	Field Parameters, BTEX
MW-24	Quarterly	Field Parameters, BTEX
MW-26	Quarterly	Field Parameters, BTEX
MW-27	Quarterly	Field Parameters, BTEX

Notes:

1. Field Parameters include temperature, pH, dissolved oxygen and specific conductance.

2. The next quarterly sampling event is scheduled for 4th Quarter 2003.

3. Monitoring well MW-20 was damaged and abandoned in 2002.

BTEX: Benzene, Toluene, Ethylbenzene and Total Xylenes.

J:\El Paso New Mexico\Blanco\North Flare Pit\2003 NFP AS Report\Final 2003 NFP AS Tables 15Oct03.xls, Table 3.1

Figures



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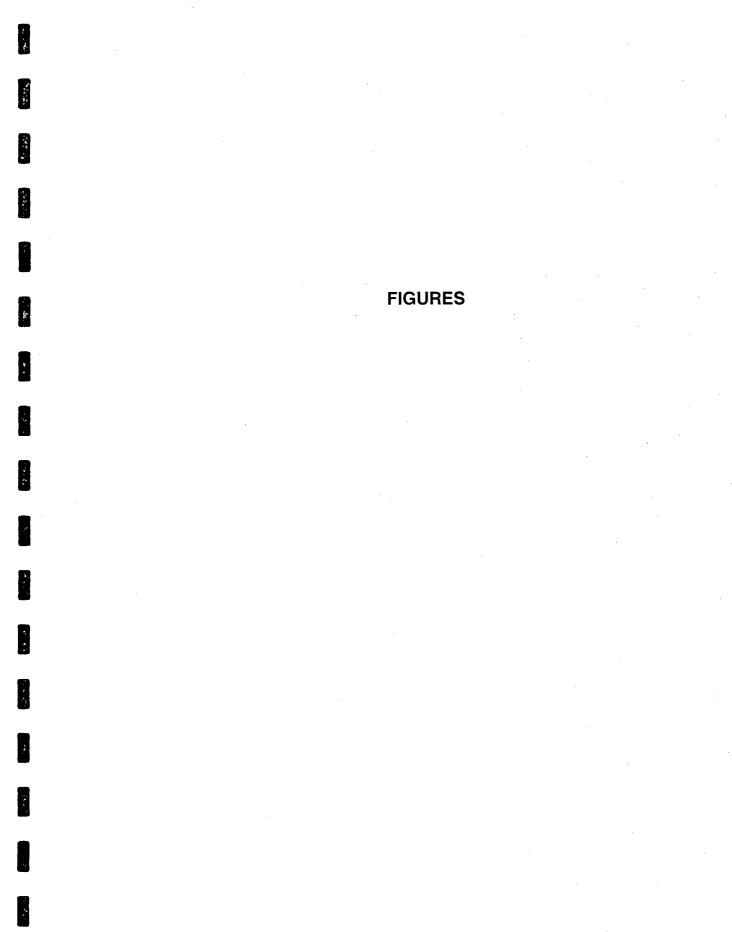
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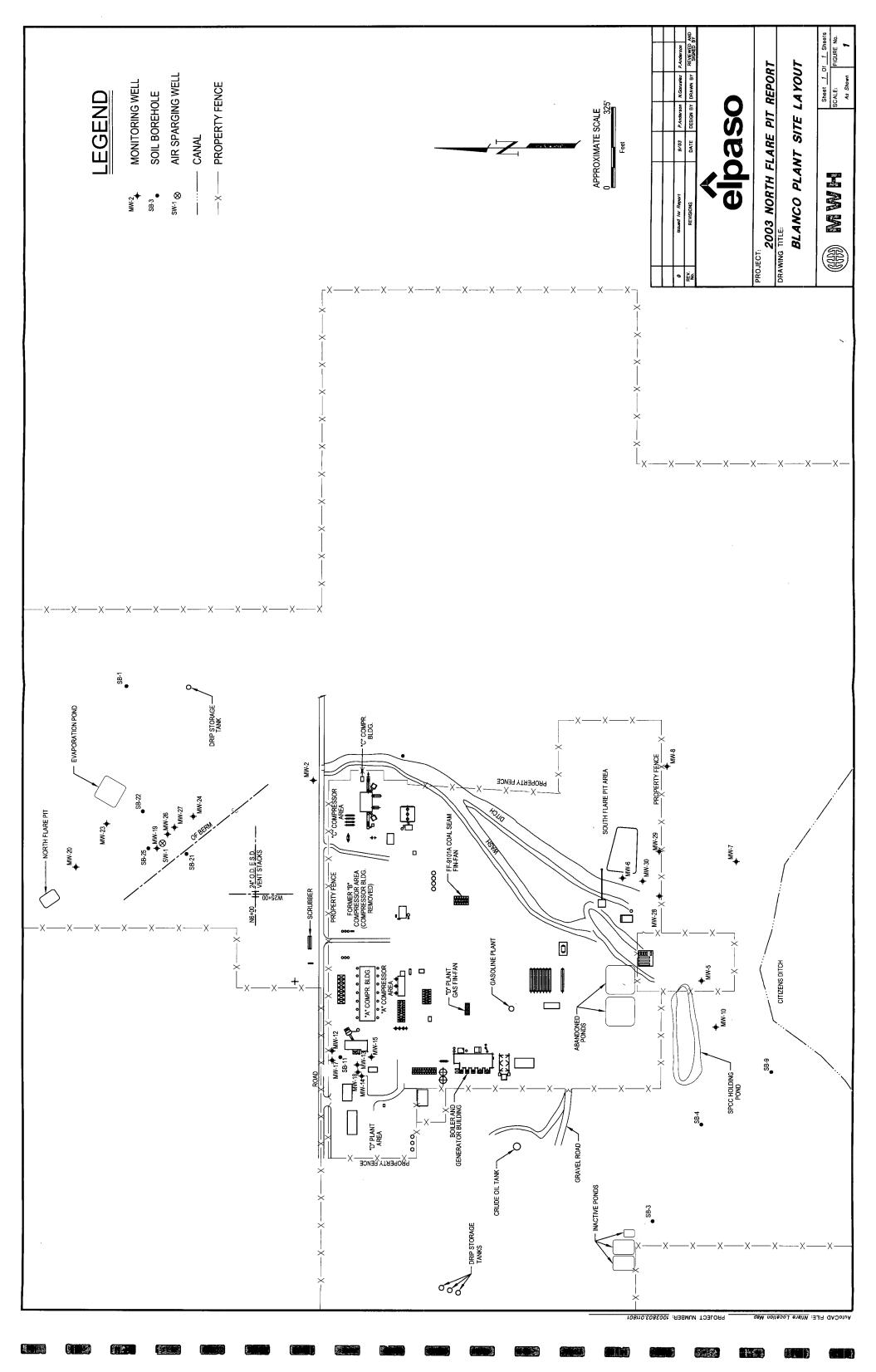
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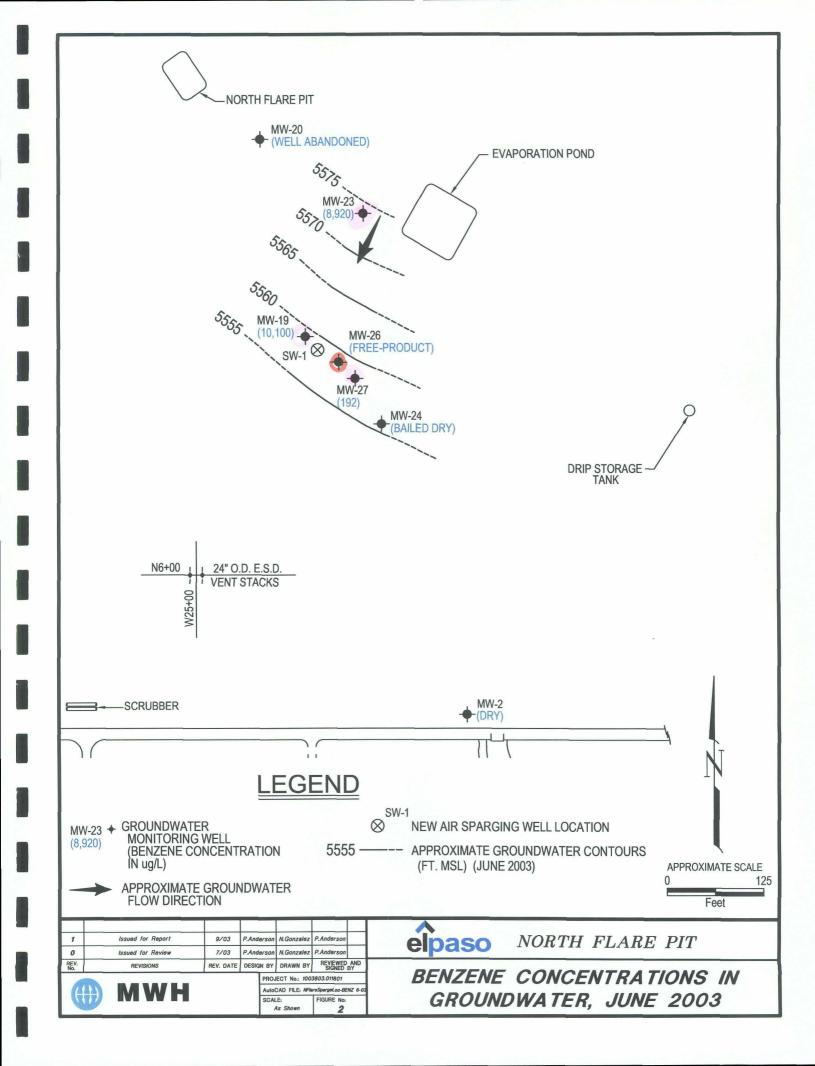
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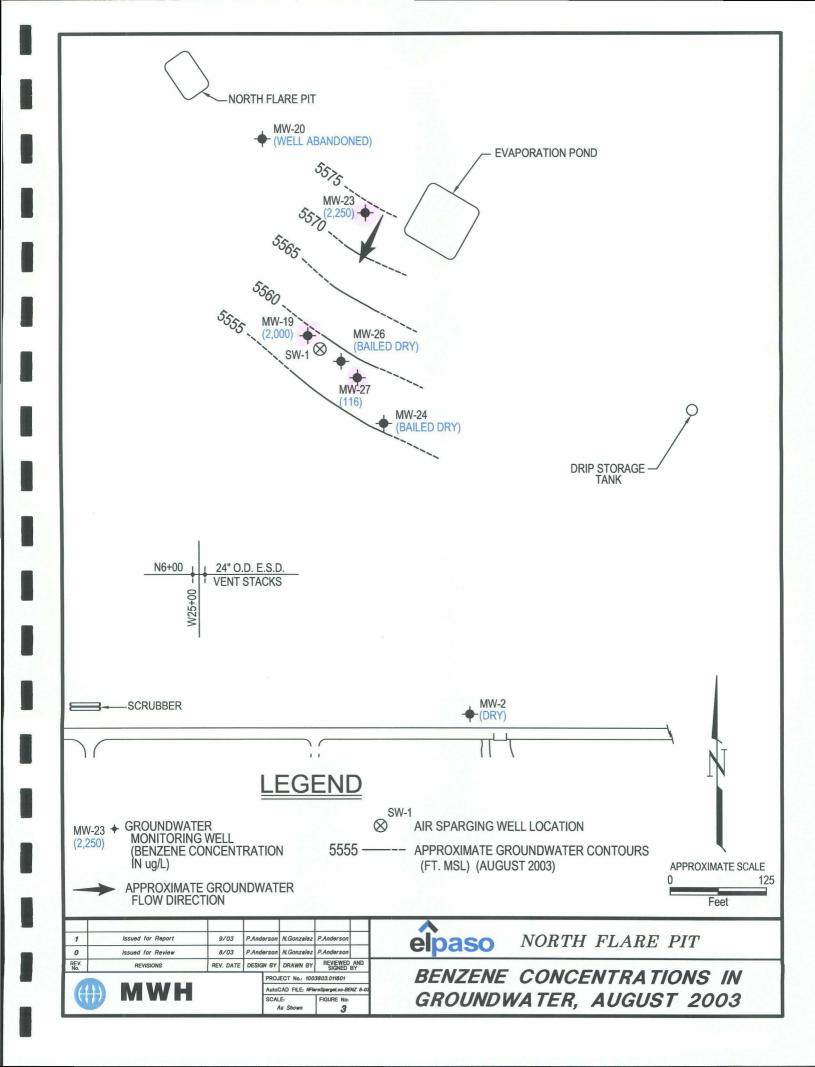
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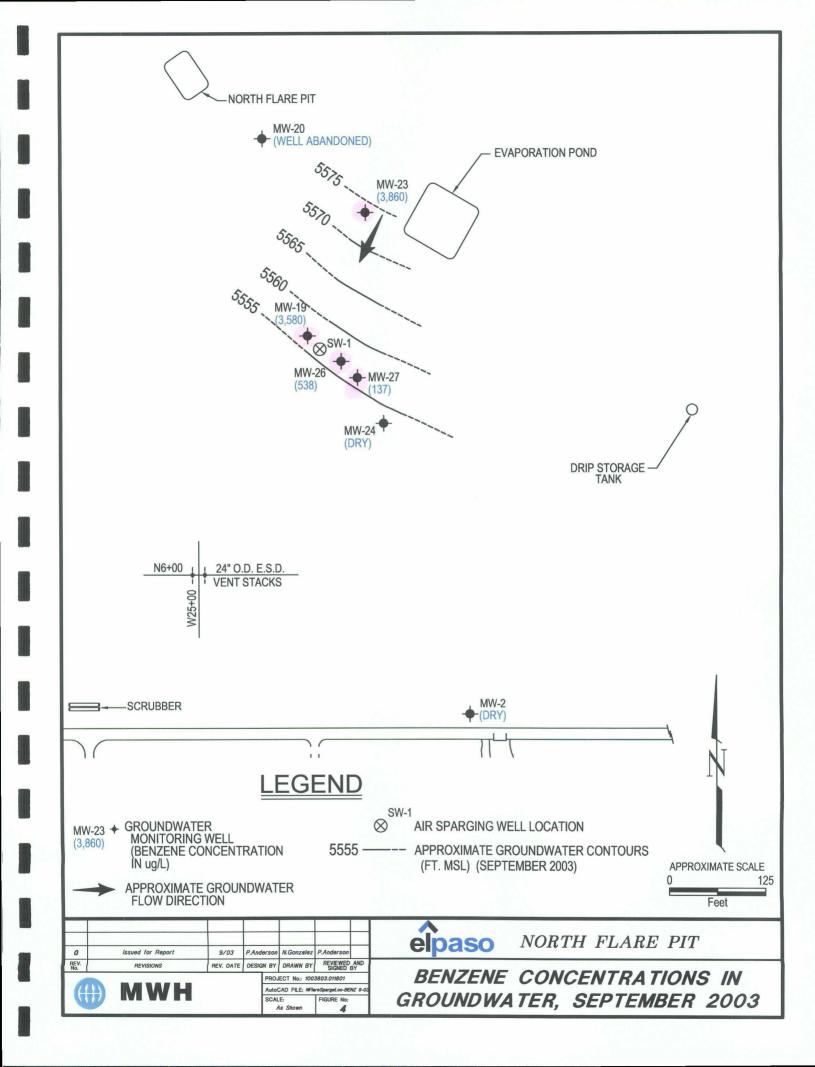
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Appendix A



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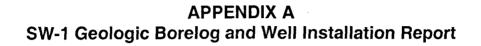
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BORF	HOLE NUMBER:	SW-	1		SHEET 1
	G LOCATION: Blanco North Flare Pit, Bloomfield, N.M.	0.11	•	SURFACE ELEVATION: ~5620	
	NG COMPANY: Envirotec			DATE/TIME STARTED: 12/16/02	
	MENT: Hollow Stam Auger			DATE/TIME FINISHED: 12/16/02	
	R DEPTH: Approx. 60 ft. bgs (based on nearby wells)			LOGGED BY: M. Nee (AESE)	
			1		
	SOIL PROFILE				
		<u>.</u>	₽	WELL DESCRIPTION	
ELEV.	SOIL	USCS	GRAPHIC		CONS
DEPTH	DESCRIPTION	CLASS	<u>ö</u>	· · · ·	
0	GROUND SURFACE.		· · · · · · · · · · · · · · · · · · ·		4.9* 0
	TOPSOIL. ORGANIC-RICH SILT AND CLAY.	ОМ			
- 5				5'	
-					
- (CLAYEY SILT. MODERATE YELLOWISH-BROWN (10YR 5/4),	· . · .	مر المراجع معلم المراجع المراجع محمد المراجع الم محمد المراجع ال		
-	UNCONSOLIDATED CLAYEY-SILT WITH VERY-FINE SAND.				
- 20	APPROXIMATELY 30:30:40 SAND, SILT, CLAY CONTENT.	ML		20'	
-	SAND. MODERATE YELLOWISH-BROWN (10 YR 5/4), VERY-FINE TO MEDIUM SAND WITH MINOR SILT.	SM	國家黨		
- 25 -				25'	
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_					60.8
_	CLAY. CLAY WITH SILT AND VERY-FINE SAND.				
66	CLAY IS STIFF.	CL		66 [.]	67.5
-			-	- -	70.2
<u> </u>	<u>SANDSTONE.</u> LITHOLOGY CHANGE BASED ON DRILLING CONDITIONS.	BEDROCK			
-75.5	END OF BORING 175.5 ft. bgs		<u></u>	75.5'	75.5
_	BOREHOLE LOGGED BASED ON CUTTINGS				
_					
-					· [
-	Note: Strong hydrocarbon odor while pulling augers from borehole.			Note: Well completed as an air sparge well. There was 0.04 feet of water in well	
-	u			at end of day.	ł
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-			<u>⊦</u> -		
		_!		CONSTRUCTION DETAIL	
				CONSTRUCTION DETAIL	
<u> </u>	APPROXIMATE FINAL WATER LEVEL C BASED ON NEARBY WELLS S	CREEN MA	TERIAL: .	2" Diameter Schedule 40 PVC 2" Schedule 40 PVC, 10 Slot	CONC
	Fi	ILTER TYP	E: 10x20	Silica Sand	SAND
	B	ENTONITE	TYPE: 3/	8" Bentonite Chips	
		ROUT TYP	CASING M	/ITH CAP: Yes LOCK: Yes	
		ENGTH OF	STICKUP	^D : Approx. 4.9 ft.	
		elp	aso	NORTH FLARE PI	T'
0 REV. No.	Issued for Report 10/03 P.Anderson N.Gonzelez P.Anderson REVISIONS REV. DATE DESIGN BY DRAWN BY REVEWED AND SIGNED BY				
	PROJECT No.: 1003803.011801			1, AIR SPARGE WELL	

A. 600 39.9

From-EL PASO FIELD SVS +505-599-2235 T-311 P.04/06 F-800 May-02-03 11:39am 11 MONITORING WELL INSTALLATION RECORD Borchole # Well # Su-**AE Schmidt Environmental** Page of 906 San Juan Hird, Ste. D Project Name Air Space Hell Blanco Farmington, New Mexico 87401 Project Number 2000 Start Cost Code _____ (505) 56n-411+ FAX (\$05) 566-9120 5620 Elevation. On-Site Geologist MIN Well Location 60 Personnel On-Site 1441-14 GWL Depth 264' Bills & mu-26 Contractors On-Site Laurates Client Personnel On-Site SiP - - Carella Installed By 1. Holen ASE Æ inverst-Date/Time Started 16-02 12-16.52 Date/Time Completed Depths in Reference to Ground Surface ltém Material Depth Top of Protoctive Casing (fcct) ЧÏ NA Top of Riser NA Top of Protective Casing NA Ground Surface NA Bottom of Protoctive Casing Top of Permanent Borehole NA NA Casing Bottom of Permanent Borehole NA NA Casing NA NA Top of Concrete NA NA Bottom of Concrete STR. \mathcal{O} Top of Grout 30.22.22 405 Bottom of Grout Aunt threads +5 Top of Well Riser -7Q.Z Bottom of Well Riser 10 Not AJC -602 70.2 4Bight 24 Top of Well Screen Top of Seal 75.2 Bottom of Well Screen 10 5AL 3 6.9 Top of Peltonite Seal ##**T*** 675 Bottom of Pettonite Seal Top of Gravel Pack 67 : 67.5 Top of Gravel Pack Top of Screen 75. Bottom of Gravel Pack NON 6 Top of Natural Cave-In Acres 6 Bottom of Natural Cavo-In Maggariadelm 14 75 Bottom of Screen Top of Groundwater Bottom of Borchole *75*-5 Total Depth of Borehole Well completed as Comments: 211 SPERCE a Lect al wo - do 0 has no Gologist Signature TD = 75.5 680 Sureen: 70.2-75.2 bgp

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RECORD OF SUBSURFACE EXPLORATION

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AE Schmidt Eavironmental AESE 906 Sea Juan Baulavard, Suite D

Farmingson, New Meuro \$7403 (505) 558 9118 FAX (005) 884 9120

2 5620 Elevation Borendie Location GWL Depth Lagged By Dnilog By Date/Time Starting 12 16-6 Date/Time Completed / 276-0 (latProject Number Proyect Location NEE ARSE wen Logged By Personner On-Site Contractors On-Site Client Personner On-Site

Ргојеск натне

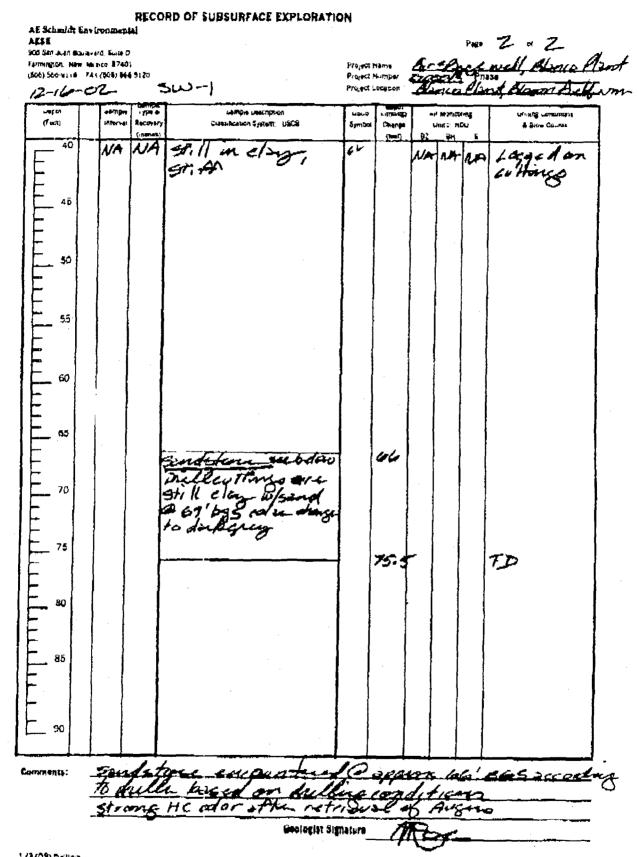
Ct. avirates Δ Drilling Met200 PIDDY Air Monitoring Meshaq

(F##)	Semple Interval	туре 4 Луре 4 Авсониту (ослев)	Sample Description Станксатор Вускот: UBCB	USCS Bymboi	Lithqidgy Gnangs (feat)		r moneta Inics: Rd RH		Drubling Congitierts & Blove Country
F	Na	NA	o-5 Torsail organic rich Sitt and clay			NA	n/a	NA	Logg + d +
			5-20 Clayer att Mod yllan bra wyr 57 Uncinsalia tar	4	5				
10			Int fine send Mer resurs @ 10' 13' 3PP imately 30% 30%, 50 Sond, silt, elay	-					
15			sond, silt, elsy						
20			20-25 cand mad 11155 Brn, 10 yr 5/4	-	20				
25			Herry Fine, to mediu moderately well sortal unconsolidate more site class of 25 with.	e ce	25				
30			Sint and Very time Sand clay ball m up clay is still moderating well	-					
36			comol, detar						
4 0		<u> </u>	ļ						
Comments:	60	<u>rep</u>	1 Lagged on ext	रतदुर	.		_		

Geologist Bignature

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Appendix B



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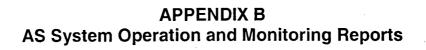
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	TD of well) Shorn ⊔C small wrater cloudd modduim crad. Δ	67.208 density difference can be seen on top of bailer.	Sheen water clear began with a septic odor 69.28 changed to a sweet smell as water removed. Product in well, product is a deep orange/red	color, smell is similar to condensate. After well bailed dry three distint liquid layers seen, red/orange product on the top with an inch laver of	black grey emulsion, with clear water on the	67.87 bottom.	Product smell on probe. Water light grev color with a stong suffur (rotten	67.33 egg) odor.	66.845 Water Ihad a light grey color with no odor.			
Blanco North Data December 17, 2002	Depth to water Depth to Product Product Thickness Volume removed TI	0 0.5 gal H20	0 1.5 gal H2O		0.75 gal H2O and	1.39 2 gal of Product	0 NA	0 1.5 gal H2O	0 8.5 gal H2O			
	pth to Product Pro					62.97	-					
	Depth to water De	65.94	63.89			64.36 approximately 0.27 feet of	water in well	63.34	90.74			
		MW-24	MW-27	MW-26		SP1		MW-19	62- MM			

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J:\El Paso New Mexico\Blanco\North Flare Pit\2003 NFP AS Report\Final 2003 Report 13Oct03\Appendix B\ ProdRecovery dec02.xls

66.59 0 0 67.208 63.36 0 67.87 73.34 62.97 1.39 2.1/2 gallons 67.87 73.34 65.24 0 1/2 gallon 67.87 0 66.845 65.24 0 0 66.845 0 66		Depth to water Dep	Depth to water Depth to Product Produc	t Thickness	d TD of well Comments
6 643 6 62.97 1.39 2.1/2 gallons 67.87 79.34 62.97 1.39 2.1/2 gallon 67.33 63.57 0 1/2 gallon 67.33 56.24 0 66.845 0 66.845	MW-24	66.59			9
64.36 62.97 1.39 2 1/2 gallons 67.87 79.34 63.57 0 1/2 gallon 67.33 66.24 0 1/2 gallon 67.33 66.24 0 66.845	12-WV	63.96			69.28
79.34 6.3.57 56.24 0 0 1/2 gallon 0 0 1/2 gallon 0 0 0 0	MW-26	64.36	62.97	1.39 2 1/2 gallons	gray in color. Bailed 1 gallon of product color wa 67.87 copper/reddish.
63.57 63.57 0 12 gallon 0 12 gallon 0 10 g	SP1	79.34		0	
	/W - 19 /W - 23	63.57 56.24		0 1/2 gallon 0	Q
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То:	Marc Greeley, Lynn Benally
From:	Martin Nee
CC:	File
Date:	2/3/03
Re:	Blanco North

1/22/03, AESE visited Blanco North to prepare a one-day pilot test to investigate communication between the newly installed sparge well and surrounding monitoring wells MW-26, 27, and 19. Well casing sizes were verified and the distance from the compressor house to the wells was measured. We looked at the existing compressor as a source of sparge air. The existing compressor is not an oil-less model and it has been drained of oil and tagged out-of-service.

A 30A 240V receptacle will need to be installed to run the oil-less compressor.

Static water in the sparge well was 68.465 feet beneath top of casing and total depth 80.18. No product was present.

1/24/03 AESE contacted David Nichols and delivered a key to the compressor shed to him at Blanco so he could wire the compressor for a pilot test at the new sparge well. AESE also placed the sparge compressor in the shed.

1/31/03 Traveled to Jaquez to pick up magnehelic gauges for pilot test at Blanco. Dropped off magnehelic gauges and checked to make sure compressor was operational. Also purchased hardware for pilot test.

2/3/03 1130 hrs, arrived at site to conduct limited pilot test. Objective is to determine if communication can be established between SW-1(sparge well 1) and nearby monitoring wells MW- 19, 27, and 26. Compressor was plumbed to SW-1 and preparations made for pilot test.

1257 hrs, water levels were measured as follows

MW-19 63.64 feet beneath top of well casing (fbtoc)

Blanco North

10/09/03

MW-26 64.55 water, 63.02 product fbtoc

MW-27 64.05 fbtoc

SW-1 68.396 fbtoc.

Water was bailed from SW-1 so the compressor would not have to push the water in the well into the formation. Approximately 3.0 gallons of water were removed. Final water level measurement indicated a depth of water at 76.80 fbtoc, td is 80.18 fbtoc.

The compressor was started at 1345 hrs and a flow rate of 12 scfm was measured while vented to the atmosphere. Flow was directed to SW-1 and the flow rate dropped to 5 scfm and remained constant throughout the test.

Pressure readings from monitoring wells were recorded as follows:

1350 hrs	MW-19	0.75 inches H 2O
1354 hrs	MW-26	1.25 inches H 2O
1358 hrs	MW-27	0.01 inches H 2O
1442 hrs	MW-27	0.02 inches H 2O
1444 hrs	MW-26	5.5 inches H 2O strong hydrocarbon vapors from well
1446 hrs	MW-19	3.8 inches H 2O
1500 hrs	Ended test	

Conclusion

Good communication between SW-1, MW-26 and MW-19.

4ESE 906 San Juan Blvd., Suite D. Farmington, NM 87401 (505) 566-9116



40°° -

To:	Marc Greeley, Lynn Benally
From:	Martin Nee
CC:	File
Date:	2/7/03
Re:	Blanco North 2/6/03 pilot

1145 hrs, water levels were measured as follows

MW-19 63.61 feet beneath top of well casing (fbtoc)

MW-26 64.31 water, 62.98 product fbtoc

MW-27 64.06 fbtoc

SW-1 75.725 fbtoc.

1208 hrs

The compressor was started and a flow rate of 11 scfm was measured while vented to the atmosphere. Flow was directed to SW-1 and the flow rate dropped to 5 scfm and remained constant throughout the test.

1238 hrs

MW-19	62.56 fbtoc		
MW-26	64.23 fbtoc v	vater 62.6	5 fbtoc product
MW-27	64.055 fbtoc	•	
1248 hrs	turned off sparge and	checked water le	vels
MW-19	62.55 fbtoc		
MW-26	64.17 fbtoc v	/ater 62.56	6 fbtoc product
MW-27	64.09 fbtoc		
SW-1	76.87 fbtoc		

Martin Nee PO Box 3861 Farmington, NM 87401-3861 (505) 334-2791 mjn@martinnee.com

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A Sumary

- Taylor -

- To: Lynn Benally
- From: Martin Nee
- cc: File

Date: May 2, 2003

Re: Blanco North

4/17/03	Moved meter house from SJRP to Blanco. Moved Overpac from Jaquez to Blanco. Picked up system from EP lab and Delivered to Blanco. Prepared to install system.
4/22/03	Met with electrician and discussed site wiring. Inventoried Xitech equipment and reviewed installation procedures. Mounted timer in meter house and installed shutoff and overflow controller in drum. Made equipment and materials list to complete installation. Depth to product from TOC 63.20 ', Depth to water from TOC 65.18 '
4/23/03	Picked up nitrogen bottle. Installed anchor post to secure nitrogen bottle. Attached air and product lines to pump and installed pump. Installed nitrogen bottle. Attached gas lines from tank to timer and from timer to pump. Installed product line from pump to tank. Set system to operate 3 cycles per day 3 minutes per cycle. Ran pump through three cycles. Initial cycle pumped product and water. The two following cycles pumped only product. Center of pump is set at the product/water interface approximately 65.18' BTOC. pressure to pump is set at 65 psi and the tank has 2400 psi.
4/24/03	System had not pumped because the timer was set to pump one cycle per day and a day had not passed. Reset the timer to pump 3 cycles per day. Measured water levels at MW-25 64.27', SW-1 67.58', MW-19 63.71'. All measurements are from top of casing. 0.04' of product have been recovered in drum. TD of 55 gallon plastic drum is 2.7' Therefore there is 20.37 g/ft. We recovered approximately .81 gallons of product.
4/25/03	Site visit revealed water in product lines. Called Xitech and discussed the water being pumped. Following discussion, the pump height was raised one foot and the pump cycled manually. The pump still pumped some water with the product. Following further discussion with Xitech the pump was pulled and the float and product tube inspected. A shipping retainer clip was removed from the pump float and the pump was reinstalled. The pump was cycled and pumped air only indicating the absence of product.
4/28/03	System operating. Can see product in lines. The depth to product in the drum is 2.57 feet beneath the top of the drum. The pump pressure is set at 65 psi and the tank pressure is at 2400 psi. The pump operated 28 minutes since the last visit and is set to run 3cycles per day at 3 minutes per cycle.
5/2/03	System operating. Can see product in lines. The product thickness in the drum is 0.08 feet, (2.63 - 2.55) feet beneath the top of the drum. There are approximately 20.37 gallons per foot of drum. Therefore, we have pumped approximately 1.63 gallons of product. The pump pressure is set at 65 psi and the tank pressure is at 2200 psi. The pump operated 34 minutes since the last visit. I cycled pump manually and it pumped only air, which indicates there is not product in the well at this time. I do not know when the last time the pump ran. I reset the timer to pump one 5 minute cycle per day and recommend that the pump is pulled soon and the well allowed to recover overnight and the pump reset.

Site Visit

Martin J. Nee PO Box 3861 Farmington, NM 87499-3861 (505)334-2791 (505)320-9675cell

Project Name_	San Juan Basin Ground Water	Project No.	30001.0
Project Manager	MJN		
Client Company	MWH	Date	5/6/03
Site Name	Blanco	-	

Well	Time	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Volume Removed
MW-26	1017	64.95	94.97	0.03	0
•					
					
					· · · · · · · · · · · · · · · · · · ·

Comments

No product has been pumped since last visit. Pulled pump to check product thicknees. There is only 3 hundredths of a foot in the well. Replaced pump and cycled manually. Product in the line did not move. The pump should have at least pumped air. Checked manual and everything checked out. Called Xitech and tried pumping at a higher pressure. Still no movement of the product in the lines. Xitech stated there is a problem in the logic valve in the pump head and will have to send pump back. Xitech will ship out pump same day they receive it. MWH LB approved returning pump. Shipped pump to Xitech. Tank pressure at 2100 psi. Pump pressure at 65 psi. System is shut in.

	Martin J. Nee	e Date:	May 6, 2003	
Signature:		<u></u>		

J:\2450162-El Paso\New Mexico\Blanco Flare Pits\2003 North Flare Pit\Blanco site visit 5-6-03.doc

Site Visit

Martin J. Nee PO Box 3861 Farmington, NM 87499-3861 (505)334-2791 (505)320-9675cell

Project Name_	San Juan Basin Ground Water	Project No.	30001.0
Project Manager	MJN		
Client Company	MWH	Date	5/12/03
Site Name	Blanco		

Well	Time	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Volume Removed
MW-26	1318	63.54	63.90	.36	.23
			· · · · · · · · · · · · · · · · · · ·		
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				·	

Comments

Received pump from xitech and installed at MW-26. Measured water level. There is .23 gallons of product in the well. Measured the distance from the top of casing to the center of pump 63.9 feet. Installed pump and cycled. The system pumped product. Set the timer to cycle once perday for 5 minutes. Pump pressure is at 65 psi and the tank pressure read 2200 psi.

Signature: Ma

. . .

Martin J. Nee

Date: May 12, 2003

LODESTAR

Memo

6/5/03

To:	Pam Anderson, Lynn Benally
From:	Martin Nee
CC:	File
Date:	June 5, 2003

Re: Blanco North

- 5/16/03 Pump set at 65 psi, tank at 2000 psi. 15 minutes of pumping had elapsed since last visit. Depth to product in drum is 2.54 beneath top of drum. Reset timer and cycled pump and it pumped product until froth came out. Did not appear to pump much product maybe a couple of ounces.
- 5/19/03 Pump set at 65 psi, tank at slightly less than 2000 psi. 20 minutes of pumping had elapsed since last visit. Depth to product in drum is 2.54 beneath top of drum. Reset timer and cycled pump and it pumped product until froth. System looks good.
- 5/23/03 Pump set at 65 psi, tank at 1950 psi. 26 minutes of pumping had elapsed since last visit. Depth to product in drum is 2.53 beneath top of drum. Reset timer and cycled pump and it pumped product until froth. System looks good.
- 5/27/03 Pump set at 65 psi, tank at 1900 psi. 20 minutes of pumping had elapsed since last visit. Depth to product in drum is 2.525 beneath top of drum. Reset timer. System looks good. Collected water level data.
- 6/2/03 Sample MW-24, MW-27, MW-19, MW-23, MW-8, attempted to sample MW-5 but it did not recover.
- 6/3/03 Sampled MW-14, MW-12, MW-13, MW-15, MW-29, MW-6, MW-30, MW-28
 - '0730 hrs arrived at site and installed pressure gauge and tested. Did not work. Shoveled dirt from inside compressor building. Water level in sparge well is 67.83' BTOC. TD is 80.25. 0800 hrs; STP, LB, and PA arrive at site. Toured site. Cycled product pump. Appeared all product pumped. Pulled product pump and verified no product in well. Bailed approximately 2.5 gallons water from sparge well. 0930 hrs; started sparge well. Flow to atmosphere is 12 scfm. Directed air to well. Flow dropped to 5 scfm. Consensus is to check system this afternoon, put air hose through building, tape all fittings, and return this afternoon for water levels and pressure readings at wells. 1030 -1100 hrs; leave site and pick up drill for air hose., 1400 hrs; traveled to Jaguez and pick up magnehelic gauges and return to site. 1501 hrs; DTW MW-23 57.03', 0.0 " H2O, DTW MW-24 66.96', 0.0 " H2O. DTW MW-27 64,48', 0.004 " H2O. DTW MW-19 62.42', 4.5 " H2O with very strong vapors in well vault when opened. High winds made low-pressure readings at distant wells almost impossible. Flow at SW-1 is 6 scfm. Shut down system and installed hose through wall, taped fittings, and installed new pressure gauge. Tested gauge. System pressure at approximately 20 psi needle on gauge vibrates severely. May have to buy oil filled pressure gauge. Set timer on sparge system to start at 0000 hrs and turn off at 1200 hrs daily. Will conduct site visit June 6 am. Product recovery tank pressure at 1750 psi, pump pressure at 65 psi. Depth to product beneath top of drum (BTOD) is 2.505 '. 35 minutes of pump time had elapsed since last visit. Reset counter on timer. 1700 hrs leave site.

Memo

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To:	Pam Anderson, Lynn Benally
From:	Martin Nee
CC:	Filo

Date: June 6, 2003

Re: Blanco North

6/6/03

0730 hrs, arrived at site. Flow is at 7 scfm. System pressure is at 32 psi. Water levels and well pressures were as follows; DTW MW-23 57.14', 0.0 " H2O, DTW MW-24 66.97', 0.0 " H2O, DTW MW-27 64.44', 0.00 " H2O, DTW MW-19 62.34', 5.8 " H2O with very strong vapors in well vault when opened. Product recovery system: Tank pressure is1650 psi and pump pressure is 65 psi. System cycled at 0827 hrs and pumped all product off. Product was measured in the drum at 2.50 feet beneath top of drum. Product was measured at 2.505 BTOD on 6/5/03 indicating 0.005 feet of additional product in the drum. This is approximately 12 ounces.

Memo

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To:	Pam Anderson, Lynn Benally
From:	Martin Nee
CC:	File
Date:	June 9, 2003
Re:	Blanco North

6/9/03 0928 hrs, arrived at site. Flow is at 7.5 scfm. System pressure is at 82 psi. Water levels and well pressures were as follows;

Well	Depth to Water from TOC Feet	рН	Temp F	Conductivity umhos/cm	Do mg/L	Pressure Inches Water
MW-23	57.03	7.13	17.8	>20,000	1.85	0.0
MW-24	66.805	6.98	21.0	16,910	1.51	0.09
MW-27	64.41	7.01	20.2	14,770	0.88	0.07
MW-19	62.31	7.30	20.4	>20,000	1.60	6.1

Product Recovery

Depth to product in drum is 2.50 feet beneath top of drum, the same measurement as on 6/6. Pump time since 6/6 was 15 minutes. Pump pressure is set at 65 psi. Tank Pressure is 1,650 psi. Cycled pump and no product was produced.

Memo

To:	Pam Anderson, Lynn Benally
From:	Martin Nee
CC:	File
Date:	June 16, 2003
Re:	Blanco North

6/16/03 1000 hrs, arrived at site. Flow is at 7.5 scfm. The pressure gauge on the compressor is broken due to vibration of compressor. It needs to be replaced with a more expensive liquid filled gauge. Water levels and well pressures were as follows;

Well TOC pH Feet Feet	
MW-23 57.085 7.14 18.7 >20,000	89 0.0
MW-24 66.74 6.94 20.0 14,020	34 0.1
MW-27 64.46 7.03 19.4 13,520 0	80 0.07
MW-19 62.47 7.53 20.9 >20,000	54 6.0

Product Recovery

Depth to product in drum is 2.48 feet beneath top of drum, an increase of .02 feet of product since 6/9. This is approximately equal to 0.41 gallons at 20.37 gallons per foot. Pump time since 6/9 was 31 minutes. Pump pressure is set at 65 psi. Tank Pressure is 1,575 psi. Cycled pump and no product was produced.

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To:	Pam Anderson, Lynn Benally
From:	Martin Nee
CC:	File
Date:	June 23, 2003
Re:	Blanco North

6/23/03 0945 hrs, arrived at site. Flow is at 7.5 scfm. The pressure gauge on the compressor remains broken. It needs to be replaced with a more expensive liquid filled gauge following MWH approval. Water levels and well pressures were as follows;

Well	Depth to Water from TOC Feet	рН	Temp F	Conductivity umhos/cm	Do mg/L	Pressure Inches Water
MW-23	56.99	7.08	19.4	>20,000	0.94	0.0
MW-24	66.71	6.93	20.0	7,390	1.54	0.09
MW-27	64.445	6.50	18.9	6,770	1.44	0.05
MW-19	62.31	6.99	20.1	>20,000	2.72	6.15
				· · · · · · · · · · · · · · · · · · ·		

Product Recovery

Depth to product in drum is still 2.48 feet beneath top of drum, there was no increase since last week. Pump time since 6/16 was 31 minutes. Pump pressure is set at 65 psi. Tank Pressure is 1,400 psi. Cycled pump and no product was produced.

Memo

Sugar Carton

To:	Pam Anderson, Lynn Benally
From:	Martin Nee
CC:	File
Date:	July 2, 2003
Re:	Blanco North

7/1/03 1045 arrived at site. The meter house for the nitrogen tank and product pump controller has been up-ended by the wind. Lynn will come out and help upright it on 7-2.

7/2/03 0754 hrs. arrived at site and installed the new pressure gauge. System pressure is 16 psi. The previous pressure reading of 82 psi on June 9 may have been due to the defective gauge.

Reset the meter house and reconnected the nitrogen. The wiring to the controller was torn from the conduit when the meter house tipped over so the product recovery system is not operating. Contacted David Nichols at El Paso to repair the wiring. He will try to get to it this week Turned the electricity to the product recovery system off and staked down the meter house. The membrane in the DO meter is broken and no measurements could be collected. The membrane will be replaced this week.

