



MEMORANDUM

Date: December 29, 1993
To: Ron Kryzanowski - DPW
From: Paul Mazza - SFWD *PM*
Subject: San Antonio Pump Station Ground Water Report

After several discussions with Bob Hickman, it has been decided that the SFWD should take responsibility for submitting the quarterly Groundwater Monitoring Report and the monthly Water Table Elevation Reports to the Alameda County Health Dept. Please direct Jeff Willett at CDM to mail the SFWD copies and the Ala. Co. copy to Paul Mazza at the address below for distribution. Thanks.

cc: J. Willett
W. Tsai
L. Fong

ALCO
HAZMAT

94 FEB 16 AM 8: 26

Report of
Groundwater Monitoring
Third Quarter
San Antonio Pump Station

City and County of San Francisco

January 1994

Prepared For:

City and County of San Francisco
San Francisco Water Department
1000 El Camino Real
Millbrea, California 94030

Prepared By:

Camp Dresser & McKee Inc.
100 Pringle Avenue, Suite 300
Walnut Creek, California 94596

CDM

*environmental engineers, scientists,
planners, & management consultants*

CAMP DRESSER & McKEE INC.

*One Walnut Creek Center
100 Pringle Avenue, Suite 300
Walnut Creek, California 94596
510 933-2900, Fax: 510 933-4174*

February 7, 1994

Mr. Paul Mazza
San Francisco Water Department
1000 El Camino Real
Millbrea, California 94030

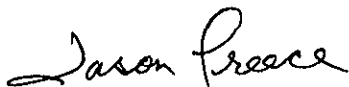
Subject: *Groundwater Monitoring Report, Third Quarter
San Antonio Pump Station, Alameda County*

Dear Mr. Mazza,

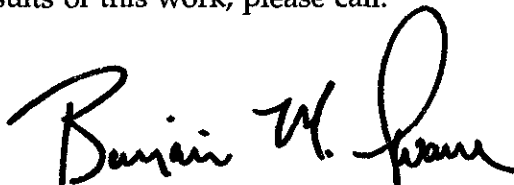
Enclosed are the results of the third quarter of groundwater monitoring conducted at the San Antonio Pump Station in rural Sunol Valley, California. The results of this groundwater sampling round confirm past sampling results which indicate that petroleum compounds previously stored in underground storage tanks have not been detected in the groundwater beneath the site.

If you have any questions about the results of this work, please call.

Sincerely,



Jason Preece
Environmental Scientist



Benjamin M. Swann, R.G.
Project Geologist

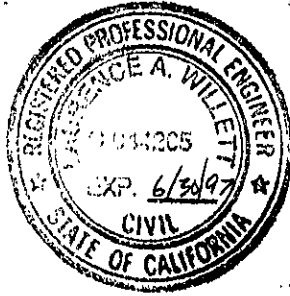
Enclosure

cc: Mr. Ron Krzyzanowski, CCSF, BCM

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PROFESSIONAL CERTIFICATION



.....
Prepared by CDM under the profession supervision of the persons whose seals
and signatures appear hereon.

Handwritten signature of Laurence A. Willett in cursive script, written over a horizontal line.

Laurence A. Willett, P.E.
Project Manager

This report has been prepared for the exclusive use of the City and County of San Francisco as it pertains to the San Antonio Pump Station located in Alameda County, California. Our services have been performed in accordance with applicable State and local ordinances, and generally accepted practices in the geosciences and environmental engineering field.

In the event that changes in the nature of the property occur, or additional relevant information about the property is brought to our attention, the conclusions and recommendations contained in this report may not be valid unless these changes and additional relevant information are review by CDM and the conclusions of this report modified or verified in writing.

San Antonio Pump Station Groundwater Monitoring Report Third Quarter

Introduction

This report presents the result of the third quarter of groundwater sampling conducted at the City of San Francisco's San Antonio Pump Station located at 5555 Calaveras Road in Sunol, California. Groundwater monitoring wells were installed at the site following the discovery of petroleum contamination associated with three underground storage tanks removed from the site in November 1991. The underground tanks consisted of two 10,000 gallon diesel fuel tanks and one 500 gallon waste oil tank. Following the discovery of soil contamination beneath the tanks, approximately 1,500 cubic yards of contaminated soil was excavated and removed from the site for disposal.

Three groundwater monitoring wells were subsequently installed to evaluate the groundwater conditions beneath the site. The groundwater monitoring wells were sampled in June 1992 for volatile organics, semi-volatile organics, and petroleum hydrocarbons. The results of the initial groundwater sampling indicated that groundwater had not been impacted at detectable levels by any of the previously detected soil contaminants or tank constituents. In order to monitor the long-term impact of the contaminants on groundwater, the Alameda County Health Care Agency (lead review agency) requested the collection and analysis of four quarters of groundwater samples. The first quarter of groundwater sampling was conducted in June 1993 and the second quarter in September 1993. Results from these sampling events again indicated that tank constituents had not impacted groundwater.

Sept '93
not presented
!!

This report presents the third quarter of groundwater sample results collected at the Sunol Pump Station.

Groundwater Sampling

On January 13, 1994, the three groundwater monitoring wells on-site (MW-1, MW-2 and MW-3) were sampled by Camp Dresser & McKee Inc. Prior to sampling, the groundwater elevations were measured to evaluate groundwater flow direction and gradient (see Table 1 Groundwater Depth and Elevation Data). Monitoring wells MW-2 and MW-3 were purged of a minimum of three well volumes using a 3.5-inch diameter bailer. Monitoring well MW-1 had very slow recharge as in previous sampling episodes and was purged of two well volumes using a disposable one-inch diameter bailer. Groundwater samples were also collected with disposal one-inch diameter bailers dedicated to each well (see Appendix B, Field Procedures). Groundwater samples were placed in one liter bottles and 40 milliliter volatile organic analysis vials pending transportation to CKY Incorporated Environmental Services in Pleasanton, California.