Well	Depth to Water from TOC Feet	рН	Temp F	Conductivity umhos/cm	Do mg/L	Pressure Inches Water
MW-23	57.06	6.45	19.9	>20,000		0.0
MW-24	66.68	6.33	22.6	7320		0.1
MW-27	64.50	6.65	21.4	6710		0.1
MW-19	62.75	7.36	21.9	>20,000		7.4

Product Recovery

Depth to product in drum is still 2.48 feet beneath top of drum, there was no increase since last week. Pump time since 6-23 was 36 minutes. Pump pressure is set at 65 psi. Tank Pressure is 1,400 psi. Will check product thickness in MW-26 before restarting the system.

Memo

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To:	Pam Anderson, Lynn Benally
From:	Martin Nee
CC:	File
Date:	July 10, 2003
Re:	Blanco North

7/10/03 0634 hrs. The wiring has not been repaired yet so I pulled the product pump from MW-26 and collected monitoring data. Surprisingly there was no product on the well!

I have left the pump out so we could record a good static reading next week. Today's data is as follows:

Well	Depth to Water from TOC	pH	Temp F	Conductivity umhos/cm	Do mg/L	Pressure Inches Water
	Feet				-	
MW-23	57.08	6.54	15.9	>20,000	0.94	0.0
MW-24	66.68	6.46	16.5	6380	1.50	.02
MW-27	64.50	6.60	16.6	6090	1.17	.04
MW-19	62.45	7.34	18.7	>20,000	2.98	5.2
MW-26	65.38*	7.80	17.9	10330	4.44	>10

No Product Recovery - System has been down.

*Pump had been pulled – water level may not be static.

Memo

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To:	Pam Anderson, Lynn Benally
From:	Martin Nee
CC:	File
Date:	July 15, 2003
Re:	Blanco North

7/15/03 0902 hrs. O&M site visit. The product recovery pump wiring has not been repaired but it may not be necessary as there was no product found in MW-26 today

Well	Depth to Water from TOC Feet	рН	Temp F	Conductivity umhos/cm	Do mg/L	Pressure Inches Water
MW-23	57.075	6.47	19.5	>20,000	0.75	0.0
MW-24	66.81	6.42	22.2	6710	2.09	.04
MW-27	64.735	6.59	20.3	6910	0.96	.07
MW-19	62.75	7.03	21.6	>20,000	1.29	6.1
MW-26	64.35	7.87	19.1	12050	6.89	>10

No Product Recovery

System pressure was at 16 psi. System flow was 8 scfm. Everything looks good.

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To:	Pam Anderson, Lynn Benally
From:	Martin Nee
CC:	File
Date:	July 29, 2003
Re:	Blanco North

7/29/03 0738 hrs. O&M site visit. MW-26 remains product free.

Well	Depth to Water from TOC	pH	Temp C	Conductivity umhos/cm	Do mg/L	Pressure Inches Water
	Feet					
MW-23	57.06	7.16	17.5	>20,000	0.64	0.0
MW-24	66.83	6.67	18.1	6470	1.55	.09
MW-27	64.68	6.80	18.2	6100	0.94	.05
MW-19	62.705	7.10	19.9	>20,000	1.41	6.6
MW-26	64.46	7.79	17.5	17240	6.16	>10

No Product Recovery

System pressure was at 16 psi. System flow was 8 scfm. Everything looks good.

Memo

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To:	Pam Anderson, Lynn Benally
From:	Martin Nee
CC:	File
Date:	August 7, 2003
Re:	Bianco North

8/7/03 0745 hrs. O&M site visit. MW-26 remains product free.

Well	Depth to Water from TOC Feet	рН	Temp C	Conductivity umhos/cm	Do mg/L	Pressure Inches Water
MW-23	57.13	6.78	18.3	>20,000	1.42	0.0
MW-24	67.09	6.69	21.7	8460	na	0.0
MW-27	64.75	6.73	20.9	6990	1.00	0.0
MW-19	65.00	6.80	21.2	>20,000	0.60	0.0
MW-26	65.26	7.15	19.3	12940	0.49	0.0

No Product Recovery. System has been off since before groundwater sampling.

0943 Started the air sparge system. System pressure rose to 42 psi. Probably high because the sparge well had water in it and it had to be pushed out into the aquifer. Flow was at 5 scfm. There was only 0.1 feet of water in MW-24 and I was able to recover 3oz, not enough to sample for DO.

Page 1

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Memo

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To:	Pam Anderson
From:	Martin Nee
CC:	File
Date:	August 21, 2003

Re: Blanco North

8/21/03 0745 hrs. O&M site visit. MW-26 remains product free.

Well	Depth to Water from TOC Feet	рН	Temp C	Conductivity umhos/cm	Do mg/L	Pressure Inches Water
MW-23	57.115	6.83	21.3	>20,000	1.11	0.0
MW-24	67.09					0.07
MW-27	64.78	6.81	23.7	7040	0.59	0.055
MW-19	64.84	7.09	25.1	>20,000	0.91	3.6
MW-26	64.585	7.63	21.9	13460	2.23	6.8

No Product Recovery. System has been off since before groundwater sampling. No product in MW-26.

0943 System operating at 8 scfm and 14 psi.

Page 1

Memo

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To:	Pam Anderson
From:	Martin Nee
CC:	File
Date:	September 10, 2003
Re:	Blanco North

9/10/03 0847hrs. O&M site visit. MW-26 remains product free.

Depth to Water from TOC Feet	рН	Temp C	Conductivity umhos/cm	Do mg/L	Pressure Inches Water
57.04	6.90	21.2	>20,000	0.64	0.0
67.08					0.03
64.81	6.57	23.1	6990	0.86	0.9
64.79	7.06	21.6	>20,000	1.10	6.4
64.55	7.27	21.1	15920	2.02	<10
	Water from TOC Feet 57.04 67.08 64.81 64.79	Water from TOCpHFeet57.046.9067.0864.816.5764.797.06	Water from TOC pH Temp C Feet 21.2 57.04 6.90 21.2 67.08 23.1 64.81 6.57 23.1 64.79 7.06 21.6	Water from TOC pH Temp C Conductivity umhos/cm Feet 21.2 >20,000 67.08 23.1 6990 64.81 6.57 23.1 6990 64.79 7.06 21.6 >20,000	$\begin{array}{c cccccc} Water from \\ TOC \\ Feet \\ 57.04 \\ 6.90 \\ 64.81 \\ 64.79 \\ 7.06 \end{array} \begin{array}{c cccccccc} Temp \\ Temp \\ C \\ umhos/cm \\ mg/L \\ 520,000 \\ 0.64 \\ 6990 \\ 0.86 \\ 520,000 \\ 1.10 \end{array}$

No Product Recovery. System has been off since before groundwater sampling. No product in MW-26. The site received approximately 1" of rain on 9/9/03. The system was off September 1 through September 9, 2003. It cycled one time before this O&M.

1120 System operating at 6.5 scfm and 16 psi.

Memo

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To:	Pam Anderson
From:	Martin Nee
CC:	File
Date;	September 25, 2003
Re:	Blanco North

9/25/03 0917 hrs. O&M site visit. MW-26 remains product free.

Well	Depth to Water from TOC Feet	рН	Temp C	Conductivity umhos/cm	Do mg/L	Pressure Inches Water
MW-23	57.12	6.99	18.5	>20,000	1.12	0.0
MW-24	67.07	6.71	18.1	5870	1.71	0.06
MW-27	64.885	6.91	19.0	7030	1.01	0.04
MW-19	63.95	6.97	19.3	>20,000	1.10	3.1
MW-26	64.55	7.34	20.1	13920	0.50	3.9

Pressures appears lower than usual at MW-19 & 26. The system timer was at 3:30 AM which means the power had been off at some time and the system was only running for 3.5 hrs before O&M.

System operating at 8.0 scfm and 15 psi.

Appendix C



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APPENDIX C Groundwater Analytical Data Reports

Groundwater Monitoring Field Data Reports

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Proiect No:	zee	DJ-0	Project	Name: S	211 Tuz,	Bosi	∽ Client:	must	
	1				-			Sampling 🕅	
Project Manag								Weather 803 SUF	v
Depth to Wat								Measuring Point TOC	
Water Column				1.			· ·		
Sampling Me									
Criteria: 3 to								s-Steel Kernmerer 🗍 heters 🖾 Other 💁 build	h
				Vater Volum					
Gai/ft x ft			Gallons		0	Dunces		Gal/oz to be removed	
4-87× -			<u>ig ×3</u>		99×			29902	
Time (military)	рН	SC (umhos/cm)		Eh-ORP (millivolts)		(NTU)	Vol Evac. (gal.)	Comments/ Flow rate	
0904	7'7	4500	175				32	milky	
	712	6050	190	·			84	shone HC coda	<u>~</u>
	7"	6270					118_	MILET	
0918	700	6850	+×		·		152		-7
	517	7250	183				180	well is builing	de
	720	6960	18-				<u>204</u> 219		
	726	6270	184				231	<u> </u>	
0435	727	6290	180	<u> </u>			239	well has bailed	A
								well astron	l
		<u></u>		- <u></u>	·			to semple	
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inal:		<u> </u>					Ferrous	·······	
Time	рН — 1 — 1	SC	Temp	Eh-ORP	D.O.	•	Iron	Vol Evac. Comments/Flow	rat
0935	721	6290	180			·	ES_	239	.
	1			- h -		/		- P. Dand	,
	S: Af	pear	19 1	ope	011	- Cora	wse	ulend prok	<u>a</u>
jace		vac 1	none	in	- 102	un	<u> </u>		
INSTRUMEN	TATION		Monitor 🕻]	·	Тетре		er 🖸	
Water Disposa	a V			J					
			27 Sam	 ple Time _/	1353	ВТ	EX 525 V	OCs 🔲 Alkilinity 🗍	•
							•.	TKN INM WQCC Metak	

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Project No: 3000	-				XPP	_ Client		
Location: BNE	🖳 Well N	o: <u>mw</u>	-27		Develo	pment 🛛	Samplin	ng 🖾
Project Manager	MIN	C	Date _ a	8/4/0	Start Tim	e	Weather	805 clea
Depth to Water_6.	372_Dept	h to Product	\sim	_ Produc	t Thickness		Measuring	Point TUC
Water Column Height								
					· · · · · · · · · · · · · · · · · · ·			
Sampling Method:		-	-					
Critoria: 3 to 5 Cocir	Bottom Valve	Bailer M. D	ouble (Check Val Sabiliza	tion of India	Stainle	ss-Steel Kei neters M	other <u>Aprildu</u>
				e in Well				
Gal/ft x ft of water		Gallons			Dunces		Gal/o	z to be removed
5-56x-16	- 2	973			· · ·		2-67	9 34202
Time pH	SC	Temp Eh		D.O.	Turbidity		•	Comments/
(milita ry)	(umhos/cm)	(°C) (mil	llivolts)	(mg/L)	(NTU)	(gal.)		Flow rate
0902 60T	6280	192	<u>_</u>			30	cha	HC ada
6100 0	6990	190				64	•	
		190				98	·	
	7410	196				156	aren	g milky
0917 673	7300	193				180		
676	7200	193					well	is bully dow
	7170	193 -				204		2000 2000
0925 691	7310	A5				708	well	has brilled day
	/ 0.0	//•						0
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inal:			<u> </u>	<u> </u>	·····	Former		····· · ·
Time pH	SC	Temp Eh	-ORP	D.O.	Turbidity	Ferrous Iron		. Comments/Flow ra
0925 691	7310	195				-	20C	•
COMMENTS:	10 pr	eserv	211	m l	que .	10	<u>LXn</u>	ofFICE
4 3100	ndne	ti			····-·			· •
			. <u> </u>					
INSTRUMENTATION	: pH	Meter 🗹			Temp	erature Me	eter 🔀	
	DON	Ionitor 🗌 _					her 🗌	
	Conductivity							
Water Disposal			- .	-	-			
Sample ID BNF	PMW	27Sample	e Time	093	<u>ර </u>	EX 🔀	VOCs 🗌	Alkilinity 🗋
TDS 🔲 Cations 🗌	Anions	Nitrat	te 🔲	Nitrite	🗋 Am	monia 厂	TKN 🗍	NM WQCC Metals
Total Phosphorus		C	J		L.J		L	J

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OB 43 US 5450 BB 2502 COMMENTS: Well due not recome in approx 5h INSTRUMENTATION: pH Meter I approx 5h DO Monitor Temperature Meter I approx 5h Water Disposal Kutz Sample ID BNEP MW24\$ sample Time NA TDS Cations Nitrate Nitrite			WELL D	EVELO	OPMENT	AND S		IG LOG	
Sampling Method: Submersible Pump □ Centrifugal Pump □ Perstattic Pump □ Other □ Bottom Valve Bailer □ Double Check Valve Bailer □ Stainless-Steel Kemmerer □ Criteria: 3 to 5 Casing Volumes of Water Removal □ Sabilization of Indicator Parameters □ Other □ Gal/tx xft of water Gallons □ Ounces Gal/oz to be removed '3 x. & C .2 x 3 -5 7 / 7/4 9.85 og Time pH SC. Temp Eh-ORP D.O. Turbidity Vol Evac. Commental (military) (umhos/cm) (°C) (millivolts) (mg/L) (NTU) Jent Y (B560 C60* 52.50 1/52 ZO (D8543 C55 4570 187 ZO (D8545 5/450 187 ZO (D8543 L/45 5/450 188 ZO (D8543 L/45 5/450 188 ZO (D6443 L/45 5/450 188 ZO (Comments/Flow ra ZSO ZSO	Location: Project Mana Depth to Wa	<u>BNF</u> ager	P Well N 21,710 291 Dep	lo: th to Pro	2 <i>W</i> - 2 Date <u>5</u> duct	4 14/03	Develo	opment [] e <u>0 825</u>	Sampling 🛛
Bottom Valve Beiler □ Double Check Valve Beiler □ Stainless-Steel Kemmerer □ Criteria: 3 to 5 Casing Volumes of Waler Removal □ Sabilization of Indicator Parameters □ Other □ Gal/ft x ft of water Gallons Gal/oz to be removed Gal/ft x ft of water Gallons Ounces Gal/oz to be removed Gal/ft x ft of water Gallons Ounces Gal/oz to be removed Gal/ft x ft of water Gallons Ounces Commental ''Gal/ft x ft of water Gal/oz to be removed Gal/oz to be removed ''Gal/ft x ft of water Gal/oz to be removed Gal/oz to be removed ''Gal/ft x ft of water Callons Ounces Commental ''Imitary PH SC Temp Eh-ORP D.0. Turbidity Vol Evac. Commental ''Gal/ft x ft of water Gal/oz to be removed 3 Gal/oz to be removed Gal/oz to be removed ''Gal/ft x ft of water Gal/ft x ft of water Gal/ft x ft of water Gal/ft x ft of water Commental ''Gal/ft x ft of water Gal/ft x ft of water ''Gal/ft of water Gal/ft x ft of water Gal/ft x ft of water						al Pump [] Peristalt	ic Pump [Other
Galler x for water Gallons Ounces Gallor to be removed ····································			Bottom Valve	Bailer [Double C	Check Val	ve Bailer	Stainles	s-Steel Kemmerer
Time (milliary) PH SC Temp Eh-ORP D.O. Turbidity Vol Evac. Comments/ Flow rate C%33 656 COXX 22' 3 9429 u/black 6/6 C%33 656 COXX 22' 3 9429 u/black 6/6 C%55 5560 197 1/4 20 20 08/6 6/6 5250 1/2' 2.0 0.0 1/4 1/4 1/							Dunces		· · · · · · · · · · · · · · · · · · ·
(military) (umhos/cm) (°C) (militvolts) (mg/L) (NTU) D2 Flow rate C%33 656 GOD 22' 8 guag u/black flow (556 5560 197 14 14 0840 665 5450 187 20 20 0843 665 5450 187 25 well is day with a structory in the structory	·3x.	65	- 2	*3					59 / 74.8800
656 5560 197 14 0840 667 5250 142 20 0843 665 5450 188 25 well in dry with the second s		рН		•				<u>_(gal.)</u>	
05443 6*5 5450 187 25 well is day with starts		656						`	grey u/black floe
0843 6*5 5450 188 25 well is day with starts	no Gen	650	5250	191	. <u></u>		·		·
Inal: Time pH SC Temp Eh-ORP D.O. Turbidity Ferrous Vol Evac. Comments/Flow ra OB43 US5 5450 188 2502 Esca	0843	605							well is day wil
Inal: Time pH SC Temp Eh-ORP D.O. Turbidity Ferrous Vol Evac. Comments/Flow ra OB43 US5 5450 188 2502 Esca				<u></u>	- <u></u>				retur laterto
Time pH SC Temp Eh-ORP D.O. Turbidity Iron Vol Evac. Comments/Flow ra C6843 L65 5450 L88 L502 L502 COMMENTS: Will Out not record Approx 5h COMMENTS: Will Out not record Approx 5h INSTRUMENTATION: pH Meter Approx Temperature Meter Approx 5h DO Monitor One Other Other Other Other Other Water Disposal Kutz Sample ID SNEP Machinity BTEX VOCs Alkilinity Ital TDS Cations Anions Nitrate Nitrite Ammonia TKN NM WQCC Metals	· · · · · · · · · · · · · · · · · · ·		·····		·				
Time pH SC Temp Eh-ORP D.O. Turbidity Iron Vol Evac. Comments/Flow ra C6843 L55 5450 L88 L502 L502 COMMENTS: Will Out not recomm Approx 5h COMMENTS: Will Out not recomm Approx 5h INSTRUMENTATION: pH Meter Approx Temperature Meter Approx 5h DO Monitor One Other Other Other Other Other Water Disposal Kutz Sample ID BNEP MW-24 Sample Time MA BTEX VOCs Alkilinity Itemperature TDS Cations Anions Nitrate Nitrite Ammonia TKN NM WQCC Metals								<u> </u>	
Time pH SC Temp Eh-ORP D.O. Turbidity Iron Vol Evac. Comments/Flow ra COB43 Los 5450 Los Los <thlos< th=""> <thlos< th=""> <thlos< th=""> <thlos< th=""></thlos<></thlos<></thlos<></thlos<>					· · <u></u>				·
Time pH SC Temp Eh-ORP D.O. Turbidity Iron Vol Evac. Comments/Flow ra COB43 165 5450 188 2502 2502 COMMENTS: Will Curd not record Approx 5h INSTRUMENTATION: pH Meter DO Temperature Meter DO Other DO Water Disposal Kutz Sample ID BNFP MW-34 sample Time MA BTEX VOCs Alkilinity TDS TDS Cations Anions Nitrate Nitrite Ammonia TKN NM WQCC Metals					·				·
Time pH SC Temp Eh-ORP D.O. Turbidity Iron Vol Evac. Comments/Flow ra COB43 165 5450 188 2502 2502 COMMENTS: Will Curd not record Approx 5h INSTRUMENTATION: pH Meter DO Temperature Meter DO Other DO Water Disposal Kutz Sample ID BNFP MW-34 sample Time MA BTEX VOCs Alkilinity TDS TDS Cations Anions Nitrate Nitrite Ammonia TKN NM WQCC Metals	·		·		. <u></u>			<u></u>	· · · · · · · · · · · · · · · · · · ·
Time pH SC Temp Eh-ORP D.O. Turbidity Iron Vol Evac. Comments/Flow ra COB43 Los 5450 Los Los <thlos< th=""> <thlos< th=""> <thlos< th=""> <thlos< th=""></thlos<></thlos<></thlos<></thlos<>					·				· · · · · · · · · · · · · · · · · · ·
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COMMENTS: Will dud not recome in approx 5h INSTRUMENTATION: pH Meter 2 DO Monitor Temperature Meter 2 Conductivity Meter 2 Other 1 Water Disposal Kut 2 Sample ID BNFP MW-24Sample Time MA TDS Cations Anions Nitrate	Time	•	-	•			-	iron	Vol Evac. Comments/Flow rate
DO Monitor									
DO Monitor	INSTRUMEN			L Meter			Temp	erature Mo	ter X
Sample ID BNEP MU-24Sample Time NA BTEX VOCs Alkilinity TDS Cations Anions Nitrate Nitrite Ammonia TKN NM WQCC Metals			DO I Conductivity	Monitor	Ó		Tomp		
TDS Cations Anions Nitrate Nitrite Ammonia TKN NM WQCC Metals	-		•	1-2468	mple Time	NA	<u>1</u> вт	EX 🗌	VOCs 🔲 Alkilinity 🗍
Total Phosphorus	трв 🔲 с	Cations [] Anions		Nitrate	Nitrite	🗋 Am	monia 🔲	TKN INM WQCC Metals

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WELL	DEVELOPMENT	AND SAMPLIN	IG LOG	
Project No: <u>30001.0</u> Location: <u>BNFP</u> We				
Project Manager <u>Mat N</u>		•		• •
Depth to Water 62 75 D				
Water Column Height 455				
Sampling Method: Submersib Bottom Va Criteria: 3 to 5 Casing Volumes	ve Bailer 🖄 Double (Check Valve Bailer	Stainless-St	eel Kemmerer
	Water Volum			Gal/oz to be removed
Gal/ft x ft of water 4,55 × 16	Gallons	Ounces	2-	
Time ptt _SC				Comments/ Flow rate
1001 72000 709			36	
1000 72000 698	214		42	
720000 686			50	grey HC odor
>2000 /082	212		64	
1036 2000 684	214		76	
1041 >2000 688	214		84	111 1:0 11.
7045 2000 694	215		90 ú 96 ú	Il return 1ster to
			>	suple
				· · · · · · · · · · · · · · · · · · ·
Time pH SC 1045 694 72000	•	D.O. Turbidity		bl Evac. Comments/Flow rate
COMMENTS: No pro-	esorvatue.	do to RX.	n of H	ice w/ ground
D	pH Meter 🛐 D Monitor 🔲 /ity Meter 🖸			2]
Sample ID <u>BUFP</u> MW-	19 Sample Time	/307 RT		
TDS Cations Anio	ns 🔲 Nitrate 🛄	Nitrite 🔲 Am	monia 🔲 Ti	KN 🗍 NM WQCC Metals 🗍
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Project No:	2000	V. O	Projec	t Name:	Enco.	NEP	Client:	mwH
								Sampling 🔽
								Weather <u>905 clen</u>
								Measuring Point <u>TOC</u>
		1 979						
			Bailer 5	Double C	heck Val	ve Bailer 🗌	Stainless	S-Steel Kemmerer
Criteria: 3	to 5 Casi	ng Volumes of				tion of Indic	ator Param	eters I Other <u>or baildy</u>
Gal/ft x f	ft of water	·	Gallons	Water Volum		Dunces		Gal/oz to be removed
9.79×	-65	6.		3				19.09 279.04
Time (military)	рН	SC (umhos/cm)		Eh-ORP (millivolts)		Turbidity (NTU)	Vol Evac. (gal.)	
1101	671	720K	215				Ζ	chean cours
	600							
<u></u>	669	720,000					6	
1119	673	729,000	201	<u></u> .			88	well is brilen down
1134	723	720,000	204				9.8	well has beiled d
inal: ^{Time} //34	рН <u>7²³</u>	sc <u>>20,000</u>		Eh-O RP	D.O.	Turbidity	Ferrous Iron	Vol Evac. Comments/Flow rate
-	TS:/	lo pre HEL	5 m		hur		fiz	zing due to
INSTRUME Water Dispo	osal	DON Conductivity	· · · ·					er 🖾 er 🗋 /OCs 🗋 Alkilinity 🗍

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_ocation: ${\cal E}$	NFP	Well N	lo: Ml	W-20		Develo	opment	Sampling 💋
	-							Weather 905
					_ Produc	t Thickness	·	Measuring Point
Water Colun	nn Heigh	1 <u>2,48</u>	Well Dia.	<u> </u>		·		······································
			Bailer [Double C	heck Val	ve Bailer 🗌	Stainles	s-Steel Kemmerer
Criteria: 3 t	o 5 Casir	ng Volumes of				tion of Indic	ator Param	eters Other
Gal/ft x f	t of water		Gallons	Water Volum		Junces		Gal/oz to be removed
2.48 ×	.15							······
Time (milita ry)	рН	SC (umhos/cm)	•	Eh-ORP (millivolts)	D.O. (mg/L)	Turbidity (NTU)	Vol Evac. (gal.)	Comments/ Flow rate
12.05	734	13360	ZZZ	<u> </u>			104	155 brilie chear at
	746		208	<u> </u>			130	gunge werre
	763	14140	209	······································		<u></u>	142	guy opsai
	756	13140	2/3				150	wellisbuland
1230	759	13180	Z14				154	mell bas beila
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i nai: Time	nН	SC	Temn	Eb-ORP	DO	Turbidity	Ferrous	Vol Evac. Comments/Flow
1650		15:00					<u> </u>	154
			1.1	T.	2.4.5		Ala	sample collei
COMMENT	rs:	wee	and	NON	ecou	z	140 3	remperaties
<u></u>								
							<u>_</u>	
INSTRUME			Motor	SF		Temp	erature Mo	ter 🕅
						remp		her []
		Conductivity	Meter	8			-	
Water Dispo	sal	Kutz						
					No	B1		/OCs 🔲 Alkilinity 🗌
Sample ID			—	•				
					Nitrite			TKN 🔲 NM WQCC Metak

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roject No.:	30001.0		Project	t Name: <u>Blan</u>	co NFP	C	lient: <u>MWH/</u>	EL Paso
		P Well		N-27		_ D		Sampling
roject Man	ager	MJN		Date <u>9/3/</u>	/03	Start Time	<u> 1003 </u>	Weather Cloudy 70s
epth to Wa	ater6	<u>4.80</u> Dept	th to Produ	ict <u>na</u> F	Product TI	hickness <u>n</u> a	a Meas	uring Point <u>TOC</u>
Vater Colur	nn Heigh	t <u>4.48</u> Well	Dia	2"				
ampling M	ethod: Si	ubmersible Pum	p 🗌	Centrifugal	Pump 🛛	Peristaltic	Pump 🗋	Other
	B	ottom Valve Bail	er x	Double Che	ck Valve I	Bailer 🗆 🛛 St	tainless-Stee	el Kemmerer 🛛
Criteria: 3	to 5 Casi	ng Volumes of V	Vater Rem	oval X stabil	lization of	Indicator Par	ameters X	Other or bail dry
				Water Volum	ne in Well			· · · · · · · · · · · · · · · · · · ·
	cft of wat	er	Gallons			Ounces		Gal/oz to be removed
4.4	8 x .16		0.72 x 3	3		91.75 x 3		275.00
Time	рН	SC	Temp	ORP	D.O.	Turbidity	Vol Evac.	Comments/
(military)	(su)	(umhos/cm)	(°C)	(millivolts)	(mg/L)	(NTU)	(ounces)	Flow rate
012	6.86	6640	20.7				32	trace product
	6.70	6540	20.3				64	HC odor, clear
	6.71	7170	19.7				93	Gray, strong HC odor
	6.76	6990	19.4			······	108	
027	6.78	7030	19.4				136	· · · · · · · · · · · · · · · · · · ·
037	7.01	6830	19.5				174	Well is dry
			<u> </u>					
and the second second						Ferrous		
inal: ime pl	H s	C Temp	Eh-ORP	D.Ø. Tu	rbidity		ol Evac.	Comments/Flow Rate
and a second sec		830 19.5	<u></u>					Vell is dry
								<u>ne kalen de sen</u>
	S: Well b:	ailed dry, returne	ed to same	le 1 5 hrs late				
	0. 1100				J.			
NSTRUME	NTATION	I: pH Meter	X			Tempe	erature Mete	er x
		DO Mor	nitor			Other	<u></u>	
	С	onductivity Mete	er X			· .		
Vater Dispo	sal <u> Κι</u>	<u>utz</u> _Sample II) <u>Blanco I</u>	<u>NFP MW-27</u>	Samp	ole Time <u>12</u>	201	
TEX VO	Cs Alkal	inity TDS Catio	ons Anion	ns Nitrate N	litrite Am	nonia TKN 1	VMWQCC I	Metals Total Phosphorus
IS/MSD		BD		BD	Name/Tin	າe		TB_030903tb01
						<u> </u>	*******	

•				t Name: <u>Blan</u>			lient: <u>MWH</u>	/EL Paso Sampling	
Project Mana Depth to Wa	ager ter6		th to Produ	Date <u>9/3/</u> ict <u>na</u> F	/03	Start Time	e0821	Weather <u>Cloudy 70s</u> uring Point <u>TOC</u>	
Sampling Me	ethod: Si	ubmersible Pum	ip 🗆	Centrifugal I	Pump 🗋	Peristaltic	Pump 🗖	Other	
Criteria: 3 t		ottom Valve Bai ng Volumes of V						el Kemmerer 🛛 Other <u>or bail dry</u>	
				Water Volum	e in Well	······			
· · · · · · · · · · · · · · · · · · ·	ft of wate 7 x .65	er	Gallons 1.74 x 3			Ounces		Gal/oz to be removed 5.21	
Time (military)	pH (su)	SC (umhos/cm)	Temp (°C)	ORP (millivolts)	D.O. (mg/L)	Turbidity (NTU)	Vol Evac. (gal.)	Comments/ Flow rate	
)826	7.36	10140	20.3				0.44	top bailer clear botto grey	
	7.46	10230	19.4				0.80	grey, sheen, old odor	
;	7.43	10890	18.9			· · · · ·	1.05	as above	
	7.42	9910	18.8				1.21		
н 	7.49	10330	18.8			· · · · · · · · · · · · · · · · · · ·	1.34		
845	7.53	10240	18.8				1.45		
	7.51	10190	18.8				1.67		
	7.51	10220	18.8				1.69		
	7.53	10010	18.8				1.71		
)849	7.49	10220	18.8				1.80	well is dry	
Final:						Ferrous			
		C Temp 0220 18.8	Eh-ORP	D.O. Tu	rbidity	lron V		Comments/Flow Rate	
COMMENTS	8: Well ba	ailed dry, returne	ed to samp	le 4hrs later a	and well h	ad not recov	ered enougl	h. Collected sample 9/4/	
NSTRUMENTATION: pH Meter X DO Monitor				Temperature Meter x Other					
Vater Dispo BTEX VOC	sal <u>Ku</u>	onductivity Mete <u>itz</u> Sample II inity TDS Catio	D_Blanco N	NFP MW-26	Samp			Metals Total Phosphorus	
//S/MSD		BD		BD	Name/Tin	ne		TB 030903tb01	

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.ocation:_BI	anco NFI	> We	II No: <u>MV</u>	V-19		. D	•	Sampling
Depth to Wa	iter6	MJN 5.06 Dep 2.24 We	oth to Produ	ict <u>na</u> F				_ Weather <u>Cloudy 70</u> suring Point <u>TOC</u>
	В		iler x	Double Che	ck Valve I	Bailer 🛛 🛛 S	tainless-Ste	Other Ot
[·	Water Volum	ie in Well			·
	(ft of wat 4 x .16	er	Gallon: 1.74 x 3			Ounces 45.88 x 3		Gal/oz to be removed 137.63
Time (military)	pH (su)	SC (umhos/cm)	Temp (°C)	ORP (millivolts)	D.O. (mg/L)	Turbidity (NTU)	Vol Evac. (ounces)	
)933	6.90	17760	22.1				28	gray, old HC odor
· · · · ·	6.99	17620	21.4				42	gray, slight sheen
	6.95	17040	21.1				50	gray
	6.95	17640	21.1				58	· · ·
<u>)947</u>	6.94	17530	20.9				64	
	6.96	17490	20.5			· ·	68	gray, slight HC odor
<u>)952</u>	7.01	17280	20.7				70	well has bailed dry
								· · ·
	4 <u>S</u> 7.01 1	C Temp 7280 20.7	Eh-ORP	D.O. Tu	irbidity	Ferrous Iron V		Comments/Flow Rate well has bailed dry
COMMENTS	S: Well ba	ailed dry, returr	ned to samp	ble 2hrs later.				
INSTRUME	С	DO Mo conductivity Me	onitor ter X			Other		er x
Water Dispo BTEX VO				NFP MW-19 ns Nitrate N				Metals Total Phosphorus
MS/MSD		חפ			N 1 (T)	ne		TB_030903tb01

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roject Man epth to Wa	ager ter5	P We <u>MJN</u> 7 <u>.11</u> Dep t <u>9.74</u> We	 oth to Produ	Date <u>9/3</u> ict <u>na</u>	/03	Start Time	e <u>1052</u>	Sampling Weather <u>Cloudy 7</u> uring Point <u>TOC</u>
ampling M	ethod: Si	ubmersible Pur	mp 🗌	Centrifugal	Pump 🗌	Peristaltic	Pump 🔲	Other
riteria: 3								el Kemmerer
· · · · · · ·				Water Volum	ne in Well			• · · · · ·
	4 x .65	er	Gallon: 6.33 x 3	·· ·· ·· ·· ·· ·· ·· ·· ·· ·· ·· ·· ··		Ounces		Gal/oz to be removed 18.99
Time (military)	pH (su)	SC (umhos/cm)	Temp (°C)	ORP (millivolts)	D.O. (mg/L)	Turbidity (NTU)	Vol Evac. (gallons)	Comments/ Flow rate
059	6.82	>20,000	19.2		<u>, </u>		1	Clear
	6.85	>20,000	19.8				4	Gray
120	6.89	>20,000	19.2		· · ·	· <u>······</u> ······	7.69	Well is bailing dow
130	7.08	>20,000	19.2	· · · ·			8.47	Well has bailed dow
		<u></u>						
· · · · · · · · · · · · · · · · · · ·								· · · · · · · · · · · · · · · · · · ·
						·····		
						· · · · · · · · · · · · · · · · · · ·	· · · ·	
					· · · · · · · · · · · · · · · · · · ·			
Final:						Ferrous		
<u>⊺ime pł</u> <u>130</u> 7	'.08	C Temp 20,0 19.2 00	Eh-ORP	D.O. Tu	irbidity	<u>lron V</u>		Comments/Flow Rate Vell has bailed down
COMMENTS	3:	······	· · · · · · · · · · · · · · · · · · ·					
NSTRUME		DO Mo	nitor		· · · · · · · · · · · · · · · · · · ·	Temp Other	erature Mete	er x
	sal <u>K</u> ı	conductivity Me <u>utz</u> Sample I inity TDS Cat	D <u>Blanco N</u>					Metals Total Phosphor

Groundwater Analytical Report – June 2003

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Technical Report for

Montgomery Watson EPFS San Juan Basin GS San Juan Basin Blanco Accutest Job Number: T4439

Report to:

El Paso

scott.pope@elpaso.com

Total number of pages in report: 13



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Ron Martino Laboratory Manager

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

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1 of 13

Sample Summary

Montgomery Watson

Job No: T4439

EPFS San Juan Basin GS Project No: San Juan Basin Blanco

Sample Number	Collected Date	Time By	Received	Matr Code		Client Sample ID
T4439-1	06/02/03	07:00 MN	06/03/03	AQ	Trip Blank Water	020603TB01
T4439-2	06/02/03	13:53 MN	06/03/03	AQ	Water	BLANCO MW-27
T4439-3	06/02/03	14:19 MN	06/03/03	AQ.	Water	BLANCO MW-19
T4439-4	06/02/03	14:50 MN	06/03/03	AQ	Water	BLANCO MW-23

Report of Analysis

Page 1 of 1

Client Sam Lab Sampl Matrix: Method: Project:				Date Sample Date Receiv Percent Soli	ed: 06/03/03	
Run #1 Run #2	File ID DF KK005235.D 1	Analyzed 06/04/03	By JH	Prep Date n/a	Prep Batch n/a	Analytical Batch GKK275
Run #1 Run #2	Purge Volume 5.0 ml					
Purgeable	Aromatics					
CAS No.	Compound	Result	RL	Units Q		
71-43-2 108-88-3	Benzene Toluene	ND ND	1.0 1.0	ug/l	,	
100-88-3	Ethylbenzene	ND	1.0	ug/l ug/l		
1330-20-7	Xylenes (total)	ND	3.0	ug/l		
95-47-6	o-Xylene	ND	1.0	ug/l		
	m,p-Xylene	ND	2.0	ug/l		
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
460-00-4	4-Bromofluorobenzene	117%		64-121%		
98-08-8	aaa-Trifluorotoluene	99%		71-121%		

ND = Not detected RL = Reporting Limit E = Indicates value exceeds calibration range J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

		Repo	rt of An	alysis	•	Page 1 of 1
Client Sam Lab Sampl Matrix: Method: Project:				Date Sampl Date Receiv Percent Sol	ed: 06/03/03	
Run #1 Run #2	File ID DF KK005250.D 25	Analyzed 06/05/03	By JH	Prep Date n/a	Prep Batch n/a	Analytical Batch GKK276
Run #1 Run #2	Purge Volume 5.0 ml					
Purgeable	Aromatics					
CAS No.	Compound	Result	RL	Units Q		
71-43-2	Benzene	192	25	ug/l		
108-88-3	Toluene	ND	25	ug/l		· .
100-41-4	Ethylbenzene	328	25	ug/l		
1330-20-7	Xylenes (total)	1480	75	ug/l		
95-47-6	o-Xylene	298	25	ug/l		
	m,p-Xylene	1190	50	ug/l		
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
460-00-4	4-Bromofluorobenzene	110%		64-121%		

98-08-8 aaa-Trifluorotoluene 93% 71-121%

ND = Not detected RL = Reporting Limit E = Indicates value exceeds calibration range J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

		Repo	rt of An	alysis	· .	Page 1 of 1
Client Sam Lab Sampl Matrix: Method: Project:		· ·		Date Sampl Date Receiv Percent Sol	ved: 06/03/03	
Run #1 Run #2 Run #3	File IDDFKK005237.D10KK005253.D100KK005255.D200	Analyzed 06/04/03 06/05/03 06/05/03	By JH JH JH	Prep Date n/a n/a n/a	Prep Batch n/a n/a n/a	Analytical Batch GKK275 GKK276 GKK276
Run #1 Run #2 Run #3	Purge Volume 5.0 ml 5.0 ml 5.0 ml					
Purgeable	Aromatics					
CAS No.	Compound	Result	RL	Units Q		
71-43-2 108-88-3 100-41-4 1330-20-7 95-47-6	Benzene Toluene Ethylbenzene Xylenes (total) o-Xylene m,p-Xylene	10100 ^a ND 3900 ^a ND ND ND	200 10 200 30 10 20	ug/l ug/l ug/l ug/l ug/l	· .	
CAS No.	Surrogate Recoveries	s Run# 1	Run# 2	Run# 3	Limits	
460-00-4 98-08-8	4-Bromofluorobenzen aaa-Trifluorotoluene	e 103% 95%	114% 90%	113% 79%	64-121% 71-121%	

(a) Result is from Run# 3

ND = Not detected RL = Reporting Limit E = Indicates value exceeds calibration range

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

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		Repo	rt of An	alysis		Page 1 of 1
Client Sam Lab Sampl Matrix: Method: Project:			· · ·	Date Sampl Date Receiv Percent Soli	ed: 06/03/03	
Run #1 Run #2	File IDDFKK005239.D10KK005254.D250	Analyzed 06/04/03 06/05/03	By JH JH	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GKK275 GKK276
Run #1 Run #2	Purge Volume 5.0 ml 5.0 ml					
Purgeable	Aromatics					
CAS No.	Compound	Result	RL	Units Q		
71-43-2 108-88-3 100-41-4 1330-20-7 95-47-6	Benzene Toluene Ethylbenzene Xylenes (total) o-Xylene m,p-Xylene	8920 ^a ND 337 1450 ND 1450	250 10 10 30 10 20	ug/l ug/l ug/l ug/l ug/l ug/l		· ·
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene	97% 89%	118% 95%	64-121% 71-121%		

(a) Result is from Run# 2

ND = Not detected RL = Reporting Limit E = Indicates value exceeds calibration range J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

QC Data Summaries

GC Volatiles

Includes the following where applicable:

• Method Blank Summaries

Blank Spike Summaries

• Matrix Spike and Duplicate Summaries

Blank Spike Summary

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Job Number:	T4439
Account:	MWHSLCUT Montgomery Watson
Project:	EPFS San Juan Basin GS

r roject.	Et 1 5 San Juan Dasn	100				
Sample GKK275-BS	File ID DF KK005233.D1	Analyzed 06/04/03	By JH	Prep Date n/a	Prep Batch n/a	Analytical Batch GKK275
The QC repor	rted here applies to the	following sam	ples:		Method: SW	/846 8021B
T4439-1, T443	39-3, T4439-4					

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	20	19.7	99	74-119
100-41-4	Ethylbenzene	20	19.7	99	82-115
108-88-3	Toluene	20	19.5	98	77-116
1330-20-7	Xylenes (total)	60	59.6	99	79-115
95-47-6	o-Xylene	20	20.0	100	78-114
	m,p-Xylene	40	39.6	99	79-116
CAS No.	Surrogate Recoveries	BSP	Liı	mits	
460-00-4	4-Bromofluorobenzene	114%	64	121%	
98-08-8	aaa-Trifluorotoluene	100%	71	-121%	

Page 1 of 1

8 of 13

Blank Spike Summary

Job Number:	T4439
Account:	MWHSLCUT Montgomery Watson
Project:	EPFS San Juan Basin GS

Sample GKK276-B	File ID DF S KK005247.D1	Analyzed 06/05/03	By JH	Pı n/	rep Date a	Prep Batch n/a	Analytical Batch GKK276
	·						
The QC re	ported here applies to the	e following san	nples:			Method: SW	/846 8021B
T 4439-2, T	4439-3, T4439-4					• •	
CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits		
71-43-2	Benzene	20	20.9	105	74-119		
100-41-4	Ethylbenzene	20	21.1	106	82-115		
108-88-3	Toluene	20	20.5	103	77-116		
1330-20-7	Xylenes (total)	60	62.4	104	79-115		• •
95-47-6	o-Xylene m,p-Xylene	20 40	20.5 42.0	103 105	78-114 79-116		
CAS No.	Surrogate Recoveries	BSP	Li	mits			
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene	121% 92%		-121% -121%			

.

Method Job Numbe Account: Project:	Blank Summary r: T4439 MWHSLCUT Montg EPFS San Juan Basin					Page 1 of
Sample GKK275-M	File ID DF B KK005234.D1	Analyzed 06/04/03	By JH	Prep Date n/a	Prep Batch n/a	Analytical Batch GKK275
ł	ported here applies to the	TOHOMING 2911	μιτο.		Method: SW	040 0021D
CAS No.	Compound	Result	RL	Units Q		

CAS No.	Surrogate Recoveries		Limits	
460-00-4	4-Bromofluorobenzene	124%* a	64-121%	
98-08-8	aaa-Trifluorotoluene	104%	71-121%	

(a) High bias.

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10 of 13

Method Blank Summary

Job Number Account: Project:	: T4439 MWHSLCUT Montgomery Watson EPFS San Juan Basin GS									
Sample GKK276-MI	File ID DF 3 KK005248.D 1	Analyzed 06/05/03	By JH	Prep Date n/a	Prep Batch n/a	Analytical Batch GKK276				
The QC rep	orted here applies to the	e following sam	ples:		Method: SW	/846 8021B				
T4439-2, T4	439-3, T4439-4									
CAS No.	Compound	Result	RL	Units Q						
71-43-2	Benzene	ND	1.0	ug/l						
100-41-4	Ethylbenzene	ND	1.0	ug/l						
	Toluene	ND	1.0	ug/l						
1330-20-7	Xylenes (total)	ND	3.0	ug/l		• •				
	o-Xylene	ND	1.0	ug/l						
•	m,p-Xylene	ND	2.0	ug/l						

CAS No.	Surrogate Recoveries		Limits
460-00-4	4-Bromofluorobenzene	118%	64-121%
98-08-8	aaa-Trifluorotoluene	91%	71-121%

11 of 13

Job Numbe Account: Project:	r: T4439 MWHSLCUT Montgo EPFS San Juan Basin	U							
Sample T4439-2MS T4439-2MS T4439-2		Analyzed 06/05/03 06/05/03 06/05/03	By JH JH JH	Prep D n/a n/a n/a	Date	Prep Batc n/a n/a n/a	G G	nalytical KK276 KK276 KK276 KK276	Batch
The QC rej	ported here applies to the	following sam	oles:			Method:	SW846	8021B	. <u> </u>
T4439-2, T	4439-3, T4439-4				*	•			
CAS No.	Compound	T4439-2	Spike Q ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPI
CAU NU.	Compound	ug/l		ug/1	70	ug/I	70	KI D	Kee/Ki
71-43-2	Benzene	192	500	687	99	709	103	3	64-124/1
100-41-4	Ethylbenzene	328	500	808	96	842	103	4	64-123/1
108-88-3	Toluene	ND	500	533	107	553	111	4	64-120/1
1330-20-7	Xylenes (total)	1480	1500	2880	93	3010	102	4	66-118/1
95-47-6	o-Xylene	298	500	765	93	795	99	4	65-119/2
	m,p-Xylene	1190	1000	2110	92	2210	102	5	66-120/2
		MS	MSD	T4	439-2	Limits			·
CAS No.	Surrogate Recoveries	IVIS	MOD			Limits			

4-DI OINOHUOI ODENZENE	11470	110/0	11070	04-12170
aaa-Trifluorotoluene	91%	97%	93%	71-121%

Matrix Spike/Matrix Spike Duplicate Summary

Job Number:	14439
Account:	MWHSLCUT Montgomery Watson
Project:	EPFS San Juan Basin GS

Sample File ID DF F4439-4MS KK005240.D 10 F4439-4MSD KK005241.D 10 F4439-4 KK005239.D 10	Analyzed B 06/04/03 J1 06/04/03 J1 06/04/03 J1	n/a n/a	Prep Batch n/a n/a n/a	Analytical Batch GKK275 GKK275 GKK275 GKK275
--	---	------------	---------------------------------	--

The QC reported here applies to the following samples:

Method: SW846 8021B

Page 1 of 1

T4439-1, T4439-3, T4439-4

CAS No.	Compound	T4439-4 ug/l Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2 100-41-4 108-88-3 1330-20-7 95-47-6	Benzene Ethylbenzene Toluene Xylenes (total) o-Xylene m,p-Xylene	7760 337 ND 1450 ND 1450	200 200 200 600 200 400	8140 502 155 1950 162 1780	190* ^a 83 78 83 81 83	8120 537 188 2030 195 1830	180* ^a 100 94 97 98 95	0 7 19* 4 18 3	64-124/16 64-123/14 64-120/13 66-118/18 65-119/20 66-120/14
CAS No.	Surrogate Recoveries	MS	MSD	T44	439-4	Limits			
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene	105% 99%	105% 96%	979 899		64-1219 71-1219			

(a) Outside control limits due to high level in sample relative to spike amount.

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	TEST or ratorie Dient/Reporting Informat			A M	CH I I I I I I I I I I I I I I I I I I I	ATA Harwin D FEL. 713-2	IN OF CU rwin Drive, Ste. 150, Hou 713-271-4700 FAX: 71 www.accutest.com Project information	AIN OF CUSTO 5 Harwin Drive, Ste. 150, Houston, TX 7 TEL. 713-271-4700 FAX: 713-271-4770 www.accutest.com Project information Beam Banco	USTQ Houston, TX77 Com com		70 FED-EX Tracking # 71036 FED-EX Tracking # 70 Accutes 1 Ouole # 70 Accutes 1 Ouole #	25	Bothe Order Control # Accutest Job # Requested Analysis		W M M	Malthix Codes Malthix Codes DW - Drinking Water GW - Ground Water WW - Water SW - Surface Wates
City Freniect Contact Lymone # Phone # Phone # Phone # Phone # Sampler Same f - Accutest Accutest Sample # Pccode f - Field 10 / Point of C		8 7 4 6 7 E-mail SUMMA# MECH Vel#	<u> </u>	City Fax # Solution Client Purchase Order # Collection Date Time Son	Berroter # 5	State Matrix bottles $\frac{2}{2}$		340N 92 1052H 0 1052H	Mercod Bo	¥318 ×					<u> </u>	SO - Soil SL - Sludge DI - Oli LIO - Other Liquid AIR - Air SOL - Other Solid WP - Wipe LAB USE ONLY
Blen	MW - 23 MW - 23		62:3	3 14:50 3 14:50		2 2 2		──┼─┼─╃╼╍┼╍╌┼─┼╶┥	N N 2	* * *						
Turnaround Time (Business Days) M Turnaround Time (Business Days) S Day SIAMDARD Approved By D 5 Day RUSH D 3 Day EMERGENCY D 2 Day EMERGENCY D 1 Day EMERGENCY D 1 Day EMERGENCY D 1 Day EMERGENCY D 1 Day EMERGENCY D Cuther D Cuther Emergency & Rush TIA data available VIA LabLink	Turraround Time (Business Days) Approved By: / Date: Adata available V/A LabLink	Date		Commercial -A Commercial -B Commercial -B Reduced Tier 1 TRRP13 Commercial -A	Commercial "A" Commercial "B" Reduced Tier 1 Full Trer 1 TRRP13 Commercial "A" =	Data Del Results Only	Data Deliverable Information	Formation			Kin Kin	rsee 103	Comments i Remarks	32 0	XXIII	
Refinque of the Sampler: 1 Refine the contract of the Sampler: 2 Refinquished by:		Date Time:	Received by Received by Received by: Received by: S	e Custody m	Sample Custody must be documented below ed by ed by: ed by:	ented below e	ach lime san Reli Reli	each time samples change possession. Relinquished by 2 Relinquished by: 4 Custody Seal #	possession, in	including courier delivery. Preserve	Preserved where applicable	Ogle Time: 0845 0-2-03 Date Time: Date Time: applicable	Received by Received by Received by	à Ch	Coder Temp.	

Groundwater Analytical Report – August 2003

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08/20/03

Technical Report for

Montgomery Watson

Blanco North

Accutest Job Number: T5038

Report to:

MWH

Pamela.J.Anderson@us.mwhglobal.com

Total number of pages in report: 10



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Ron Martino Laboratory Manager

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Sample Summary

Montgomery Watson

Job No:

T5038

Blanco North

Sample Number	Collected Date	Time By	Received	Matı Code		Client Sample ID
T5038-1	08/04/03	07:00 MJN	08/05/03	AQ	Trip Blank Water	040803TB01
T5038-2	08/04/03	09:30 MJN	08/05/03	AQ	Water	MW-27
T5038-3	08/04/03	11:50 MJN	08/05/03	AQ	Water	MW-23
T5038-4	08/04/03	13:07 MJN	08/05/03	AQ	Water	MW-19

Report of Analysis

Page 1 of 1

Client Sam Lab Sample Matrix: Method: Project:		Water		Date Sample Date Receive Percent Solie	ed: 08/05/03	
Run #1 Run #2	File ID DF KK005602.D 1	Analyzed 08/11/03	By BC	Prep Date n/a	Prep Batch n/a	Analytical Batch GKK299
Run #1 Run #2	Purge Volume 5.0 ml					
Purgeable A	Aromatics					·
CAS No.	Compound	Result	RL	Units Q		
71-43-2 108-88-3 100-41-4 1330-20-7 95-47-6	Benzene Toluene Ethylbenzene Xylenes (total) o-Xylene m,p-Xylene	ND ND ND ND ND	1.0 1.0 3.0 1.0 2.0	ug/l ug/l ug/l ug/l ug/l ug/l		
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene	99% 102%		64-121% 71-121%		

ND = Not detected RL = Reporting Limit E = Indicates value exceeds calibration range J = Indicates an estimated value

B = Indicates analyte found in associated method blank

Report of Analysis

Page 1 of 1

Client Sam Lab Samp Matrix: Method: Project:	•	2 /ater 8021B		•	Date Sampl Date Receiv Percent Soli	ed: 08/05/03	
Run #1 Run #2	File ID KK005606.D KK005607.D	DF 10 25	Analyzed 08/11/03 08/11/03	By BC BC	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GKK299 GKK299
Run #1 Run #2	Purge Volume 5.0 ml 5.0 ml						
Purgeable	Aromatics						
CAS No.	Compound		Result	RL	Units Q		
71-43-2 108-88-3 100-41-4 1330-20-7 95-47-6	Benzene Toluene Ethylbenzene Xylenes (total) o-Xylene m,p-Xylene		116 ND 145 697 134 563	10 10 10 30 10 20	ug/l ug/l ug/l ug/l ug/l ug/l		

 CAS No.
 Surrogate Recoveries
 Run# 1
 Run# 2
 Limits

 460-00-4
 4-Bromofluorobenzene
 110%
 108%
 64-121%

 98-08-8
 aaa-Trifluorotoluene
 138% b
 131% a
 71-121%

(a) Outside control limits due to matrix interference. Confirmed by reanalysis.

(b) Outside control limits due to matrix interference.

ND = Not detected RL = Reporting Limit E = Indicates value exceeds calibration range J = Indicates an estimated value

B = Indicates analyte found in associated method blank

	• •	Repo	rt of An	alysis		Page 1 of 1
Client Sam Lab Sampl Matrix: Method: Project:		······································	•••	Date Sample Date Receiv Percent Soli	ed: 08/05/03	· · ·
Run #1 Run #2	File ID DF KK005604.D 10 KK005605.D 25	Analyzed 08/11/03 08/11/03	By BC BC	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GKK299 GKK299
Run #1 Run #2	Purge Volume 5.0 ml 5.0 ml					· · · · · · · · · · · · · · · · · · ·
Purgeable	Aromatics					
CAS No.	Compound	Result	RL	Units Q		
71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Xylenes (total)	2250 a ND 99.8 337	25 10 10 30	ug/l ug/l ug/l ug/l		
95-47-6	o-Xylene m,p-Xylene	ND 337	10 20	ug/l ug/l		
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene	98% 96%	95% 94%	64-121% 71-121%		

(a) Result is from Run# 2

ND = Not detected RL = Reporting Limit E = Indicates value exceeds calibration range J = Indicates an estimated value

B = Indicates analyte found in associated method blank

		Repo	rt of An	alysis		Page 1 of
Client San Lab Samp Matrix: Method: Project:			· · · ·	Date Sample Date Receiv Percent Soli	ed: 08/05/03	
Run #1 Run #2	File ID DF KK005603.D 10 KK005617.D 25	Analyzed 08/11/03 08/12/03	By BC BC	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GKK299 GKK299
Run #1 Run #2	Purge Volume 5.0 ml 5.0 ml			 	······································	· · ·
Purgeable	Aromatics		· · · · · · · · · · · · · · · · · · ·		· · ·	
CAS No.	Compound	Result	RL	Units Q		· · ·
71-43-2 108-88-3	Benzene Toluene	2000 ^a ND	25 10	ug/l ug/l		
100-41-4 1330-20-7 95-47-6	Ethylbenzene Xylenes (total) o-Xylene	304 ND ND	10 30 10	ug/l ug/l ug/l		
55-47-0	m,p-Xylene	ND	20	ug/l		
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene	103% 99%	107% 112%	64-121% 71-121%		

(a) Result is from Run# 2

ND = Not detected RL = Reporting Limit E = Indicates value exceeds calibration range J = Indicates an estimated value

B = Indicates analyte found in associated method blank

GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Blank Spike Summary Job Number: T5038

Account:	MWHSLCUT Montgomery Watson
Project:	Blanco North

Sample	File ID D	OF Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GKK299-BS	KK005600.D 1	08/11/03	BC	n/a	n/a	GKK299

T5038-1, T5038-2, T5038-3, T5038-4

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	20	21.0	105	74-119
100-41-4	Ethylbenzene	20	19.9	100	82-115
108-88-3	Toluene	20	19.9	100	77-116
1330-20-7	Xylenes (total)	60	60.3	101	79-115
95-47-6	o-Xylene	20	20.2	101	78-114
	m,p-Xylene	40	40.1	100	79-116
CAS No.	Surrogate Recoveries	BSP	Liı	mits	
460-00-4	4-Bromofluorobenzene	101%	. 64	-121%	
98-08-8	aaa-Trifluorotoluene	101%		-121%	

Method Blank Summary

Job Number:	15038
Account:	MWHSLCUT Montgomery Watson
Project:	Blanco North

		-			· · ·	·	
Sample GKK299-MB	File ID KK005601.D	DF)1	Analyzed 08/11/03	By BC	Prep Date n/a	Prep Batch n/a	Analytical Batch GKK299
The QC repor	ted here appli	es to th	e following sam	ples:		Method: SW	/846 8021B

T5038-1, T5038-2, T5038-3, T5038-4

CAS No.	Compound	Result	RL	Units Q
71-43-2 100-41-4 108-88-3 1330-20-7 95-47-6	Benzene Ethylbenzene Toluene Xylenes (total) o-Xylene m,p-Xylene	ND ND ND ND ND	1.0 1.0 1.0 3.0 1.0 2.0	ug/l ug/l ug/l ug/l ug/l
CAS No.	Surrogate Recoveries		Limit	S
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene	102% 100%	64-12 71-12	

Matrix Spike/Matrix Spike Duplicate Summary

Job Number:	15038	
Account:	MWHSLCUT Montgomery Watson	
Project:	Blanco North	

Sample	File ID	DF	Analyzed	Bv	Prep Date	Prep Batch	Analytical Batch
T5038-2MS	KK005608.		08/11/03	BC	n/a	n/a	GKK299
T5038-2MSD	KK005609.		08/11/03	BC	n/a	n/a	GKK299
T5038-2	KK005606.		08/11/03	BC	n/a	n/a	GKK299
T5038-2	KK005607.		08/11/03	BC	n/a	n/a	GKK299

The QC reported here applies to the following samples:

Method: SW846 8021B

Page 1 of 1

T5038-1, T5038-2, T5038-3, T5038-4

Compound	T5038-2	Spike	MS	MS	MSD	MSI	D	Limits
	ug/l Q	ug/l	ug/l	%	ug/l	%	RPD	Rec/RPD
Benzene	116	500	625	102	616	100	1	64-124/16
Ethylbenzene	145	500	623	96	599	91	4	64-123/14
Toluene	ND	500	548	110	535	107	2	64-120/13
Xylenes (total)	697	1500	2170	98	2080	92	4	66-118/18
o-Xylene	134	500	619	97	595	92	4	65-119/20
m,p-Xylene	563	1000	1550	99	1490	93	4	66-120/14
Surrogate Recoveries	MS	MSD 98%			T5038- 108%		Limits 64-121%	
	Benzene Ethylbenzene Toluene Xylenes (total) o-Xylene m,p-Xylene Surrogate Recoveries	Compoundug/lQBenzene116Ethylbenzene145TolueneNDXylenes (total)697o-Xylene134m,p-Xylene563	Compoundug/lQug/lBenzene116500Ethylbenzene145500TolueneND500Xylenes (total)6971500o-Xylene134500m,p-Xylene5631000Surrogate RecoveriesMSMSD	Compound ug/l Q ug/l ug/l Benzene 116 500 625 Ethylbenzene 145 500 623 Toluene ND 500 548 Xylenes (total) 697 1500 2170 o-Xylene 134 500 619 m,p-Xylene 563 1000 1550	Compoundug/lQug/lug/l%Benzene116500625102Ethylbenzene14550062396TolueneND500548110Xylenes (total)6971500217098o-Xylene13450061997m,p-Xylene5631000155099	Compound ug/l Q ug/l ug/l ug/l % ug/l Benzene 116 500 625 102 616 Ethylbenzene 145 500 623 96 599 Toluene ND 500 548 110 535 Xylenes (total) 697 1500 2170 98 2080 o-Xylene 134 500 619 97 595 m,p-Xylene 563 1000 1550 99 1490	Compound ug/l Q ug/l ug/l ug/l % ug/l % Benzene 116 500 625 102 616 100 Ethylbenzene 145 500 623 96 599 91 Toluene ND 500 548 110 535 107 Xylenes (total) 697 1500 2170 98 2080 92 o-Xylene 134 500 619 97 595 92 m,p-Xylene 563 1000 1550 99 1490 93	Compound ug/l Q ug/l ug/l ug/l % ug/l % RPD Benzene 116 500 625 102 616 100 1 Ethylbenzene 145 500 623 96 599 91 4 Toluene ND 500 548 110 535 107 2 Xylenes (total) 697 1500 2170 98 2080 92 4 o-Xylene 134 500 619 97 595 92 4 m,p-Xylene 563 1000 1550 99 1490 93 4

(a) Outside control limits due to matrix interference. Confirmed by reanalysis.

(b) Outside control limits due to matrix interference.

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	ACCUTEST				10165 H TE	10165 Harwin Drive, Ste. 150, Houston, 1:X 77036 FEDEX Tracking # TEL. 713-271-4700 FAX: 713-271-4770 855603	ve, Ste. 15 4700 FA	0, Housto X: 713-27	n, 'I'X 7701 'I-4770			757077		Bottle Order Control #	*		
J	Laboratories				I	~~	vw.accutes	t.com	•	Accutes			1	Accutest Job #			
	Client / Reporting Information		122.00			Project Information	rmation					Regu		sted Analysis		Matrix Codes	8
Company Name	253			Project Name	•	X	4 4	7.	<i>G</i>						- 	DW Drinking Water	Vater
Address			Street	8			2	<u>í</u>		<u> </u>						GW - Ground Water WW - Water	
City Er	Mrgfin NM	87400	X City			State				1						SW - Surface Water SU - Soil	Vater
Project Contact	n Benally	E-mail	Project #	# #						T				<u> </u>		SL Sludge	
Phone #	505 599 2178		Fax#	505	5	66-	211	8		~						LIO - Other Liquid	pnt
Sampler's Name	12		Client	Client Purchase Order #	ي #			1		3						AIR - Air SOL Other Solid	olid
Accutest Sample #	Field 1D / Point of Collection	SUMMA# MEOH Val#	# Date	Collection	Sampled By	Matrix bottles	HORN NCIT		ed Bottles	18						WP - Wipe LAB USE ONLY	Ľ
-	OHOBOZ TZO I		\$	678	3 20	1 87				×						Vee	ŀ
2	12-mm		8-4-8	84.4092	NU	w6 3		2		×	·						
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	Turmaryund Time (Business Dave)						Data Deliverable Information	Tation						Commants / Barnarite			
K 10 Day S	10 Day STANDARD Approved By: / Date:	Date:		Commercial 'A	'A' lei:		EDD Format	xmat									
C 5 Day RUSH	USH			Commercial 'B	žial "8" Tier 1												Τ
	3 Day EMERCENCY 2 Day EMERGENCY 4 Day ELEPCENCY			D Full Tiler 1 TRRP13									F	E S	VS		
C I usy cmcrocirci				Commercial	urrial "∆" = }	"∆" = Results Only			·				4				
Emergency	oL ink													X			
			Sample Custody must be documented below each time samples change possession.	Custody mus	be documen	ted below eac	th time sampl	es change pc	ssession, incl	including counter delivery	delivery.	Date Time 76.20	20 Received				
	A A	1440	l				2	2				8-5-03					
Refinquimed by		Date Time:	Received by: 3				Relingu 4	ished by:				Date Lime:	4	\sum_{n}			
Refinquished by: 5		Date Time:	Received by				Custod	Custody Seal #			Preserved where applicable	applicable	a S S	8-4	S Cooler Temp.	emp.	<u> </u>

	TEST	SAMPLI	E RECEIPT	LOG			
JOB #: 7503	2	DATE/TIME RECE	X	-5-03	083	0	
		DATE/TIME RECE	:IVED:				
CLIENT Z PASO M			•	INITIALS:		-	ι
3. Y N Sample rec 5. Y N Sample volu	eived in undamag eived with proper ume sufficient for	ped condition. 2/ pH. 4 analysis. 6	Y N Samp Y N Samp Y N Samp		vithin temp. ra	ange. iners.	
8. Y N Custody sea	al received intact	ample IDs on conta and tamper evider and tamper evider	nt on cooler.				
SAMPLE or FIELD ID	BOTTLE #	DATE SAMPLED	MATRIX	VOLUME	LOCATION	PREŞERV.	РН
l		8-4-03		1X 40ml	VREF	(1)2,3,4,5,6	U, <2, >12, 1
2	1-2			ex Yomi	1	1,2,3,4,5,6	U, <2, >12
3						12,3,4,5,6	U, <2, >12
Ч				J	\checkmark	1,2,3,4,5,6	U, <2, >12, N
						1,2,3,4,5,6	U, <2. >12, N
						1,2,3,4,5,6	U, <2, >12, N
						1,2,3,4,5,6	U, <2, >12, N
						1,2,3,4,5,6	U, <2, >12, N
						1,2,3,4,5,6	U, <2, >12, N
						1,2,3,4,5,6	U, <2, >12, N
					· · · · · · · · · · · · · · · · · · ·	1,2,3,4,5,6	U, <2, >12, N
· · · · · · · · · · · · · · · · · · ·						1,2,3,4,5,6	U, <2, >12, N
						1,2,3,4,5,6	U, <2, >12, N
				-		1,2,3,4,5,6	U, <2, >12, N
		· ·		_	· · · · · · · · · · · · · · · · · · ·	1,2,3,4,5,6	U, <2, >12, N
	VD. Volatila D. G	SHD. Subsector			······································	1,2,3,4,5,6	U, <2, >12, N
LOCATION: WI: Walk-In PRESERVATIVES: 1: Non		3 4: H2SO4 5: NAO		re Freezer	Viels	ARE N	01
pH of waters checked exclo pH of soils N/A	uuing voiatiles			RESERVE	わ		
Delivery method: Couri Tracking	er: <u>FED-EX</u> #: <u>52E_A7</u>	TACHED		COOLER TEM		COOLER TEI	
Method of sample dis	posal: (circle one	e) Accutest dispo	osal Hold	Return to	Client	Fo	rm: SM012

Anal	ytical Methoo	l/Analytes:	SW-846 8021B (B)	TEX)	Sample Col	lection Date(s): _	08/04/03
	L	aboratory:	Accutest		MW	H Job Number: _	EPC-SJR (Blanco Nor
	Batch Ide	ntification:	T5038			Matrix:	Water
	MS/MSD I	Parent(s) ^(a) :	T5038-02		Field Repl	icate Parent(s):	None
Val	idation Co	omplete: <u>/</u>	Jon Bit	tas	(Date/Signate		
Foot Notes	Site ID	Sample II) Lab. ID	Hits (Y/N)	Quals.	Comn	nents
None	Trip Blank	040803TB01	T5038-01	N	Quant		<u>icitus</u>
1,2	Blanco North	MW-27	T5038-02	Y		Benzene @ 116 Ethylbenzene @ Xylenes (total) @ o-Xylene @ 134 m,p-Xylene @ 5	145 μg/l Ͽ 697 μg/l μg/l
None	Blanco North	MW-23	T5038-03	Y		Benzene @ 2250 Ethylbenzene @ Xylenes (total) @ m,p-Xylene @ 3) μg/l 99.8 μg/l ፬ 337 μg/l
None	Blanco North	MW-19	T5038-04	Y		Benzene @ 2000 Ethylbenzene @) μg/l
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DATA VALIDATION WORKSHEET

(Page 2 of 2)

Analytical Method:

SW-846 8021B (BTEX)

MWH Job Number: EPC-SJRB (Blanco North)

Laboratory: Accutest

est

Batch Identification: T5038

Validation Criteria						 	<u></u>
Validation Criteria Sample ID	040803TB 01	Blanco North MW-27	Blanco North MW-23	Blanco North MW-19			
Lab ID	T5038-01	T5038-02	T5038-03	T5038-04			ŀ
Holding Time	A	A	Α	А			
Analyte List	A	A	А	A			
Reporting Limits	A	A	Α	A			
Trip Blank	A	A	A	А			
Equipment Rinseate Blanks	N/A	N/A	N/A	N/A			
Field Duplicate/Replicate	N/A	N/A	N/A	N/A			
Surrogate Spike Recovery	А	A ¹	A	А			
Initial Calibration	N	N	N	N			
Initial Calibration Verification (ICV)	N	N	N	N			
Continuing Calibration Verification (CCV)	N	N	N	N			
Laboratory Control Sample (LCS)	A	А	A	Α			
Laboratory Control Sample Duplicate (LCSD)	N	N	N	N	· ·		
Method Blank	A	A	А	Α			
Matrix Spike/Matrix Spike Dup. (MS/MSD)	N/A	A ²	N/A	N/A		+	
Retention Time Window	N	N	N	N			1
Injection Time(s)	N	N	N	N			1
Hardcopy vs. Chain-of-Custody	А	A	A	A			
EDD vs. Hardcopy	N	N	N	N			
EDD vs. Chain of Custody	N	N	N	N			

(a) List QC batch identification if different than Batch ID

A indicates validation criteria were met

A/L indicates validation criteria met based upon Laboratory's QC Summary Form

X indicates validation criteria were not met

N indicates data review were not a project specific requirement

N/A indicates criteria are not applicable for the specified analytical method or sample

N/R indicates data not available for review

NOTES:

- 1) Surrogate percent recovery outside acceptance criteria for aaa-Trifluorotoluene @ 138% (71-121) and confirmed outside acceptance criteria by reanalysis @ 131%. Only one surrogate outside acceptance criteria, no data qualified.
- 2) Matrix spike surrogate percent recoveries outside acceptance criteria for aaa-Trifluorotoluene @ 123% (71-121). Only one surrogate outside acceptance criteria, data quality not affected.

HAIN OF CUSTODY & ogoso3 mv 61 10165 Harwin Drive, Ste. 150, Houston, 1:X 77036 [FEDEX Tracking # 10165 Harwin Drive, Ste. 250, HOUSTON, 1:X 77036 [SS 554 053 757 757] Bottle Order Control #	Accutest Quote # Accutest Job #	Requested Analysis Matrix Odes	22 CW Dinking Water	WW - Water	SW - Surface Water	SL - Sludge		Alf - Air Solu Other Solid	Number of preserved Bottles WP-Wpe			×				Comments / Remarks / With the second comments / Remarks / With the second second second second second second se		1503	documented below each time samples change possession, including courier delivery.	Date time 2630 Received	Date Time: - Recorded Dy
	ł	Client / Reporting Information	CLBSS/Mans	Address (4 Reill A we	Stat	-114 ma	Phone# 505 599 2178	1)	Accutest Field ID / Point of Collection SUMMA # Sample # McCutvia #	0408037301	2 mw-27	3 MW-23	4 mw -19			K 10 Day STANDARD I UMaround Lime (business Days) Q 10 Day STANDARD Approved By: / Date:	D 3Day Fuences/CY	LI 2 UBY EMERGENCY	Emergency & Kush I/A data available VIA LabLink Sample Custody must be	Date Time	Reinquicked by Contraction Date Time: Received by:

Groundwater Analytical Report – September 2003

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Technical Report for

Montgomery Watson

Blanco North

040903mn01

Accutest Job Number: T5289

Report to:

Total number of pages in report: 14



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Ron Martino Laboratory Manager

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories.

Sample Summary

Montgomery Watson

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Job No: T5289

Blanco North Project No: 040903mn01

Sample Number	Collected Date	Time By	Received	Matr Code		Client Sample ID
T5289-1	09/03/03	11:35 MJN	09/05/03	AQ	Water	BLANCO NFP MW-23
T5289-2	09/03/03	11:45 MJN	09/05/03	AQ	Water	BLANCO NFP MW-19
T5289-3	09/03/03	12:01 MJN	09/05/03	AQ.	Water	BLANCO NFP MW-27
T5289-4	09/03/03	07:50 MJN	09/05/03	AQ	Water	BLANCO NFP MW-26
T5289-5	09/03/03	07:00 MJN	09/05/03	ÂQ	Water	030903TB01

	Report of Analysis						
Client Sam Lab Sampl Matrix: Method: Project:		MW-23	·····	Date Sampl Date Receiv Percent Soli	ed: 09/05/03		
Run #1 ^a Run #2 ^a Run #3 ^a	File ID DF KK005678.D 1 KK005679.D 25 KK005696.D 50	Analyzed 09/06/03 09/06/03 09/07/03	By BC BC BC	Prep Date n/a n/a n/a	Prep Batch n/a n/a n/a	Analytical Batch GKK304 GKK304 GKK305	
Run #1 Run #2 Run #3	Purge Volume 5.0 ml 5.0 ml 5.0 ml						
Purgeable	Aromatics						
CAS No.	Compound	Result	RL	Units Q			
71-43-2 108-88-3 100-41-4 1330-20-7 95-47-6	Benzene Toluene Ethylbenzene Xylenes (total) o-Xylene m,p-Xylene	3860 ^b 7.8 208 ^c 768 ^c ND ^c 768 ^c	50 1.0 25 75 25 50	ug/l ug/l ug/l ug/l ug/l ug/l			
CAS No.	Surrogate Recoveries	Run# 1	. Run# 2	Run# 3	Limits		
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene	126% ^d 172% ^d	99% 99%	101% 104%	64-121% 71-121%		

(a) Sample was not preserved to a pH < 2; reported results are considered minimum values.

(b) Result is from Run# 3

(c) Result is from Run# 2

(d) Outside control limits due to matrix interference.

ND = Not detected RL = Reporting Limit E = Indicates value exceeds calibration range

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound

		Repo	rt of An	alysis		Page 1 of 1
Client Sam Lab Sampl Matrix: Method: Project:		IW-19		Date Sample Date Receiv Percent Soli	ed: 09/05/03	
Run #1 ^a Run #2 ^a Run #3 ^a	File ID DF KK005680.D 1 KK005681.D 25 KK005697.D 50	Analyzed 09/06/03 09/06/03 09/07/03	By BC BC BC	Prep Date n/a n/a n/a	Prep Batch n/a n/a n/a	Analytical Batch GKK304 GKK304 GKK305
Run #1 Run #2 Run #3	Purge Volume 5.0 ml 5.0 ml 5.0 ml		4. -	· · · · · · · · · · · · · · · · · · ·	· · · · · ·	
Purgeable	Aromatics					
CAS No.	Compound	Result	RL	Units Q		
71-43-2 108-88-3 100-41-4 1330-20-7 95-47-6	Benzene Toluene Ethylbenzene Xylenes (total) o-Xylene m,p-Xylene	3580 ^b ND 1020 ^c ND ND ND	50 1.0 25 3.0 1.0 2.0	ug/l ug/l ug/l ug/l ug/l ug/l	•	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run# 3	Limits	
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene	134% d 131% d	102% 98%	98% 95%	64-121% 71-121%	

(a) Sample was not preserved to a pH < 2; reported results are considered minimum values.

(b) Result is from Run# 3

(c) Result is from Run# 2

(d) Outside control limits due to matrix interference.

ND = Not detected RL = Reporting Limit E = Indicates value exceeds calibration range

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound

		Repo	ort of An	alysis		Page 1 of 1
Client San Lab Samp Matrix: Method: Project:				Date Sampl Date Receiv Percent Soli	ed: 09/05/03	
Run #1 ^a Run #2 ^a	File ID DF KK005685.D 1 KK005698.D 10	Analyzed 09/06/03 09/07/03	By BC BC	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GKK304 GKK305
Run #1 Run #2	Purge Volume 5.0 ml 5.0 ml					
Purgeable	Aromatics					
Purgeable CAS No.	Aromatics Compound	Result	RL	Units Q		
CAS No.	Compound					
CAS No. 71-43-2	Compound Benzene	137 ^b	10	ug/l		
CAS No. 71-43-2 108-88-3	Compound Benzene Toluene	137 ^b 17.4	10 1.0	ug/l ug/l		
CAS No. 71-43-2 108-88-3 100-41-4	Compound Benzene Toluene Ethylbenzene	137 ^b 17.4 274 ^b	10 1.0 10	ug/l ug/l ug/l		
CAS No. 71-43-2 108-88-3 100-41-4 1330-20-7	Compound Benzene Toluene Ethylbenzene Xylenes (total)	137 ^b 17.4 274 ^b 1240 ^b	10 1.0 10 30	ug/l ug/l ug/l ug/l		
CAS No. 71-43-2 108-88-3 100-41-4	Compound Benzene Toluene Ethylbenzene	137 ^b 17.4 274 ^b	10 1.0 10	ug/l ug/l ug/l		
CAS No. 71-43-2 108-88-3 100-41-4 1330-20-7	Compound Benzene Toluene Ethylbenzene Xylenes (total) o-Xylene	137 ^b 17.4 274 ^b 1240 ^b 243 ^b 995 ^b	10 1.0 10 30 10	ug/l ug/l ug/l ug/l ug/l	· ·	
CAS No. 71-43-2 108-88-3 100-41-4 1330-20-7 95-47-6	Compound Benzene Toluene Ethylbenzene Xylenes (total) o-Xylene m,p-Xylene	137 ^b 17.4 274 ^b 1240 ^b 243 ^b 995 ^b ss Run# 1	10 1.0 10 30 10 20	ug/l ug/l ug/l ug/l ug/l ug/l		

(a) Sample was not preserved to a pH < 2; reported results are considered minimum values.

(b) Result is from Run# 2

(c) Outside control limits due to matrix interference.

ND = Not detected RL = Reporting Limit E = Indicates value exceeds calibration range

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

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		Repo	rt of An	alysis		Page 1 of 1
Client Sam Lab Sampl Matrix: Method: Project:		W-26		Date Sample Date Receive Percent Soli	ed: 09/05/03	· · · · · · · · · · · · · · · · · · ·
Run #1 Run #2	File IDDFKK005687.D1KK005701.D10	Analyzed 09/06/03 09/07/03	By BC BC	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch GKK304 GKK305
Run #1 Run #2	Purge Volume 5.0 ml 5.0 ml					· · · · ·
Purgeable	Aromatics					
CAS No.	Compound	Result	RL	Units Q		
71-43-2 108-88-3 100-41-4 1330-20-7 95-47-6	Benzene Toluene Ethylbenzene Xylenes (total) o-Xylene m,p-Xylene	538 ^a 9.6 139 ^a 466 ^a 98.5 ^a 367 ^a	10 1.0 10 30 10 20	ug/1 ug/1 ug/1 ug/1 ug/1 ug/1		
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		. · · ·
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene	185% ^b 242% ^b	103% 109%	64-121% 71-121%		

(a) Result is from Run# 2

(b) Outside control limits due to matrix interference.

ND = Not detectedRL = Reporting Limit E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

		Repo	rt of An	alysis		Page 1 of 1
Client Sam Lab Sampl Matrix: Method: Project:				Date Sample Date Receiv Percent Soli	ed: 09/05/03	
Run #1 Run #2	File ID DF KK005695.D 1	Analyzed 09/07/03	By BC	Prep Date n/a	Prep Batch n/a	Analytical Batch GKK305
Run #1 Run #2	Purge Volume 5.0 ml					
Purgeable .	Aromatics					
CAS No.	Compound	Result	RL	Units Q		
71-43-2 108-88-3 100-41-4 1330-20-7 95-47-6	Benzene Toluene Ethylbenzene Xylenes (total) o-Xylene m,p-Xylene	ND ND ND ND ND	1.0 1.0 3.0 1.0 2.0	ug/l ug/l ug/l ug/l ug/l ug/l		
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene	101% 101%		64-121% 71-121%		

ND = Not detected RL = Reporting Limit E = Indicates value exceeds calibration range J = Indicates an estimated value

B = Indicates analyte found in associated method blank N = Indicates presumptive evidence of a compound

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QC Data Summaries

Includes the following where applicable:

- Method Blank SummariesBlank Spike Summaries
- Matrix Spike and Duplicate Summaries ٠

Blank S Job Numbe Account:	pike Summary er: T5289 MWHSLCUT Mont	gomory Watsor					Page 1 of
Project:	Blanco North						
Sample GKK304-B	File ID DF S KK005676.D1	Analyzed 09/06/03	By BC	Pı n/	rep Date a	Prep Batch n/a	Analytical Batch GKK304
· ·							
The QC re	ported here applies to th	e following sar	nples:			Method: SV	V846 8021B
	ported here applies to th 5289-2, T5289-3, T5289-		nples:			Method: SV	W846 8021B
			nples:		·	Method: SV	V846 8021B
		4	nples: BSP	BSP		Method: SV	V846 8021B
T5289-1, T				BSP %	Limits	Method: SV	V846 8021B
	5289-2, T5289-3, T5289- Compound	4 Spike	BSP		Limits 82-115	Method: SV	V846 8021B
T5289-1, T CAS No.	5289-2, T5289-3, T5289-	4 Spike ug/l	BSP ug/l	%		Method: SV	V846 8021B
T5289-1, T CAS No. 100-41-4	5289-2, T5289-3, T5289- Compound Ethylbenzene	4 Spike ug/l 20	BSP ug/l 22.0	% 110	82-115	Method: SV	V846 8021B
T5289-1, T CAS No. 100-41-4 108-88-3	5289-2, T5289-3, T5289- Compound Ethylbenzene Toluene	4 Spike ug/l 20 20	BSP ug/l 22.0 21.7	% 110 109	82-115 77-116	Method: SV	V846 8021B

Limits

64-121% 71-121%

BSP

103% 102%

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- Yes -

CAS No.

460-00-4

98-08-8

Surrogate Recoveries

4-Bromofluorobenzene

aaa-Trifluorotoluene

Blank Spike Summary

Job Number:	T5289
Account:	MWHSLCUT Montgomery Watson
Project:	Blanco North

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GKK305-BS	KK005693.D)1	09/07/03	BC	n/a	n/a	GKK305
The QC repor	ted here applie	es to the	following sam	ples:	······································	Method: SW	/846 8021B

T5289-1, T5289-2, T5289-3, T5289-4, T5289-5

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	20	21.3	107	74-119
100-41-4	Ethylbenzene	20	21.6	108	82-115
108-88-3	Toluene	20	21.4	107	77-116
1330-20-7	Xylenes (total)	60	64.9	108	79-115
95-47-6	o-Xylene	20	21.2	106	78-114
	m,p-Xylene	40	43.6	109	79-116
CAS No.	Surrogate Recoveries	BSP	Liı	mits	
460-00-4	4-Bromofluorobenzene	106%	64	-121%	
98-08-8	aaa-Trifluorotoluene	106%		-121%	

Method Blank Summary

Job Number:	15289
Account:	MWHSLCUT Montgomery Watson
Project:	Blanco North

Sample GKK304-MB	File ID DF KK005677.D 1	Analyzed 09/06/03	By BC	Prep Date n/a	Prep Batch n/a	Analytical Batch GKK304
The QC repor	ted here applies to the	following sam	ples:		Method: SW	/846 8021B
T5289-1, T528	9-2, T5289-3, T5289-4					

CAS No.	Compound	Result	RL	Units Q
100-41-4 108-88-3 1330-20-7 95-47-6	Ethylbenzene Toluene Xylenes (total) o-Xylene m,p-Xylene	ND ND ND ND ND	1.0 1.0 3.0 1.0 2.0	ug/l ug/l ug/l ug/l ug/l
CAS No.	Surrogate Recoveries		Limit	s
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene	99% 102%	64-12 71-12	

Page 1 of 1

Method Blank Summary

Job Number:	T5289
Account:	MWHSLCUT Montgomery Watson
Project:	Blanco North

Sample GKK305-MB	File ID KK005694.	DF D1	Analyzed 09/07/03	By BC	Prep Date n/a	Prep Batch n/a	Analytical Batch GKK305
The QC repor	ted here app	lies to the	following sam	ples:		Method: SW	/846 8021B
T5289-1, T528	9-2, T5289-3	, T5289-4	, T5289-5			• •	

CAS No.	Compound	Result	RL	Units	Q
71-43-2 100-41-4 108-88-3 1330-20-7 95-47-6	Benzene Ethylbenzene Toluene Xylenes (total) o-Xylene m,p-Xylene	0.91 ND ND ND ND ND	1.0 1.0 3.0 1.0 2.0	ug/l ug/l ug/l ug/l ug/l ug/l	J
CAS No.	Surrogate Recoveries		Limi	ts	
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene	100% 104%	64-12 71-12		

12 of 14

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Job Number Account: Project:	: T5289 MWHSLCUT Montg Blanco North	omery Watson			· .				
Sample	File ID DF	Analyzed	Ву	Prep D)ate	Prep Bat	ch Ar	nalytical	Batch
T5289-2MS	a KK005682.D 25	09/06/03	BC	n/a		n/a	Gł	KK304	
T5289-2MSI		09/06/03	BC	n/a		n/a		KK304	
T5289-2 a	KK005680.D1	09/06/03	BC	n/a		n/a		KK304	
T5289-2 a	KK005681.D25	09/06/03	BC	n/a		n/a	GI	KK304	
The QC rep	orted here applies to the	following samp	les:			Method:	SW846	8021B	
Т5289-1, Т5	289-2, T5289-3, T5289-4			•					
		T5289-2	Spike	MS	MS	MSD	MSD		Limits
	289-2, T5289-3, T5289-4 Compound		Spike 2 ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	
CAS No.	Compound							RPD 4	Rec/RPI
CAS No.		ug/l (Q ug/l	ug/l	%	ug/l	%	4	Rec/RPI 64-123/1
CAS No.	Compound Ethylbenzene Toluene	ug/l (1020 ^b	Q ug/l 500	ug/l 1480	% 92	ug/l 1420	% 80		Limits Rec/RPI 64-123/1 64-120/1 66-118/1
CAS No. 100-41-4 108-88-3 1330-20-7	Compound Ethylbenzene	ug/l (1020 ^b ND	Q ug/l 500 500	ug/l 1480 557	% 92 111	ug/l 1420 540	% 80 108	4 3	Rec/RPI 64-123/1 64-120/1
CAS No. 100-41-4 108-88-3 1330-20-7 95-47-6	Compound Ethylbenzene Toluene Xylenes (total)	ug/l (1020 ^b ND ND	Q ug/l 500 500 1500	ug/l 1480 557 1740	% 92 111 116	ug/l 1420 540 1660	% 80 108 111	4 3 5	Rec/RPI 64-123/1 64-120/1 66-118/1

101%

97%

102%

98%

134%* ^c

131%* ^c

64-121%

71-121%

(a) Sample was not preserved to a pH < 2; reported results are considered minimum values.