Table 1
Groundwater Depth & Elevation Data

	MW-1		MW-2		MW-3	
	Well elevation: 289.50		Well elevation: 288.98		Well elevation: 289.24	
	Total well depth: 15.90		Total well depth: 21.20		Total well depth: 21.22	
	Depth	Elevation	Depth	Elevation	Depth	Elevation
June 1992	14.95	274.55	14.74	274.24	15.43	274.31
June 1993	14.28	275.22	14.62	274.36	15.30	274.44
September 1993	14.82	274.68	15.18	273.80	15.50	274.24
October 1993	15.08	274.42	14.84	274.14	15.62	273.62
November 1993	no access	--	14.86	274.12	15.57	273.67
December 1993	14.04	275.10	14.70	274.28	15.43	273.81
January 1994	14.57	274.93	14.86	274.12	15.58	273.66

Analytical Procedures

Groundwater samples were analyzed for the compounds listed below. The laboratory analytical results and sample Chain-of-Custody documents are presented in Appendix A.

Table 2
Groundwater Analyses

Compound Type	Detection Limits micrograms/liter (µg/l)
TPH as Diesel	50
Total Oil and Grease	5,000
Acid and Base Neutral Extractables	2.0-80
Aromatic Volatile Hydrocarbons (BTEX)	0.3-0.6
Purgeable Halocarbons	0.2-2.0

Results and Conclusions

The results of this monitoring were non-detect for all compounds in groundwater from the three groundwater monitoring wells (see Appendix A).

The results of the groundwater elevation data is presented in Table 1 and displayed in Figure 1. The groundwater elevation has risen in groundwater monitoring wells MW-1 and MW-2 since the last sampling in September 1993, whereas, the level has dropped slightly in monitoring well MW-3. The wells exhibited their lowest level thus far during late October 1993. The groundwater flow continues to be to the southwest.

These results confirm that the contaminants released from the underground storage tanks have had no detectable impact on groundwater quality beneath the site.

CDM/CADD ST6

02/07/94 0:10:58

PLAN002A

X:\ACAD\5800-110\

GROUNDWATER
FLOW DIRECTION

MW-2
(274.12)

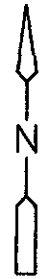
MW-1
(274.93)

MW-3
(273.66)

PUMP HOUSE
BUILDING

CALAVERAS ROAD

275.00
274.50
274.00



1" = 30'



EXPLANATION

MW-1
(274.68)



MONITORING WELL WITH
GROUNDWATER ELEVATION

275.00

ESTIMATED EQUIPOTENTIAL
LINE

ADAPTED FROM ENVIRONMENTAL BIO-SYSTEMS REPORT DATED NOVEMBER 1992.

SAN ANTONIO PUMP STATION

**GROUNDWATER MONITORING WELL LOCATION &
GROUNDWATER FLOW MAP
3rd QUARTER SAMPLING**



environmental engineers, scientists,
planners, & management consultants

Figure No. 1

Appendix A
Laboratory Results and Chain of Custody



**CKY incorporated
Environmental Services**

Date: 01/18/94
N9401-12

Camp Dresser & McKee
100 Pringle Avenue, Suite 300
Walnut Creek, CA 94596

Attn: Mr. Jason Preece

Subject: Laboratory Report
Project: San Antonio Pump Station

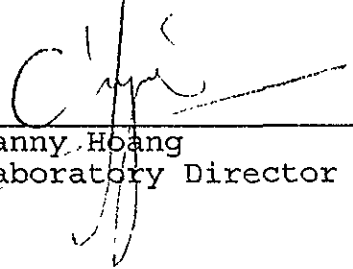
Enclosed is the laboratory report for samples received on 01/13/94. The samples were received in coolers with ice and intact; the chain-of-custody forms were properly filled out. The data reported includes:

<u>Method</u>	<u>No. of Analysis</u>
418.1	3 Water
M8015-D	3 Water
M8015-G	4 Water
EPA 601	4 Water
EPA 602 (BTEX)	4 Water
EPA 625	3 Water

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning these results.

Sincerely,



Danny Hoang
Laboratory Director

EPA METHOD 418.1
TOTAL RECOVERABLE PETROLEUM HYDROCARBONS

=====
CLIENT: CDM DATE REC'D: 01/13/94
PROJECT: SAN ANTONIO DATE EXTRACTED: 01/14/94
CONTROL NO: N9401-12 DATE ANALYZED: 01/14/94
MATRIX: WATER
=====

<u>SAMPLE ID:</u>	<u>CONTROL NO:</u>	<u>RESULTS</u> <u>(mg/L)</u>	<u>DETECTION LIMIT</u> <u>(mg/L)</u>
METHOD BLANK	N940112-BLK	ND	1
MW-1	N940112-01	ND	1
MW-2	N940112-02	ND	1
MW-3	N940112-03	ND	1

=====

EPA METHOD Mod. 8015-DIESEL
TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

=====
CLIENT: CDM DATE REC'D: 01/13/94
PROJECT: SAN ANTONIO DATE EXTRACTED: 01/14/94
CONTROL NO: N9401-12 DATE ANALYZED: 01/14/94
MATRIX: WATER
=====

<u>SAMPLE ID:</u>	<u>CONTROL NO:</u>	<u>RESULTS</u> (mg/L)	<u>H-C RANGE</u>	<u>%SURROGATE</u>	
				<u>1,4-DCB</u>	<u>Di-n-oct</u>
PREP BLANK	N9401-12-BLK	ND	N.A.	86	104
MW-1	N9401-12-01	ND	N.A.	83	92
MW-2	N9401-12-02	ND	N.A.	88	96
MW-3	N9401-12-03	ND	N.A.	82	96