100%

101%

(b) Result is from Run #2.

460-00-4

98-08-8

(c) Outside control limits due to matrix interference.

4-Bromofluorobenzene

aaa-Trifluorotoluene

Matrix Spike/Matrix Spike Duplicate Summary

Job Number:	15289
Account:	MWHSLCUT Montgomery Watson
Project:	Blanco North

The QC reported here applies to the following samples:

Method: SW846 8021B

Page 1 of 1

T5289-1, T5289-2, T5289-3, T5289-4, T5289-5

CAS No.	Compound	T5289-3 ug/l Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2 100-41-4	Benzene Ethylbenzene	137 274	200 200	372 511	118 119	365 501	114 114	2 2	64-124/16 64-123/14
108-88-3 1330-20-7 95-47-6	Toluene Xylenes (total) o-Xylene	20.0 1240 243	200 600 200	277 1890 460	129* 108 109	270 1910 469	125* 112 113	3 1 2	64-120/13 66-118/18 65-119/20
	m,p-Xylene	995	400	1430	109	1440	111	1	66-120/14
CAS No.	Surrogate Recoveries	MS	MSD	T52	289-3	Limits			
460-00-4 98-08-8	4-Bromofluorobenzene aaa-Trifluorotoluene	102% 120%	105% 124%*	104 115		64-1219 71-1219			

(a) Sample was not preserved to a pH < 2; reported results are considered minimum values.

(b) Outside control limits due to matrix interference.

	CHAIN OF CUSTODY	
ZACCUTEST	10165 Harwin Drive, Ste. 150, Houston, TX 77036 FEDEX Taxking# TEL. 713-271-4700 FAX: 713-271-4770	X Tracking # 27 / //4 Bottle Order Control #
ratorie	www.accutest.com	Accutest Quote # Accutest Job #
Client / Reporting Information	Project Information	Renneted Analysis Marin Codes
-	N N	
Address Address Address Reilly	Street (NFP)	WW - Water
City Formington NW 87401	City State	SW - Surface Water SU - Soil
9	Project #	SL - Sludge
1 V	Far# 505 599 2/19 X	
Sampler's Name MATKU	Client Purchase Order #	AIR - AIr - Cher Sold SOL - Cher Sold
Accutest Field ID / Point of Collection SUMMA #		
MECHVAR MECHVAR	Date Time Samped Matrix bottles Fi age of the root of	LAB USE DNLY
NFPMWHAM	111 WW WE Z 2 2	
CE-WMPANDO	MN 115 2 2	
Benie NFPMW-26	2 2 7M NG	
2371841	7.3.02000NWQ1 1 X	
NOL		Comments / Remarks
S Day RUSH 3 Day EMERGENCY	Commercial 'B'	
1 1 bay EMERGENCY 1 1 bay EMERGENCY		
Cother	- Commercial "A" = Results Only	
Ermergency & Rush T/A data available V/A LabLink		
ne / 11	Sample Custody must be documented below each time samples change possession, including counter delivery. Received by	ner delivery
9/4/03		2 Date Time: Received by
2002/	HABOT V	4
Relinquished by: Date Time: Rece 5 9/5 1000 5	Received Dell Duct	Preserved where applicable On Ligy Cooker lerve.

ACCU.	TEST.	SAMPLE	RECEIPT	LOG			
JOB #:		DATE/TIME RECEI	VED: 9	15/03	1000		
CLIENT: MWH	ELPAS			INITIALS:	KS		
Condition/Variance (Ci		- -	Lis circled s		vr explanation	\-	
1. V N Sample rece	eived in undamag	ed condition. 2.	🖌 N Sampl	es received w	ithin temp. rai	nge.	
5. N Sample volu	eived with proper Ime sufficient for	analysis. 6/1	N Sampl		proper contair th chain of cus		
		mple IDs on contain and tamper evident					
9. YNA Qustody sea							
SAMPLE or FIELD ID	BOTTLE #	DATE SAMPLED	MATRIX	VOLUME	LOCATION	PRESERV.	рн
	[9303		VOA'S	VREP	1,2,3,4,5,6	U, <2, >12, NA
24	2					1,2,3,4,5,6	U, <2, >12, NA
342	<u> </u>					1,2,3,4,5,6	U, <2, >12, NA
4152	2					1,2,3,4,5,6	U, <2, >12, NA
5*3	1					1,2,3,4,5,6	U, <2, >12, NA
3	2	\bigvee				1,2,3,4,5,6	U, <2, >12, NA
4	f.	9/4/03				1,2,3,4,5,6	U, <2, >12, NA
4	2	J K	. /			1,2,3,4,5,6	U, <2, >12, NA
5	1	9/3/03		\bigvee	V	1,2,3,4,5,6	U, <2, >12, NA
			A			1,2,3,4,5,6	U, <2, >12, NA
						1,2,3,4,5,6	U, <2, >12, NA
						1,2,3,4,5,6	U, <2, >12, NA
						1,2,3,4,5,6	U, <2, >12, NA
						1,2,3,4,5,6	U, <2, >12, NA
			· · ·			1,2,3,4,5,6	U, <2, >12, NA
			·			1,2,3,4,5,6	U, <2, >12, NA
LOCATION: WI: Walk-In PRESERVATIVES: 1: Not		-		re Freezer			
pH of waters checked excl pH of soils N/A	luding volatiles		Comments:			<u>.</u>	
Delivery method: Court Tracking		57757114		COOLER TEM	P: <u>3</u> ,7°С P:	COOLER TE	
Method of sample dis	•	e) Accutest dispo	osal Hold				orm: SM012

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Analyt	tical Method	d/Analytes:	SW-846 8021B (BT	<u>(EX)</u> S	ample Col	lection Date(s):	09/03/03	
Laboratory:		aboratory:	Accutest		MWH Job Number:			
						· –	(Blanco No	
	Batch Identification:		T5289			Matrix:	Water	
	MS/MSD I	Parent(s) ^(a) :	T5289-2 & 3		Field Repl	icate Parent(s):	None	
Valic	lation Co	omplete: _/	Bane In	Stas	9-1 (Date/Signatu	1-03 ire)		
Foot Notes	Site ID	Sample ID	Lab. ID	Hits (Y/N)	Data Qualifiers	Comr	nents	
1,5	Blanco	MW-23	T5289-01	Y	B	Benzene @ 386		
	North				J	Toluene @ 7.8 µ Ethylbenzene @ Xylenes (total) (m,p-Xylene @ 7	ιg/l 208 μg/l @ 768 μg/l	
2,5	Blanco	MW-19	T5289-02	Y	В	Benzene @ 358		
	North					Ethylbenzene @		
3,5,6,7	Blanco North	MW-27	T5289-03	Y	BJ	Benzene @ 137 Toluene @ 17.4 Ethylbenzene @ Xylenes (total) @ o-Xylene @ 243 m,p-Xylene @ 9	μg/l 274 μg/l @ 1240 μg/l 6 μg/l	
4,5	Blanco North	MW-26	T5289-04	Y	BJ	Benzene @ 538 Toluene @ 9.6 µ Ethylbenzene @ Xylenes (total) @ o-Xylene @ 98. m,p-Xylene @ 3	ıg/l 139 μg/l @ 466 μg/l 5 μg/l	
None	Trip Blank	030903TB01	T5289-05	N				
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DATA VALIDATION WORKSHEET

(Page 2 of 3)

Analytical Method: SW-846 8021B (BTEX)

MWH Job Number: EPC-SJRB (Blanco North)

Laboratory:

Accutest

Batch Identification:

T5289

Validation Criteria							
Sample ID	Blanco North MW-23	Blanco North MW-19	Blanco North MW-27	Blanco North MW-26	030903TB 01		
Lab ID	T5289-01	T5289-02	T5289-03	T5289-04	T5289-05		
Holding Time	А	A	A	A	А		
Analyte List	A	A	A	A	А		
Reporting Limits	А	А	A	A	A		
Trip Blank	A	A	A	A	А		
Equipment Rinseate Blanks	N/A	N/A	N/A	N/A	N/A		
Field Duplicate/Replicate	N/A	N/A	N/A	N/A	N/A		
Surrogate Spike Recovery	A ¹	A ²	A ³	A ⁴	А		
Initial Calibration	N	N	N	N	N		
Initial Calibration Verification (ICV)	N	N	N	N	N		
Continuing Calibration Verification (CCV)	N	N	N	N	Ν		
Laboratory Control Sample (LCS)	A	A	A	A	А		· · · ·
Laboratory Control Sample Duplicate (LCSD)	N	N	N	N	N		
Method Blank	A ⁵	A ⁵	A ⁵	A ⁵	A ⁵		
Matrix Spike/Matrix Spike Dup. (MS/MSD)	N/A	A	A ^{6,7}	N/A	N/A		
Retention Time Window	N	N	N	N	N		
Injection Time(s)	N	N	N	N	N		
Hardcopy vs. Chain-of-Custody	A	A	A	A	A		
EDD vs. Hardcopy	N	N	N	N	N		
EDD vs. Chain of Custody	N	N	N ·	N	N		

(a) List QC batch identification if different than Batch ID

A indicates validation criteria were met

A/L indicates validation criteria met based upon Laboratory's QC Summary Form

X indicates validation criteria were not met

N indicates data review were not a project specific requirement

N/A indicates criteria are not applicable for the specified analytical method or sample

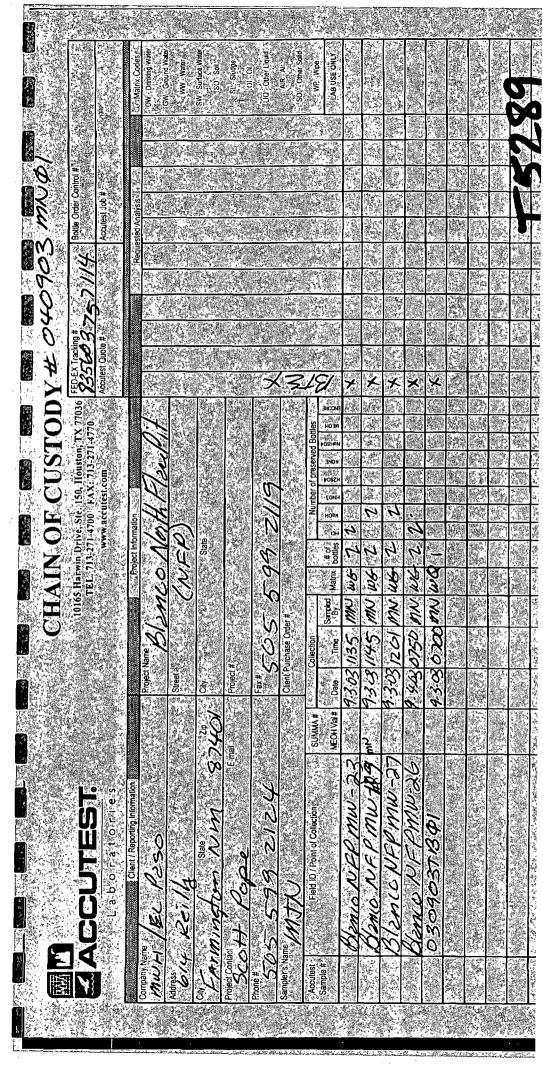
N/R indicates data not available for review

NOTES:

- Surrogate percent recoveries from Run #1 outside acceptance criteria for 4-Bromofluorobenzene @ 126% (64-121) and aaa-1) Trifluorotoluene @ 172% (71-121), indicating a possible high bias. Qualify associated analyte hits with "J" flags to indicate that the data are estimated and potentially biased high.
- 2) Surrogate percent recoveries from Run #1 outside acceptance criteria for 4-Bromofluorobenzene @ 134% (64-121) and aaa-Trifluorotoluene @ 131% (71-121), indicating a possible high bias. Associated analytes not detected, no data qualified.
- 3) Surrogate percent recoveries from Run #1 outside acceptance criteria for 4-Bromofluorobenzene @ 167% (64-121) and aaa-Trifluorotoluene @ 425% (71-121), indicating a possible high bias. Qualify associated analyte hits with "J" flags to indicate that the data are estimated and potentially biased high.

DATA VALIDATION WORKSHEET (Page 3 of 3)

- 4) Surrogate percent recoveries from Run #1 outside acceptance criteria for 4-Bromofluorobenzene @ 185% (64-121) and aaa-Trifluorotoluene @ 242% (71-121), indicating a possible high bias. Qualify associated analyte hits with "J" flags to indicate that the data are estimated and potentially biased high.
- 5) Benzene detected in the method blank (GKK305-MB) @ $0.91 \mu g/l$. Qualify associated sample hits greater than five times the amount detected in the method blank (5 x 0.91 $\mu g/l = 4.55 \mu g/l$) with "B" flags to indicate that the analyte was detected in an associated blank. Qualify associated sample hits less than five times the amount detected in the method blank (5 x 0.91 $\mu g/l = 4.55 \mu g/l$) with "B" flags to indicate that the analyte was detected in an 4.55 $\mu g/l$) with "UB" flags to indicate that the analyte is considered not detected due to associated blank contamination.
- 6) Matrix spike duplicate sample (MSD) surrogate percent recovery outside acceptance criteria for aaa-Trifluorotoluene @ 124% (71-121). Only one surrogate outside acceptance criteria, data quality not affected.
- 7) Matrix spike and matrix spike duplicate sample (MS/MSD) percent recoveries for Toluene are outside acceptance criteria @ 129% and 125% (64-120), indicating a possible high bias. Qualify associated sample hits with "J" flags to indicate that the data are estimated and potentially biased high.



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EL PASO NATURAL GAS COMPANY



614 Reilly Avenue Farmington, New Mexico 87401

2003 GROUNDWATER REPORT FOR THE BLANCO PLANT SOUTH FLARE PIT AND D PLANT AREAS

San Juan County, New Mexico

August 2003

Prepared by:

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TABLE OF CONTENTS

<u>Sectio</u>	n No.	<u>Page No.</u>
1.0	INTRODUCTION	1
2.0	SITE BACKGROUND	2
2.1 2.2	Previous Investigations of Groundwater Nitrate Site Geology/Hydrogeology	2 2
3.0	2003 ANNUAL GROUNDWATER SAMPLING	4
3.1 3.2	GROUNDWATER NITRATE DATA GROUNDWATER CHLORINATED HYDROCARBON DATA	4 4
4.0	CONCLUSIONS	5
5.0	REFERENCES	6

LIST OF TABLES

Tabl	le	No.	Description

a starter

5.6.4.6

44 to 20

- Groundwater Nitrate Analytical Data (1991 2003) 2.1
- 3.1 Groundwater Chlorinated Hydrocarbon Analytical Data (2002 and 2003)
- 4.1 Groundwater Sampling Schedule

LIST OF FIGURES

Figure No. **Description**

- 1.1 Blanco Plant Site Layout
- 2.1 Groundwater Potentiometric Surface Map - June 2003
- 3.1 Groundwater Nitrate Data – June 2003

LIST OF APPENDICES

- Α Field Sampling Forms
- В Laboratory Analytical Reports

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LIST OF ACRONYMS

CHC DCA DCB DCE EPNG MWH NMOCD	Chlorinated Hydrocarbons Dichloroethane Dichlorobenzene Dichloroethene El Paso Natural Gas Company MWH Americas, Inc. New Mexico Oil Conservation Division
	Dichloroethene
EPNG	El Paso Natural Gas Company
MWH	MWH Americas, Inc.
NMOCD	New Mexico Oil Conservation Division
NMWQCC	New Mexico Water Quality Control Commission
PCE	Tetrachloroethene
TCE	Trichloroethene

1.0 INTRODUCTION

This Draft 2003 Annual Groundwater Report for the Blanco Plant South Flare Pit and D Plant Areas (Report) has been prepared on behalf of El Paso Natural Gas Company (EPNG) to report the results of the 2003 annual groundwater sampling event at the Blanco Plant site. In addition, results of the chlorinated hydrocarbon sampling in the D Plant area from 2002 are also presented. This work has been performed according to the proposed actions outlined in the Groundwater Nitrate Report for the Blanco Plant South Flare Pit and D Plant Areas, April 2003 (Nitrate Report) (MWH, 2003), which are as follows:

- All groundwater monitoring wells on the Blanco Plant and in the North Flare Pit area will be sampled annually and analyzed for nitrate+nitrite concentrations.
- Groundwater samples from monitoring wells in the D Plant Area (MW-12, MW-13, MW-14 and MW-15) will be analyzed for chlorinated hydrocarbon compounds.
- The results of the nitrate and chlorinated hydrocarbon groundwater sampling will be reported to NMOCD in annual groundwater monitoring reports.

This work was initiated, pursuant to a New Mexico Oil Conservation Division (NMOCD) letter dated May 3, 2002, regarding remediation activities at EPNG's Blanco Plant. The regulatory driver for groundwater remediation at this site is the New Mexico Water Quality Control Commission's (NMWQCC) nitrate standard of 10 mg/L. The Groundwater Nitrate Work Plan for Blanco South Flare Pit and D Plant Areas (the Work Plan) (MWH, 2002) was submitted to NMOCD in July 2002 and was conditionally approved by NMOCD in a letter dated February 21, 2003.

The Blanco Plant is located in San Juan County, New Mexico, approximately 1.5 miles northeast of the town of Bloomfield, New Mexico on San Juan County Road 4900. Figure 1.1, Blanco Plant Site Layout, presents the Blanco Plant site layout and location of the D Plant and South Flare Pit. The map also shows the location of the North Flare Pit area.

Section 2.0 of this report summarizes historical information related to groundwater nitrate at the site, including a description of previous investigations and a description of the geology/hydrogeology of the area. Section 3.0 presents the results of the groundwater sampling investigation in 2003, and Section 4.0 discusses continued activities at the site.

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2.0 SITE BACKGROUND

2.1 PREVIOUS INVESTIGATIONS OF GROUNDWATER NITRATE

An initial assessment of site hydrogeology and groundwater resources of the Blanco Plant area was conducted by Bechtel Environmental in 1989 (Bechtel, 1989). Six monitoring wells were installed and sampled during this investigation. High nitrate concentrations were identified in wells MW-2 (290 ppm) and MW-6 (51 ppm) at that time. It was concluded in this study that "the high concentration of nitrate in the upgradient well (MW-2) could not have been due to plant operations".

As part of a groundwater study by K.W. Brown & Associates, Inc (K.W. Brown, 1990) to investigate the extent of contamination resulting from a leaking underground storage tank in the D Plant Area, the source of elevated nitrate in groundwater was further investigated. Monitoring well, MW-19, was installed upgradient of MW-2. Sampling results from this investigation indicated high nitrate concentrations in MW-2 (200 ppm), MW-19 (90 ppm), MW-14 (210 ppm) and MW-15 (89 ppm). Inspection of the plant area at that time did not find a source for potential nitrate contamination.

Historic and recent groundwater nitrate data from several rounds of groundwater sampling (1991 - 2003) at the site (including North Flare Pit wells) are presented in Table 2.1, *Groundwater Nitrate Analytical Data* (1991 - 2003).

2.2 SITE GEOLOGY/HYDROGEOLOGY

The geologic framework of the site has been summarized by Bechtel Environmental (Bechtel, 1989) and K.W. Brown and Associates (K.W. Brown, 1990). Based on these assessments, the plant area is located on Quaternary alluvium consisting of sand, silt, clay and gravel. At the plant site, the thickness of the alluvium varies from less than three feet to more than 75 feet (Bechtel, 1989). Underlying the alluvium is the Tertiary Nacimiento Formation consisting of interbedded coarse- to medium-grained arkosic sandstone, siltstone and shale which were deposited as both channel fill and floodplain deposits (Bechtel, 1989). Orientation of the channel-fill sandstone deposits may locally control groundwater flow due to higher hydraulic conductivities through these features.

An assessment of site hydrogeology and groundwater resources of the Blanco Plant area was conducted by Bechtel Environmental in 1989 (Bechtel, 1989). Based on the information collected during this study, it was concluded that the direction of groundwater flow through the plant area is to the south-southwest and then trends southward through the southern portion of the site. The average hydraulic conductivity was estimated to be 2.1×10^{-4} centimeters per second. Depth to groundwater ranged from 50 feet (at MW-2) to nine feet (at MW-10) below ground surface (5564 to 5552 feet above sea level) (EPNG, 1989). These results were generally consistent with the findings of K.W. Brown (1990).

A potentiometric surface map for the site has been prepared based on water level measurements collected in June 2003, and is presented in Figure 2.1, *Groundwater Potentiometric Surface Map - June 2003*. Based on these data, groundwater is flowing to the southeast with a hydraulic gradient of 0.027 ft/ft in the Blanco Plant site area and 0.067 ft/ft in the North Flare Pit area. At the southern boundary of the site the

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MWH * 1475 Pine Grove Road, Ste. 109 * Steamboat Springs, CO 80477 * (970) 879-1054

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groundwater gradient trends towards the east, likely as a result of groundwater mounding in that area due to recharge from Citizens Ditch. This is consistent with the groundwater flow pattern of previous years.

3.0 2003 ANNUAL GROUNDWATER SAMPLING

3.1 GROUNDWATER NITRATE DATA

Groundwater samples were collected on June 3, 2003 from wells MW-6, MW-8, MW-12, MW-13, MW-14, MW-15, MW-19, MW-23, MW-27, MW-28, MW-29 and MW-30 using standard purging and sampling techniques and analyzed for nitrite+nitrate concentrations. Groundwater sampling was attempted at wells MW-2, MW-5, MW-7, MW-24 and MW-26 at this time; however, these wells were either dry (MW-2 and MW-7), purged dry (MW-5 and MW-24) or contained free-product (MW-26 in North Flare Pit area) and could not be sampled. Field data and sampling information are presented on field sampling forms, included in Appendix A.

Analytical data are listed in Table 2.1, and laboratory analytical reports are included in Appendix B. Nitrate concentrations were consistent with historic data for these wells. These data indicate that nitrate concentrations have consistently exceeded NMWQCC standards in monitoring wells MW-6, MW-14, MW-15, MW-28, MW-29 and MW-30. Monitoring well MW-2 has not been sampled since 1994 because the well has been dry (although data collected from 1991 through 1994 indicated elevated nitrate concentrations at that location). Monitoring well MW-20 was damaged in 2000 and abandoned in 2002.

Groundwater nitrate concentrations from the June 2003 sampling event are presented on Figure 3.1, *Groundwater Nitrate Data - June 2003*. The 10 mg/L isoconcentration contour is also presented on this figure to indicate areas in exceedance of the NMWQCC standard. As shown in this figure, there is no obvious source or apparent trend in the nitrate data. Instead, there appear to be two confined areas or "hot spots" of high nitrate concentrations that are adjacent to wells with nitrate concentrations consistently below NMWQCC standards. In addition, there is no indication that high nitrate groundwater is migrating off site.

3.2 GROUNDWATER CHLORINATED HYDROCARBON DATA

Four wells in the D Plant area were also sampled and analyzed for a suite of selected chlorinated hydrocarbons (CHCs), in accordance with the site monitoring requirements The CHCs include tetrachloroethene (PCE), trichloroethene (TCE), 1,1-dichloroethane (DCA), 1,2-dichlorobenzene (DCB), 1,1-dichloroethene (DCE), trans 1,2-DCE and cis 1.2-DCE. These compounds were targeted because they had been detected previously at the site. Analytical data from May 2002 and June 2003 are presented in Table 3.1, Groundwater Chlorinated Hydrocarbon Analytical Data (2002 and 2003). As shown in this table, analytical data are generally consistent between the two years, with the exception that concentrations of several CHCs in MW-12 decreased in 2003. PCE, the most highly-chlorinated solvent of the analyte group, occurs in wells MW-12 and MW-13, and TCE is present in wells MW-12, MW-13 and MW-14. Daughter products of these two compounds (DCE and DCA) are detected in all of the wells, indicating that degradation of these compounds is naturally occurring in the groundwater. The only CHC detected in well MW-15 is a relatively low concentration of 1,1-DCA (6.0 μ g/L in June 2003), indicating that the groundwater at this location is likely approaching non-detectable levels of CHCs.

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4.0 CONCLUSIONS

In order to continue to monitor groundwater nitrate and CHC concentrations at the site, the following actions will continue to be conducted by EPNG:

- All groundwater monitoring wells on the Blanco Plant and in the North Flare Pit area will be sampled annually and analyzed for nitrate+nitrite concentrations, as shown in Table 4.1, *Groundwater Sampling Schedule*.
- Groundwater samples from monitoring wells in the D Plant Area (MW-12, MW-13, MW-14 and MW-15) will continue to be analyzed for chlorinated hydrocarbon compounds, as listed in Table 4.1.
- The results of the nitrate and chlorinated hydrocarbon groundwater sampling will be reported to NMOCD in annual groundwater monitoring reports (typically submitted in August of each year).
- In accordance with the approval letter from NMOCD, dated May 3, 2002, EPC will plug and abandon monitoring wells MW-10, MW-16, MW-17 and MW-18.

EPNG will notify NMOCD at least 48 hours in advance of all scheduled sampling activities, such that NMOCD has the opportunity to witness the events and split samples, if desired.

5.0 REFERENCES

- Bechtel Environmental, 1989. Groundwater Investigation Report, El Paso Natural Gas Company's Blanco Plant, San Juan County, New Mexico. January 1989.
- K.W. Brown and Associates, Inc, 1990. Site Investigation of the Blanco Plant, San Juan County, New Mexico. Prepared for El Paso Natural Gas Company. February 1990.
- MWH, 2002. Groundwater Nitrate Work Plan for Blanco South Flare Pit and D Plant Areas. July 2002.
- MWH, 2003. Groundwater Nitrate Report for the Blanco Plant South Flare Pit and D Plant Areas. April 2003.

Tables



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TABLES

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TABLE 2.1 GROUNDWATER NITRATE ANALYTICAL DATA (1991 - 2003) BLANCO PLANT - SAN JUAN COUNTY, NEW MEXICO

Monitoring Well	Sample Date	Nitrate (mg/l)	Monitoring Well	Sample Date	Nitrate (mg/l)	Monitoring Well	Sample Date	Nitrate (mg/l)
	NMOCD SI	andard: 10 mg/L		NMOCD S	tenderd: 10 mg/L		NMOCD S	standard: 10 mg/L
	6/18/91	180		2/25/93	19.2 State		9/26/92	1.42
MW-2	2/23/93	256	MW-14	6/8/93	17.5	MW-24	2/23/93	<1.0
	6/8/93	228		9/28/93	11.8		6/10/93	<1.0
	9/29/93	233 - 101		1/27/94	15.4		9/29/93	<1.0
	2/10/94	249		8/8/00	19		2/10/94	<1.0
	5/29/02	dry		11/13/00	0.24		5/13/94	NA
	6/3/03	dry		3/22/01	v. 13 🔔		8/22/94	NA
	6/18/91	0.08		8/28/01			11/13/00	0.1
MW-5	2/19/93	<1.0		5/28/02	15		3/26/01	0.18
	6/7/93	<1.0		6/3/03	15		5/30/02	0.15
	1/27/94	<1.0		6/19/91	50		6/3/03	dry
	8/8/00	4.6	MW-15	2/24/93	5		2/25/93	559-33-231.25
	8/8/00	4.6		6/8/93	48.1	MW-26	6/10/93	8.2
	11/10/00	4		9/28/93	43 0		3/26/01	0.24
	9/24/02	dry		1/27/94	43.7		5/30/02	0.26
	6/3/03	dry		8/8/00	35		6/3/03	NS
	6/19/91	9. 110		11/9/00	38		2/26/93	<1.0
MW-6	2/19/93	63.5		3/22/01	25 52	MW-27	6/10/93	<1.0
	6/7/93	76.4		8/28/01	30		9/30/93	<1.0
	9/28/93	85.9		5/28/02	24	1	2/2/94	<1.0 NA
	10/7/93	94.5		6/3/03	21		5/14/94	
	1/26/94	95.8	2012/17		0.07		11/13/00	0.28
	8/20/94	1.7	MW-16	2/25/93	3.7		3/26/01	0.61
		94 790.6		6/8/93 6/3/03	NS		5/30/02 6/3/03	0.21 <0.10
	2/16/95	59	······	2/25/93	15.3		10/7/93	2.1
	9/24/02	95.1	MW-17	9/24/02	dry	MW-28	2/2/94	2.8
	6/3/03	74		6/3/03	NS		8/20/94	2.7
	6/18/91	0.28		2/25/93	8.19		12/20/94	0.33
MW-7	6/7/93	3	MW-18	6/8/93	<1.0		2/16/95	1.6
(ME (N=)	9/27/93	<2.8		9/28/93	<1.0		8/10/00	25
	5/29/02	dry		9/24/02	3.1		11/10/00	53 1.7
	9/24/02	dry		6/3/03	NS		3/23/01	341
	6/3/03	dry		6/19/91	70		8/28/01	63 63
	6/18/91	<0.06	MW-19	2/25/93	10.6		5/28/02	83
MW-8	2/19/93	2.0		6/10/93	NA		6/3/03	87
	6/7/93	<1.0		11/13/00	<0.1		10/7/93	8.3
	9/27/93	<1.0		3/26/01	0.19	MW-29	2/2/94	19.6
	1/27/94	<1.0		5/30/02	0.13		8/20/94	28.8
	11/10/00	<0.1		6/3/03	<0.10		12/20/94	- 41
	11/10/00	<0.1		9/26/92	NA		2/16/95	28.1 get
	3/23/01	0.21	MW-20	2/24/93	<1.0		8/10/00	50
	3/23/01	0.21		6/10/93	<1.0		11/10/00	Ma 66 17
	8/28/01	0.33		9/29/93	<1.0		3/26/01	70
	5/28/02	0.26		1/27/94	<1.0		8/28/01	58
	6/3/03	0.13		5/13/94	NA		5/28/02	70
	6/18/91	0.74		8/22/94	NA		6/3/03	79
MW-10	2/19/93	1.2		11/13/00	damaged		10/7/93	28.15
	6/7/93	2.2		6/3/03	abandoned	MW-30	2/2/94	1.57.1
	9/27/93	2.1		9/26/92	0.62		8/20/94	67.6
	1/27/94	2.0	MW-23	2/1/93	NA		2/16/95	91.3
	5/28/02	dry		2/25/93	0.56		8/10/00	84
	9/24/02	dry		6/8/93	<1.0		3/26/01	70. • 72
	6/3/03	NS 7.8		9/29/93	<1.0	1	8/28/01	76
MIN 12	6/19/91 2/25/93	7.8		2/10/94	<1.0 NA		5/28/01	/6 /6
MW-12	6/7/93	7.8		5/13/94 8/22/94	NA NA		6/3/03	58
	9/28/93	9.1			0.12	L	0/3/03	Sakaciana 30 Salaka
	1/27/94	7.3		11/13/00 3/26/01	0.12			
	8/8/00	<10		5/30/02	0.23			
	11/9/00	5.7		6/3/03	<0.10			
	3/22/01	8.4		1				
	8/28/01	8.0						
	5/28/02	2.0						
	6/3/03	6.7						
~ ~ ~ ~	6/19/91	6.3						
MW-13	2/24/93	10.9						
176 77 - 1.3	6/8/93	8.1						
	9/28/93	4.1						
		5.4						
		-125						
	8/8/00	<12.5						
	8/8/00 11/9/00	9.8		·				
	8/8/00 11/9/00 3/22/01	9.8 13						
	8/8/00 11/9/00	9.8						

< Indicates analyte not detected at the method detection limit (MDL). Value shown is the MDL. Shaded values indicate exceedances of the NMWQCC Nitrate+Nitrite (as N) standard of 10 mg/L.

GROUNDWATER CHLORINATED HYDROCARBON ANALYTICAL DATA (2002 and 2003) **BLANCO PLANT - SAN JUAN COUNTY, NEW MEXICO** TABLE 3.1

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					Chlorinated	Chlorinated Hydrocarbons by EPA M 8260 (ug/L)	A M 8260 (ug/L)		
Monitoring Well	Sample Date	Static Water Level (ft btoc)	1,1-DCA	1,2-DCB	1,1-DCE	trans 1,2-DCE	cis 1,2-DCE	TCE	PCE
NMN	VQCC Water (NMWQCC Water Quality Standard:	25	SN	5.0	SN	SN	100	20
		US EPA MCL:	NS	NS	0.7	100	··· 70	5.0	5.0
002 Sampl	May 2002 Sampling Event								
MW-12	5/28/02	20.95	21	5.2	<1.0	1.7	20	8.0	3.0
MW-13	5/28/02	16.76	7 61 ٦	79	1.3	8.2	45	39	1.6
MW-14	5/29/02	21.57	8.7	<1.0	<1.0	<1.0	2.9	1.9	<1.0
MW-15	5/28/02	20.33	5.3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
003 Sampl	June 2003 Sampling Event								
MW-12	6/3/03	16.99	8.2	3.4	<2.0	<2.0	8.2	4.5	3.2
MW-13	6/3/03	14.44	ີ 53.8\	50.5	1.4	8.2	33	35.1	1.4
MW-14	6/3/03	19.85	9.5	<2.0	<2.0	<2.0	3.3	2.4	<2.0
MW-15	6/3/03	18.85	6.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0

Chlorinated Hydrocarbons by EPA Method 8260

PCE: Tetrachloroethene

TCE: Trichloroethene

DCE: Dichloroethene

DCB: Dichlorobenzene DCA: Dichloroethane

< Indicates analyte not detected at the method detection limit (MDL). Value shown is the MDL.

NMWQCC: New Mexico Water Quality Control Commission US EPA MCL: United States Environmental Protection Agency Maximum Contaminant Level

NS: No Standard

TABLE 4.1GROUNDWATER SAMPLING SCHEDULEBLANCO PLANT - SAN JUAN COUNTY, NEW MEXICO

Monitoring Well	Analyses	Sampling Frequency
North Flare Pit Area	, k ., ₂₀ , k .	
MW-2	Nitrate+Nitrite	Annual
MW-19	Nitrate+Nitrite	Annual
MW-23	Nitrate+Nitrite	Annual
MW-24	Nitrate+Nitrite	Annual
MW-26	Nitrate+Nitrite	Annual
MW-27	Nitrate+Nitrite	Annual
South Flare Pit Area		
MW-5	Nitrate+Nitrite	Annual
MW-6	Nitrate+Nitrite	Annual
MW-7	Nitrate+Nitrite	Annual
MW-8	Nitrate+Nitrite	Annual
MW-28	Nitrate+Nitrite	Annual
MW-29	Nitrate+Nitrite	Annual
MW-30	Nitrate+Nitrite	Annual
D Plant Area		
MW-12	Nitrate+Nitrite, CHCs	Annual
MW-13	Nitrate+Nitrite, CHCs	Annual
MW-14	Nitrate+Nitrite, CHCs	Annual
MW-15	Nitrate+Nitrite, CHCs	Annual

CHCs: Chlorinated Hydrocarbons by EPA M 8260: 1,1-DCA, 1,1-DCE, 1,2-DCB, cis 1,2-DCE, trans 1,2-DCE, TCE and PCE.

Nitrate+Nitrite as N by EPA M 353.2, 354.1, or 4500.

PCE: Tetrachloroethene TCE: Trichloroethene DCE: Dichloroethene DCB: Dichlorobenzene DCA: Dichloroethane

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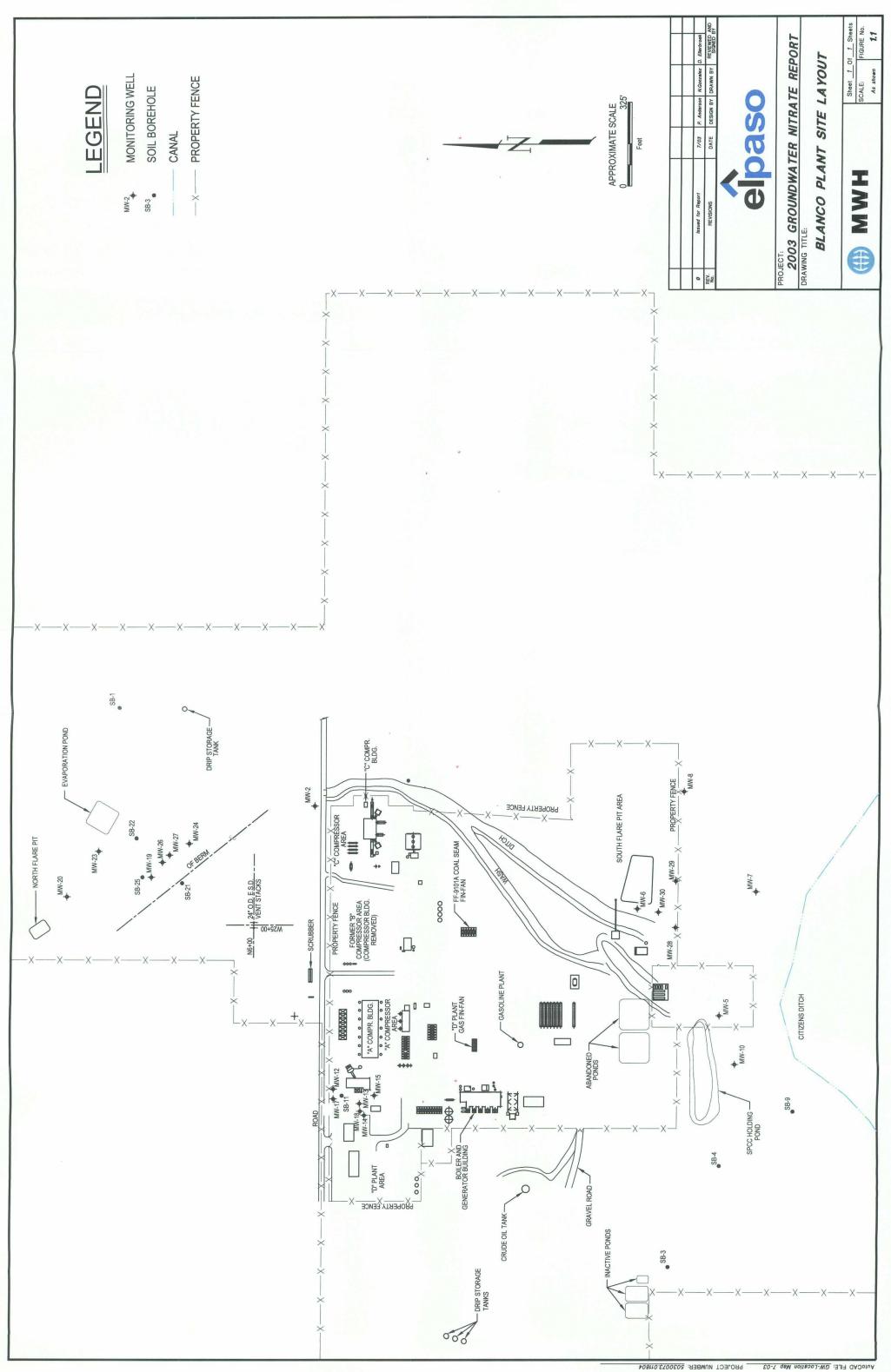
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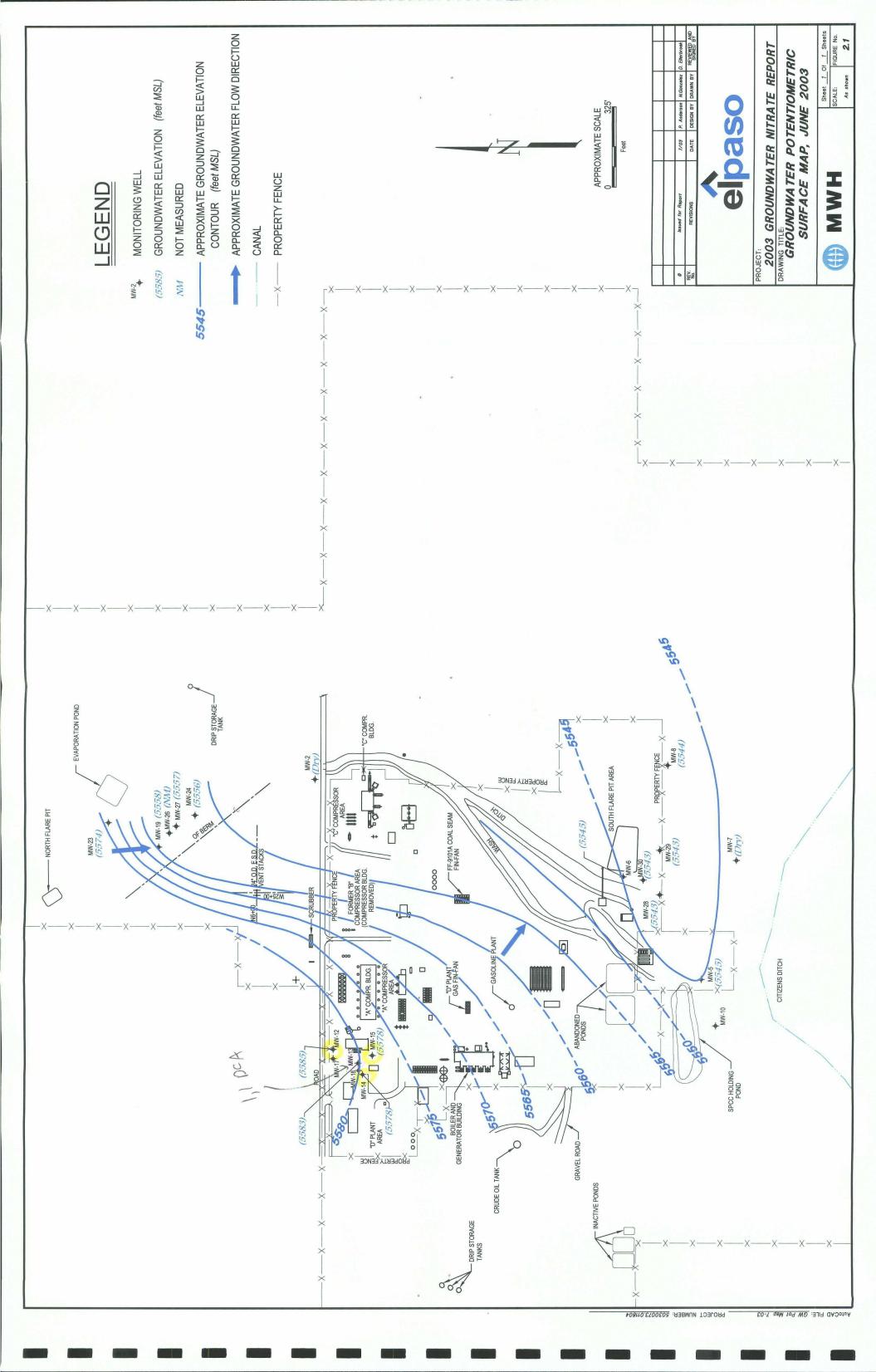
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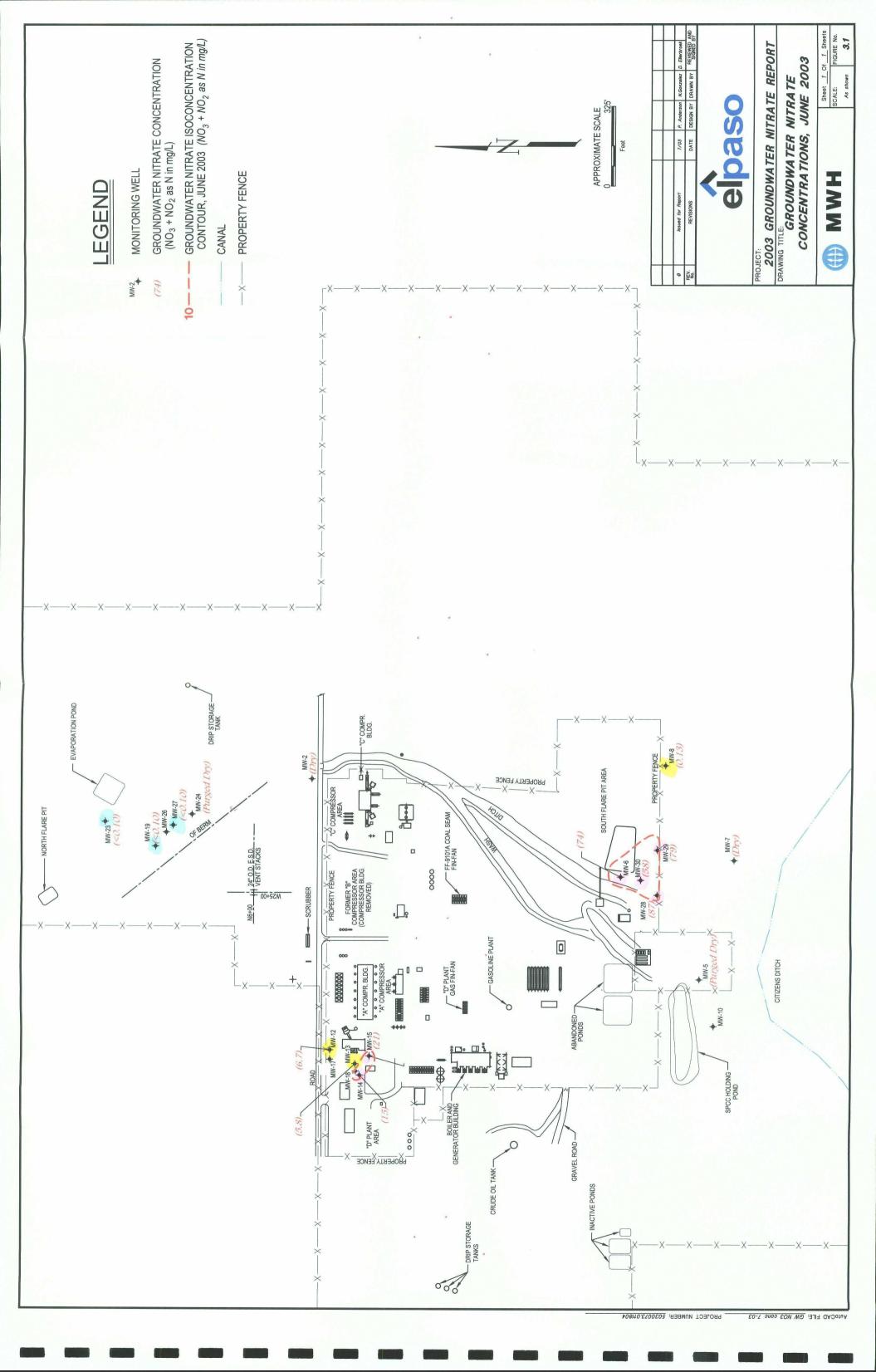
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FIGURES







Appendix A



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FIELD SAMPLING FORMS

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WATER LEVEL DATA

Martin J. Nee PO Box 3861 Farmington, NM 87499-3861 (505)334-2791 (505)320-9675cell

Project Name_	San Juan Basin Ground Water	Project No.	30001.0
Project Manager	MJN		
Client Company	MWH	Date	5-27-03
Site Name	Blanco	-	

Well	Time	Depth to Product (ft)	Depth to Water (ft)	Comments
MW-2	1130	-	-	Well is dry
MW-19		-	63.90	
MW-23		-	57.12	
MW-24		-	66.38	
MW-26		-		Product pump in well
MW-27		-	64.41	Very Strong HC odor
MW-5			20.36	
MW-6			29.62	
MW-7		-	· -	Well is dry
MW-8			34.05	
MW-28			29.68	
MW-29		-	31.96	
MW-30		-	31.87	
MW-12		-	16.99	
MW-13		-	14.44	
MW-14		-	19.85	
<u>MW-15</u>		-	18.85	

Comments

Signature: Martin & Nev

Date:

May 27, 2003

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Project No 3000		•		cn Juc	Besn	- Cuent	murn
Location: Blance	wei	No: M	2-5		Develo	namera 🗌	Sampling 😼
Project Manager	MJW		Date 4	1-2-03	Start Tim	e 1210	Weather <u>805 Sung</u> -Wn
Dauth to Water 24	Der Der	th to Prod		Produc	Thickness		Measuring Point _ T_CC
We er Column risig!	0.88	Well Dia.	41	_ 110000	111041665		
······································							
Sampling Method.							
Chtena, 3 to 5 Casi	na Volumes o	e baser 🛄 of Water Ri	- Double C amoval 57	neck Vah Sabiliza	ve Bailer [_] Son of India	Stainles	s-Stool Kommerer
			later Volum				
Gal/h x ft of water		Callons		(Junces		Gailoz to be removed
· 011-105	:57				-4	1.	71 620
Time pH (military)	SC (umpc s/c/n)		Eh-ORP (millivolts)	D.O. (mg/L)	Turbidity (NTU)	Vol Evac.	Comments/ Flow rate
1.5	77.13	755		-		07	t tutto
1215 677	23:40 2220 2210	774	, -			20	with as light grag
$ \frac{12}{718}$	2711	66			· ·	<u>-58</u> -	
1228 705	2150	2/2		<u> </u>		70-	- Proventing
1463 1-	2110	<u> </u>			······································	18	Will be day
		,					will be active
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nal:							
	SC	Tamp	En-ORP	D.O.	Turbidity	Ferrols	Vol Evac. Comments/Flow rate
1228 705	71515	70°			-		7802
COMMENTS: R	turne	la	13.21	to	easo	n la	well had not
h orralla	ed at	all	A	ks		2.	
<u>, , , , , , , , , , , , , , , , , , , </u>					- ye		
INSTRUMENTATION		Neter 🛃 Notitor			Tempe	rature Met	er 🗹
	Conquictivity	Meter 🖉			<u>^</u>		
				No	Sump	be-	
water Disposal			_	1			
	o mu	🛃 Sam	ple Time		B1	ፍላ 1 ነ ነ	/UUSI Kikihinivi I
Sample: ID Bland	· · ·		-				
water Disposal Sampli: ID <u>Blance</u> TDS [] Cations [] Total Phosphorus []	Anions		rate 🔲	Nante	🗋 Amr		

06-30-03 15:16 TO:MONTGOMERY WATSON HARZA FROM:+505 599 2235 P08

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Project No: 3000	(-0	Project N	lame. 💪		Besin	Chent.	forecord
Location: Blence							Sampling 🔀
Project Manager						•	Weather Sunny 903
							Aeasuring Point TOL
Water Column Height	•			_			
	·····						
Sampling Method:							
							eiers 🖪 Other 🖉 prild
	<u> </u>		ater Velum				
Gal/fix ft of water		Cations			Juncês		Cultoz to be removed
7-61-6-5		· 04 × 3			T + 41	1415	3-13
Tune pH (military)	SC (umhos/cm)		En-ORP nalivolis)	D.O. (mg/L)		Vol Ev.ic. (gal.	Comments/ Flow rate
1257 098	5030	222				.5	elea
JAH	4400	204				.75	Elea peiling down
1252 675	4890	205				1	dryf
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Final:					· · · • • · · · · · · · · · · · · · · ·	Forrous	
Тілне рн	SC	-	En-ORP	0.0	Turbidity	kon	Vol Evac Commants/Flow r
1252 648	4890	205					1 gal
	7		1 1	1. 10	7 J	<u> </u>	FF + 1
COMMENTS.	t en our A. G	to Ha	ten 72	pier	boll	0 00 12	55 returned @
1410 10							·
INSTRUMENTATION		Meter			Temp		
	DO I Conquisivity	Monitor				Ou	ner []
Water Disposal	_ /						
		🧷 San	- Iple Time	125	5 В	тех 🗋	
					-		
Total Phosphorus [

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Location:	Blenc	e weilt	Na: <u>M</u>	w-8		Devek	opmeni 🗋	Sampling 🖾
Ргорст мал	ager 💋	2521		Date	12-03	_ Stan Tur	ne 1255	Weather 805 Same
Depth to W	ater 39	Dop 5 Dop	th to Pro	auct	_ Produc	t Thickness		Measuring Point
Water Colur	nn Heigh	2.6	Well Dia	. 4h	-			
Sampling N	ethaa.	Supmersible		Centrifug	ai Pump	Peristal		Other
, -				-	· .			s-Steel Kemmerer
Criteria. 3	lo 5 Casi	ng Volumas o				non of Inda	alor Paran	nators 🖸 Other on brill da
Gal/frx1	t of water		Gallons	Water Volum		Dunces		Gal/oz to be removed
2-10%.	45	1.1	S X3					5-0160
Time (military)	рн	SC (umhos/cm)		En-ORP (millivoits)	D.Q (mg/L)	Turbidity (NTU)	Voi Evac (gail)	Comments/ Flow rate
1255	772	5750	217				-5	elem
	265	5550 5660					1.0	
1323	70	5600	22'	· <u></u> · <u></u> ·	<u></u>		1.5	well is dry
_ _		·						will setur later to
								Sample
<u> </u>		 -		·				· · · · · · · · · · · · · · · · · · ·
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inal:				·			Ferrous	· · · · · · · · · · · · · · · · · · ·
Tirne	рн 			En-OF:P		+	non	Vot Evac Comments/Flow rate
1323	2	5420	22'					1-5
COMMENT	 S-			······				
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INSTRUMEN			Meter]	8		Termo	BERTURA BACA	er 🕅
		DON	ADDITOF	j	· · · · · · · · · · · · · · · · · · ·	rambi		ér 💭 🚬
Water Dispo		Conductivity	Meter	<u>K</u> i	_			
Water UISPO			-S -		140	<u>ن</u>		/OCs 🔲 Alkilimity 🗍
						_ HT		ZOUSE L Alkalmatz [7]

06-30-03 15:16 TO:MONTGOMERY WATSON HARZA FROM:+505 599 2235 P09

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WE	LL DEVELOPMENT	AND SAMPLING LO	DG
Project No: <u>Secol</u> <u>b</u> Location: <u>blanco</u> Project Manager <u>Phot</u> Depth in Water <u>16</u> Water Column Huight <u>9</u> Sarr pling Method. Subme	Well No Mul -1 Z Date 6 Depth to Product 7 Well Dia. 27	Development	Sampling Sampl
	i Valve Bailer 🔲 Double C	neck Valve Bailer 🔲 Staj	niess-Steel Kammerer 🗐 💦 🦉 A
	Water Volum	e în Well	
Gal/ft x lt ol water	Gallons	Ounces	Gal/oz tu bë remuved
4.17x.ke	1.47 13		4.40
Tme pH Sc (mutary) (umho	C Temp En-ORP s/cm) (°C) (milikvolts)	D.O Turbidity Vol E (mg/L) (NTU) (ga	-
استسبب الشريقان والمحموقين	00 167 50 160	0.	5 Clean
	60 160		5
	80 160	2-	
	50 11.9		5
- 174 -73			<u> </u>
964 1	10		
		· · · · · · · · · · · · · · · · ·	
			······································
,	C Temp En-ORP	Ferri D.O. Turbidily Iro	
COMMENTS			·
INSTRUMENTATION	PH Meter 🗳 DO Monitor 🗖 uctivity Mater 🗕		Moter 📴
Water Disposal <u>Kut 2</u> Sample ID <u>Blance Ma</u>			
•	_	· · · ·	
Total Phosphorus 📋 💷		 _	[] INN [] NM WOOC METAIS [] [] [] [] []
		·	

06-30-03 15:17 TO:MONTGOMERY WATSON HARZA FROM:+505 599 2235 P12

 $\frac{1}{2} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1$

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Project No. 30001-0 Project Name. Serv (Jack Resonance Control Product) I coation. March Col. Weat Not. March Col. Sumpling IS Project Manager MITL Dotal 36.023.5tan Time 27.94 Weather (Junite, Store) Deptin to Product. Product Tructures:	W	ELL DEVELO	PMENT AND		i
Columa: 3 to 5 Cound Volume Removal & Sabilization of Indicator Parameters IA Other on Deckdary Cartis from water	Location. Banco Project Manager _ 1917 Depth to Water _ 1 4 3 Water Column Height & Sampling Method: Sup	Well No:	<u>₩-13</u> Date <u>3-6-03</u> luci Produc <u>2</u> <u>//</u> Centrifugal Pump [Development [] 	Sumpling X Weather <u>Cloudy</u> 805 Measuring Point <u>Tax</u>
Callon's Ourness Gallon s 33 70 × 1/4 1.59 × 3 4478 Time pn SC Temp Eh-ORP D.O. Turbidity Vol Evec. Comments/ (millivally) Flow rate 0:36 7 735 4270 1/84 - 727 342:0 1/84 - - 727 342:0 1/84 - - 727 342:0 1/84 - - 727 342:0 1/84 - - 721 91:00 1/77 2:5 - 721 100:20 1/77 3:5 - 721 10:20 1/77 3:5 - 721 10:20 1/77 3:5 - 721 10:20 1/77 3:5 - 721 10:20 1/77 3:5 - 721 10:20 1/77 3:5 - 721 10:20 1/77 4:5 - 70:15 721 10:20 1/77 - - 10:15 72 10:20 1/77 -	Bott Criteria, 3 to 5 Casing V	olumes of Water Ri	emoval 🕅 Sabiliza	ve Bailer D Staintes ition of Indicator Parar	neters A Other or bailding
Time ph SC Temp Eh-ORP D.O. Turbidiy Vol Evec. Comments/ (millisty) p1 SC 184 -5 -7 -7 727 8420 184 1 -5 -7 -7 721 970 17 -5 -7 -7 721 970 17 -5 -7 -7 721 920 17 -5 -7 -7 721 920 17 3-5 -5 -7 721 122.0 17 3-5 -7 -7 721 122.0 17 3-5 -7 -7 721 122.0 17 3-5 -7 -7 -7 1615 724 12620 127 4-5 -7 -7 -7 1015 24 10 10 Turbudy Irons Vol Evac. Comments/Flow rate 1015 24 10 10 10 -7 4-5 1 -7 1015 10 <t< td=""><td></td><td>Gallions</td><td></td><td>0un.es</td><td>Gal/oz to be removed</td></t<>		Gallions		0un.es	Gal/oz to be removed
(uminestum) (°C) (millivoitis)	13-70 × -14	1,39 + 3			4018
727 3#4:0 181 721 9170 177 1.5 721 920 177 2.5 721 102.0 177 3.5 721 102.0 177 3.5 15.5 721 106.20 177 15.5 721 106.20 177 15.7 106.20 177 3.5 15.7 106.20 177 4.5 15.7 106.20 177 4.5 16.5 721 106.20 177 16.5 721 106.20 177 173 4.5 1.100 1015 724 106.20 177 105 106.20 172 4.5 105 106.20 172 4.5 100 Monabr 172 4.5 100 100.20 172 4.5 100 100.20 172 4.5 100 100.20 172 10.20 100 100.20 172 10.20	•				_
721 9/70 77 7.5 720 9740 77 2.5 721 62.0 77 3.5 725 9740 77 3.5 721 62.0 77 3.5 725 721 72.0 77 721 62.0 77 3.5 725 721 72.0 77 721 72.0 77 3.5 727 475 72 727 475 72 721 720 72 721 720 72 721 720 72 721 720 72 721 720 72 721 72 72 721 72 72 721 72 72 721 72 72 721 72 72 721 72 72 721 72 72 721 72 72 721 72 72 <td></td> <td> · · · · · · · · · · · · · · · ·</td> <td></td> <td></td> <td>_ itean</td>		· · · · · · · · · · · · · · · ·			_ itean
1607 720 9740 177 3.5 1615 721 10200 172 4-5 10400 1615 721 10000 172 4-5 10400 Image: Strate					
IC: 5 72' 10020 172 4-5 [] funn Image: Strain Strai				Z-5	
Final: Farrous Time pH SC Temp Eh-ORP D.O. Turbidity Forrous POID Vol Evac. Comments/Flow rate 10/5 72 44.5 //can COMMENTS: Conductivity BIEX Conductivity Water Disposal £0/52 Sample ID Bience Mainter Sample Time Total Phosphorus Nitrate Sample ID Animona Total Phosphorus Total Phosphorus				3.5	
Time pH SC Temp En-ORP D.O. Turbidity Iron Vol Evac. Comments/Flow rate 1015 721 10620 177 4.5 //cm COMMENTS:	1015 12 10	610 17	tr	4-3	_ Ulen
Time pH SC Temp Eh-ORP D.O. Turbidity Iron Vol Evac. Comments/Flow rate 1015 721 10620 177 445 //cm COMMENTS:			· · · · · · · · · · · · · · · · · · ·		
Time pH SC Temp Eh-ORP D.O. Turbidity Iron Vol Evac. Comments/Flow rate 1015 721 10620 177 445 //cm COMMENTS:		·			
Time pH SC Temp Eh-ORP D.O. Turbidity Iron Vol Evac. Comments/Flow rate 1015 721 10620 177 445 //cm COMMENTS:					
Time pH SC Temp Eh-ORP D.O. Turbidity Iron Vol Evac. Comments/Flow rate 1015 721 10620 177 445 //cm COMMENTS:	· · · · · · · · · · · · · · · · · · ·		••••••••••••••••••••••••••••••••••••••		
Time pH SC Temp Eh-ORP D.O. Turbidity Iron Vol Evac. Comments/Flow rate 1015 721 10620 177 445 //cm COMMENTS:					
Time pH SC Temp Eh-ORP D.O. Turbidity iron Vol Evac. Comments/Flow rate 1015 721 10620 177 445 //cm COMMENTS:					· ····································
Time pH SC Temp Eh-ORP D.O. Turbidity Iron Vol Evac. Comments/Flow rate 1015 721 10620 177 445 //cm COMMENTS:					
INSTRUMENTATION pH Meter Temperature Meter DO Monitor	Tim a pH		En-ORP D.O.	Галоцз Тигонаку Ігол	
DO Monitor	COMMENTS:				
DO Monitor		** *** *******************************	· · · · · · · · · · · · · · · · · · ·		
Sampic ID <u>Blance MU-1</u> 3 Sample Time <u>1025</u> BTEX VOCs Alkitenity TDS [] Cations Arions Nitrate 3 Nitrate 3 Ammonia [] TKN NW WQCC Metals Total Phosphorus	Co	DO Monitor]		
TDS [] Cations [] Arions [] Nitrate 🔀 Nitrate 🔂 Ammonia [] TKN [] NM WQCC Metals []					
Total Phosphorus MS/MSD BE: BD Name/Time TB のまままのまで合わり					•
	Total Phosphorus			_ □	

06-30-03 15:18 TO:MONTGOMERY WATSON HARZA FROM:+505 599 2235 P13

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WELL DE	VELOPMENT	AND SAMPLIN	GLOG	
Project No. 30001-0	Project Name: 5	n Jun Bein	Chent a	w M
Location: Blanco Well N	maria - 14	Detwick	oment D Sa	
				amer cloudy 803
Project Manager <u>m.T.A.</u> Depth to Water <u>1965</u> Depth				
Water Column Height 278 V			Wicka	string r unit <u> x</u>
			······································	
Sampling Method: Submersible F Bottom Valve	Bailer 🚰 Double C	Check Valve Bailer 🗖	Stainless-Sta	el Kammerer 🗍
Crimina. 3 to 5 Casing Volumes of			ator Paramétér	s El Orner da partitage
Lilitt x ft of water	Water Valum Gallons	Ounces		Gal/oz to be removed
7-75x.16 1.	64 x 3		3.	73
Time pH SC (military) (umnos/cm)	Temp En-ORP ("C) (millivolts)	· · ·	Val Evz C (gal.)	Comments/ Flow rate
1670 74 83.0			.25	clean
0528 72 83.0 720 7370 707 7670	170		- 5	
707 7670	170		Ĩ	·····
648 8740	17'		1.5	
0545 698 8250	12^{3}		1.8! u	all pailed dry will
				tun bate 10 samp
	-			
		<u></u>		
		·	<u> </u>	
Final:				
Lon- of SC	Temp En-ORP	DO Turpidity	tron Vo	Evac. Comments/Flow rate
0845 648 8250	<u>17³</u>			1.81
			~	
······································				
DÓ N	Meter 23 Aonitor 🛄			3
Water Disposal Kutz				
Sampis ID Blonco MIL'-1	4 Sample Time	<u>1420</u> в		
TDS [] Cations] Anions	🗋 🔹 Nitrate 🕅	Nimie 🖌 An	imonia [] Ti	KN 🗋 NM WOCC Metats 🗋
) Name/Time		TB 232-03784

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WELL DEVELOPMENT	AND SAMPLING LC)G
Project No: 30001.0 - Project Name: 2	mitum Bear Ci	ent must
Location: Blenco - Wall No MAN-15		Sampling 🖾
Proje cl Manager MTN Date 6	3.03 Stan Time 10:	57 weather chardy 8005
Depth to Water 18 5 5 Depth to Product	Product Thickness	Measuring Point Tac
Water Column Height 818 Well Dia. 2"		
Sampling Method. Submersible Pump C Centrifug Bottom Valve Bailer 199 Double (Criteila, 3 to 5 Casing Volutions of Water Removal 199	Check Valve Bailer 🔲 Star	riess-Steel Kemmerer 🗔 👘 🧃
Vater Volumes of Water Volumes		
Gal/trxtrofwaler Gatium	Ounces	Gal/oz to be removed
E184-160 1-34 ×3		3.93
Դրին pH SC Temp En-ORP (military) (umho::/cm) (°C) (militvolis)	D.O Turbidity Vol Er (mg/L) (NT니) (gai	_
1051 503 4560 205		Yellow
449 11890 217		
420 12650 214	<u></u> <u></u>	5
389 13610 205	2-	5
385 13470 200	3-	5
1109 324 13230 198	4.	0 yellow
·	· · · · · · · · · · · · · · · · · · ·	
······································		
Final:	Ferr	Th :5
Timé pH SC Temp En-ORP		on Vol Evac Comments/Flow rate
1107 377 13230 198		4.0 Yellow
COMMENTS		
INSTRUMENTATION: pH Meter DY DO Monitor D Conductivity Meter D		3 Meter 123 Other 🔲
Water Disposal Kutz		
Sampis ID Blenco MU-15 Sample Time	1120 BTEX	
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06-30-03 15:18 TO:MONTGOMERY WATSON HARZA FROM:+505 599 2235 P15

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Provent No.	2000	1_2)	Projec	t Name	ant 4	- Born	- Chana	muser
								Sampling 🗖
Loca ion A	<u></u>		(0) <u>-</u> 6.f.		12-02	Stor Tor		Weather <u>805 Surray</u>
Project Mar	ager 🗾	277		Date 10	292	_ ətarcı m	م <u>یہ مرب میں د</u> کا	Weddidi <u>act</u>
Depth to W	later	Depi	th to Pro	duct	_ Բամսն	t Thickness	· N	Aeasuring Point Tac
water Colu	mn Heign	353	Well Dia	<u>-Z" -</u>				
Sampling A	Aethod:	Submersible	 Purnn []]	Centrifuce	Pump] Penstat	նշ Բսաթ 🗋	
and hund a								
Criteria 3	to 5 Casil	ng Volumes of	Water F	Removal 🗷	Sabiiza	tion of Indi	ator Param	eters IS Other of bellow
1	ft of water			Water Vulum				Galvoz to be removêd
		.56	Gallons			Junces		56 / 2169 0Z
<u>5-53 ≻</u> Time	<u>ле</u> рН	S(:		En-ORP	0.0	Turbidity	Vol Evac.	Comments/
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06-30-03 15:16 TO:MONTGOMERY WATSON HARZA FROM:+505 599 2235 P07

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WELL DEVELOPMENT AND SAMPLING LOG
Project No <u>3000</u>)-O Project Nome. <u>Ban Jen Boston</u> Client <u>man Hel</u> Location. <u>Blance</u> IVell No <u>Muc-27</u> Development [] Sampling M Project Manager <u>MTN</u> Date <u>62.63</u> Start Time <u>OPE</u> Weather <u>863</u> Summe Deptr. to Water <u>6441</u> Deptn to Product <u>Product Thickness</u> <u>Measuring Point</u> <u>TCC</u> Water Column Height <u>4-78</u> Well Dig <u>2"</u>
Sampling Method:Submersible PumpCentrifugal PumpPeristaltic PumpOtherBottom:Jaive Bailer IIDouple Check Valve BailerStantless-Steel KemmarerCnteria:3 to 5 Casing Volumes of Water Removal IISapilization of Indicator Parameters IIIOther or buildingCat/frix ft of waterWater Volume In WellGallorsGallorsCat/frix ft of waterGallonsOuncesGallors4+372k-16233 x 399 x 3249 ozTimepriSCTempEn-ORPDiminosicm)("C")("millivoits)("mg/L)(NTU)(gal.)Flow rate09047.74500175327/16230196118Miller
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
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COMMENTS. Appeared to be oil on witerland porto
INSTF:UMENTATION: pH Motor pH Motor Temperature Meter 50 DO Monitor

06-30-03 15:15 TO:MONTGOMERY WATSON HARZA FROM:+505 599 2235 P05

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Location Bentice Well No. Multi-244 Development II Sampling Project Manager MT4 Date 6:3:03 Start Time 1199 Weather 1 Depth to Water 2455 Depth to Product Product Thickness Measuring P Water Column Height 525 Welt Dia. 427 Sampling Method: Submersible Pump II Centraling Pump II Penetative Pump II Other II Bottom Vaive Bailer Double Check Valve Bailer Stanuess-Steel Kern	B Sunny 803
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INSTRUMENTATION PH Meter 🗹 Temperature Meter 🗹 DO Monitor 🗌 Other 🗋	·
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Water Dispersal Kut 7 Sample ID Blanco Mul-29 Sample Time 1230 BTEX VOCS A	Nkilinity 🔲
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Development Development		MELI	L DEVI	LOPM	ent an	WELL DEVELOPMENT AND PURGING DATA FORM	D DNIE	ATAF	ORM			•		
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Project Name <u> V V S</u> Client Company(C)	Deen Frek	1 26	SPC NECS		Project N	Project Manager		IN IN IN						
Site Name <u>Z/an CO</u>	plant				Site Add	Site Address [3/00m	mfie	1 17	(N/)					
Development Criteria (13)to 5 Casing Volumes of Water Removal Cabilization of Indicator Parameters	a nes of Water Remo ator Parameters	lava		Nater Volume Initial Depth of Initial Depth to Heicht of Wate	Water Volume Calculation Initial Depth of Well (feet) Initial Depth to Water (feet) Heicht of Water Column in W.	teet)	20.92 Had		Inst Z	Instruments Z pH Meter		Serial N	Serial No. (If applicable).	•
e v	lopment Báiler D'Bottom Valve			Diameter (ii litem Well Casing	water Vol S. 2.6	2 // 2 0.50		Pack Gallons to be Removed 2,55	ם של של נ	Conduct	Domunity Meter Conductivity Meter Temperature Meter		N N N	
Denistaltic DSt Other	LI DOUDIE CNECK VAIVE Cl Stainless-steel Kemmerer	ve merer	<u>ا عاقا ق</u>	Gravel Pack Drilling Fluids Total			0	55	K V Z	Water Disposal	sal Bre. Tor	13/0	Nomfield KI	5
Water Removal Data	D.				·				ł				- -	
	Development Removal Method (gal/min)	Intake Depth (feet) V	Ending Water Depth (feet)	Water Volu (go	Water Volume Removed (gallons)	Product Volume Removed (galions)		Temperature (°C)	Hd	Canductivity (mmhos/cm)	Dissolved Oxygen (mg/L)	Ŭ	Comments	
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Developer's Signature(s) ,	(s) And .	m				Date	00 	20-	Revi	Reviewer	JUUU Date	63	02	
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		Project No. /<u>/</u>2000/21		Serial No. (If applicable) <u>VST 63</u> <u>VST 95</u>	or <u>257</u> 3	- BNOMFIELD AUN		Comments	CITUL NO BLOW		=	O Change				W (3)02
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Page Project Nc		er aitor	ばConductivity Meter ばTemperature Meter ロ Other	oosal Oere-Tor		Dissolved Oxygen {mg/L}	. 			0.74				
1	M		1	Instruments Z pH Meter Z DO Monitor	Id Conduc Id Temper	1 1 3		Canductivity (immhos/cm)	17 15	<u>.</u>	13.36	13.1			9	Reviewe
Sealer in	A FOR	hinn	V/V	<u> </u>	σ B			Hd		6.97	20.02	2,03				б Г
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	PURGI	nager <u>L</u>	Site Address 13/00 m	ttion)33. et)6, in Well (feel	es): Well 2 ^d Grav Water Volume in Well ubic Feet Gallons			Product Volume Removed (gallons)								Date
	Well Development and Purging Data Form	Project Manager_	Site Addre	of Well (feet)	Diameter (inches): Well 2 th Gravel Water Volume in Well Item Cubic Feet Gallons Well Casing 6.37 1.03 X 3		•	emoved		1.5	3.38	3,75				
2 - 1 - 10 - 10 - 10 - 10 - 10 - 10 - 10	ELOPME			Water Volur Initial Depth Initial Depth 1 Height of Wa	Diameter (ind Item Well Casing	Drilling Fluids Total		Water Volu (ga	.) S	,75	S/r			 /335		
1. A. S.	LL DEVI	T. WEBS		<u>See</u> Ŧ		51 <u>2</u> 181		th Ending Water Depth (feet)	_			17.82		Trates		
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			t T	iteria olumes of Indicator F	elopment Bailer D'Botton	1 Stainle	Data	Develo Met Pumol	-					 poled		ature(s)
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	Instruments Z pH Meter Z DO Monitor Z Conductivity Meter Z Conductivity Meter Z Conductivity Meter D Other Mater Disposal Lu-TZ, Scotre Tor	Conductivity (mmhas/cm)	Reviewent Le
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	Well Number MW 15	<u>< 15</u>		1			•								Page		of		
	Project Name ED FS	FSC	7	, d	· ofect			Project	Project Manager_	R LISA	ł	hinn		Proj	Project No./	12/20	20002		
•	Client Company <u>E</u> L	L Daso	4 00	ek	Secu	1,205			2			4							
	Site Name <u> Zlan CO</u>	<u>co plan</u>	-un					Site Ad	dress 🕰	Site Address [5/00 m	F1610		5						
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	Pump Centrifugal	Báiler D'Bottom Valve	Valve			Ň	ltem Well Casing	Cubic Feet 6. 49			Removed 3, 15	3 7		Democrature Meter	Meter	N N	2		
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	Water Removal Data	Data				_]						ע ן	114	CLEVE	101	15/201	2/00/11/6/0		
		Development Method		Removal Inta Rate Laat/mint	Intake Depth (feet) M	Ending Water Depth (feet)	Water	Volume Removed (gallons)		Product Volume Removed (galions)	Temperature (°C)	Hd	Canductivity (mmhas/cm)		Dissolved Oxygen (mg/L)	Соп	Comments		·
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Appendix B



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APPENDIX B

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GC/MS RESULTS

TEST CLIENT PROJECT #	: VOLATILE ORGANI : AMEC EARTH & EN : 1517000121	VIRONMENTAL	8260	PINNACLE I.D		205224 05/29/02
SAMPLE	: BLANCO PLANT (SO		DATE	DATE	DATE	DIL.
ID #		MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
205224-01	BLA-0205-MW12	AQUEOUS	05/28/02	N/A	06/03/02	1
PARAMETER (CAS#)	DET. LIMIT	RESULT	UNITS			<u> </u>
Dichlorodifluoromethane (75-71-8)	1.0	< 1.0	ug/L			
Chloromethane (74-87-9)	1.0	< 1.0	ug/L			
Vinyl Chloride (75-01-4)	1.0	< 1.0	ug/L			
Bromomethane (74-83-9)	2.0	< 2.0	ug/L			
Chloroethane (75-00-3)	2.0	< 2.0	ug/L			
Trichlorofluoromethane (75-69-4)	1.0	< 1.0	ug/L			
Acetone (67-64-1)	10	< 10	ug/L			
Acrolein (107-02-8)	5.0	< 5.0	ug/L		1	
1,1-Dichloroethene (75-35-4)	1.0	< 1.0	ug/L			
R lodomethane (74-88-4)	5.0	< 5.0	ug/L			
Methylene Chloride (75-09-2)	1.0	< 1.0	ug/L			
Acrylonitrile (107-13-1)	5.0	< 5.0	ug/L			
cis-1,2-Dichloroethene (107-06-2)	1.0	20	ug/L			
	1.0	< 1.0	ug/L			
Methyl-t-butyl Ether (628-28-4) 1,1,2-Trichlorotrifluoroethane (76-13-1)	5.0	< 5.0	ug/L			
1,1-Dichloroethane (75-34-3)	1.0	21	ug/L			
trans-1,2-Dichloroethene (156-60-5)	1.0	1.7	ug/L			
2-Butanone (78-93-3)	10	< 10	ug/L			
Carbon Disulfide (75-15-0)	1.0	< 1.0	ug/L			
Bromochloromethane (74-97-5)	. 1.0	< 1.0	ug/L			
Chloroform (67-66-3)	1.0	< 1.0	ug/L			
2,2-Dichloropropane (594-20-7)	1.0	< 1.0	ug/L			
1,2-Dichloroethane (107-06-2)	1.0	< 1.0	ug/L			
Vinyl Acetate (108-05-4)	1.0	< 1.0	ug/L			
1,1,1-Trichloroethane (71-55-6)	1.0	< 1.0	ug/L			
1,1-Dichloropropene (563-58-6)	1.0	< 1.0	ug/L			
Carbon Tetrachloride (56-23-5)	1.0	< 1.0	ug/L			
Benzene (71-43-2)	1.0	< 1.0	ug/L			
1,2-Dichloropropane (78-87-5)	1.0	< 1.0	ug/L			
Trichloroethene (79-01-6)	1.0	8.0	ug/L			
Bromodichloromethane (75-27-4)	1.0	< 1.0	ug/L			
2-Chloroethyl Vinyl Ether (110-75-8)	10	< 10	ug/L			
cis-1,3-Dichloropropene (10061-01-5)	1.0	< 1.0	ug/L			
<pre>trans-1,3-Dichloropropene (10061-02-6)</pre>	1.0	< 1.0	ug/L			
1,1,2-Trichloroethane (79-00-5) 1,3-Dichloropropane (142-28-9)	1.0	< 1.0	ug/L			
1,3-Dichloropropane (142-28-9)	1.0	< 1.0	ug/L			
Dibromomethane (74-95-3)	1.0	< 1.0	ug/L			
Toluene (108-88-3)	1.0	< 1.0	ug/L			
1,2-Dibromoethane (106-93-4)	1.0	< 1.0	ug/L			
4-Methyl-2-Pentanone (108-10-1)	10	< 10	ug/L			
2-Hexanone (591-78-6)	10	< 10	ug/L			
Dibromochloromethane (124-48-1)	1.0	< 1.0	ug/L			
Tetrachioroethene (127-18-4)	1.0	3.0	ug/L			
Chlorobenzene (108-90-7)	1.0	< 1.0	ug/L			
Ethylbenzene (100-41-4)	1.0	< 1.0	ug/L			

GC/MS RESULTS

TEST	: VOLATILE ORGANI	CS EPA METHOD	8260	•		
CLIENT	: AMEC EARTH & EN	VIRONMENTAL		PINNACLE I.D	·. :	205224
PROJECT #	: 1517000121			DATE RECEIVED	D:	05/29/02
PROJECT NAME	: BLANCO PLANT (SO	OUTH)				
SAMPLE			DATE	DATE	DATE	DIL.
<u>ID #</u>	CLIENT ID	MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOF
205224-01	BLA-0205-MW12	AQUEOUS	05/28/02	N/A	06/03/02	1
205224-01 PARAMETER (CAS#)	DET. LIMIT	RESULT	UNITS			
1,1,1,2-Tetrachloroethane (630-20-6)	1.0	< 1.0	ug/L			
_ m&p Xylenes (108-38-3, 106-42-3)	1.0	< 1.0	ug/L			
o-Xylene (95-47-6)	1.0	< 1.0	ug/L			
o-Xylene (95-47-6) Styrene (100-42-5)	1.0	< 1.0	ug/L			
Bromoform (75-25-2)	1.0	< 1.0	ug/L			
1,1,2,2-Tetrachloroethane (79-34-5)	1.0	< 1.0	ug/L			
1,2,3-Trichloropropane (96-18-4)	1.0	< 1.0	ug/L			
1,2,3-Trichloropropane (96-18-4) Isopropyl Benzene (98-82-8)	1.0	< 1.0	ug/L			
Bromobenzene (108-86-1)	1.0	< 1.0	ug/L			
trans-1,4-Dichloro-2-Butene (110-57-6)	1.0	< 1.0	ug/L			
n-Propylbenzene (103-65-1)	1.0	< 1.0	ug/L			
n-Propylbenzene (103-65-1) 2-Chlorotoluene (95-49-8)	1.0	< 1.0	ug/L			
4-Chlorotoluene (106-43-4)	1.0	< 1.0	ug/L			
1,3,5-Trimethylbenzene (108-67-8)	1.0	< 1.0	ug/L			
tert-Butylbenzene (98-06-6)	1.0	< 1.0	ug/L			
tert-Butylbenzene (98-06-6) 1,2,4-Trimethylbenzene (95-63-6)	1.0	< 1.0	ug/L			
Sec-Butybenzene (133-98-8)	1.0	< 1.0	ug/L			
1,3-Dichlorobenzene (541-73-1)	1.0	< 1.0	ug/L			
1,4-Dichlorobenzene (106-46-7)	1.0	< 1.0	ug/L			
1,3-Dichlorobenzene (541-73-1) 1,4-Dichlorobenzene (106-46-7) p-lsopropyltoluene (99-87-6) 1,2-Dichlorobenzene (95-50-1)	1.0	< 1.0	ug/L			
1,2-Dichlorobenzene (95-50-1)	. 1.0	5.2	ug/L			
n-Butylbenzene (104-51-8)	1.0	< 1.0	ug/L			
1,2-Dibromomo-3-chloropropane (96-12-8)	1.0	< 1.0	ug/L			
1,2-Dibromomo-3-chloropropane (96-12-8) 1,2,4-Trichlorobenzene (120-82-1) Naphthalene (91-20-3)	1.0	< 1.0	ug/L			
Naphthalene (91-20-3)	3.0	< 3.0	ug/L			
Hexachlorobutadiene (87-68-3)	1.0	< 1.0	ug/L			
1,2,3-Trichlórobenzene (87-61-6) SURROGATE % RECOVERY	1.0	< 1.0	ug/L			
SURROGATE % RECOVERY						
1,2-Dichloroethane-d4		98				
3		(80 - 120)				
Toluene-d8		101				
		(88 - 110)				

100

(86 - 115)

Bromofluorobenzene

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GC/MS RESULTS

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a deren	CLIENT PROJECT #	: VOLATILE ORGANIO : AMEC EARTH & EN : 1517000121 : BLANCO PLANT (SC	VIRONMENTAL	8260	PINNACLE I.D DATE RECEIVED		205224 05/29/02
1	SAMPLE ID #	CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
1.7% BA	205224-02	BLA-0205-MW13	AQUEOUS	05/28/02	N/A	06/03/02	1
	PARAMETER (CAS#)	DET. LIMIT	RESULT	UNITS			
- 11	Dichlorodifluoromethane (75-71-8)	1.0	< 1.0	ug/L			
a the set of	Chloromethane (74-87-9)	1.0	< 1.0	ug/L			
- B.	Vinyl Chloride (75-01-4)	1.0	< 1.0	ug/L			
	Bromomethane (74-83-9)	2.0	< 2.0	ug/L			
	Chloroethane (75-00-3)	2.0	< 2.0	ug/L			
******	Trichlorofluoromethane (75-69-4)	1.0	< 1.0	ug/L			
1	Acetone (67-64-1)	10	< 10	ug/L			
	Acrolein (107-02-8)	5.0	< 5.0	ug/L			
	1,1-Dichloroethene (75-35-4)	1.0	1.3	ug/L			
Ser Est	lodomethane (74-88-4)	5.0	< 5.0	ug/L			
6.	Methylene Chloride (75-09-2)	1.0	< 1.0	ug/L			
	Acrylonitrile (107-13-1)	5.0	< 5.0	ug/L			
15 28	cis-1,2-Dichloroethene (107-06-2)	1.0	45	ug/L		* *	
in the second	Methyl-t-butyl Ether (628-28-4)	1.0	< 1.0	ug/L			
58	1,1,2-Trichlorotrifluoroethane (76-13-1)	5.0	< 5.0	ug/L			
	1,1-Dichloroethane (75-34-3)	1.0	61	ug/L			
-	trans-1,2-Dichloroethene (156-60-5)	1.0	8.2	ug/L			
States Street	2-Butanone (78-93-3)	10	< 10	ug/L			
and a second	Carbon Disulfide (75-15-0)	1.0	< 1.0	ug/L			
	Bromochloromethane (74-97-5)	. 1.0	< 1.0	ug/L			
-	Chloroform (67-66-3)	1.0	< 1.0	ug/L			
	2,2-Dichloropropane (594-20-7)	1.0	< 1.0	ug/L			
8.98 	1,2-Dichloroethane (107-06-2)	1.0	< 1.0	ug/L			
	Vinyl Acetate (108-05-4)	1.0	< 1.0	ug/L			
_	1,1,1-Trichloroethane (71-55-6)	1.0	< 1.0	ug/L			
the the	1,1-Dichloropropene (563-58-6)	1.0	< 1.0	ug/L			
e.	Carbon Tetrachloride (56-23-5)	1.0	< 1.0	ug/L			
	Benzene (71-43-2)	1.0 1.0	1.8	u g/L ug/L			
	1,2-Dichloropropane (78-87-5) Trichloroethene (79-01-6)	1.0	< 1.0 39	ug/L			
S. Backler	Bromodichloromethane (75-27-4)	1.0	< 1.0	ug/L			
al an	2-Chloroethyl Vinyl Ether (110-75-8)	10	< 10	ug/L			
	cis-1,3-Dichloropropene (10061-01-5)	1.0	< 1.0	ug/L			
2	trans-1,3-Dichloropropene (10061-02-6)	1.0	< 1.0	ug/L			
1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	1,1,2-Trichloroethane (79-00-5)	1.0	< 1.0	ug/L			
<u> </u>	1,3-Dichloropropane (142-28-9)	1.0	< 1.0	ug/L			
	Dibromomethane (74-95-3)	1.0	< 1.0	ug/L			
	Toluene (108-88-3)	1.0	< 1.0	ug/L			
2-385.25	1,2-Dibromoethane (106-93-4)	1.0	< 1.0	ug/L			
20	4-Methyl-2-Pentanone (108-10-1)	10	< 10	ug/L			
	2-Hexanone (591-78-6)	10	< 10	ug/L			
Ø	Dibromochloromethane (124-48-1)	1.0	< 1.0	ug/L			
1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	Tetrachloroethene (127-18-4)	1.0	1.6	ug/L			
×	Chlorobenzene (108-90-7)	1.0	< 1.0	ug/L			
	Ethylbenzene (100-41-4)	1.0	< 1.0	ug/L			
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GC/MS RESULTS