DETECTION LIMIT: 1.0 mg/L
=====

EPA METHOD 5030/Mod. 8015-GASOLINE
TOTAL PETROLEUM HYDROCARBONS BY PURGE & TRAP

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=====
CLIENT:      CDM                      DATE REC'D:   01/13/94
PROJECT:     SAN ANTONIO              DATE ANALYZED: 01/14/94
CONTROL NO:  N9401-12                MATRIX:       Water
=====

```

<u>SAMPLE ID:</u>	<u>CONTROL NO:</u>	<u>RESULTS</u> <u>(mg/L)</u>	<u>DET. LIMIT</u> <u>(mg/L)</u>	<u>% SURRO</u> <u>RECOVERY</u>
M. BLANK	N940112-BLK	ND	1.0	80
MW-1	N940112-1	ND	1.0	92
MW-2	N940112-2	ND	1.0	91
MW-3	N940112-3	ND	1.0	104
TRAVEL BLANK	N940112-4	ND	1.0	93

EPA METHODS - 601

```

=====
CLIENT:      CDM                      DATE REC'D:    01/13/94
PROJECT:     San Antonio              DATE ANALYZED: 01/20/94
SAMPLE ID:   BLANK                   MATRIX TYPE:   Water
CONTROL NO:  N9401-12
=====

```

<u>PARAMETERS (601)</u>	<u>RESULTS (ug/L)</u>	<u>DETECTION LIMIT (ug/L)</u>
Dichlorodifluoromethane	ND	5
Chloromethane	ND	5
Vinyl Chloride	ND	5
Bromomethane	ND	5
Chloroethane	ND	5
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
Methylene Chloride	ND	5
Trans-1,2-Dichloroethene	ND	1
cis 1,2 Dichloroethene	ND	1
1,1-Dichloroethane	ND	1
Chloroform	ND	1
1,1,1-Trichloroethane	ND	1
Carbon Tetrachloride	ND	1
1,2-Dichloroethane	ND	1
Trichloroethene	ND	1
1,2-Dichloropropane	ND	1
Bromodichloromethane	ND	1
2-Chloroethylvinylether	ND	1
Trans-1,3-Dichloropropene	ND	1
Cis-1,3-Dichloropropene	ND	1
1,1,2-Trichloroethane	ND	1
Tetrachloroethene	ND	1
Dibromochloromethane	ND	1
Chlorobenzene	ND	1
Bromoform	ND	1
1,1,2,2-Tetrachloroethane	ND	1
M-Dichlorobenzene	ND	1
P-Dichlorobenzene	ND	1
O-Dichlorobenzene	ND	1

% Surrogate Recovery 92
=====



EPA METHODS - 601

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=====
CLIENT:      CDM                      DATE REC'D:   01/13/94
PROJECT:     San Antonio              DATE ANALYZED: 01/20/94
SAMPLE ID:   MW-1                    MATRIX TYPE:  Water
CONTROL NO:  N9401-12-01
=====

```

<u>PARAMETERS (601)</u>	<u>RESULTS (ug/L)</u>	<u>DETECTION LIMIT (ug/L)</u>
Dichlorodifluoromethane	ND	5
Chloromethane	ND	5
Vinyl Chloride	ND	5
Bromomethane	ND	5
Chloroethane	ND	5
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
Methylene Chloride	ND	5
Trans-1,2-Dichloroethene	ND	1
cis 1,2 Dichloroethene	ND	1
1,1-Dichloroethane	ND	1
Chloroform	ND	1
1,1,1-Trichloroethane	ND	1
Carbon Tetrachloride	ND	1
1,2-Dichloroethane	ND	1
Trichloroethene	ND	1
1,2-Dichloropropane	ND	1
Bromodichloromethane	ND	1
2-Chloroethylvinylether	ND	1
Trans-1,3-Dichloropropene	ND	1
Cis-1,3-Dichloropropene	ND	1
1,1,2-Trichloroethane	ND	1
Tetrachloroethene	ND	1
Dibromochloromethane	ND	1
Chlorobenzene	ND	1
Bromoform	ND	1
1,1,2,2-Tetrachloroethane	ND	1
M-Dichlorobenzene	ND	1
P-Dichlorobenzene	ND	1
O-Dichlorobenzene	ND	1

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% Surrogate Recovery      99
=====

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CKY

EPA METHODS - 601

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=====
CLIENT:      CDM                      DATE REC'D:   01/13/94
PROJECT:     San Antonio              DATE ANALYZED: 01/20/94
SAMPLE ID:   MW-2                    MATRIX TYPE:   Water
CONTROL NO:  N9401-12-02
=====

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<u>PARAMETERS (601)</u>	<u>RESULTS (ug/L)</u>	<u>DETECTION LIMIT (ug/L)</u>
Dichlorodifluoromethane	ND	5
Chloromethane	ND	5
Vinyl Chloride	ND	5
Bromomethane	ND	5
Chloroethane	ND	5
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
Methylene Chloride	ND	5
Trans-1,2-Dichloroethene	ND	1
cis 1,2 Dichloroethene	ND	1
1,1-Dichloroethane	ND	1
Chloroform	ND	1
1,1,1-Trichloroethane	ND	1
Carbon Tetrachloride	ND	1
1,2-Dichloroethane	ND	1
Trichloroethene	ND	1
1,2-Dichloropropane	ND	1
Bromodichloromethane	ND	1
2-Chloroethylvinylether	ND	1
Trans-1,3-Dichloropropene	ND	1
Cis-1,3-Dichloropropene	ND	1
1,1,2-Trichloroethane	ND	1
Tetrachloroethene	ND	1
Dibromochloromethane	ND	1
Chlorobenzene	ND	1
Bromoform	ND	1
1,1,2,2-Tetrachloroethane	ND	1
M-Dichlorobenzene	ND	1
P-Dichlorobenzene	ND	1
O-Dichlorobenzene	ND	1

% Surrogate Recovery 112
=====

EPA METHODS - 601

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=====
CLIENT:      CDM                      DATE REC'D:   01/13/94
PROJECT:     San Antonio              DATE ANALYZED: 01/20/94
SAMPLE ID:   MW-3                    MATRIX TYPE:   Water
CONTROL NO:  N9401-12-03
=====
  
```

<u>PARAMETERS (601)</u>	<u>RESULTS (ug/L)</u>	<u>DETECTION LIMIT (ug/L)</u>
Dichlorodifluoromethane	ND	5
Chloromethane	ND	5
Vinyl Chloride	ND	5
Bromomethane	ND	5
Chloroethane	ND	5
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
Methylene Chloride	ND	5
Trans-1,2-Dichloroethene	ND	1
cis 1,2 Dichloroethene	ND	1
1,1-Dichloroethane	ND	1
Chloroform	ND	1
1,1,1-Trichloroethane	ND	1
Carbon Tetrachloride	ND	1
1,2-Dichloroethane	ND	1
Trichloroethene	ND	1
1,2-Dichloropropane	ND	1
Bromodichloromethane	ND	1
2-Chloroethylvinylether	ND	1
Trans-1,3-Dichloropropene	ND	1
Cis-1,3-Dichloropropene	ND	1
1,1,2-Trichloroethane	ND	1
Tetrachloroethene	ND	1
Dibromochloromethane	ND	1
Chlorobenzene	ND	1
Bromoform	ND	1
1,1,2,2-Tetrachloroethane	ND	1
M-Dichlorobenzene	ND	1
P-Dichlorobenzene	ND	1
O-Dichlorobenzene	ND	1

% Surrogate Recovery	112	
=====		

EPA METHODS - 601

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=====
CLIENT:      CDM                      DATE REC'D:    01/13/94
PROJECT:     San Antonio              DATE ANALYZED: 01/20/94
SAMPLE ID:   TRAVEL BLANK            MATRIX TYPE:   Water
CONTROL NO:  N9401-12-04
=====
  
```

<u>PARAMETERS (601)</u>	<u>RESULTS (ug/L)</u>	<u>DETECTION LIMIT (ug/L)</u>
Dichlorodifluoromethane	ND	5
Chloromethane	ND	5
Vinyl Chloride	ND	5
Bromomethane	ND	5
Chloroethane	ND	5
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
Methylene Chloride	ND	5
Trans-1,2-Dichloroethene	ND	1
cis 1,2 Dichloroethene	ND	1
1,1-Dichloroethane	ND	1
Chloroform	ND	1
1,1,1-Trichloroethane	ND	1
Carbon Tetrachloride	ND	1
1,2-Dichloroethane	ND	1
Trichloroethene	ND	1
1,2-Dichloropropane	ND	1
Bromodichloromethane	ND	1
2-Chloroethylvinylether	ND	1
Trans-1,3-Dichloropropene	ND	1
Cis-1,3-Dichloropropene	ND	1
1,1,2-Trichloroethane	ND	1
Tetrachloroethene	ND	1
Dibromochloromethane	ND	1
Chlorobenzene	ND	1
Bromoform	ND	1
1,1,2,2-Tetrachloroethane	ND	1
M-Dichlorobenzene	ND	1
P-Dichlorobenzene	ND	1
O-Dichlorobenzene	ND	1

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% Surrogate Recovery      97
=====
  
```

EPA METHOD - 602
BTEX

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=====
CLIENT:      CDM                      DATE REC'D:    01/13/94
PROJECT:     SAN ANTONIO              DATE ANALYZED: 01/14/94
CONTROL NO:  N9401-12                MATRIX:       Water
=====
  
```

<u>SAMPLE ID:</u>	<u>CONTROL NO:</u>	<u>Benz</u>	<u>RESULTS (ug/L)</u>			<u>Xyls</u>	<u>% SURR REC</u>
			<u>Tol</u>	<u>Et</u>	<u>Benz</u>		
M. BLANK	N940112-BLK	ND	ND	ND	ND	81	
MW-1	N940112-1	ND	ND	ND	ND	92	
MW-2	N940112-2	ND	ND	ND	ND	91	
MW-3	N940112-3	ND	ND	ND	ND	103	
TRAVEL BLANK	N940112-4	ND	ND	ND	ND	92	
DETECTION LIMIT		1.0	1.0	1.0	1.0		

EPA METHOD - 625
SEMIVOLATILE ORGANICS BY GC/MS

```

=====
CLIENT:      CDM                      DATE REC'D:    01/13/94
PROJECT:     SAN ANTONIO              DATE EXTRACTED: 01/18/94
SAMPLE ID:   Blank                   DATE ANALYZED:  01/18/94
CONTROL NO:  N9401-12-Blk           MATRIX:        Water
=====