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TEST CLIENT PROJECT #	: VOLATILE ORGANIC : AMEC EARTH & EN : 1517000121		5200	PINNACLE I.D		205224
				DATE RECEIVED):	05/29/02
PROJECT NAME	: BLANCO PLANT (SC		DATE			
ID #	CLIENT ID	MATRIX	SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
205224-02	BLA-0205-MW13	AQUEOUS	05/28/02	N/A	06/03/02	1
PARAMETER (CAS#)	DET. LIMIT	RESULT	UNITS			
1,1,1,2-Tetrachloroethane (630-20-6)	1.0	< 1.0	ug/L			
m&p Xylenes (108-38-3, 106-42-3)	1.0	< 1.0	ug/L			
o-Xylene (95-47-6)	1.0	< 1.0	ug/L			
Styrene (100-42-5)	1.0	< 1.0	ug/L			
Bromoform (75-25-2)	1,0	< 1.0	ug/L			
1,1,2,2-Tetrachloroethane (79-34-5)	1.0	< 1.0	ug/L			
1,2,3-Trichloropropane (96-18-4)	1.0	< 1.0	ug/L			
Isopropyl Benzene (98-82-8)	1.0	< 1.0	ug/L			
Bromobenzene (108-86-1)	1.0	< 1.0	ug/L			
trans-1,4-Dichloro-2-Butene (110-57-6)	1.0	< 1.0	ug/L			
n-Propylbenzene (103-65-1)	1.0	< 1.0	ug/L			
2-Chlorotoluene (95-49-8)	1.0	< 1.0	ug/L			
4-Chlorotoluene (106-43-4)	1.0	< 1.0	ug/L			
1,3,5-Trimethylbenzene (108-67-8)	1.0	< 1.0	ug/L			
tert-Butylbenzene (98-06-6)	1,0	< 1.0	ug/L			
1,2,4-Trimethylbenzene (95-63-6)	1.0	< 1.0	ug/L			
sec-Butylbenzene (135-98-8)	1,0	< 1.0	ug/L			
1,3-Dichlorobenzene (541-73-1)	1.0	< 1.0	ug/L			
1.4-Dichlorobenzene (106-46-7)	1.0	< 1.0	ug/L			
p-Isopropyltoluene (99-87-6)	1,0	< 1.0	ug/L			
1,2-Dichlorobenzene (95-50-1)	1.0	79	ug/L			
n-Butylbenzene (104-51-8)	1.0	< 1.0	ug/L			
1,2-Dibromomo-3-chloropropane (96-12-8)	1.0	< 1.0	ug/L			·
1,2,4-Trichlorobenzene (120-82-1)	1.0	< 1.0	ug/L			
Naphthalene (91-20-3)	3.0	< 3.0	ug/L			
Hexachlorobutadiene (87-68-3)	1,0	< 1.0	ug/L			
1,2,3-Trichlorobenzene (87-61-6)	1.0	< 1.0	ug/L			
SURROGATE % RECOVERY		00				
1,2-Dichloroethane-d4		98				
		(80 - 120)				
Toluene-d8		102				. •
		(88 - 110)				
Bromofluorobenzene		99 (86 - 115)				

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GC/MS RESULTS

and the set	TEST CLIENT PROJECT # PROJECT NAME	: VOLATILE ORGANI : AMEC EARTH & EN : 1517000121 : BLANCO PLANT SC	VIRONMENTAL	8260	PINNACLE I.D DATE RECEIVED		205241 05/31/02
and Sugar		CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
	205241-01	BLA-0205-MW14	AQUEOUS	05/29/02	N/A	06/03/02	1
adding too	PARAMETER (CAS#)	DET. LIMIT	RESULT	UNITS			
	Dichlorodifluoromethane (75-71-8)	1.0	< 1.0	ug/L			
	Chloromethane (74-87-9)	1.0	< 1.0	ug/L			
1	Vinyl Chloride (75-01-4)	1.0	< 1.0	ug/L			
. 9 2	Bromomethane (74-83-9)	2.0	< 2.0	ug/L			
	Chloroethane (75-00-3)	2.0	< 2.0	ug/L			
-	Trichlorofluoromethane (75-69-4)	1.0	< 1.0	ug/L			
Sec. F.	Acetone (67-64-1)	10	< 10	ug/L			
- 32	Acrolein (107-02-8)	5.0	< 5.0	ug/L			
	1,1-Dichloroethene (75-35-4)	1.0	< 1.0	ug/L			
		5.0	< 5.0	ug/L			
10.20 B. 1	Methylene Chloride (75-09-2)	1.0	< 1.0	ug/L			
1	Acrylonitrile (107-13-1)	5.0	< 5.0	ug/L			
	cis-1,2-Dichloroethene (107-06-2)	1.0	2.9	ug/L			
_	Methyl-t-butyl Ether (628-28-4)	1.0	< 1.0	ug/L			
S. 400	1,1,2-Trichlorotrifluoroethane (76-13-1)	5.0	< 5.0	ug/L			
1	1,1-Dichloroethane (75-34-3)	1.0	8.7	ug/L			
	trans-1,2-Dichloroethene (156-60-5)	1.0	< 1.0	ug/L			
	2-Butanone (78-93-3)	10	< 10	ug/L			
1	Carbon Disulfide (75-15-0)	1.0	< 1.0	ug/L			
1. A.	Bromochloromethane (74-97-5)	. 1.0	< 1.0	ug/L			
	Chloroform (67-66-3)	1.0	< 1.0	ug/L			
	2,2-Dichloropropane (594-20-7)	1.0	< 1.0	ug/L			
1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	1,2-Dichloroethane (107-06-2)	1.0	< 1.0	ug/L			
2.9 St. 6 7	Vinyl Acetate (108-05-4)	1.0	< 1.0	ug/L			
	1,1,1-Trichloroethane (71-55-6)	1.0	< 1.0	ug/L			
	1,1-Dichloropropene (563-58-6)	1.0	< 1.0	ug/L			
à.	· · · ·	1.0	< 1.0	ug/L			
A. A. &.	Carbon Tetrachloride (56-23-5) Benzene (71-43-2)	1.0	< 1.0	ug/L			
	1,2-Dichloropropane (78-87-5)	1.0	< 1.0	ug/L			
	Trichloroethene (79-01-6)	1.0	1.9	ug/L			
5	Bromodichloromethane (75-27-4)	1.0	< 1.0	ug/L			
S. Sala	2-Chloroethyl Vinyl Ether (110-75-8)	10	< 10	ug/L			
	cis-1,3-Dichloropropene (10061-01-5)	1.0	< 1.0	ug/L			
	trans-1,3-Dichloropropene (10061-02-6)	1.0	< 1.0	ug/L			
j)	1,1,2-Trichloroethane (79-00-5)	1.0	< 1.0	ug/L			
	1,3-Dichloropropane (142-28-9)	1.0	< 1.0	ug/L			
2	Dibromomethane (74-95-3)	1.0	< 1.0	ug/L			
		1.0	< 1.0	ug/L			
	Toluene (108-88-3) 1,2-Dibromoethane (106-93-4)	1.0	< 1.0	ug/L			
	4-Methyl-2-Pentanone (108-10-1)	10	< 10	ug/L			
		10	< 10				
	2-Hexanone (591-78-6)			ug/L			•
	Dibromochloromethane (124-48-1)	1.0	< 1.0	ug/L			
	Tetrachloroethene (127-18-4)	1.0	< 1.0	ug/L			
	Chlorobenzene (108-90-7)	1.0	< 1.0	ug/L			
	Ethylbenzene (100-41-4)	1.0	< 1.0	ug/L			

GC/MS RESULTS

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Canada Ca	TEST CLIENT PROJECT # PROJECT NAME	: VOLATILE ORGANIO : AMEC EARTH & EN : 1517000121 : BLANCO PLANT SO	VIRONMENTAL	8260	PINNACLE I.D DATE RECEIVED		205241 05/31/02
6. 2. 3	SAMPLE ID #	CLIENT ID	MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	DIL. FACTOR
7 33	205241-01	BLA-0205-MW14	AQUEOUS	05/29/02	N/A	06/03/02	1
Sale S	PARAMETER (CAS#)	DET, LIMIT	RESULT	UNITS			
31	1,1,1,2-Tetrachloroethane (630-20-6)	1.0	< 1.0	ug/L	<u></u>		
	m&p Xylenes (108-38-3, 106-42-3)	1.0	< 1.0	ug/L			
	o-Xylene (95-47-6)	1.0	< 1.0	ug/L			
A ALE DE	Styrene (100-42-5)	1.0	< 1.0	ug/L			
1	Bromoform (75-25-2)	1.0	< 1.0	ug/L			
	1,1,2,2-Tetrachloroethane (79-34-5)	1.0	< 1.0	ug/L			
	1,2,3-Trichloropropane (96-18-4)	1.0	< 1.0	ug/L			
144944	Isopropyl Benzene (98-82-8)	1.0	< 1.0	ug/L			
	Bromobenzene (108-86-1)	1.0	< 1.0	ug/L			
	trans-1,4-Dichloro-2-Butene (110-57-6)	1.0	< 1.0	ug/L			
1.0	n-Propylbenzene (103-65-1)	1.0	< 1.0	ug/L			
A 3.24 Mar 10	2-Chlorotoluene (95-49-8)	1.0	< 1.0	ug/L			
5.2.5	4-Chlorotoluene (106-43-4)	1.0	< 1.0	ug/L			
	1,3,5-Trimethylbenzene (108-67-8)	1.0	< 1.0	ug/L			
	tert-Butylbenzene (98-06-6)	1.0	< 1.0	ug/L			
W. Oak	1,2,4-Trimethylbenzene (95-63-6)	1.0	< 1.0	ug/L			
jų.	sec-Butylbenzene (135-98-8)	1.0	< 1.0	ug/L			
	1,3-Dichlorobenzene (541-73-1)	1.0	< 1.0	ug/L			
-	1,4-Dichlorobenzene (106-46-7)	1.0	< 1.0	ug/L			
a read	p-Isopropyltoluene (99-87-6)	1.0	< 1.0	ug/L			
10 C	1,2-Dichlorobenzene (95-50-1)	. 1.0	< 1.0	ug/L			
	n-Butylbenzene (104-51-8)	1.0	< 1.0	ug/L			
_	1,2-Dibromomo-3-chloropropane (96-12-8)	1.0	< 1.0	ug/L			
	1,2,4-Trichlorobenzene (120-82-1)	1.0	< 1.0	ug/L			
1.17	Naphthalene (91-20-3)	3.0	< 3.0	ug/L			
	Hexachlorobutadiene (87-68-3)	1.0	< 1.0	ug/L			
St. 1.	1,2,3-Trichlorobenzene (87-61-6)	1.0	< 1.0	ug/L			
24	SURROGATE % RECOVERY						
_	1,2-Dichloroethane-d4		99				
• 463 • 4	Toluene-d8		(80 - 120) 103 (88 - 110)	,			
_	Bromofluorobenzene		101 (86 - 115)				

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GC/MS RESULTS

A Start	CLIENT PROJECT # <u>PROJECT NAME</u> SAMPLE	: VOLATILE ORGANI : AMEC EARTH & EN : 1517000121 : BLANCO PLANT (SC	VIRONMENTAL	DATE	PINNACLE I.D DATE RECEIVED DATE	D : DATE	205224 05/29/02 DIL.
	<u>ID</u> #	CLIENT ID	MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
10	205224-03	BLA-0205-MW15	AQUEOUS	05/28/02	N/A	06/03/02	1
1. A. B. A.	PARAMETER (CAS#)	DET. LIMIT	RESULT	UNITS			
œs			·				
-	Dichlorodifluoromethane (75-71-8)	1.0	< 1.0	ug/L			
5. S. 26 8	Chloromethane (74-87-9)	1.0	< 1.0	ug/L			
944	Vinyl Chloride (75-01-4)	1.0	< 1.0	ug/L			
	Bromomethane (74-83-9)	2.0	< 2.0	ug/L			
-	Chloroethane (75-00-3)	2.0	< 2.0	ug/L			
64 8 30 the	Trichlorofluoromethane (75-69-4)	1.0	< 1.0	ug/L			
37.9	Acetone (67-64-1)	10	< 10	ug/L			
—	Acrolein (107-02-8)	5.0	< 5.0	ug/L			
_	1,1-Dichloroethene (75-35-4)	1.0	< 1.0	ug/L			
Posts.	lodomethane (74-88-4)	5.0	< 5.0	ug/L			
industry.	Methylene Chloride (75-09-2)	1.0	< 1.0	ug/L			
-	Acrylonitrile (107-13-1)	5.0	< 5.0	ug/L			
	cis-1,2-Dichloroethene (107-06-2)	1.0	< 1.0	ug/L			
Add Alar	Methyl-t-butyl Ether (628-28-4)	1.0	< 1.0	ug/L			
	1,1,2-Trichlorotrifluoroethane (76-13-1)	5.0	< 5.0	ug/L			
	1,1-Dichloroethane (75-34-3)	1.0	5.3	ug/L			
	trans-1,2-Dichloroethene (156-60-5)	1.0	< 1.0	ug/L			
	2-Butanone (78-93-3)	10	< 10	ug/L			
18 . C. A.	Carbon Disulfide (75-15-0)	1.0	< 1.0	ug/L			
°94°	Bromochloromethane (74-97-5)	• 1.0	< 1.0	ug/L			
	Chloroform (67-66-3)	1.0	1.1	ug/L			
ب	2,2-Dichloropropane (594-20-7)	1.0	< 1.0	ug/L			
書いた	1,2-Dichloroethane (107-06-2)	1.0	< 1.0	ug/L			
<u></u>	Vinyl Acetate (108-05-4)	1.0	< 1.0	ug/L			
	1,1,1-Trichloroethane (71-55-6)	1.0	< 1.0	ug/L			
3	1,1-Dichloropropene (563-58-6)	1.0	< 1.0	ug/L			
10 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -	Carbon Tetrachloride (56-23-5)	1.0	< 1.0	ug/L			
ک	Benzene (71-43-2)	1.0	1.1	ug/L			
	1,2-Dichloropropane (78-87-5)	1.0	< 1.0	ug/L			
9	Trichloroethene (79-01-6)	1.0	< 1.0	ug/L			
and the	Bromodichloromethane (75-27-4)	1.0	< 1.0	ug/L			
8	2-Chloroethyl Vinyl Ether (110-75-8)	10	< 10	ug/L			
	cis-1,3-Dichloropropene (10061-01-5)	1.0	< 1.0	ug/L			
儒	trans-1,3-Dichloropropene (10061-02-6)	1.0	< 1.0	ug/L			
Rad Sale	1,1,2-Trichloroethane (79-00-5)	1.0	< 1.0	ug/L			
1	1,3-Dichloropropane (142-28-9)	1.0	< 1.0	ug/L			
	Dibromomethane (74-95-3)	1.0	< 1.0	ug/L			
	Toluene (108-88-3)	1.0	< 1.0	ug/L			
5 . S. S	1,2-Dibromoethane (106-93-4)	1.0	< 1.0	ug/L			
	4-Methyl-2-Pentanone (108-10-1)	10	< 10	ug/L			
	2-Hexanone (591-78-6)	10	< 10	ug/L			
2	Dibromochloromethane (124-48-1)	1.0	< 1.0	ug/L			
- A BAS	Tetrachloroethene (127-18-4)	1.0	< 1.0	ug/L			
¥.	Chlorobenzene (108-90-7)	1.0	< 1.0	ug/L			
	Ethylbenzene (100-41-4)	1.0	< 1.0	ug/L			

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GC/MS RESULTS

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TEST	: VOLATILE ORGANI	CS EPA METHOD	8260			
CLIENT	: AMEC EARTH & EN			PINNACLE I.D). :	205224
PROJECT #	: 1517000121			DATE RECEIVED		05/29/02
PROJECT NAME	: BLANCO PLANT (SC	OUTH)				
SAMPLE	· · · · · · · · · · · · · · · · · · ·		DATE	DATE	DATE	DIL.
ID #	CLIENT ID	MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
205224-03	BLA-0205-MW15	AQUEOUS	05/28/02	N/A	06/03/02	1
PARAMETER (CAS#)	DET. LIMIT	RESULT	UNITS			
1,1,1,2-Tetrachloroethane (630-20-6)	1.0	< 1.0	ug/L			
m&p Xylenes (108-38-3, 106-42-3)	1.0	< 1.0	ug/L		2	
o-Xylene (95-47-6)	1.0	< 1.0	ug/L			
Styrene (100-42-5)	1.0	< 1.0	ug/L			
Bromoform (75-25-2)	1.0	< 1.0	ug/L			
1,1,2,2-Tetrachloroethane (79-34-5)	1.0	< 1.0	ug/L			
1,2,3-Trichloropropane (96-18-4)	1.0	< 1.0	ug/L			
Isopropyl Benzene (98-82-8)	1.0	< 1.0	ug/L			
Bromobenzene (108-86-1)	1.0	< 1.0	ug/L			
trans-1,4-Dichloro-2-Butene (110-57-6)	1.0	< 1.0	ug/L		4	
n-Propylbenzene (103-65-1)	1.0	< 1.0	ug/L			
2-Chlorotoluene (95-49-8)	1.0	< 1.0	ug/L			
4-Chlorotoluene (106-43-4)	1.0	< 1.0	ug/L			
1,3,5-Trimethylbenzene (108-67-8)	1.0	< 1.0	ug/L			
tert-Butylbenzene (98-06-6)	1.0	< 1.0	ug/L			
1,2,4-Trimethylbenzene (95-63-6)	1.0	< 1.0	ug/L			
sec-Butylbenzene (135-98-8)	1.0	< 1.0	ug/L			
1,3-Dichlorobenzene (541-73-1)	1.0	< 1.0	ug/L			
1,4-Dichlorobenzene (106-46-7)	1.0	< 1.0	ug/L			
p-isopropyltoluene (99-87-6)	1.0	< 1.0	ug/L			
1,2-Dichlorobenzene (95-50-1)	1.0	< 1.0	ug/L			
n-Butylbenzene (104-51-8)	1.0	< 1.0	ug/L			
1,2-Dibromomo-3-chloropropane (96-12-8)	1.0	< 1.0	ug/L			
1,2,4-Trichlorobenzene (120-82-1)	1.0	< 1.0	ug/L			
Naphthalene (91-20-3)	3.0	< 3.0	ug/L			
Hexachlorobutadiene (87-68-3)	1.0	< 1.0	ug/L			
1,2,3-Trichlorobenzene (87-61-6)	1.0	< 1.0	ug/L			
SURROGATE % RECOVERY						
1,2-Dichloroethane-d4		101				
		(80 - 120)				
Toluene-d8		100				
		(88 - 110)		•		
Bromofluorobenzene		100				
Brontondorobonzono		(86 - 115)				
		(00-110)				

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ANALYTICAL DATA REPORTS NITRATE + NITRITE (as N) JUNE 2003

No. of the



Technical Report for

Montgomery Watson

EPFS San Juan Basin GS

San Juan Basin Blanco

Accutest Job Number: T4438

Report to:

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Pamela.J.Anderson@us.mwhglobal.com

Total number of pages in report: 10



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Ron Martino Laboratory Manager

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Sample Summary

Montgomery Watson

Job No: T4438

EPFS San Juan Basin GS Project No: San Juan Basin Blanco

Sample Number	Collected Date	Time By	Received	Matr Code		Client Sample ID
T4438-1	06/02/03	13:53 MN	06/03/03	AQ	Water	BLANCO MW-27
T4438-2	06/02/03	14:19 MN	06/03/03	AQ	Water	BLANCO MW-19
T4438-3	06/02/03	14:31 MN	06/03/03	AQ	Water	BLANCO MW-23
T4438-4	06/02/03	14:50 MN	06/03/03	AQ	Water	BLANCO MW-8

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Report of Analysis

Page 1 of 1

Lab Sample ID: T	mple ID: T4438-1				Date Sampled: 06/02/03 Date Received: 06/03/03 Percent Solids: n/a				
Project: E	CPFS San Juan Basin G	S							
General Chemistry									
Analyte	Result	RL	Units	DF	Analyzed	By	Method		
Nitrogen, Nitrate ^a Nitrogen, Nitrate + N Nitrogen, Nitrite	< 0.10 itrite < 0.050 < 0.050	0.10 0.050 0.050	mg/l mg/l mg/l	1 1 1	06/03/03 14:00 06/03/03 14:00 06/03/03 13:00	LN	SM18 4500NO3E/NO2B EPA 353.2 EPA 353.2		

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

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Lab Sample ID:	BLANCO MW-19 F4438-2 AQ - Water			Date I	Sampled: 06/02/0 Received: 06/03/0 nt Solids: n/a		
Project: I	EPFS San Juan Basin GS						
General Chemistry							J
Analyte	Result	RL	Units	DF	Analyzed	By	Method
Nitrogen, Nitrate ^a Nitrogen, Nitrate + N Nitrogen, Nitrite		0.10 0.050 0.050	mg/l mg/l mg/l	1 1 1	06/03/03 14:00 06/03/03 14:00 06/03/03 13:00	LN	SM18 4500NO3E/NO2B EPA 353.2 EPA 353.2

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Report of Analysis

RL = Reporting Limit

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Report of Analysis

Page 1 of 1

Lab Sample ID: 7 Matrix: 7	BLANCO MW-23 T4438-3 AQ - Water EPFS San Juan Basin (GS		Date I	Sampled: 06/02/ Received: 06/03/ nt Solids: n/a		
General Chemistry	······································	 -		n <u></u>		<u> </u>	·
Analyte	Result	RL	Units	DF	Analyzed	Ву	Method
Nitrogen, Nitrate ^a Nitrogen, Nitrate + N Nitrogen, Nitrite	< 0.10 Nitrite < 0.050 < 0.050	0.10 0.050 0.050	mg/l mg/l mg/l	1 1 1	06/03/03 14:00 06/03/03 14:00 06/03/03 13:00	LN	SM18 4500NO3E/NO2B EPA 353.2 EPA 353.2

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

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		Repor	rt of An	alysis			Page 1 of 1
Lab Sample ID:	BLANCO MW-8 F4438-4 AQ - Water			Date I	Sampled: 06/02/ Received: 06/03/ nt Solids: n/a		
Project:	EPFS San Juan Basin	GS		1 01 00			
General Chemistry		<u></u>					
Analyte	Result	RL	Units	DF	Analyzed	By	Method
Nitrogen, Nitrate ^a	0.13	0.10	mg/l	1	06/03/03 14:00	LN	SM18 4500NO3E/NO2B
Nitrogen, Nitrate + N	Nitrite 0.13	0.050	mg/l	1	06/03/03 14:00	LN	EPA 353.2
Nitrogen, Nitrite	< 0.050	0.050	mg/l	1	06/03/03 13:00	LN	EPA 353.2

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

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General Chemistry

QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike SummariesDuplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY GENERAL CHEMISTRY

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Login Number: T4438 Account: MWHSLCUT - Montgomery Watson Project: EPFS San Juan Basin GS

Analyte	Batch ID	RL	MB Result	Units	BSP %Recov	QC Limits	
Nitrogen, Nitrate + Nitrite Nitrogen, Nitrite	GN4410 GN4409	0.050 0.050	<0.050 <0.050	mg/l mg/l	97.0 100.0	80-114% 80-120%	
Associated Samples: Batch GN4409: T4438-1, T4438-2 Batch GN4410: T4438-1, T4438-2	•						

DUPLICATE RESULTS SUMMARY GENERAL CHEMISTRY

Login Number: T4438 Account: MWHSLCUT - Montgomery Watson Project: EPFS San Juan Basin GS

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Nitrogen, Nitrate + Nitrite	GN4410	T4438-4	mg/l	0.13	0.13	0.0	0-5%
Nitrogen, Nitrite	GN4409	T4438-4	mg/l	<0.050	<0.050		0-20%

Batch GN4409: T4438-1, T4438-2, T4438-3, T4438-4 Batch GN4410: T4438-1, T4438-2, T4438-3, T4438-4

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Page 1

MATRIX SPIKE RESULTS SUMMARY GENERAL CHEMISTRY

Login Number: T4438 Account: MWHSLCUT - Montgomery Watson Project: EPFS San Juan Basin GS

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Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Nitrogen, Nitrate + Nitrite Nitrogen, Nitrite	GN4410 GN4409	T4438-4 T4438-1	mg/l mg/l	0.13 <0.050	0.100 0.100	0.23 0.11	100.0 107.0	90-115% 75-125%
Associated Samples: Batch GN4409: T4438-1, T4438- Batch GN4410: T4438-1, T4438-								

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					10165	i Harwin	Drive, St	e. 150, Hc	uston, T	X 77036	5 Harwin Drive, Ste. 150, Houston, TX 77036 FED-EX tracking #	king #		Bottle Order Control #		Γ
						FEL. 713	-271-4700	FAX: 7	13-271-4	170	836557	836557901.56	0	årrulaet loh #		
	Laboratories						WWW.ac	WWW.Acculest.com	E			# 01				
	Client / Reporting Information	u					Project Information						Reque:	Requested Analysis	Matri	Matrix Codes
Company Name	Pasa		Pro	Project Name Sen D	yra V	teen	Bes	2	Juell	3					DW-DI CM-C	DW - Drinking Water GW - Ground Water
1.1	4		Street	el							o t					WW - Water
P	State		City				State				.11		 ,		SUV-Su	SVJ - Surface Water SO - Soil
Project Contact		E-mail		Project #							C'N				· م	SL - Studge
3	28		Fax#	* 505	6	5 25	611				12				ГЮ-0 ГЮ-0	Ur - Oll LPQ - Other Liquid
Sampler's Name Mar H	Nec		Ğ	Client Purchase Order #	Order #						f PA				SOL - 0	AfR - Air SOL - Other Solid
Accutest Field ID Sample #	Field 1D / Point of Collection	SUMMA # MEOH Vial#	# # Date	Collection Time	Sampled	Matrix ho		lumber of	preserved Bot	NCORE 1409	YIN					WP - Wipe LAB USE ONLY
ALMU2	mu-27			حّــل	NW		1	4	1.0	+-	*		-		96	743
2 Denco	MW- 19		623		NW	23			*		×					
3 Blanco	mw-23		2	523 1431	NIC	tu G			¥		×					
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templa	- Yr															
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	Turnaround Time (Business Days)			_	_		Data Deliverable-Information	e-Information			-		-3	L I I I Comments / Remarks		
C 10 Day STANDARD	Approved By: / Date:	Date:			Commercial 'A'		۵	EDD Format								
5 Day RUSH			I		Commercial "B"											
3 Day EMERGENCY			I		Reduced fier 1 Fuil Tier 1						I					
1 Day EMERGENCY 1 Day EMERGENCY			Ì	TRRP13	. £											
Other											- I,			V		
			1	Con	Commercial "A"	= Results Only	Only							10		
Ernergency & Rush TIA data available VIA LabLink	ailable VIA LabLink		see Sam	le Custody m	ust be docur	nented belo	w each time	samples cha	nge posses	sion, includir	ng courier de	ivery.		<u>/////////////////////////////////////</u>		
Relinquished by Shedlir		(m2m03 // 3/2	Received by	ed by Reinquished by 2				Relinquished b	*				0ate Time: 0845 F	cceirat Oliver		
Relinquisped by		Dale Time:	Received by:					Relinquished by:	*			Date Trime	illue.	contract by:		
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Technical Report for

Montgomery Watson

EPFS San Juan Basin GS

San Juan Basin Blanco

Accutest Job Number: T4449

Report to:

El Paso

scott.pope@elpaso.com

Total number of pages in report: 14



Tors Hartins

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Ron Martino Laboratory Manager

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Sample Summary

Montgomery Watson

Job	No:	T4449
•		

EPFS San Juan Basin GS Project No: San Juan Basin Blanco

Sample Number		Time By	Received	Matr Code		Client Sample ID
T4449-1	06/03/03	09:30 MJN	06/04/03	AQ	Water	BLANCO MW-12
T4449-2	06/03/03	10:25 MJN	06/04/03	AQ	Water	BLANCO MW-13
T4449-3	06/03/03	11:20 MJN	06/04/03	AQ	Water	BLANCO MW-15
T4449-4	06/03/03	12:30 MJN	06/04/03	AQ	Water	BLANCO MW-29
T4449-5	06/03/03	12:55 MJN	06/04/03	AQ	Water	BLANCO MW-6
T4449-6	06/03/03	13:35 MJN	06/04/03	AQ	Water	BLANCO MW-30
T4449-7	06/03/03	14:00 MJN	06/04/03	AQ	Water	BLANCO MW-28
T4449-8	06/03/03	14:20 MJN	06/04/03	AQ	Water	BLANCO MW-14

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		Repo	rt of Ar	nalysis			Page 1 of 1
Client Sample ID: Lab Sample ID: Matrix:	BLANCO MW-12 T4449-1 AQ - Water	2		Date 1	Sampled: 06/03/ Received: 06/04/ nt Solids: n/a		
Project:	EPFS San Juan Ba	asin GS		10100	nt oonus. m/u		
General Chemistry							
Analyte	Result	RL	Units	DF	Analyzed	By	Method
Nitrogen, Nitrate ^a Nitrogen, Nitrate + Nitrogen, Nitrite	6.7 Nitrite 6.7 < 0.05	1.3 1.3 0 0.050	mg/l mg/l mg/l	1 25 1	06/06/03 11:00 06/06/03 11:00 06/04/03 14:00	LN	SM18 4500NO3E/NO2B EPA 353.2 EPA 353.2

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

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Lab Sample ID:	BLANCO MW-13 T4449-2 AQ - Water			Date l	Sampled: 06/03/03 Received: 06/04/03 nt Solids: n/a	
Project:	EPFS San Juan Basin (GS				
General Chemistry						
Analyte	Result	RL	Units	DF	Analyzed By	Method
Nitrogen, Nitrate ^a Nitrogen, Nitrate + Nitrogen, Nitrite	5.8 Nitrite 5.9 0.090	1.3 1.3 0.050	mg/l mg/l mg/l	1 25 1	06/06/03 11:00 ln 06/06/03 11:00 ln 06/04/03 14:00 ln	SM18 4500NO3E/NO2B EPA 353.2 EPA 353.2

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Report of Analysis

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		Repor	rt of An	alysis			Page 1 of 1
Client Sample ID: Lab Sample ID: Matrix:	BLANCO MW-15 T4449-3 AQ - Water			Date 1	Sampled: 06/03/ Received: 06/04/ nt Solids: n/a		
Project:	EPFS San Juan Basir	n GS		I CICC.	in conus. in a		
General Chemistry							
Analyte	Result	RL	Units	DF	Analyzed	Ву	Method
Nitrogen, Nitrate ^a Nitrogen, Nitrate + Nitrogen, Nitrite	21.0 Nitrite 21.0 < 0.050	1.3 1.3 0.050	mg/l mg/l mg/l	1 25 1	06/06/03 11:00 06/06/03 11:00 06/04/03 14:00) ln	SM18 4500NO3E/NO2B EPA 353.2 EPA 353.2

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

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Lab Sample ID: 7	3LANCO MW-29 74449-4 AQ - Water			Date H	Sampled: 06/03/0 Received: 06/04/0 nt Solids: n/a		
Project: E	EPFS San Juan Basin (GS					
General Chemistry							
Analyte	Result	RL	Units	DF	Analyzed	By	Method
Nitrogen, Nitrate ^a Nitrogen, Nitrate + N Nitrogen, Nitrite	78.7 Jitrite 79.0 0.30	5.1 5.0 0.050	mg/l mg/l mg/l	1 100 1	06/06/03 11:00 06/06/03 11:00 06/04/03 14:00	LN	SM18 4500NO3E/NO2B EPA 353.2 EPA 353.2

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

6 of 14

Page 1 of 1

Report of Analysis

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			Repor	rt of An	alysis			Page 1 of 1
Client Sample ID: Lab Sample ID: Matrix:	BLANC T4449-5 AQ - Wa				Date I	Sampled: 06/03/ Received: 06/04/ nt Solids: n/a		
Project:	EPFS Sa	n Juan Basin (GS		1 (1 ()	nt oontis. m/u		
General Chemistry	1							
Analyte		Result	RL	Units	DF	Analyzed	By	Method
Nitrogen, Nitrate ^a Nitrogen, Nitrate + Nitrogen, Nitrite	Nitrite	74.0 74.0 < 0.050	5.1 5.0 0.050	mg/l mg/l mg/l	1 100 1	06/06/03 11:00 06/06/03 11:00 06/04/03 14:00	LN	SM18 4500NO3E/NO2B EPA 353.2 EPA 353.2

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

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Client Somale ID: 1	BLANCO MW-30					~ <u>~</u>	
1	Γ4449-6			Date S	Sampled: 06/03/	/03	
Matrix: A	AQ - Water				Received: 06/04/ nt Solids: n/a	/03	
Project: I	EPFS San Juan Basin (GS		i eitei	n Jonus. II/d		
General Chemistry					<u>.</u>		
Analyte	Result	RL	Units	DF	Analyzed	By	Method
Nitrogen, Nitrate ^a	58.0	5.1	mg/l	1	06/06/03 11:0) ln	SM18 4500NO3E/NO2B
Nitrogen, Nitrate + N		5.0	mg/l	100	06/06/03 11:00		EPA 353.2
Nitrogen, Nitrite	< 0.050	0.050	mg/l	1	06/04/03 14:00) ln	EPA 353.2

Report of Analysis

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

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Page 1 of 1

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1	BLANCO MW-28 T4449-7 AQ - Water			Date F	Sampled: 06/03/0 Received: 06/04/0 nt Solids: n/a		
Project:	EPFS San Juan Basin GS			1 01 001			
General Chemistry							,
Analyte	Result	RL	Units	DF	Analyzed	Ву	Method
Nitrogen, Nitrate ^a Nitrogen, Nitrate + Nitrogen, Nitrite	86.9 Nitrite 87.0 0.10	5.1 5.0 0.050	mg/l mg/l mg/l	1 100 1	06/06/03 11:00 06/06/03 11:00 06/04/03 14:00	LN	SM18 4500NO3E/NO2B EPA 353.2 EPA 353.2

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Report of Analysis

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Lab Sample ID:	BLANCO MW-14 T4449-8 AQ - Water			Date I	Sampled: 06/03/0 Received: 06/04/0 nt Solids: n/a	-	
Project:	EPFS San Juan Basin (GS		reite	nt Sonus. n/a		
General Chemistry		- <u> </u>					
Analyte	Result	RL	Units	DF	Analyzed	By	Method
Nitrogen, Nitrate ^a Nitrogen, Nitrate + 1 Nitrogen, Nitrite	14.8 Nitrite 15.0 0.20	1.3 1.3 0.050	mg/l mg/l mg/l	1 25 1	06/06/03 11:00 06/06/03 11:00 06/04/03 14:00	LN	SM18 4500NO3E/NO2B EPA 353.2 EPA 353.2

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Report of Analysis

RL = Reporting Limit

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General Chemistry

QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY GENERAL CHEMISTRY

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Login Number: T4449 Account: MWHSLCUT - Montgomery Watson Project: EPFS San Juan Basin GS

Analyte	Batch ID	RL	MB Result	Units	BSP %Recov	QC Limits
Nitrogen, Nitrate + Nitrite Nitrogen, Nitrite	GN4423 GN4411	0.050 0.050	<0.050 <0.050		99.0 112.0	
Associated Samples: Batch GN4411: T4449-1, T4449-2 Batch GN4423: T4449-1, T4449-2						

DUPLICATE RESULTS SUMMARY GENERAL CHEMISTRY

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Login Number: T4449 Account: MWHSLCUT - Montgomery Watson Project: EPFS San Juan Basin GS

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Nitrogen, Nitrate + Nitrite Nitrogen, Nitrite	GN4423 GN4411	T4449-4 T4449-4	mg/l mg/l	79.0 0.30	80.0 0.30	1.3 0.0	0-5% 0-20%
Associated Samples: Batch GN4411: T4449-1, T4449-2 Batch GN4423: T4449-1, T4449-2							

MATRIX SPIKE RESULTS SUMMARY GENERAL CHEMISTRY

Login Number: T4449 Account: MWHSLCUT - Montgomery Watson Project: EPFS San Juan Basin GS

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Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Nitrogen, Nitrate + Nitrite Nitrogen, Nitrite	GN4423 GN4411	T4449-4 T4449-4	mg∕l mg∕l	79.0 0.30	10.0 0.100	88.0 <0.050	90.0 100.0	90-115% 75-125%
Associated Samples: Batch GN4411: T4449-1, T4449-2 Batch GN4423: T4449-1, T4449-2								

2.64 a			Matrix Codes	DW - Drinkung Water GW - Ground Water	WW - Water	SW - Surface Water SO - Soil	St Sludge Ot - Ot	LIQ - Other Liquid	AIR - Air SOL - Other Solid	WP WIDE	AB USE ONLY	\mathbf{D}								K									smp.
	Bottle Order Control #	Accutest Job #	Requested Analysis			· · · · · · · · · · · · · · · · · · ·						· · ·							Commonie (Demadre					1	\mathcal{N}		Received		Pres S S Coder Temp.
	FED-EX Tracking #		Reque	1-4	, <u>9</u> E	ź.	Ç 298	аş ш	it Ha	20 z h	9																Date Timesar	Date Time:	Preserveć where applicable
OF CUSTODY #	150, Houston, TX 77036 FAX: 713-271-4770	ltest.com		/\∽	27				47.	er of preserved Bottles			×	× 1				× 	I I I I I I I I I I I I I I I I I I I	G EDD Format						Sample Custody must be documented below each time samples change possession, including couner delivery.	Relinquished by 2	elinquished by:	Custody Seal #
CHAIN OF	10165 Harwin Drive, Ste. TEL. 713-271-4700	WWW.acc	Project Information	Noon Besin	2	State			Order #	Combol 4	By Matrix bottles 7 2	5 MW WB 1	Na	NW	NU	M	HOOMN WO 1	itzomn va 1	Data Deliverable		Commercial "8" Reduced Tier 1	ier 1	5	Commercial 'A" = Results Only		nust be documented below each time s	2 2	<u> </u>	0
and the second se				Popiect Name	Street	Es Cr	Project #	Fax #	Client Purchase Order #	SUMMA # Collection	MEOH Vial # Date Time	103.03 1025	0211 50-89	63 03 1230	6-3-09/255	1335 1335	1403 140	6309 142	 					Co		Sample Custody r	Received by:	Received by: 3	Received by: 5
S. J. S. V.		ູຍ	ng Information			WW BUTCH	ц Г Ш	Ň				-13	15	29	9	30	28	-14	 ess Davs)	Approved By: / Date:					LabLink		163C	Are Time:	Oate Time:
		0 1 0	Client / Reporting Information	121 1250	:1/2 Ave	often State	1 Banella	8612565	mJNee	Field ID / Point of Collection	el-WM Olme	- mm one	PANO MMU-	o-ull cine		2MO MW-	-WM MW-	- WM when	Turnaround Time (Business Davs)			NCV	NCY		Ernergency & Rush T/A data available VIA LabLink				
				Company Name	Address Addres	City Demin	· 🗸 🐨		Sampler's Name	Accutest Sample #	R	2 3	3 B.	4 B	S A	6 /	7 131	e G		To Day STANDARD	C 3 Day RUSH	D 2 Day EMERGENCY	C 1 Day EMERGENCY		Emergency & Ru	ľ	Reline 13 and by Sampler	Reikhurshöderg: 3	. Relinquished by: 5

ANALYTICAL DATA REPORT CHLORINATED HYDROCARBONS JUNE 2003

Sector Sec



Technical Report for

Montgomery Watson

EPFS San Juan Basin GS

San Juan Basin Blanco

Accutest Job Number: T4448

Report to:

El Paso

scott.pope@elpaso.com

ATTN: Scott Pope

Total number of pages in report: 14



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Ron Martino Laboratory Manager

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Sample Summary

Montgomery Watson

EPFS San Juan Basin GS Project No: San Juan Basin Blanco

Sample Number	Collected Date	Time By	Received	Matri Code		Client Sample ID
T4448-1	06/03/03	09:30 MJN	06/04/03	AQ	Water	BLANCO MW-12
T4448-2	06/03/03	10:25 MJN	06/04/03	AQ	Water	BLANCO MW-13
T4448-3	06/03/03	11:20 MJN	06/04/03	AQ	Water	BLANCO MW-15
T4448-4	06/03/03	14:20 MJN	06/04/03	AQ	Water	BLANCO MW-14
T4448-5	06/03/03	07:00 MJN	06/04/03	AQ	Trip Blank Water	030603TB01

Report of Analysis Client Sample ID: BLANCO MW-12 Lab Sample ID: T4448-1 Date Sampled: 06/03/03 Matrix: AQ - Water Date Received: 06/04/03 Method: SW846 8260B Percent Solids: n/a Project: EPFS San Juan Basin GS File ID DF By **Prep Date Prep Batch** Analytical Batch Analyzed Run #1 F0055519.D 1 06/08/03 IH VF852 n/a n/a Run #2 **Purge Volume** Run #1 5.0 ml Run #2 VOA TCL List CAS No. Compound Result RL Units Q 75-34-3 2.0 ug/l 1,1-Dichloroethane 8.2 75-35-4 1,1-Dichloroethylene ND 2.0 ug/l 156-59-2 cis-1,2-Dichloroethylene 8.2 2.0 ug/l o-Dichlorobenzene 95-50-1 3.4 2.0ug/l 156-60-5 trans-1,2-Dichloroethylene ND 2.0 ug/l ug/l 127-18-4 Tetrachloroethylene 3.2 2.0 79-01-6 Trichloroethylene 4.52.0 ug/l Run# 2 CAS No. Surrogate Recoveries Run#1 Limits Dibromofluoromethane 1868-53-7 99% 88-114% 17060-07-0 1.2-Dichloroethane-D4 97% 81-122% 2037-26-5 Toluene-D8 101% 88-110% 460-00-4 4-Bromofluorobenzene 104% 88-115%

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sam Lab Sampl Matrix: Method: Project:		n GS		Date Sample Date Receive Percent Soli	ed: 06/04/03	
Run #1 ^a Run #2	File ID DF Z1988.D 1	Analyzed 06/12/03	By JH	Prep Date n/a	Prep Batch n/a	Analytical Batch VZ104
Run #1 Run #2	Purge Volume 5.0 ml					
VOA TCL	List					
CAS No.	Compound	Result	RL	Units Q		
75-34-3 75-35-4 156-59-2 95-50-1 156-60-5	1,1-Dichloroethane 1,1-Dichloroethylene cis-1,2-Dichloroethylene o-Dichlorobenzene trans-1,2-Dichloroethylene	53.8 1.4 33.0 50.5 8.2	2.0 2.0 2.0 2.0 2.0 2.0	ug/l ug/l J ug/l ug/l ug/l		
127-18-4 79-01-6	Tetrachloroethylene Trichloroethylene	8.2 1.4 35.1	2.0 2.0 2.0	ug/l J ug/l		
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
1868-53-7 17060-07-0 2037-26-5 460-00-4	Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8 4-Bromofluorobenzene	106% 102% 97% 97%		88-114% 81-122% 88-110% 88-115%		

(a) Sample was not preserved to a pH < 2; reported results are considered minimum values.