```

PARAMETER	RESULTS (mg/L)	PARAMETER	RESULTS (mg/L)
Phenol	ND(.01)	Acenaphthene	ND(.01)
bis(2-chloroethyl)ether	ND(.01)	2,4-Dinitrophenol	ND(.02)
2-Chlorophenol	ND(.01)	4-Nitrophenol	ND(.02)
1,3-Dichlorobenzene	ND(.01)	Dibenzofuran	ND(.01)
1,4-Dichlorobenzene	ND(.01)	2,4-Dinitrotoluene	ND(.01)
Benzyl Alcohol	ND(.01)	2,6-Dinitrotoluene	ND(.01)
1,2-Dichlorobenzene	ND(.01)	Diethylphthalate	ND(.01)
2-Methylphenol	ND(.01)	4-Chlorophenyl-phenylether	ND(.01)
bis(2-chloroisopropyl)ether	ND(.01)	Fluorene	ND(.01)
4-Methylphenol	ND(.01)	4-Nitroaniline	ND(.02)
N-Nitroso-Di-n-Propylamine	ND(.01)	4,6-Dinitro-2-Methylphenol	ND(.02)
Hexachloroethane	ND(.01)	N-Nitrosodiphenylamine	ND(.01)
Nitrobenzene	ND(.01)	4-Bromophenyl-phenylether	ND(.01)
Isophorone	ND(.01)	Hexachlorobenzene	ND(.01)
2-Nitrophenol	ND(.01)	Pentachlorophenol	ND(.02)
2,4-Dimethylphenol	ND(.01)	Phenanthrene	ND(.01)
Benzoic Acid	ND(.02)	Anthracene	ND(.01)
bis-(2-Chloroethoxy)methane	ND(.01)	Di-n-Butylphthalate	ND(.01)
2,4-Dichlorophenol	ND(.01)	Fluoranthene	ND(.01)
1,2,4-Trichlorobenzene	ND(.01)	Pyrene	ND(.01)
Naphthalene	ND(.01)	Butylbenzylphthalate	ND(.01)
4-Chloroaniline	ND(.01)	3,3'-Dichlorobenzidine	ND(.01)
Hexachlorobutadiene	ND(.01)	Benzo(a)Anthracene	ND(.01)
4-Chloro-3-Methylphenol	ND(.01)	bis(2-Ethylhexyl)Phthalate	ND(.01)
2-Methylnaphthalene	ND(.01)	Chrysene	ND(.01)
Hexachlorocyclopentadiene	ND(.01)	Di-n-Octyl Phthalate	ND(.01)
2,4,6-Trichlorophenol	ND(.01)	Benzo(b)Fluoranthene	ND(.01)
2,4,5-Trichlorophenol	ND(.02)	Benzo(k)Fluoranthene	ND(.01)
2-Chloronaphthalene	ND(.01)	Benzo(a)Pyrene	ND(.01)
2-Nitroaniline	ND(.02)	Indeno(1,2,3-cd)Pyrene	ND(.01)
Dimethyl Phthalate	ND(.01)	Dibenz(a,h)Anthracene	ND(.01)
Acenaphthylene	ND(.01)	Benzo(g,h,i)Perylene	ND(.01)
3-Nitroaniline	ND(.02)		

ND = Not Detected

% Surrogate Recovery

2-Fluorophenol	73	21-100
Phenol - d ₅	78	10-94
Nitrobenzene - d ₅	87	35-114
2-Fluorobiphenyl	84	43-116
2,4,6 Tribromophenol	84	10-123
Terphenyl - d ₁₄	77	33-141
2-Chlorophenol- d ₄	83	33-110
1,2-dichlorobenzene - 4	83	16-110

EPA METHOD - 625
SEMIVOLATILE ORGANICS BY GC/MS

```

=====
CLIENT:      CDM                      DATE REC'D:    01/13/94
PROJECT:     SAN ANTONIO              DATE EXTRACTED: 01/18/94
SAMPLE ID:   MW-1                    DATE ANALYZED:  01/18/94
CONTROL NO:  N9401-12-1              MATRIX:       Water
=====
  
```

<u>PARAMETER</u>	<u>RESULTS</u> <u>(mg/L)</u>	<u>PARAMETER</u>	<u>RESULTS</u> <u>(mg/L)</u>
Phenol	ND(.01)	Acenaphthene	ND(.01)
bis(2-chloroethyl)ether	ND(.01)	2,4-Dinitrophenol	ND(.02)
2-Chlorophenol	ND(.01)	4-Nitrophenol	ND(.02)
1,3-Dichlorobenzene	ND(.01)	Dibenzofuran	ND(.01)
1,4-Dichlorobenzene	ND(.01)	2,4-Dinitrotoluene	ND(.01)
Benzyl Alcohol	ND(.01)	2,6-Dinitrotoluene	ND(.01)
1,2-Dichlorobenzene	ND(.01)	Diethylphthalate	ND(.01)
2-Methylphenol	ND(.01)	4-Chlorophenyl-phenylether	ND(.01)
bis(2-chloroisopropyl)ether	ND(.01)	Fluorene	ND(.01)
4-Methylphenol	ND(.01)	4-Nitroaniline	ND(.02)
N-Nitroso-Di-n-Propylamine	ND(.01)	4,6-Dinitro-2-Methylphenol	ND(.02)
Hexachloroethane	ND(.01)	N-Nitrosodiphenylamine	ND(.01)
Nitrobenzene	ND(.01)	4-Bromophenyl-phenylether	ND(.01)
Isophorone	ND(.01)	Hexachlorobenzene	ND(.01)
2-Nitrophenol	ND(.01)	Pentachlorophenol	ND(.02)
2,4-Dimethylphenol	ND(.01)	Phenanthrene	ND(.01)
Benzoic Acid	ND(.02)	Anthracene	ND(.01)
bis-(2-Chloroethoxy)methane	ND(.01)	Di-n-Butylphthalate	ND(.01)
2,4-Dichlorophenol	ND(.01)	Fluoranthene	ND(.01)
1,2,4-Trichlorobenzene	ND(.01)	Pyrene	ND(.01)
Naphthalene	ND(.01)	Butylbenzylphthalate	ND(.01)
4-Chloroaniline	ND(.01)	3,3'-Dichlorobenzidine	ND(.01)
Hexachlorobutadiene	ND(.01)	Benzo(a)Anthracene	ND(.01)
4-Chloro-3-Methylphenol	ND(.01)	bis(2-Ethylhexyl)Phthalate	ND(.01)
2-Methylnaphthalene	ND(.01)	Chrysene	ND(.01)
Hexachlorocyclopentadiene	ND(.01)	Di-n-Octyl Phthalate	ND(.01)
2,4,6-Trichlorophenol	ND(.01)	Benzo(b)Fluoranthene	ND(.01)
2,4,5-Trichlorophenol	ND(.02)	Benzo(k)Fluoranthene	ND(.01)
2-Chloronaphthalene	ND(.01)	Benzo(a)Pyrene	ND(.01)
2-Nitroaniline	ND(.02)	Indeno(1,2,3-cd)Pyrene	ND(.01)
Dimethyl Phthalate	ND(.01)	Dibenz(a,h)Anthracene	ND(.01)
Acenaphthylene	ND(.01)	Benzo(g,h,i)Perylene	ND(.01)
3-Nitroaniline	ND(.02)		

ND = Not Detected

% Surrogate Recovery

2-Fluorophenol	38	21-100
Phenol - d ₅	27	10-94
Nitrobenzene - d ₅	62	35-114
2-Fluorobiphenyl	70	43-116
2,4,6 Tribromophenol	83	10-123
Terphenyl - d ₁₄	73	33-141
2-Chlorophenol - d ₄	63	33-110
1,2-dichlorobenzene - d ₄	60	16-110

**EPA METHOD - 625
SEMIVOLATILE ORGANICS BY GC/MS**

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=====
CLIENT:      CDM                      DATE REC'D:    01/13/94
PROJECT:     SAN ANTONIO              DATE EXTRACTED: 01/18/94
SAMPLE ID:   MW-2                    DATE ANALYZED: 01/18/94
CONTROL NO:  N9401-12-2             MATRIX:      Water
=====

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<u>PARAMETER</u>	<u>RESULTS</u> <u>(mg/L)</u>	<u>PARAMETER</u>	<u>RESULTS</u> <u>(mg/L)</u>
Phenol	ND(.01)	Acenaphthene	ND(.01)
bis(2-chloroethyl)ether	ND(.01)	2,4-Dinitrophenol	ND(.02)
2-Chlorophenol	ND(.01)	4-Nitrophenol	ND(.02)
1,3-Dichlorobenzene	ND(.01)	Dibenzofuran	ND(.01)
1,4-Dichlorobenzene	ND(.01)	2,4-Dinitrotoluene	ND(.01)
Benzyl Alcohol	ND(.01)	2,6-Dinitrotoluene	ND(.01)
1,2-Dichlorobenzene	ND(.01)	Diethylphthalate	ND(.01)
2-Methylphenol	ND(.01)	4-Chlorophenyl-phenylether	ND(.01)
bis(2-chloroisopropyl)ether	ND(.01)	Fluorene	ND(.01)
4-Methylphenol	ND(.01)	4-Nitroaniline	ND(.02)
N-Nitroso-Di-n-Propylamine	ND(.01)	4,6-Dinitro-2-Methylphenol	ND(.02)
Hexachloroethane	ND(.01)	N-Nitrosodiphenylamine	ND(.01)
Nitrobenzene	ND(.01)	4-Bromophenyl-phenylether	ND(.01)
Isophorone	ND(.01)	Hexachlorobenzene	ND(.01)
2-Nitrophenol	ND(.01)	Pentachlorophenol	ND(.02)
2,4-Dimethylphenol	ND(.01)	Phenanthrene	ND(.01)
Benzoic Acid	ND(.02)	Anthracene	ND(.01)
bis-(2-Chloroethoxy)methane	ND(.01)	Di-n-Butylphthalate	ND(.01)
2,4-Dichlorophenol	ND(.01)	Fluoranthene	ND(.01)
1,2,4-Trichlorobenzene	ND(.01)	Pyrene	ND(.01)
Naphthalene	ND(.01)	Butylbenzylphthalate	ND(.01)
4-Chloroaniline	ND(.01)	3,3'-Dichlorobenzidine	ND(.01)
Hexachlorobutadiene	ND(.01)	Benzo(a)Anthracene	ND(.01)
4-Chloro-3-Methylphenol	ND(.01)	bis(2-Ethylhexyl)Phthalate	ND(.01)
2-Methylnaphthalene	ND(.01)	Chrysene	ND(.01)
Hexachlorocyclopentadiene	ND(.01)	Di-n-Octyl Phthalate	ND(.01)
2,4,6-Trichlorophenol	ND(.01)	Benzo(b)Fluoranthene	ND(.01)
2,4,5-Trichlorophenol	ND(.02)	Benzo(k)Fluoranthene	ND(.01)
2-Chloronaphthalene	ND(.01)	Benzo(a)Pyrene	ND(.01)
2-Nitroaniline	ND(.02)	Indeno(1,2,3-cd)Pyrene	ND(.01)
Dimethyl Phthalate	ND(.01)	Dibenz(a,h)Anthracene	ND(.01)
Acenaphthylene	ND(.01)	Benzo(g,h,i)Perylene	ND(.01)
3-Nitroaniline	ND(.02)		

ND = Not Detected

% Surrogate Recovery

2-Fluorophenol	31	21-100
Phenol - d ₅	22	10-94
Nitrobenzene - d ₅	65	35-114
2-Fluorobiphenyl	66	43-116
2,4,6 Tribromophenol	78	10-123
Terphenyl - d ₁₄	77	33-141
2-Chlorophenol - d ₄	63	33-110
1,2-dichlorobenzene - d ₄	65	16-110

**EPA METHOD - 625
SEMIVOLATILE ORGANICS BY GC/MS**

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=====
CLIENT:      CDM                      DATE REC'D:    01/13/94
PROJECT:     SAN ANTONIO              DATE EXTRACTED: 01/18/94
SAMPLE ID:   MW-3                    DATE ANALYZED: 01/18/94
CONTROL NO:  N9401-12-3              MATRIX:      Water
=====

```

<u>PARAMETER</u>	<u>RESULTS</u> (mg/L)	<u>PARAMETER</u>	<u>RESULTS</u> (mg/L)
Phenol	ND(.01)	Acenaphthene	ND(.01)
bis(2-chloroethyl)ether	ND(.01)	2,4-Dinitrophenol	ND(.02)
2-Chlorophenol	ND(.01)	4-Nitrophenol	ND(.02)
1,3-Dichlorobenzene	ND(.01)	Dibenzofuran	ND(.01)
1,4-Dichlorobenzene	ND(.01)	2,4-Dinitrotoluene	ND(.01)
Benzyl Alcohol	ND(.01)	2,6-Dinitrotoluene	ND(.01)
1,2-Dichlorobenzene	ND(.01)	Diethylphthalate	ND(.01)
2-Methylphenol	ND(.01)	4-Chlorophenyl-phenylether	ND(.01)
bis(2-chloroisopropyl)ether	ND(.01)	Fluorene	ND(.01)
4-Methylphenol	ND(.01)	4-Nitroaniline	ND(.02)
N-Nitroso-Di-n-Propylamine	ND(.01)	4,6-Dinitro-2-Methylphenol	ND(.02)
Hexachloroethane	ND(.01)	N-Nitrosodiphenylamine	ND(.01)
Nitrobenzene	ND(.01)	4-Bromophenyl-phenylether	ND(.01)
Isophorone	ND(.01)	Hexachlorobenzene	ND(.01)
2-Nitrophenol	ND(.01)	Pentachlorophenol	ND(.02)
2,4-Dimethylphenol	ND(.01)	Phenanthrene	ND(.01)
Benzoic Acid	ND(.02)	Anthracene	ND(.01)
bis-(2-Chloroethoxy)methane	ND(.01)	Di-n-Butylphthalate	ND(.01)
2,4-Dichlorophenol	ND(.01)	Fluoranthene	ND(.01)
1,2,4-Trichlorobenzene	ND(.01)	Pyrene	ND(.01)
Naphthalene	ND(.01)	Butylbenzylphthalate	ND(.01)
4-Chloroaniline	ND(.01)	3,3'-Dichlorobenzidine	ND(.01)
Hexachlorobutadiene	ND(.01)	Benzo(a)Anthracene	ND(.01)
4-Chloro-3-Methylphenol	ND(.01)	bis(2-Ethylhexyl)Phthalate	ND(.01)
2-Methylnaphthalene	ND(.01)	Chrysene	ND(.01)
Hexachlorocyclopentadiene	ND(.01)	Di-n-Octyl Phthalate	ND(.01)
2,4,6-Trichlorophenol	ND(.01)	Benzo(b)Fluoranthene	ND(.01)
2,4,5-Trichlorophenol	ND(.02)	Benzo(k)Fluoranthene	ND(.01)
2-Chloronaphthalene	ND(.01)	Benzo(a)Pyrene	ND(.01)
2-Nitroaniline	ND(.02)	Indeno(1,2,3-cd)Pyrene	ND(.01)
Dimethyl Phthalate	ND(.01)	Dibenz(a,h)Anthracene	ND(.01)
Acenaphthylene	ND(.01)	Benzo(g,h,i)Perylene	ND(.01)
3-Nitroaniline	ND(.02)		

ND = Not Detected

% Surrogate Recovery

2-Fluorophenol	30	21-100
Phenol - d ₅	25	10-94
Nitrobenzene - d ₅	61	35-114
2-Fluorobiphenyl	65	43-116
2,4,6 Tribromophenol	73	10-123
Terphenyl - d ₁₄	70	33-141
2-Chlorophenol - d ₄	57	33-110
1,2-dichlorobenzene - d ₄	60	16-110

QUALITY CONTROL DATA

CLIENT: CDM
PROJECT: SAN ANTONIO DATE EXTRACTED: 01/14/94
CONTROL NO: N9401-12 DATE ANALYZED: 01/14/94

METHOD EPA 418.1
MATRIX: Water

SAMPLE ID: BLANK

<u>COMPOUND</u>	<u>SAMPLE RESULTS</u> (mg/L)	<u>AMOUNT SPIKED</u> (mg/L)	<u>% REC.</u>	<u>DUP. % REC.</u>	<u>RPD</u>
IR REF STD	ND	150	101	99	2



QUALITY CONTROL DATA

CLIENT: CDM
 PROJECT: SAN ANTONIO DATE EXTRACTED: 01/14/94
 CONTROL NO: N9401-12 DATE ANALYZED: 01/14/94

METHOD M8015-DIESEL
 MATRIX: Water

SAMPLE ID: N940110-01

<u>COMPOUND</u>	<u>SAMPLE RESULTS</u> (mg/L)	<u>AMOUNT SPIKED</u> (mg/L)	<u>% REC.</u>	<u>DUP. % REC.</u>	<u>RPD</u>
DIESEL	ND	100	105	94	11



QUALITY CONTROL DATA

CLIENT: CDM
 PROJECT: SAN ANTONIO DATE ANALYZED: 01/14/94
 CONTROL NO: N9401-12

METHOD M8015-GAS
 MATRIX: Water

SAMPLE ID: N940110-01

<u>COMPOUND</u>	<u>SAMPLE RESULTS</u> (mg/L)	<u>AMOUNT SPIKED</u> (mg/L)	<u>% REC.</u>	<u>DUP. % REC.</u>	<u>RPD</u>
GAS	ND	5.0	96	96	0



LABORATORY CONTROL SAMPLE

CLIENT: CDM DATE EXTENDED: N/A
PROJECT: San Antonio DATE ANALYZED: 01/20/94
CONTROL NO: N9401-12

METHOD EPA 601
MATRIX: Water

SAMPLE ID: LCS

<u>COMPOUND</u>	<u>SAMPLE RESULTS</u> (ug/L)	<u>AMOUNT SPIKED</u> (ug/L)	<u>SPIKED RECOVERY</u> (ug/L)	<u>% REC.</u>
1,1 DCE	ND	30	29	97
TCE	ND	30	29	97
Chlorobenzene	ND	30	36	120

QUALITY CONTROL DATA

CLIENT: CDM **DATE EXTC'D:** N/A
PROJECT: San Antonio **DATE ANALYZED:** 01/20/94
CONTROL NO: N9401-12-1

METHOD EPA 601
MATRIX: Water

SAMPLE ID: MW-1

<u>COMPOUND</u>	<u>SAMPLE RESULTS</u> (ug/L)	<u>AMOUNT SPIKED</u> (ug/L)	<u>% REC.</u>	<u>DUP. % REC.</u>	<u>RPD</u>
1,1 DCE	ND	30	80	97	19
TCE	ND	30	87	103	17
Chlorobenzene	ND	30	97	117	19



QUALITY CONTROL DATA

CLIENT: CDM
PROJECT: SAN ANTONIO DATE ANALYZED: 01/14/94
CONTROL NO: N9401-12

METHOD EPA 602
MATRIX: Water

SAMPLE ID: N940110-01