ND = Not detected RL = Reporting Limit E = Indicates value exceeds calibration range

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sam Lab Sample Matrix: Method: Project:		sin GS		Date Sample Date Receiv Percent Soli	ed: 06/04/03	
Run #1 Run #2	File ID DF Z1991.D 1	Analyzed 06/12/03	By JH	Prep Date n/a	Prep Batch n/a	Analytical Batch VZ104
Run #1 Run #2	Purge Volume 5.0 ml					
VOA TCL	List					
CAS No.	Compound	Result	RL	Units Q		
75-34-3	1,1-Dichloroethane	6.0	2.0	ug/l		
75-35-4	1,1-Dichloroethylene	ND	2.0	ug/l		
156-59-2	cis-1,2-Dichloroethylene	ND	2.0	ug/l		
95-50-1	o-Dichlorobenzene	ND	2.0	ug/l		
156-60-5	trans-1,2-Dichloroethylene	e ND	2.0	ug/l		
127-18-4	Tetrachloroethylene	ND	2.0	ug/l		
79-01-6	Trichloroethylene	ND	2.0	ug/l		
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
1868-53-7	Dibromofluoromethane	104%		88-114%		
17060-07-0	1,2-Dichloroethane-D4	100%		81-122%		
2037-26-5	Toluene-D8	99%		88-110%		
460-00-4	4-Bromofluorobenzene	99%		88-115%		

ND = Not detected RL = Reporting Limit E = Indicates value exceeds calibration range J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

	Report	t of	Analysis	
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Page 1 of 1

Client Sam Lab Sampl Matrix: Method: Project:		in GS		Date Sample Date Receive Percent Soli	ed: 06/04/03	
Run #1 Run #2	File IDDFZ1987.D1F0055522.D1	Analyzed 06/11/03 06/08/03	By JH JH	Prep Date n/a n/a	Prep Batch n/a n/a	Analytical Batch VZ104 VF852
Run #1 Run #2	Purge Volume 5.0 ml 5.0 ml					
VOA TCL	List					
CAS No.	Compound	Result	RL	Units Q		
75-34-3	1,1-Dichloroethane	9.5	2.0	ug/l		
75-35-4	1,1-Dichloroethylene	ND	2.0	ug/l		
156-59-2	cis-1,2-Dichloroethylene	3.3	2.0	ug/l		
95-50-1	o-Dichlorobenzene	ND	2.0	ug/l		
156-60-5	trans-1,2-Dichloroethylene	ND	2.0	ug/l		
127-18-4	Tetrachloroethylene	ND	2.0	ug/l		
79-01-6	Trichloroethylene	2.4	2.0	ug/l		
0 4 0 X	Surrogate Recoveries	Run# 1	Run# 2	Limits		
CAS No.						
CAS No. 1868-53-7	Dibromofluoromethane	104%	73% a	88-114%		
		104% 102%	73% ^a 47% ^a	88-114% 81-122%		
1868-53-7						

(a) Outside control limits due to matrix interference. Confirmed by reanalysis.

ND = Not detected RL = Reporting Limit E = Indicates value exceeds calibration range

- J = Indicates an estimated value
- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sam Lab Sample Matrix: Method: Project:				Date Sample Date Receiv Percent Soli	ed: 06/04/03	
Run #1 Run #2	File ID DF F0055518.D 1	Analyzed 06/08/03	By JH	Prep Date n/a	Prep Batch n/a	Analytical Batch VF852
Run #1 Run #2	Purge Volume 5.0 ml					
VOA TCL	List					
CAS No.	Compound	Result	RL	Units Q		
CAS No. 75-34-3	Compound 1,1-Dichloroethane	Result ND	RL 2.0	C C		
75-34-3	•			Units Q ug/l ug/l		
75-34-3 75-35-4	1,1-Dichloroethane	ND	2.0	ug/l ug/l		
75-34-3 75-35-4 156-59-2	1,1-Dichloroethane 1,1-Dichloroethylene	ND ND	2.0 2.0	ug/l		
75-34-3 75-35-4 156-59-2 95-50-1	1,1-Dichloroethane 1,1-Dichloroethylene cis-1,2-Dichloroethylene	ND ND ND	2.0 2.0 2.0 2.0 2.0	ug/l ug/l ug/l		
75-34-3 75-35-4 156-59-2 95-50-1 156-60-5 127-18-4	1,1-Dichloroethane 1,1-Dichloroethylene cis-1,2-Dichloroethylene o-Dichlorobenzene trans-1,2-Dichloroethylene Tetrachloroethylene	ND ND ND ND ND ND	2.0 2.0 2.0 2.0 2.0 2.0	ug/l ug/l ug/l ug/l		
75-34-3 75-35-4 156-59-2 95-50-1 156-60-5 127-18-4	1,1-Dichloroethane 1,1-Dichloroethylene cis-1,2-Dichloroethylene o-Dichlorobenzene trans-1,2-Dichloroethylene	ND ND ND ND ND	2.0 2.0 2.0 2.0 2.0	ug/l ug/l ug/l ug/l ug/l		
	1,1-Dichloroethane 1,1-Dichloroethylene cis-1,2-Dichloroethylene o-Dichlorobenzene trans-1,2-Dichloroethylene Tetrachloroethylene	ND ND ND ND ND ND	2.0 2.0 2.0 2.0 2.0 2.0	ug/l ug/l ug/l ug/l ug/l ug/l		
75-34-3 75-35-4 156-59-2 95-50-1 156-60-5 127-18-4 79-01-6	1,1-Dichloroethane 1,1-Dichloroethylene cis-1,2-Dichloroethylene o-Dichlorobenzene trans-1,2-Dichloroethylene Tetrachloroethylene Trichloroethylene	ND ND ND ND ND ND	2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0	ug/l ug/l ug/l ug/l ug/l ug/l ug/l		
75-34-3 75-35-4 156-59-2 95-50-1 156-60-5 127-18-4 79-01-6 CAS No.	1,1-Dichloroethane 1,1-Dichloroethylene cis-1,2-Dichloroethylene o-Dichlorobenzene trans-1,2-Dichloroethylene Tetrachloroethylene Trichloroethylene Surrogate Recoveries Dibromofluoromethane	ND ND ND ND ND ND Run# 1	2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0	ug/l ug/l ug/l ug/l ug/l ug/l ug/l		
75-34-3 75-35-4 156-59-2 95-50-1 156-60-5 127-18-4 79-01-6 CAS No. 1868-53-7	1,1-Dichloroethane 1,1-Dichloroethylene cis-1,2-Dichloroethylene o-Dichlorobenzene trans-1,2-Dichloroethylene Tetrachloroethylene Trichloroethylene Surrogate Recoveries Dibromofluoromethane	ND ND ND ND ND ND Run# 1 102%	2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0	ug/l ug/l ug/l ug/l ug/l ug/l Limits 88-114%		

ND = Not detected RL = Reporting Limit E = Indicates value exceeds calibration range J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

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QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Blank Spike Summary

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Job Number:	T4448
Account:	MWHSLCUT Montgomery Watson
Project:	EPFS San Juan Basin GS

J			-				
Sample VF852-BS	File ID F0055515.D	DF 1	Analyzed 06/08/03	By JH	Prep Date n/a	Prep Batch n/a	Analytical Batch VF852
The QC repo	orted here appli	es to the	following sam	ples:		Method: SW	/846 8260B

T4448-1, T4448-4, T4448-5

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
75-34-3	1,1-Dichloroethane	25	26.2	105	74-127
75-35-4	1,1-Dichloroethylene	25	27.8	111	70-134
156-59-2	cis-1,2-Dichloroethylene	25	23.7	95	76-125
95-50-1	o-Dichlorobenzene	25	24.5	98	77-116
156-60-5	trans-1,2-Dichloroethylene	25	26.8	107	72-131
127-18-4	Tetrachloroethylene	25	27.3	109	69-134
79-01-6	Trichloroethylene	25	25.4	102	75-128
CAS No.	Surrogate Recoveries	BSP	Lim	its	
1868-53-7	Dibromofluoromethane	100%	88-1	14%	
17060-07-0	1,2-Dichloroethane-D4	99%	81-1	22%	
2037-26-5	Toluene-D8	103%	88-1	10%	
460-00-4	4-Bromofluorobenzene	98%	88-1	15%	·

Page 1 of 1

9 of 14

Blank Spike Summary Job Number: T4448

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Account:MWHSLCUT Montgomery WatsonProject:EPFS San Juan Basin GS

ample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
7Z104-BS	Z1971.D	1	06/11/03	JH	n/a	n/a	VZ104

The QC reported here applies to the following samples:

Method: SW846 8260B

T4448-2, T4448-3, T4448-4

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
75-34-3	1,1-Dichloroethane	25	25.2	101	74-127
75-35-4	1,1-Dichloroethylene	25	26.8	107	70-134
156-59-2	cis-1,2-Dichloroethylene	25	23.6	94	76-125
95-50-1	o-Dichlorobenzene	25	23.4	94	77-116
156-60-5	trans-1,2-Dichloroethylene	25	26.1	104	72-131
127-18-4	Tetrachloroethylene	25	25.2	101	69-134
79-01-6	Trichloroethylene	25	24.5	98	75-128
CAS No.	Surrogate Recoveries	BSP	Lim	its	
1868-53-7	Dibromofluoromethane	100%	88-1	14%	
17060-07-0	1,2-Dichloroethane-D4	99%	81-1	22%	
2037-26-5	Toluene-D8	99%	88-1	10%	
460-00-4	4-Bromofluorobenzene	99%	88-1	15%	

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Method Blank Summary

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Job Number:	T4448
Account:	MWHSLCUT Montgomery Watson
Project:	EPFS San Juan Basin GS

Sample VF852-MB	File ID I F0055516.D 1	DF	Analyzed 06/08/03	By JH	Prep n/a	Date	Prep Batch n/a	Analytical Batch VF852
						-		
The QC rep	ported here applies	to the fol	llowing samp	ples:			Method: SW	846 8260B
T4448-1, T4	4448-4, T4448-5							
CAS No.	Compound		Result	RL	Units	Q		
75-34-3	1,1-Dichloroethane	2	ND	2.0	ug/l			
75-35-4	1,1-Dichloroethyle	ne	ND	2.0	ug/l			
156-59-2	cis-1,2-Dichloroeth		ND	2.0	ug/l			
95-50-1	o-Dichlorobenzene		ND	2.0	ug/l			
156-60-5	trans-1,2-Dichloro	ethylene	ND	2.0	ug/l			
127-18-4	Tetrachloroethylen	e	ND	2.0	ug/l			
79-01-6	Trichloroethylene		ND	2.0	ug/l			
CAS No.	Surrogate Recove	ries		Limi	ts			
1868-53-7	Dibromofluoromet	hane	100%	88-11	4%			
17060-07-0	1,2-Dichloroethane		95%	81-12	2%			
2037-26-5	Toluene-D8		99%	88-11	0%			
460-00-4	4-Bromofluoroben	zene	103%	88-11	5%			

Method Blank Summary

Job Number:	T4448
Account:	MWHSLCUT Montgomery Watson
Project:	EPFS San Juan Basin GS

Sample VZ104-ME	File ID DF 3 Z1972.D 1	Analyzed 06/11/03	By JH	Prep Date n/a	Prep Batch n/a	Analytical Batch VZ104
_	ported here applies to the fo 4448-3, T4448-4	ollowing sam	ples:		Method: SW	846 8260B
CAS No.	Compound	Result	RL	Units Q		
75-34-3	1,1-Dichloroethane	ND	2.0	ug/l		
75-35-4	1,1-Dichloroethylene	ND	2.0	ug/l		
156-59-2	cis-1,2-Dichloroethylene	ND	2.0	ug/l		
95-50-1	o-Dichlorobenzene	ND	2.0	ug/l		
156-60-5	trans-1,2-Dichloroethylene	ND	2.0	ug/l		
127-18-4	Tetrachloroethylene	ND	2.0	ug/l		
79-01-6	Trichloroethylene	ND	2.0	ug/l		
CAS No.	Surrogate Recoveries		Limits	5		

C/15 110.	Surrogate Accoveries		Linnts
1868-53-7	Dibromofluoromethane	101%	88-114%
17060-07-0	1,2-Dichloroethane-D4	99%	81-122%
2037-26-5	Toluene-D8	98 %	88-110%
460-00-4	4-Bromofluorobenzene	99 %	88-115%

Job Number: Account:	T4448	- UT Montg	ce Duplicate gomery Watson 1 GS	e Sum	mary		Page 1 of 1
Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
T4448-2MS	Z1989.D	1	06/12/03	JĤ	n/a	n/a	VZ104
T4448-2MSD	Z1990.D .	1	06/12/03	JH	n/a	n/a	VZ104
T4448-2 a	Z1988.D	1	06/12/03	JH	n/a	n/a	VZ104

The QC reported here applies to the following samples:

Method: SW846 8260B

T4448-2, T4448-3, T4448-4

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CAS No.	Compound	T4448-2 ug/l (Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
75-34-3 75-35-4 156-59-2 95-50-1 156-60-5 127-18-4 79-01-6	1,1-Dichloroethane 1,1-Dichloroethylene cis-1,2-Dichloroethylene o-Dichlorobenzene trans-1,2-Dichloroethylene Tetrachloroethylene Trichloroethylene	53.8 1.4 33.0 50.5 8.2 1.4 35.1	J	25 25 25 25 25 25 25 25	82.1 28.2 59.2 75.2 35.5 25.4 62.4	113 107 105 99 109 96 109	77.5 28.1 58.9 74.2 35.0 25.3 61.7	95 107 104 95 107 96 106	6 0 1 1 1 0 1	78-125/11 72-136/12 77-123/10 77-113/10 72-133/10 80-127/11 81-124/10
CAS No. 1868-53-7 17060-07-0 2037-26-5 460-00-4	Surrogate Recoveries Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8 4-Bromofluorobenzene	MS 102% 102% 96% 98%		MSD 102% 99% 99% 97%	T44 106 102 979 979	%	Limits 88-1149 81-1229 88-1109 88-1159	% %		

(a) Sample was not preserved to a pH < 2; reported results are considered minimum values.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number:	T4448
Account:	MWHSLCUT Montgomery Watson
Project:	EPFS San Juan Basin GS

Sample File ID DF T4448-4MS F0055523.D 1 T4448-4MSD F0055524.D 1 T4448-4 F0055522.D 1	Analyzed By 06/08/03 JH 06/08/03 JH 06/08/03 JH	Prep Date n/a n/a n/a	Prep Batch n/a n/a n/a	Analytical Batch VF852 VF852 VF852 VF852	
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The QC reported here applies to the following samples:

Method: SW846 8260B

T4448-1, T4448-4, T4448-5

. .

CAS No.	Compound	T4448-4 ug/l Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
75-35-4 156-59-2 95-50-1 156-60-5 127-18-4	1,1-Dichloroethane 1,1-Dichloroethylene cis-1,2-Dichloroethylene o-Dichlorobenzene trans-1,2-Dichloroethylene Tetrachloroethylene Trichloroethylene	9.8 ND 3.7 ND ND ND 3.0	25 25 25 25 25 25 25 25	34.7 32.7 23.2 17.8 29.9 40.5 29.5	100 131 78 71* 120 162* 106	34.5 31.2 23.7 18.8 28.8 38.2 28.8	99 125 80 75* 115 153* 103	1 5 2 5 4 6 2	78-125/11 72-136/12 77-123/10 77-113/10 72-133/10 80-127/11 81-124/10
1868-53-7 I 17060-07-0 1 2037-26-5 7	Surrogate Recoveries Dibromofluoromethane 1,2-Dichloroethane-D4 Toluene-D8 4-Bromofluorobenzene	MS 70%* 48%* 136%* 134%*	MSD 73%* 51%* 132%* 128%*	739 479 137	148-4 6* a 6* a %* a %* a	Limits 88-1149 81-1229 88-1109 88-1159	6 6		

(a) Outside control limits due to matrix interference. Confirmed by reanalysis.

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					10165 I TF	55 Harwin Drive, Ste. 150, Houston, TX 7 TEL. 713-271-4700 FAX: 713-271-4770	Drive, St 271-4700	Harwin Drive, Ste. 150, Houston, TX 77036 St. 713-271-4700 FAX: 713-271-4770	ouston, ⁷ 13-271-4	TX 77036		EX Tracking A	90065	651	Bottle O	Bottle Order Control #	*		
	■ ⊾				•		WWW.ac	www.accutest.com			Accules	Accutest Quote #			Accutest Job #	tob #			
	Client / Repo					Project	Project Information							8	Requested Analysis	lysis		W	Matrix Codes
Company Name	UH /22 Paso		Proje	Project Name	Ar J	1.5	B	N S	ړ			371'		'				- MC	DW - Drinking Water GW - Ground Water
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No.	Erming from NM	374CV	D City				State				20-1		m	E F7	/	~ 		MS	SW - Surface Water SO - Soil
Project Contact	Barollo	E-mail	Project #	ci #						-	2-19 '1'y		A		FA				SL - Studge
Phone #	5992178		Fax #	-							- 12 - 12	- 21	17 87	7	717	<u> </u>			UC - Other Liquid
Sampler's Name	MJVee		Clien	Client Purchase Order #	rder #						370	1 54	7 1	ر مسر ک				S 	AIR - Air SOL - Other Solid
Accutest Sample #	Field 1D / Point of Collection	SUMMA#		Collection	Sampled	# of		Number of D	ireserved Bo	otties ∂+ K	7-7' 292	رج)	nt TT	Z					WP - Wipe
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Prepared for:

El Paso Field Services 614 Reilly Avenue Farmington, New Mexico 87401

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BLANCO NORTH FLARE PIT WORK PLAN UPDATE TECHNICAL MEMORANDUM SAN JUAN COUNTY, NEW MEXICO

June 2003

Prepared by:

MWH

1475 Pine Grove Road, Suite 109 P.O. Box 774018 Steamboat Springs, Colorado 80477 (970) 879-6260 Service State

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TABLE OF CONTENTS

Section No.

1.0	INTRODUCTION	1
2.0	REMEDIAL ACTIVITIES	2
2.	1 RECENT REMEDIAL ACTIVITIES	2
2.2	2 PHASE I: AIR SPARGING-ENHANCED FREE-PRODUCT REMOVAL	2
2.	3 PHASE II: GROUNDWATER REMEDIATION BY AIR SPARGING	
	2.3.1 AS System Operation	4
	2.3.2 AS System and Groundwater Monitoring	4
3.0	SCHEDULE AND REPORTING	6
4.0	REFERENCES	7

LIST OF TABLES

<u>Table No.</u>	Description

2.1	Groundwater Monitoring
3.1	2003 AS System and Free Product Removal

LIST OF FIGURES

Figure No. Description

2.1 New Air Sparging Well Location

LIST OF ATTACHMENTS

Attachment No. Description

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AESE Field Reports, February 2003

Page No.

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LIST OF ACRONYMS

AS	Air Sparging
AFCEE	Air Force Center for Environmental Excellence
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene and total xylenes
cfm	cubic feet per minute
EPFS	El Paso Field Services
NMOCD	New Mexico Oil Conservation Division
NMWQCC	New Mexico Water Quality Control Commission
psi	pounds per square inch

1.0 INTRODUCTION

This Blanco North Flare Pit Work Plan Update has been prepared for El Paso Field Services (EPFS) as a technical memorandum to update the Work Plan for the Blanco North Flare Pit, July 2002 (MWH, 2002) (Work Plan). This update has been developed due to the recent unexpected detection of free-product in one of the wells in the North Flare Pit area. As a result, this update details modifications to the scope and schedule of the Work Plan to address this development in site conditions, including operation and monitoring of the recently installed free-product removal and air sparging (AS) systems in the North Flare Pit area.

The purpose of these systems is groundwater remediation downgradient of the North Flare Pit. Constituents of potential concern at the site include free-phase hydrocarbons (i.e., free-product), benzene, ethylbenzene, toluene and total xylenes (BTEX). Regulatory drivers for groundwater remediation at this site include New Mexico Oil Conservation Division's (NMOCD) guidelines and the New Mexico Water Quality Control Commission's (NMWQCC) regulations. This update describes a phased approach to groundwater remediation at the site. Phase I will consist of AS enhanced free-product removal. Following adequate removal of free-product, Phase II will be initiated which will consist of AS for groundwater remediation of dissolved-phase hydrocarbon contamination.

The Work Plan summarizes the available information related to the North Flare Pit, including a summary of previous site activities and investigations, a description of the geology/hydrogeology of the area and historic groundwater quality data. Therefore these discussions will not be reiterated in this update.

2.0 REMEDIAL ACTIVITIES

2.1 RECENT REMEDIAL ACTIVITIES

As described in the Work Plan (MWH, 2002), EPFS proposed AS in the vicinity of the impacted groundwater to remediate dissolved-phase hydrocarbon contamination and reduce BTEX concentrations to below NMWQCC standards. On December 16, 2002 a new AS well, SW-1, was installed approximately 25 feet upgradient (north) of monitoring well MW-26 as shown on Figure 2.1, *New Air Sparging Well Location*. The AS well was drilled through unconsolidated sediments to a depth of approximately 66 feet below ground surface (bgs) and into sandstone bedrock to a total boring depth of 75.5 feet bgs. The well was constructed of two-inch diameter PVC casing with a five-foot long, 0.01-inch slotted well screen. The well screen was installed at the base of the well from 70.2 to 75.2 feet bgs. The water level in MW-26 is typically between 62 and 64 feet below top of casing, which is indicative of the final water level in the new AS well.

During drilling and installation of the AS well, free-product was discovered in well MW-26. The nearby monitoring wells were checked for the presence of free-product; however, none was encountered in any of the existing wells or the new AS well. On December 17th, approximately 1.4 feet of free-product was measured and removed from MW-26 (approximately 2 gallons of water/product). On February 3, 2003, approximately 1.53 feet of free-product was measured in the well, and on April 22, 2003, approximately 2 feet of free-product was measured. In mid-April 2003 a skimmer pump was installed in MW-26 and free-product removal was initiated on April 23, 2003. On May 2, 2003, it was reported that a total of 1.63 gallons of free-product had been removed from the well. Operation and maintenance of the skimmer pump is ongoing.

On February 3, 2002, a one-day pressure test was conducted on the AS system to investigate communication between the AS well and the surrounding monitoring wells MW-26, MW-27 and MW-19. The field reports are included in Attachment A, *AESE Field Reports, February 2003.* It was concluded that there is good communication between the AS well, SW-1, and wells MW-26 and MW-19.

Currently, the AS system is instrumented and prepared for operation. The AS system operation has not yet been initiated, pending baseline groundwater sampling scheduled for May 2003, as described in the Work Plan and summarized in Section 2.3.2. Start-up of the AS system is tentatively scheduled for June 5, 2003.

2.2 PHASE I: AIR SPARGING-ENHANCED FREE-PRODUCT REMOVAL

Phase I of groundwater remediation at the site will consist of AS enhanced free-product removal. The skimmer will continue to be operated in MW-26 to remove free-product. Air sparging will be initiated to potentially enhance free-product removal. Enhancement of free-product removal by air sparging has been demonstrated at other sites (Payne et al., 1997; Payne et al., 1998). AS system start-up is tentatively scheduled for June 5, 2003.

Air will be introduced into the AS well, SW-1, to volatilize free-product and to enhance biodegradation of the dissolved phase hydrocarbons. The injection will be conducted on a

June 2003

12-hour off/on cycle to help reduce the potential for channeling. Volatilized hydrocarbons will be biodegraded in the vadose zone. Extensive testing conducted by the United States Air Force Center for Environmental Excellence (AFCEE) and EPFS's experience in the local area, has shown that AS systems are more effective when the air injected into a formation is pulsed. The pulsing helps to prevent and close preferential pathways that may be generated by over-pressuring the formation. These pathways essentially short circuit the treatment process and reduce the effectiveness of the AS system. EPFS anticipates injecting 5 to 10 cubic feet per minute (cfm) of air into the well at 50 to 100 pounds per square inch (psi). The air flow and injection pressures of the system will be monitored and adjusted to optimize air flow through the affected area.

During the initial phase of operation, weekly maintenance checks on the skimmer and AS systems will be conducted. Air pressure measurements will be measured at each well head using magnehelic gages, and field parameters, including pH, temperature, specific conductance and dissolved oxygen, will be monitored (preferably downhole measurements). Once the systems are generally stabilized, maintenance visits may be reduced to bi-weekly or monthly. Visits may be more or less frequent depending on operational conditions and constraints. Following each visit, a field report will be prepared that will include the following information:

General

- date/time of the visit
- overall status of the systems
- any maintenance that was performed
- any relevant information related to the system operations

Free-product Removal/Skimmer System

- volume of product recovered
- volume of product disposed (if any)
- pressures on the skimmer pump and tank
- skimmer pump timer settings

AS System Monitoring

- injection pressure
- flow measurements
- imposed air pressure at monitoring wells
- water levels in monitoring wells
- groundwater field parameters in monitoring wells

2.3 PHASE II: GROUNDWATER REMEDIATION BY AIR SPARGING

Following adequate removal of free-product from MW-26 (and any additional wells where free-product may have developed), Phase II of groundwater remediation will be initiated. This phase of remediation will consist of removal of dissolved-phase hydrocarbon contamination using the AS system. An eight-week pilot test will be conducted to evaluate the effectiveness of the system in remediating groundwater. Based

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MWH * 1475 Pine Grove Road, Ste. 109 * Steamboat Springs, Colorado 80487 * (970) 879-6260

on the results of the pilot test, recommendations will be made for continued operation of the AS system. This pilot test is described in the Work Plan and is summarized below.

2.3.1 AS System Operation

The AS system will continue to be operated under the conditions and on the schedule determined to be optimal during Phase I of operations.

2.3.2 AS System and Groundwater Monitoring

Prior to system start-up, groundwater monitoring will be conducted at each of the six monitoring wells in the North Flare Pit area (wells containing free-product will not be sampled). These wells and monitoring parameters are listed in Table 2.1, *Groundwater Monitoring*. Groundwater levels and field parameters (pH, temperature, specific conductance and dissolved oxygen) will be measured at each monitoring well (preferably downhole measurements), and samples will be analyzed for BTEX. Groundwater samples will be collected again from all of the monitoring wells after four weeks, and again after eight weeks of Phase II system operations. (Forty-eight hours prior to sample collection the AS system will be shut-down to ensure natural groundwater conditions are being evaluated.)

During this period, maintenance visits for the AS system will be conducted bi-weekly. Air pressures at well heads, water levels and field parameters will also be monitored during these visits. Following each visit, a field report will be prepared that will include the following:

General

- date/time of the visit
- overall status of the AS system
- any maintenance that was performed
- any relevant information related to the system operations

AS System/Groundwater Monitoring (bi-weekly)

- air injection pressure
- air flow measurement
- imposed air pressure at monitoring wells
- water levels in monitoring wells
- groundwater field parameters in monitoring wells

Groundwater Monitoring (Baseline, 4 weeks and 8 weeks)

- water levels
- groundwater field parameters
- date/time of sample collection
- types of samples collected (numbers, amounts, preservatives)
- condition of samples (color, odor)
- Chain of Custody form

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At the end of the pilot test, EPFS will continue to operate the AS system and groundwater sampling will continue on a quarterly basis until four, consecutive rounds of groundwater samples indicate BTEX concentrations below NMWQCC standards or until levels reach steady-state values.

3.0 SCHEDULE AND REPORTING

The free-product removal and AS system operation and monitoring schedule for 2003 is presented in Table 3.1, 2003 AS System and Free-Product Removal Operation and Monitoring Schedule.

At the end of the eight-week evaluation period, the results of the AS pilot-study will be evaluated and reported to NMOCD with recommendations. A report documenting performance of the pilot AS system and status of the free-product removal activities will be prepared. This report will include a summary of free-product removal, location and construction details of the AS well, as-built details of the AS system and groundwater analytical results collected over this period. An evaluation of the AS system and recommendations for modifications and future activities will also be included in this report. This report will be submitted to NMOCD within 30 days of receipt of the final groundwater sampling data report.

In addition, results of the quarterly groundwater sampling events will be submitted to NMOCD in annual reports.

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4.0 **REFERENCES**

- Burlington Environmental, Inc, 1992. Monitoring Well Installation and Testing at the North Flare Pit Area of Blanco Plant. Prepared for El Paso Natural Gas Company. December 1992.
- EPNG, 1989. Groundwater Investigation Report, El Paso Natural Gas Company's Blanco Plant, San Juan County, New Mexico. January 1989.
- EPNG, 1995. Letter from El Paso Natural Gas Company (David Bays) to New Mexico Oil Conservation Division (William C. Olson); Re: Blanco Plant Sampling Plan. September 7, 1995.
- K.W. Brown and Associates, Inc, 1990. Site Investigation of the Blanco Plant, San Juan County, New Mexico. Prepared for El Paso Natural Gas Company. February 1990.
- Payne, R.E., M.N. Gallagher, S.J. Pinizzotto and E.M. Nobles-Harris. 1997. Air Sparging Below Hydrocarbon Free Product Without Vapor Control. Battelle Conference.
- Payne. R.E., M.N. Gallagher, et al. 1998. Using Air Sparging To Enhance Free Product Recovery Without Vapor Control, API/NGWA Hydrocarbon Conference.
- MWH, 2002. *Work Plan for the Blanco North Flare Pit*. Prepared for El Paso Natural Gas Company. July 2002.

TABLES

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TABLE 2.1 GROUNDWATER MONITORING BLANCO PLANT - SAN JUAN COUNTY, NEW MEXICO EL PASO FIELD SERVICES

Monitoring Well	Analyses
North Flare Pit Area	
MW-2	Field Parameters, BTEX
MW-19	Field Parameters, BTEX
MW-23	Field Parameters, BTEX
MW-24	Field Parameters, BTEX
MW-26	Field Parameters, BTEX
MW-27	Field Parameters, BTEX

Notes:

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1. Field Parameters include temperature, pH, dissolved oxygen, specific conductance and air pressure measurement and will be conducted bi-weekly during the 8-week pilot test.

2. Monitoring well MW-20 was damaged and will be abandoned in 2003.

3. Monitoring wells containing free product will not be sampled.

BTEX: Benzene, Toluene, Ethylbenzene and Total Xylenes.

2003 AS SYSTEM AND FREE PRODUCT REMOVAL OPERATION AND MONITORING SCHEDULE BLANCO PLANT - SAN JUAN COUNTY, NEW MEXICO EL PASO FIELD SERVICES **TABLE 3.1**

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PHASE I: AIR SPARGING ENHANCED FREE PRODUCT REMOVAL	E PROD	UCT REN	IOVAL											
Free Product Removal	×													
AS System Operation		×												
Maintenance Visits ¹	×	×	×	×	×	×								
PHASE II: GROUNDWATER REMEDIATION BY AIR SPARC	I BY AI	R SPARG	GING		1				-					
Groundwater Sampling	×									×				×
Maintenance Visits ²	×						×		×	×	١.	×		×
Field Parameter Monitoring	×						x		x	×		x		×

A maintenance visit consists of monitoring of the free-product removal system, the AS system and groundwater field parameter measurements.
 A maintenance visit consists of monitoring of the AS system and groundwater field parameter measurements.

FIGURE

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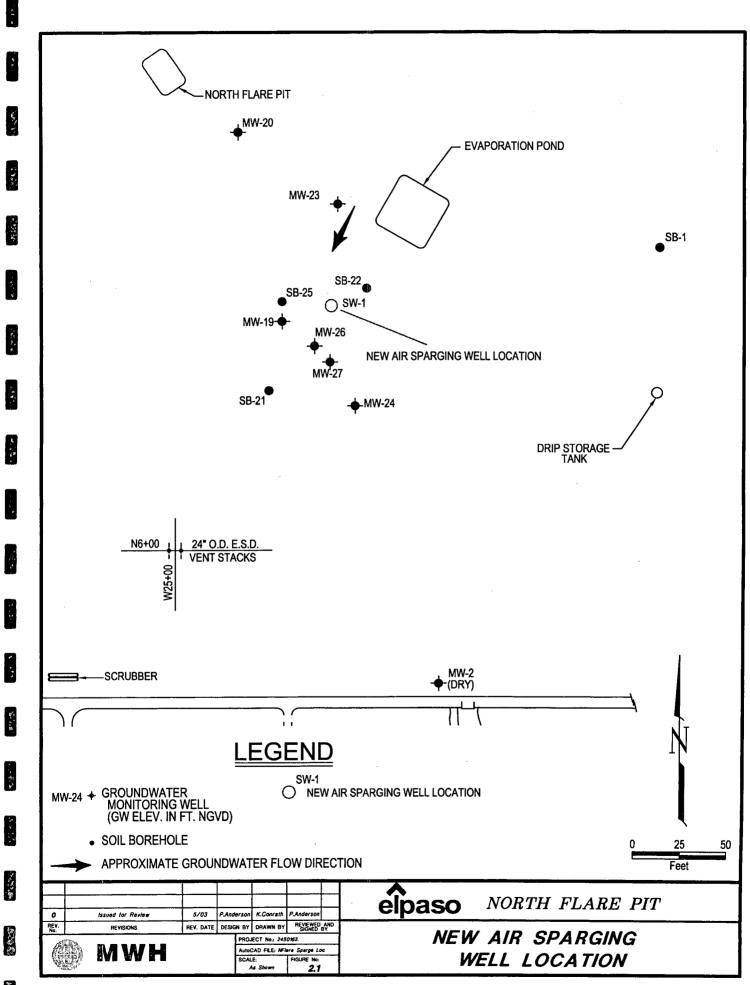
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AESE Field Reports, February 2003

ESE 906 San Juan Blvd., Suite D,

Farmington, NM 87401 (505) 566-9116



To:	Marc Greeley, Lynn Benally
From:	Martin Nee
CC:	File
Date:	2/3/03
Re:	Blanco North

1/22/03, AESE visited Blanco North to prepare a one-day pilot test to investigate communication between the newly installed sparge well and surrounding monitoring wells MW-26, 27, and 19. Well casing sizes were verified and the distance from the compressor house to the wells was measured. We looked at the existing compressor as a source of sparge air. The existing compressor is not an oil-less model and it has been drained of oil and tagged out-of-service.

A 30A 240V receptacle will need to be installed to run the oil-less compressor. Static water in the sparge well was 68.465 feet beneath top of casing and total depth 80.18. No product was present.

1/24/03 AESE contacted David Nichols and delivered a key to the compressor shed to him at Blanco so he could wire the compressor for a pilot test at the new sparge well. AESE also placed the sparge compressor in the shed.

1/31/03 Traveled to Jaquez to pick up magnehelic gauges for pilot test at Blanco. Dropped off magnehelic gauges and checked to make sure compressor was operational. Also purchased hardware for pilot test.

2/3/03 1130 hrs, arrived at site to conduct limited pilot test. Objective is to determine if communication can be established between SW-1(sparge well 1) and nearby monitoring wells MW- 19, 27, and 26. Compressor was plumbed to SW-1 and preparations made for pilot test.

1257 hrs, water levels were measured as follows

MW-19	63.64 feet beneath top of well casing (fbtoc)
MW-26	64.55 water, 63.02 product fbtoc
MW-27	64.05 fbtoc
SW-1	68.396 fbtoc.

Water was bailed from SW-1 so the compressor would not have to push the water in the well into the formation. Approximately 3.0 gallons of water were removed. Final water level measurement indicated a depth of water at 76.80 fbtoc, td is 80.18 fbtoc.

The compressor was started at 1345 hrs and a flow rate of 12 scfm was measured while vented to the atmosphere. Flow was directed to SW-1 and the flow rate dropped to 5 scfm and remained constant throughout the test.

Pressure readings from monitoring wells were recorded as follows:

1350 hrs	MW-19	0.75 inches H 2O
1354 hrs	MW-26	1.25 inches H 2O
1358 hrs	MW-27	0.01 inches H 2O
1442 hrs	MW-27	0.02 inches H 2O
1444 hrs	MW-26	5.5 inches H ₂ O strong hydrocarbon vapors from well
1446 hrs	MW-19	3.8 inches H 2O
1500 hrs	Ended test	

Conclusion

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Good communication between SW-1, MW-26 and MW-19.

AESE

906 San Juan Blvd., Suite D, Farmington, NM 87401 (505) 566-9116



1. A.

To:	Marc Greeley, Lynn Benally
From:	Martin Nee
CC:	File
Date:	2/7/03
Re:	Blanco North 2/6/03 pilot

1145 hrs, water levels were measured as follows

MW-19	63.61 feet beneath top of well casing (fbtoc)
MW-26	64.31 water, 62.98 product fbtoc
MW-27	64.06 fbtoc
SW-1	75.725 fbtoc.

1208 hrs

The compressor was started and a flow rate of 11 scfm was measured while vented to the atmosphere. Flow was directed to SW-1 and the flow rate dropped to 5 scfm and remained constant throughout the test.

1238 hrs

MW-19	62.56 fbtoc	
MW-26	64.23 fbtoc water	62.65 fbtoc product
MW-27	64.055 fbtoc	

1248 hrs	turned off spa	arge and checked wate	er levels
MW-1	.9	62.55 fbtoc	
MW-2	26	64.17 fbtoc water	62.56 fbtoc product
MW-2	27	64.09 fbtoc	
SW-1		76.87 fbtoc	

Prepared for:

EL PASO NATURAL GAS COMPANY



614 Reilly Avenue Farmington, New Mexico 87401

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APR 21 2003

ENVIRONMENTAL BUREAU OIL CONSERVATION DIVISION

GROUNDWATER NITRATE REPORT FOR THE BLANCO PLANT SOUTH FLARE PIT AND D PLANT AREAS

San Juan County, New Mexico

April 2003

Prepared by:

MWH P.O. Box 774018 Steamboat Springs, Colorado 80477 (970) 879-6260 A. A.

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TABLE OF CONTENTS

<u>Sectio</u>	<u>n No.</u> Page No.
1.0	INTRODUCTION1
2.0	SITE BACKGROUND
2.1 2.2	PREVIOUS INVESTIGATIONS – GROUNDWATER NITRATE
3.0	GROUNDWATER NITRATE INVESTIGATION
3.1 3.2 3.3 3.4	GROUNDWATER NITRATE INVESTIGATION TASKS
4.0	PROPOSED ACTIONS
5.0	REFERENCES

LIST OF TABLES

Table No.Description

- 3.1 Groundwater Nitrate Analytical Data
- 4.1 Groundwater Sampling Schedule

LIST OF FIGURES

Figure No. Description

- 1.1 Blanco Plant Site Layout
- 3.1 Groundwater Nitrate Concentrations and Potentiometric Surface

LIST OF APPENDICES

- A Blanco Plant Site Interview
- B Laboratory Analytical Reports

1.0 INTRODUCTION

This Draft Groundwater Nitrate Report for the Blanco Plant South Flare Pit and D Plant Areas (report) has been prepared on behalf of El Paso Natural Gas Company (EPNG) to summarize results of work conducted to investigate the source and extent of elevated nitrate concentrations in groundwater in these areas. This work was initiated, pursuant to New Mexico Oil Conservation Division's (NMOCD) letter dated May 3, 2002 regarding remediation activities at EPNG's Blanco Plant, and was described in the *Groundwater Nitrate Work Plan for Blanco South Flare Pit and D Plant Areas* (the Work Plan) (MWH, 2002). The Work Plan was submitted to NMOCD in July 2002 and was approved by NMOCD in a letter dated February 21, 2003, with the following conditions:

- EPNG will sample all groundwater wells annually for nitrate
- Results of the nitrate sampling will be presented in annual reports
- EPNG will notify NMOCD in advance of scheduled sampling events

These conditions are discussed in more detail in this report.

The Blanco Plant is located in San Juan County, New Mexico, approximately 1.5 miles northeast of the town of Bloomfield, New Mexico on San Juan County Road 4900. Figure 1.1, *Blanco Plant Site Layout*, presents the Blanco Plant site layout and location of the D Plant and South Flare Pit. The map also shows the location of the North Flare Pit area.

This report describes historic and current information regarding nitrate concentrations in groundwater at the site and summarizes results of work conducted under the Work Plan. These tasks include:

- 1. A literature review of background groundwater nitrate data in the region
- 2. A review of EPNG site information to investigate potential on-site nitrate source(s)
- 3. Groundwater sampling of selected wells

Regulatory drivers for groundwater remediation at this site include the New Mexico Water Quality Control Commission's (NMWQCC) nitrate standard of 10 mg/L.

Section 2.0 of this report summarizes available information relating to groundwater nitrate in the South Flare Pit and D Plant area including a description of previous investigations and a description of the geology/hydrogeology of the area. Section 3.0 describes the Work Plan tasks and results of the investigations. Section 4.0 proposes continued actions at the site.

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2.0 SITE BACKGROUND

2.1 PREVIOUS INVESTIGATIONS – GROUNDWATER NITRATE

An initial assessment of site hydrogeology and groundwater resources of the Blanco Plant area was conducted by Bechtel Environmental in 1989 (Bechtel, 1989). Six monitoring wells were installed and sampled during this investigation. High nitrate concentrations were identified in wells MW-2 (290 ppm) and MW-6 (51 ppm) at that time. It was concluded in this study that "the high concentration of nitrate in the upgradient well (MW-2) could not have been due to plant operations".

As part of a groundwater study by K.W. Brown & Associates, Inc (K.W. Brown, 1990) to investigate the extent of contamination resulting from a leaking underground storage tank in the D Plant Area, the source of elevated nitrate in groundwater was further investigated. Monitoring well, MW-19, was installed upgradient of MW-2. Sampling results from this investigation indicated high nitrate concentrations in MW-2 (200 ppm), MW-19 (90 ppm), MW-14 (210 ppm) and MW-15 (89 ppm). Inspection of the plant area at that time did not find a source for potential nitrate contamination. Suggested potential sources included the presence of naturally occurring sodium nitrate salts (nitratine, NaNO₃), amines from sour gas treatment or by-products from pigging piplines (K.W. Brown, 1990).