<u>COMPOUND</u>	<u>SAMPLE RESULTS</u> (ug/L)	<u>AMOUNT SPIKED</u> (ug/L)	<u>% REC.</u>	<u>DUP. % REC.</u>	<u>RPD</u>
Benzene	ND	50	98	98	0
Toluene	ND	50	96	96	0
Ethyl Benzene	ND	50	94	94	0
Xylene	ND	100	92	92	0

QUALITY CONTROL DATA

CLIENT: CDM **DATE EXTC'D:** 01/18/94
PROJECT: SAN ANTONIO **DATE ANALYZED:** 01/18/94
CONTROL NO: N9401-12

METHOD EPA 625
MATRIX: Water

SAMPLE ID: Blank

<u>COMPOUND</u>	<u>SAMPLE RESULTS</u> (mg/L)	<u>AMOUNT SPIKED</u> (mg/L)	<u>% REC.</u>	<u>DUP. % REC.</u>	<u>RPD</u>
Phenol	ND	200	24	22	9
2-Chlorophenol	ND	200	51	40	24
1,4-DCB	ND	100	52	46	12
N-Nitroso-di-n propylamine	ND	100	73	57	25
1,2,4-TCB	ND	100	54	46	16
4-Chloro-3- methylphenol	ND	200	65	46	33
Acenaphthene	ND	100	61	53	14
4-Nitrophenol	ND	200	24	22	7
2,4-Dinitrotoluene	ND	100	65	56	15
Pentachlorophenol	ND	200	88	80	10
Pyrene	ND	100	64	60	6



CHAIN OF CUSTODY RECORD

Camp Dresser & McKee Inc.

CDM

PROJECT NAME San Antonio Pump Station

PROJECT NUMBER 9005-116-BI-FLD

Field Log Book Reference No. _____

LEGEND: Original: Return to Sample Traffic Control Center Copies: Ship with Samples

SAMPLE NUMBER	DATE	TIME	SAMPLE LOCATION	SAMPLE TYPE	ANALYSES										NUMBER OF CONTAINERS	LOG BOOK PG. NO.	REMARKS		
					EXTR. ORG. VOA	PEST. PCB	TRACE METALS	PH	DO	TEMP	TOX	RESIDUALS	PHENOLS	THAL				VOA	
1	1-13-94	1300	MW-1	Water													7		Test methods:
2		900	MW-2	↓													8		5030/M8015/
3		1030	MW-3	↓													8		602/601/
4			Travel Blank	↓													2		M8015 (Luft)/
																			418.1/8270
N9401-12																			
																			UDA R-4
																			LETTER R-5
																			THIS IS A TRAVEL BLANK
																			MW-1
																			ADD FOR TRAVEL/FRPH

SAMPLED BY (SIGN) Jason Preece

RELINQUISHED BY (SIGN) ① <u>Jason Preece</u> DATE/TIME (<u>1/13/94 1427</u>)	RELINQUISHED BY (SIGN) ② _____ DATE/TIME (/ /)	RELINQUISHED BY (SIGN) _____ DATE/TIME (/ /)	RELINQUISHED BY (SIGN) ④ _____ DATE/TIME (/ /)	RELINQUISHED BY (SIGN) ⑤ _____ DATE/TIME (/ /)
RECEIVED BY (SIGN) ① <u>[Signature]</u> DATE/TIME (<u>1/13/94 1427</u>)	RECEIVED BY (SIGN) ② _____ DATE/TIME (/ /)	RECEIVED BY (SIGN) ③ _____ DATE/TIME (/ /)	RECEIVED BY (SIGN) ④ _____ DATE/TIME (/ /)	RECEIVED BY (SIGN) ⑤ _____ DATE/TIME (/ /)

METHOD OF SHIPMENT _____	SHIPPED BY (SIGN) _____	RECEIVED FOR LABORATORY BY (SIGN) _____	DATE/TIME (/ /)
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Appendix B
Field Procedures and Field Logs

FIELD PROCEDURES

Groundwater Monitoring Well Purging and Sampling

Groundwater well purging protocol requires the withdrawal of a sufficient quantity of groundwater from the well to ensure that representative formation water is sampled. At this site, a minimum of three well casing volumes was removed from monitoring wells MW-2 and MW-3. Only 2.5 well casing volumes was removed from monitoring well MW-1 due to slow groundwater recharge. Aquifer parameters include pH, electrical conductivity, and temperature were monitored during the purging process to ensure that stable groundwater conditions were present prior to sampling. Removal of groundwater was performed with an one-inch diameter PVC bailer. Aquifer parameters were collected at two gallon intervals for all wells. Field data sheets showing measure purge parameters, volumes and time are included.

Groundwater samples were also collected with an one-inch diameter disposal bailer directly following purging. For each well, a groundwater sample was transferred into two 1-liter glass bottles and four 40-ml VOA vials. Monitoring wells MW-2 and MW-3 produced an adequate supply of water, however, monitoring well MW-1 produced only enough water to fill the four VOA vials and one 1-liter bottle after a two hour well recovery waiting period.

Sample ID No.: <u>MW-1</u>	
MONITORING WELL PURGING LOG Well No.: <u>MW-1</u>	
Installation:	Site: <u>San Antonio Pump Station</u>
HAZWRAP Contractor:	Project No.: <u>9005-116-BI-FLD</u>
Purge Start: (Date) <u>1/13/94</u> (Time) <u>11:00a</u>	Purge End: (Date) <u>1/13/94</u> (Time) <u>2:01p</u>
Purged by: <u>Jason Preece</u>	

Depth Measurement Ref. Point: * 289.50 TOC Well Csg ID: 2" (4) 6" Other _____

Well Hdapace/Odor: NA LNAPL Check (Y/N) (N) DNAPL Check (Y/N) (N)

Equipment Used To Measure Thickness and Sample Free Product (Make, Model, etc.)

NA

Depth to Top