2.2 SITE GEOLOGY/HYDROGEOLOGY

The geologic framework of the site has been summarized by Bechtel Environmental (Bechtel, 1989) and K.W. Brown and Associates (K.W. Brown, 1990). Based on these assessments, the plant area is located on Quaternary alluvium consisting of sand, silt, clay and gravel. At the plant site, the thickness of the alluvium varies from less than three feet to more than 75 feet (Bechtel, 1989). Underlying the alluvium is the Tertiary Nacimiento Formation consisting of interbedded coarse- to medium-grained arkosic sandstone, siltstone and shale which were deposited as both channel fill and floodplain deposits (Bechtel, 1989). Orientation of the channel-fill sandstone deposits may locally control groundwater flow due to higher hydraulic conductivities through these features.

An assessment of site hydrogeology and groundwater resources of the Blanco Plant area was conducted by Bechtel Environmental in 1989 (Bechtel, 1989). Based on the information collected during this study, it was concluded that the direction of groundwater flow through the plant area is to the south-southwest and then trends southward through the southern portion of the site. The average hydraulic conductivity was estimated to be 2.1×10^{-4} centimeters per second. Depth to groundwater ranged from 50 feet (at MW-2) to nine feet (at MW-10) below ground surface (5564 to 5552 feet above sea level) (EPNG, 1989). These results were generally consistent with the findings of K.W. Brown (1990).

A potentiometric surface map for the site has been prepared based on water level measurements collected on May 30, 2002, and is presented in Figure 3.1, *Groundwater Nitrate Concentrations and Potentiometric Surface*. Based on these data, groundwater is flowing to the southeast with a hydraulic gradient of 0.032 ft/ft in the Blanco Plant site area and 0.067 ft/ft in the North Flare Pit area. At the southern boundary of the site the groundwater gradient trends towards the east, likely as a result of groundwater mounding in that area due to recharge from Citizens Ditch.

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3.0 GROUNDWATER NITRATE INVESTIGATION

3.1 GROUNDWATER NITRATE INVESTIGATION TASKS

Tasks associated with the groundwater nitrate investigation were outlined in the Work Plan (MWH, 2002). The objective of the work was to investigate potential sources and extent of nitrate concentrations in groundwater at the site. The tasks included:

- Review available data for nitrate data in the region
- Review EPNG site information to investigate potential, on-site nitrate source(s)
- Sample existing selected monitoring wells

The results and findings of these tasks are described in the following sections.

3.2 REGIONAL NITRATE DATA

A review of available literature and databases was conducted in an attempt to determine potential background nitrate concentrations in alluvial aquifers in the area. Databases maintained by USGS and other sources/documents were reviewed. Following is a brief summary of the findings.

- USGS Hydrogeologic Maps (Levings et al, 1990): Maps of the area present groundwater nitrate data from 29 wells in the Naciemento Formation collected between 1938 1984. Nitrate concentrations ranged between 0.02 and 5.6 mg/L. These concentrations are all below the nitrate standard of 10 mg/L.
- USGS Surface Water Data from Animas River, San Juan River and La Plata River near Farmington, USGS Stations: 09364500, 09365000, 09387500, 09367500 (Data from 1970 – August 2001): Total nitrogen concentrations ranged between 0.05 and 22 mg/L. Total nitrate/nitrite concentrations ranged between 0 and 3.2 mg/L.
- New Mexico Bureau of Mines and Mineral Resources, Hydrogeology and Water Resources of San Juan Basin, New Mexico, (Stone et al 1983): According to this report, "...stormflow specific conductance values as high as 7000 umhos" have been reported to occur when "....the rising water dissolves salts left by evaporation at the channel floor..... Analysis of salt or "alkalai deposits" indicates NaNO₃ evaporite mineral (page 23)."

In order to investigate the presence of nitrate-rich evaporative salts at the site, a soil sample was collected and leachate from the soil was analyzed for nitrate (as well as other major cations and anions). The nitrate concentration in the leachate was 8.5 mg/L. Other major ion analyses included sulfate (199 mg/L), chloride (23.6 mg/L), sodium (126 mg/L), calcium (46 mg/L), magnesium (3.2 mg/L) and potassium (5.8 mg/L). The laboratory report for this analysis is attached in Appendix B. These data indicate that

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evaporite salt deposits may be present at the site and based on the results of the leachate test may produce concentrations high enough to generate elevated nitrate concentrations in groundwater.

3.3 BLANCO PLANT SOURCE INVESTIGATION

Blanco Plant files were reviewed and appropriate site personnel were interviewed to investigate the presence of nitrogen-containing compounds on-site that may constitute a potential source(s). A site interview was conducted on December 16, 2002 and is attached as Appendix A to this Report. Potential sources were identified during the interview, as described below.

The following potential sources in the D plant area were identified:

- A possible leach field for the old office and lab building.
- An old chemical storage building that was once in that area. However, this building apparently had a concrete floor and no significant spills of nitrate-based chemicals were reported.

The following potential sources in the area around MW-2 were identified:

- North Flare Pit: The only known discharge into the flare pit would have been pipeline condensates. These condensates typically do not contain high concentrations of nitrates.
- Kutz separator evaporation ponds: The Kutz separator ponds receive pipeline condensates from the field. The hydrocarbons and water are separated, water evaporated and hydrocarbons recovered for sale to the local refinery.

The following potential sources near the South flare pit area were identified:

- Former Fertilizer Storage Shed: The Shed was located near the south fence in the area of the South Flare pit and was used to store fertilizer for the golf course to the south and east of the plant fence. No large spills of fertilizer were reported.
- Sewer Pit: A sewer pit that may have stored sewage from the plant or camp was also in the area of the south flare pit. Water from the camp housing sewage lagoons (mostly located south and east of the plant fence) was used throughout the plant and camp area for dust control and irrigation.

In approximately 1983, the corrosion-inhibiting chemical used in the cooling system for compressors in the B plant was switched to a nitrite-based chemical. The chemical was used in a closed system in small quantities and no known spills of significant volume occurred. The chemical is called Unichem 2310 and its main ingredient is sodium nitrite. This sodium nitrite-based chemical is currently used in the A plant compressors. Specific concentrations are not reported in the MSDS sheet. The B plant was decommissioned in

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1988 and demolished in 1989. The former B plant area was due east and cross-gradient from the D plant area.

In addition, a nitrite-based chemical is used is the boiler water to prevent scaling. Again, no significant spills of this chemical have been reported at the plant. The chemical is called Unichem 3030. The main ingredient is listed as sodium nitrate at 15%. Other ingredients include Ethylenediaminetetraacetic acid, tetrasodium salt, potassium hydroxide and trisodium nitrilotriacetate. The boiler area is due south and cross-gradient of the D plant area.

Based on site knowledge there does not appear to be a known source of nitrate or nitrite to groundwater resulting from plant operations or an on-site source.

3.4 GROUNDWATER NITRATE DATA

Groundwater samples were recently collected (September 2002) from wells MW-6 and MW-18 using standard purging and sampling techniques and analyzed for nitrite and nitrate concentrations. Groundwater sampling was attempted at wells MW-5, MW-7, MW-10 and MW-17 at this time, however these wells were dry and could not be sampled. The wells listed above were selected because they had not been recently sampled and would provide additional information on the extent of nitrate in the groundwater. Nitrate concentrations in wells MW-6 and MW-18 were 95.1 mg/L and 3.1 mg/L, respectively, consistent with historic data for these wells. Nitrite was not detected in either sample. Laboratory analytical reports are included in Appendix B.

Historic and recent groundwater nitrate data from several rounds of groundwater sampling (1991 – 2002) at the site (including North Flare Pit wells) are presented in Table 3.1, *Groundwater Nitrate Analytical Data.* These data indicate that nitrate concentrations have consistently exceeded NMWQCC standards in monitoring wells, MW-2, MW-6, MW-14, MW-15, MW-28, MW-29 and MW-30. Monitoring well MW-2 has not been sampled since 1994 because the well has been dry.

The most recent nitrate concentration from each of the wells is presented on Figure 3.1. The 10 mg/L iso-concentration contour, based on May/September 2002 nitrate data, is also presented on this figure to indicate areas in exceedance of the NMWQCC standard. As shown in this figure, there is no obvious source or apparent trend in the nitrate data. Instead, there appears to be confined areas or "hot spots" of high nitrate concentrations adjacent to wells with nitrate concentrations consistently below NMWQCC standards. In addition, there is no indication that high nitrate groundwater is migrating off site.

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4.0 **PROPOSED ACTIONS**

In order to continue to monitor groundwater nitrate concentrations at the site, the following actions will be conducted by EPNG:

- All groundwater monitoring wells on the Blanco Plant and in the North Flare Pit area will be sampled annually and analyzed for nitrate+nitrite concentrations, as shown in Table 4.1, *Groundwater Sampling Schedule*.
- Groundwater samples from monitoring wells in the D Plant Area (MW-12, MW-13, MW-14 and MW-15) will also continue to be analyzed for chlorinated hydrocarbon compounds, as listed in Table 4.1.
- The results of the nitrate and chlorinated hydrocarbon groundwater sampling will be reported to NMOCD in annual groundwater monitoring reports (typically submitted in August of each year).
- In accordance with the approval letter from NMOCD, dated May 3, 2002, EPC will plug and abandon monitoring wells MW-10, MW-16, MW-17 and MW-18.
- EPNG will notify NMOCD at least 48 hours in advance of all scheduled sampling activities, such that NMOCD has the opportunity to witness the events and split samples, if desired.

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5.0 REFERENCES

Bechtel Environmental, 1989. Groundwater Investigation Report, El Paso Natural Gas Company's Blanco Plant, San Juan County, New Mexico. January 1989.

Dana, J.D., 1977. Manual of Mineralogy, 20th Edition. John Wiley and Sons, New York.

- K.W. Brown and Associates, Inc, 1990. Site Investigation of the Blanco Plant, San Juan County, New Mexico. Prepared for El Paso Natural Gas Company. February 1990.
- Levings et al. 1990. USGS Hydrogeologic Maps (Map HA-720-A)
- MWH, 2002. Groundwater Nitrate Work Plan for Blanco South Flare Pit and D Plant Areas. July 2002.
- Stone, et al. 1983. *Hydrogeology and Water Resources of San Juan Basin, New Mexico.* NM Bureau Mines and Mineral Resources

Tables



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TABLE 3.1 GROUNDWATER NITRATE ANALYTICAL DATA (1991 - 2002) BLANCO PLANT - SAN JUAN COUNTY, NEW MEXICO

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		Nitrate (mg/l)			Nitrate (mg/l)			Nitrate (mg/l
	NMOCD Standard	10		NMOCD Standard	10		NMOCD Standard	10
Monitoring Well	Sample Date		Monitoring Well	Sample Date		Monitoring Well	Sample Date	
	18-Jun-1991	100		19-Jun-1991	50			
	23-Feb-1993	180		24-Feb-1993	50		07-Oct-1993 02-Feb-1994	2.1
MW-2	08-Jun-1993	256		8-Jun-1993	48.1		20-Aug-1994	2.83
WINA-Z	29-Sep-1993	228		28-Sep-1993	43	1	20-Dec-1994	2.72
		233				1000		0.33
	10-Feb-1994	249	MW-15	27-Jan-1994	43.7	MW-28	16-Feb-1995	1.56
	29-May-2002	dry		8-Aug-2000	35		10-Aug-2000	25
	18-Jun-1991	0.08		9-Nov-2000	38		10-Nov-2000	53
	19-Feb-1993	<1.0		22-Mar-2001	25		23-Mar-2001	34
	07-Jun-1993	<1.0		28-Aug-2001	30		28-Aug-2001	63
MW-5	27-Jan-1994	<1.0		28-May-2002	24	L	28-May-2002	83
	08-Aug-2000	4.6		19-Jun-1991	0.07		07-Oct-1993	8.3
	08-Aug-2000	4.6	MW-16	25-Feb-1993	<u>3.68</u> <1.0		02-Feb-1994	19.6
	10-Nov-2000	4	1000 47	8-Jun-1993			20-Aug-1994	28.84
	24-Sep-2002	dry	MW-17	25-Feb-1993	15.3		20-Dec-1994	41
	19-Jun-1991	110	ļ	24-Sep-2002	dry	MW-29	16-Feb-1995	28.1
	19-Feb-1993	63.5		25-Feb-1993	8.19		10-Aug-2000	50
	07-Jun-1993	76.4	MW-18	8-Jun-1993	<1.0		10-Nov-2000	66
MW-6	28-Sep-1993 07-Oct-1993	85.9 94.5		28-Sep-1993 24-Sep-2002	<1.0 3.1		26-Mar-2001 28-Aug-2001	70
IAI AA-D	26-Jan-1994	95.8		19-Jun-1991	70		28-May-2002	58 70
	20-Jan-1994 20-Aug-1994	1.68	MW-19	25-Feb-1993	10.6		07-Oct-1993	28.1
	20-Dec-1994	94		10-Jun-1993	NA		02-Feb-1994	57.1
	16-Feb-1995	90.6		13-Nov-2000	<0.1		20-Aug-1994	67.63
	10-Nov-2000	59		26-Mar-2001	0.19	MW-30	16-Feb-1995	91.3
	24-Sep-2002	95.1	1	30-May-2002	0.13		10-Aug-2000	84
· · · · · · · · ·	18-Jun-1991	0.28		26-Sep-1992	NA		10-Nov-2000	70
MW-7	07-Jun-1993	3	MW-20	24-Feb-1993	<1.0	1	26-Mar-2001	72
	27-Sep-1993	<2.8		10-Jun-1993	<1.0		28-Aug-2001	76
	29-May-2002	dry		29-Sep-1993	<1.0		28-May-2002	66
	24-Sep-2002	dry	1	27-Jan-1994	<1.0	N		
	18-Jun-1991	<0.06		13-May-1994	NA			
	19-Feb-1993	1.95	1	22-Aug-1994	NA			
	07-Jun-1993	<1.0		13-Nov-2000	damaged			
	27-Sep-1993	<1.0		26-Sep-1992	0.62			
MW-8	27-Jan-1994	<1.0	MW-23	1-Feb-1993	NA			
	10-Nov-2000	<0.1		25-Feb-1993	0.56			
	10-Nov-2000	<0.1		8-Jun-1993	<1.0			
	23-Mar-2001	0.21	1	29-Sep-1993 10-Feb-1994	<1.0 <1.0			
	23-Mar-2001	0.21		13-May-1994	NA			
	28-Aug-2001 28-May-2002	0.33	1	22-Aug-1994	NA			
	18-Jun-1991	0.74	1	13-Nov-2000	0.12			
	19-Feb-1993	1.19		26-Mar-2001	0.18			
	07-Jun-1993	2.16		30-May-2002	0.23			
MW-10	27-Sep-1993	2.1		26-Sep-1992	1.42			
	27-Jan-1994	1.95	MW-24	23-Feb-1993	<1.0			
	28-May-2002	dry		10-Jun-1993	<1.0			
	24-Sep-2002	dry		29-Sep-1993	<1.0			
	19-Jun-1991	7.8	1	10-Feb-1994	<1.0			
	25-Feb-1993	7.82	1	13-May-1994	NA			
	07-Jun-1993	8.45	1	22-Aug-1994	NA			
	28-Sep-1993	9.1	I	13-Nov-2000	0.1			
MW-12	27-Jan-1994	7.32	1	26-Mar-2001	0.18			
	08-Aug-2000	<10	 	30-May-2002	0.15			
	09-Nov-2000	5.7	Marian	25-Feb-1993	23			
	22-Mar-2001 28-Aug-2001	8.4	MW-26	10-Jun-1993 26-Mar-2001	8.23 0.24			
	28-Aug-2001 28-May-2002	8.0		30-May-2002	0.24			
	19-Jun-1991	<u>2.0</u> 6.3	L	26-Feb-1993	<1.0			
	24-Feb-1993	10.9	MW-27	10-Jun-1993	<1.0			
	08-Jun-1993	8.09		30-Sep-1993	<1.0			
	28-Sep-1993	4.1		2-Feb-1994	<1.0			
MW-13	27-Jan-1994	5.37	1	14-May-1994	NA			
	08-Aug-2000	<12.5		13-Nov-2000	0.28			
	09-Nov-2000	9.8		26-Mar-2001	0.61			
	22-Mar-2001	13	L	30-May-2002	0.21			
	28-Aug-2001	7.9						
	28-May-2002	6.0						
	25-Feb-1993	19.2						
]	08-Jun-1993	17.5						
1	28-Sep-1993	11.8						
MW-14	27-Jan-1994	15.4						
j	08-Aug-2000	19						
1	13-Nov-2000	0.24						
1	22-Mar-2001	13						
	28-Aug-2001	20						
		15						

TABLE 4.1 GROUNDWATER SAMPLING SCHEDULE BLANCO PLANT - SAN JUAN COUNTY, NEW MEXICO

Monitoring Well	Analyses	Sampling Frequency
North Flare Pit Area		
MW-2 ,	Nitrate+Nitrite	Annuai
MW-19	Nitrate+Nitrite	Annual
MW-23	Nitrate+Nitrite	Annual
MW-24	Nitrate+Nitrite	Annual
MW-26	Nitrate+Nitrite	Annual
MW-27	Nitrate+Nitrite	Annual
South Flare Pit Area	·	
MW-5	Nitrate+Nitrite	Annual
MW-6	Nitrate+Nitrite	Annual
MW-7	Nitrate+Nitrite	Annual
MW-8	Nitrate+Nitrite	Annual
MW-28	Nitrate+Nitrite	Annual
MW-29	Nitrate+Nitrite	Annual
MW-30	Nitrate+Nitrite	Annual
D Plant Area		
MW-12	Nitrate+Nitrite, CHCs	Annual
MW-13	Nitrate+Nitrite, CHCs	Annual
MW-14	Nitrate+Nitrite, CHCs	Annual
MW-15	Nitrate+Nitrite, CHCs	Annual

CHCs: Chlorinated Hydrocarbons by EPA M 8260: 1,1-DCA, 1,1-DCE, 1,2-DCE, cis 1,2-DCE, trans 1,2-DCE, TCE and PCE.

Nitrate+Nitrite as N by EPA M 353.2, 354.1, or 4500.

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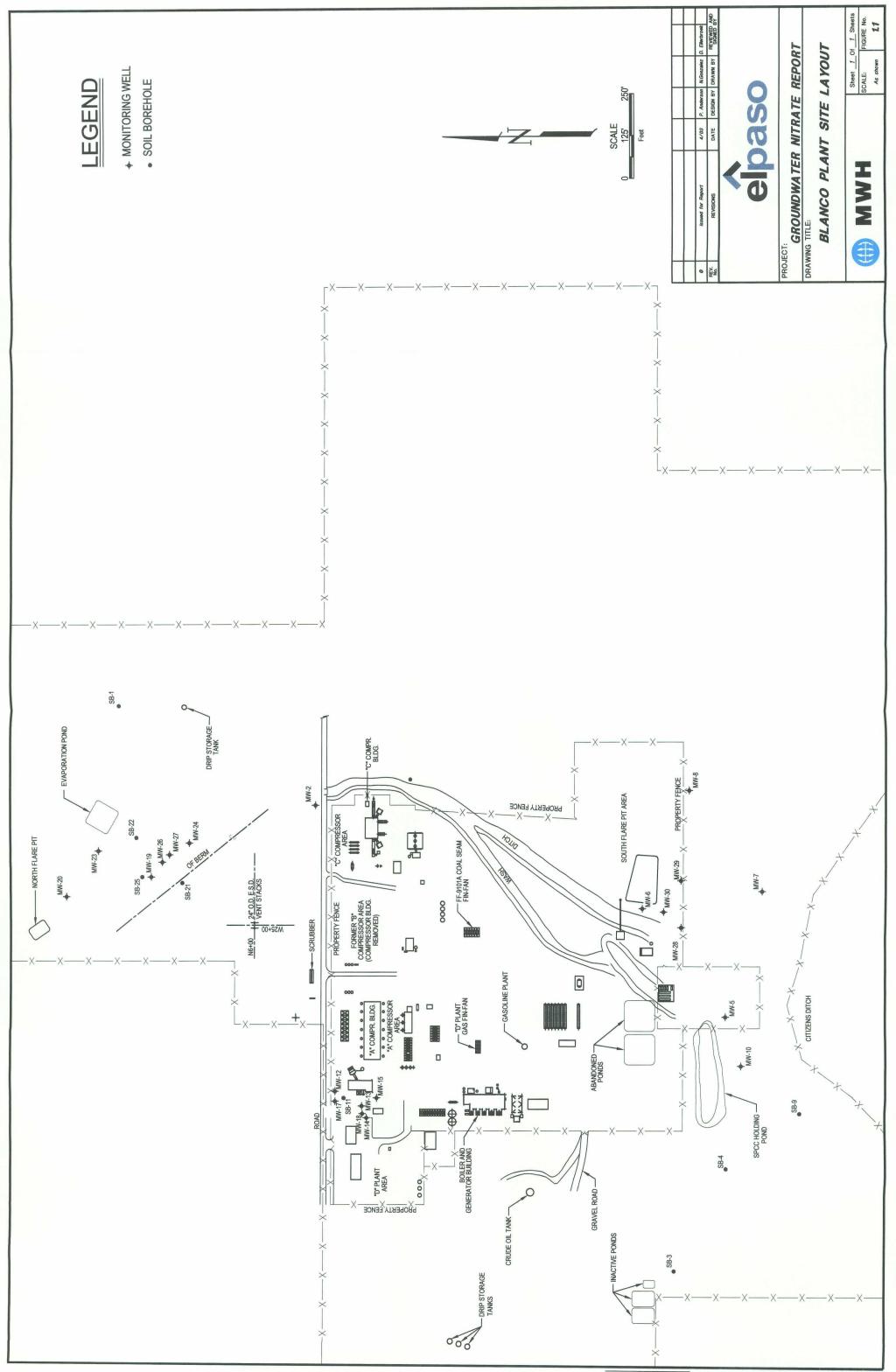
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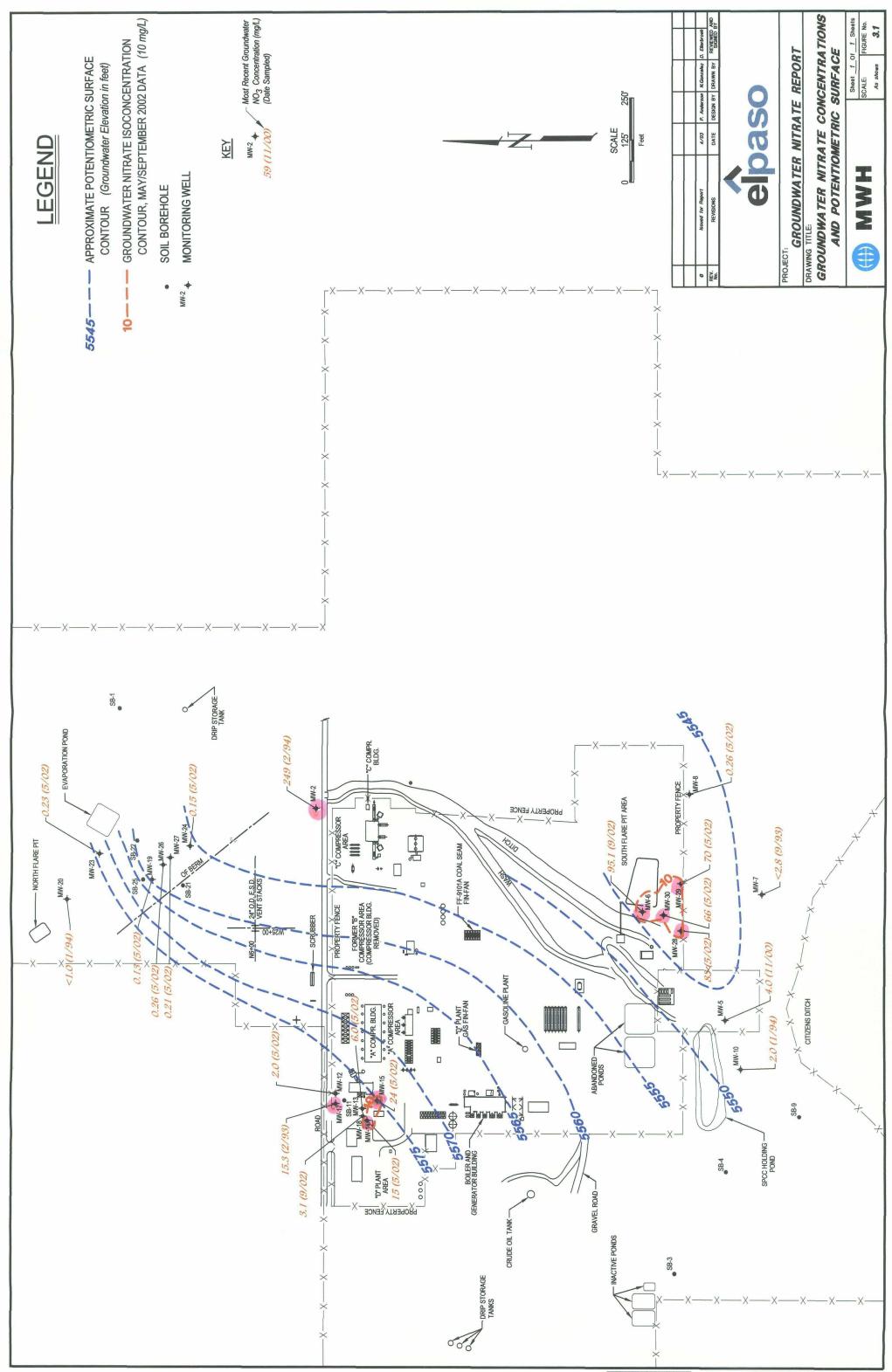
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AutoCAD FILE: GW-Location Map 3-03 PROJECT NUMBER: 5030074.011804



AutoCAD FILE: GW-VIItrate-pot surf 4-03 PROJECT NUMBER: 5030073.011804

Appendix A



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APPENDIX A

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BLANCO PLANT SITE INTERVIEWS (February 28, 2003)

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MEMORANDUM

To: Blanco South Flare Pit File

From: Scott Pope

Date: February 28, 2003

Place: Environmental Remediation

Subject: Interview with Don Sanders Regarding Potential Sources of Nitrates in Groundwater at Blanco Plant

On December 16, 2002 I met with Don Sanders at the Blanco Plant to discuss potential sources of nitrates that would have been released in significant quantities to cause impact to groundwater. Don has worked at the plant since 1980 and has some historical knowledge of operations of the plant prior to 1980.

I showed Don the current plume map showing concentrations above standards in the D plant area, north of the plant near MW-2 and the area south of the plant near the former south flare pit. He identified the following as potential sources in the D plant area:

- Possible leach field for the old office and lab building.
- Old chemical storage building that was once in that area. However, this building apparently had a concrete floor and no significant spills of nitrate-based chemicals were reported.

Potential sources in the area around MW-2:

- North Flare Pit. However the only know discharge into the flare pit would have been pipeline condensates. These condensates typically do not contain high concentrations of nitrates.
- Kutz Separator Evaporation Ponds. Again, the Kutz separator ponds receive pipeline condensates from the field. The hydrocarbons and water are separated, water evaporated and hydrocarbons recovered for sale to the local refinery.

Potential sources near the South Flare Pit area:

- Former Fertilizer Storage Shed. The Shed was located near the south fence in the area of the South Flare Pit. The shed was used to store fertilizer for the golf course south and east of the plant fence. No large spills of fertilizer were reported.
- A Sewer Pit. A sewer pit that may have stored sewage from the plant or camp was also in the area of the South Flare Pit. Water from the camp housing sewage lagoons (mostly located south and east of the plant fence) were used throughout the plant and camp area for dust control and irrigation.

When asked about other potential sources of nitrates, Mr. Sanders indicated that in approximately 1983 the corrosion inhibiting chemical used in the cooling system for compressors in the B plant was switched to a nitrite-based chemical. He added that the chemical was in a closed system and was used in small quantities and no known spills of significant volume had occurred. The chemical is called Unichem 2310 and its main ingredient is sodium nitrite. This sodium nitrite based chemical is

Appendix A: Blanco Plant Site Interview

currently used in the A plant compressors. Specific concentrations are not reported in the MSDS sheet. The B plant was decommissioned in 1988 and demolished in 1989. The former B plant area was located due east and cross gradient of the D plant area.

Another area where a nitrite-based chemical is used is in the boiler water to prevent scaling. Again no significant spills have been reported of this chemical at the plant. The chemical is called Unichem 3030. The main ingredient is listed as sodium nitrate at 15%. Other ingredients include Ethylenediaminetetraacetic acid, tetrasodium salt, potassium hydroxide, and trisodium nitrilotriacetate. The boiler area is located due south and cross gradient of the D plant area.

In conclusion, based on site knowledge there does not appear to be a known source coming from the plant operations. Even if the potential sources identified had impacted groundwater they are generally located cross gradient or down gradient of areas identified as having elevated nitrates.

Appendix B



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APPENDIX B

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LABORATORY ANALYTICAL REPORTS

GROUNDWATER NITRATE/NITRITE ANALYSES MW-6 AND MW-18

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ANALYTICAL DATA REPORT SEPTEMBER 2002

EL PASO BLANCO PLANT

Applied P & Ch Laboratory

13760 Magnolia Ave. Chino CA 91710

Tel: (909) 590-1828 Fax: (909) 590-1498

Submitted to: Montgomery Watson Harza Attention: Brian Buttars 10619 South Jordan Gateway Salt Lake City UT 84095 Tel: (801)617-3200 Fax: (801)617-4200

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APCL Analytical Report

Service ID #: 801-025076 Collected by: Ashley Lowe Collected on: 09/24/02
 Received:
 09/25/02

 Extracted:
 N/A

 Tested:
 09/25/02

 Reported:
 10/02/02

Sample Description: Water Project Description: 220013

San Juan River Basin

Analysis of Water Samples

				Analys	sis Result
Component Analyzed	Method	Unit	PQL	MW-6 Blanco 02-05076-1	MW-18 Blanco 02-05076-2
Dilution Factor				50	5
NITRATE AS N	EPA300.0	mg/L	0.04	95.1	3.1
NITRITE AS N	EPA300.0	mg/L	0.04	< 2	< 0.2

PQL: Practical Quantitation Limit. MDL: Method Detection Limit.

N.D.: Not Detected or less than the practical quantitation limit.

CRDL: Contract Required Detection Limit "-": Analysis is not required.

J: Reported between PQL and MDL.

Listed Dilution Factors (DF) are relative to the method default DF. All unlisted DFs are 1.0

Respectfully submitted,

Domitte Lau Laboratory Director Applied P & Ch Laboratory

CADHS ELAP No.: 1431

Cl-0984 D004 🕅 02-5076 📮 Page: 1 of 1

Applied P & Ch Laboratory

13760 Magnolia Ave. Chino CA 91710 Tel: (909) 590-1828 Fax: (909) 590-1498

Submitted to: Montgomery Watson Harza Attention: Brian Buttars 10619 South Jordan Gateway Salt Lake City, UT 84095 Tel: (801)617-3200 Fax: (801)617-4200

APCL QA/QC Report

Service ID #: 801-025076 Collected by: Ashley Lowe Collected on: 09/24/02Sample description: Water

Received: 09/25/02 Tested: 09/25/02 Reported: 10/03/02

801-025076QC

Project: San Juan River Basin /220013

Analysis of Water

Component Name	Analysis Batch #	CCV (mg/L)		M-Blank	Conc. Unit	SP Level	•		MSD %Rec	MS/MSD %RPD	Contro %Rec	l Limit %Diff
WET Analysis in Water							•					
Nitrite as N-NO $\frac{1}{2}$, by IC	02W4532	1.50	95	N.D.	mg/L	7.50	100	104	104	1	75-125	20
Nitrate as N-NO $\frac{1}{3}$, by IC	02W4532	1.50	94	N.D.	mg/L	7.50	101	99	99	0	75-125	20

*: LCS/LCSD is used.

Notation: ICV - Initial Calibration Verification CCV - Continuation Calibration Verification LCS - Lab Control Spike MS - Matrix Spike MSD - Matrix Spike Duplicate ICS - Interference Check Standard MD - Matrix Duplicate N.D. - Not detected or less than PQL

CCB - Continuation Calibration Blank M-blank – Method Blank SP Level - Spike Level %Rec - Recovery Percent %RPD - Relative Percent Differences %Diff - Control Limit for %RPD ICP-SD - ICP Serial Dilution N.A. - Not Applicable

Respectfully submitted,

Regina Kirakozova, Associate QA/QC Director Applied P & Ch Laboratory

DATA VALIDATION WORKSHEET

「	Analytic	cal Method/Analytes:	Wet Chemistry		Sample (Collection Date(s):	09/24/02
and the second		Laboratory:	APCL		Μ	WH Job Number:	SJRB (So. Flare Pit)
A. 1. 1.	Bato	ch Identification:	02-05076			Matrix:	Water
	QC	Identification ^(a) :				Page:	1 of 2
	Valio	dation Complete:	(Date/Signature)	Ha	s_10	9-9-02	
きに開き	Project	Sample ID	Lab. ID	Hits (Y/N)	Quals.	Comm	ents
And the star	SF SF	Blanco MW-6 Blanco MW-18	02-05076-01 02-05076-02	Y Y			
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	Analytical Method:V	Vet Chemi	stry	_ MW	'H Job N	umber: _	SJRB	(South Fl	are Pit)
いたの時代であ	Laboratory:	APCL		Batch Identification:		ication: _	02-05076		
いながあ									
1	Validation Criteria								
83	Analytes	Nitrate	& Nitrite						
AN POL	Analytical Method	U.S. EF	A 300.0						
	Sample ID	Blanco MW-6	Blanco MW-18						
al all	Lab ID	02-05076- 01	02-05076- 02						
	Hardcopy vs. Chain-of-Custody	A	А						
	Holding Time	Α	Α.						
	Analyte List	A	А						
鑴	Reporting Limits	А	А						
Star Barrier	Method Blank (all methods)	Α	А						
	Equipment Rinseate Blanks	N/A	N/A						
i the sec	Field Duplicate/Replicate	N/A	N/A						
	Initial Check Verification (ICV)	N	N						
	Continuing Calibration Verification (CCV)	Α	Α						
	Laboratory Control Sample (LCS)	А	A						
權	Laboratory Control Sample Duplicate (LCSD)	N	N						
	Matrix Spike/Matrix Spike Dup. (MS/MSD)	A	Α						
and the second	Matrix Duplicate	N/A	N/A						
	Initial Calibration	N	N						1
	Analysis Time(s)	N	N						
14 F.	EDD vs. Hardcopy	N	N						

(a) List QC batch identification if different than Batch ID

A indicates validation criteria were met

A/L indicates validation criteria met based upon Laboratory's QC Summary Form

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X indicates validation criteria were not met

N indicates data review were not a project specific requirement

N/A indicates criteria are not applicable for the specified analytical method or sample N/R indicates data not available for review

NOTES:

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EDD vs. Chain of Custody

-	·						SAMPLI		·
	Project No: Location: _£ Project Man	<u>3lance</u>	2 Well	No: _M	V-18		Devel	opment 🛛	Sampling D Weather <u>80°, Sugn</u> Y
	Depth to Water Colum		•						Measuring Point
ſ	Sampling M		Bottom Valv	e Bailer 🕒	Double (Check Val	ve Bailer 🗌] Stainles:	Other □ s-Steel Kemmerer □ neters □ Other <u>er bail dry</u>
			<u> </u>		Water Volum				
		t of water		Gallons			Dunces		Gal/oz to be removed
•	<u>0.16 ×</u> Time (military) <u>12:59</u>	0.48 pH _7.11	SC (umhos/cm) 2340	_30.9	Eh-ORP (millivolts)	D.O. (mg/L)	Turbidity (NTU)	Vol Evac. (gal.) 8 o z	0.23gal = 14 oz Comments/ Flow rate light brown, silt partic
		<u>6.85</u>	2150	28.4				1202	
		· · · · · · · · · · · · · · · · · · ·			·				
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F	Final: Time B:21	рН <u>6.85</u>	sc 2150		Eh-ORP		-	Ferrous Iron	Vol Evac. Comments/Flow rate
	<u> </u>	<u> </u>	er well w d 14 ic at A	bottle	after ; left said	purgin gram	g 120 e back	z. Cam z at lu	e back to sample f:06 & filled '2
	INSTRUMEN		DO N Conductivity	Ionitor [Meter []			Tempe	rature Mete Othe	
		Blanco	MW-18	Sam	_	~			DCs 🗍 Alkilinity 🗍 TKN 🗍 NM WQCC Metals 🗍
	Total Phosph MS/MSD				BD N				

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Project No:	2200	13	Projec	t Name:	ian Juar	River B	Client:	MWH
		Well						
	Δ				9/24/02		•	Weather 80° Sunny
	-	. /			1 1			Measuring Point TOC
•		t_Z.102'				31.222		· · · · · · · · · · · · · · · · · · ·
		Submersible Bottom Valve	a Bailer 🗗		Check Valv	/e Bailer 🗌	Stainles	s-Steel Kemmerer 🗍 🚬 👔
Criteria: 3 t	o 5 Casir	ng Volumes c				tion of India	ator Param	neters 🛛 Other <u>or bail dr</u>
Gal/ft x f	t of water		Gallons	Vater Volum		Dunces		Gal/oz to be removed
0.65	(Z.107	2 1,	37×3					4.1gal
Time (military) //:45	рН <u>7.0/</u> 7.00	SC (umhos/cm) 5340 5020	Temp (°C) <u>24.8</u> 24.1	Eh-ORP (millivolts)	D.O. (mg/L)	Turbidity (NTU)	Vol Evac. - (gal.) 24 oz 32	Comments/ Flow rate light yellow, clear
	<u>7.00</u>	5020	22.9	······································			<u>76</u> 48	
	6.84	4910	21.6		<u></u>		60	;
	6.84	4950	21.5				72	bailing down
· · · · · · · · · · · · · · · · · · ·	10.84	4870	21.4	··········		·	80	yut the boot
	6.84	488D	21.6	·			85_	almost dry
	<u>v.a.</u>		<u></u>	_ <u></u> -			DRV	
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	рН	SC	Temp	Eh-ORP	D.O.	Turbidity	Iron	Vol Evac. Comments/Flow rate
516	6.84	4880	21.6				· · · · · · · · ·	8502
	s. Ba	led dr	y th	en ret	urn oc	ZD,	nine la	for to collect samp
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LABORATORY <u>APCL</u> contract El Paso Corp., San Jaun River Basin MWH		CHAIN OF CUSTODY RECORD/LAB WORK REQUEST	DF CUS	тору	RECC	DRD/L	AB	WOR	X X		LSI	Chain of C Page Air Bill No.	chain of Custody ID <u>0209244LD</u> Page of Air Bill No. <u>83んらら5790152</u> 2
	(801) 6							ANALY	SES RE	ANALYSES REQUESTED	G		LABORATORY USE ONLY
Project <u>San Juan Kiver</u> Project Number <u>220013</u> Date Due <u>21 Days</u> Sampler's Name <u>ASh)ey Lo</u> (print blearly	n <u>Kiver Brin</u> 20013 Nev Lowe (print Elearly)		Dollected	b9t29lloO	^(d) əupindəəT pni	SW-846 8021B	1.091 A932	A0747 & B0109 & A0747 & B0109 & B0108 & 7470A	s USEPA 300.0	0.05EPA 300.0			SAMPLES WERE: 1 Shipped or hand delivered <i>Notes</i> : 2 Ambient or Chilled
Location	Sample	e Depth Interval (ff)) ətsü	əmiT XinteM			<u></u>						Notes: 3 Temperature
Blanco	0-MW	\$	9/24/02	13: 48 WG	6 B					7			4 Received Broken/Leaking
Blanco	MW-18		1/20/42/6	13:41 MG	60					د ر			
													Notes:
					_								5 Property Preserved
	-												
				-					L	2			
								 			D		6 Received Within Holding Times
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													COC Tape Was:
													1 Present on Outer Package
													Y NA
													2 Unbroken on Outer
													Y N NA
(a) Matrix: AA SO – Soil WQ W/S Surface Water	AA – Air WQ – Trip Blank/ Equipment Blanks	(b) Sampling Teo Composite=C	(b) Sampling Technique: Composite=C		Submersible Pump=SP Bladder Pump=BP Boilore B	p=SP		Location IDs: Groundwater Sites=GW	s: r Sites=G		North Flare Pit=NF South Flare Pit=SF	=SF	3 Present on Sample Y N NA
	WW - Wastewater	Hand A	Hand Auger=HA	Wellhea Hydropu	Wellhead Faucet=WF Hydropunch=HP	=WF	Jac Jac	Jaquez=JA		0			4 Unbroken on Sample Y NA
Relir	Relinquished by/Affiliation				Re	Received by/Affiliation	/Affiliat	ion			Date	Time	Notes:
Rehley Low	w MESE			1 miles	エ						124/02	14:00	Discrepancies Between
	1			3	M Pr						m/524.		Record?
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SOIL LEACHATE ANALYSIS

ANALYTICAL DATA REPORT NOVEMBER 2002

EL PASO BLANCO PLANT

Client:	El Paso Natural Gas			
Sample ID:	1127020845		Date Received:	11/27/02
Lab ID:	0302W04992		Date Reported:	12/10/02
Matrix:	Soil		Date Sampled:	11/27/02
Condition:	Cool/Intact		Time Sampled:	0845
Para	meter	Analytical Result	Units	
1+1 SOIL WA	TER EXTRACT			<u>, </u>
PH		7.8	s .u.	
Electrical Cond	luctivity	0.70	mmhos/cm	•
Solids - Total D	Dissolved (Calc)	420	mg/Kg	
Alkalinity (CaC	O3)	20	mg/Kg	

Hardness (CaCO3)	128	mg/Kg
Major Cations		
Calcium	46.0	mg/Kg
Magnesium	3.2	mg/Kg
Potassium	5.8	mg/Kg
Sodium	126	mg/Kg
Major Anions		
Bicarbonate (HCO3)	24	mg/Kg
Carbonate (CO3)	<1	mg/Kg
Chloride	24	mg/Kg
Nitrate (IC)	8	mg/Kg
Fluoride	2.20	mg/Kg
Sulfate	199	mg/Kg

Reference: EPA - "Methods for Chemical Analysis of Water and Wastes (MCAWW)" - EPA/600/4-79-020 - March, 1983. SM - "Standard Methods for the Examination of Water and Wastewater", APHA-AWWA-WEF,19th Edition, 1995. EPA - "Methods for the Determination of Metals in Environmental Samples" - Supplement I - 600/R-94-111 - May, 1994.

bet hot Reviewed By: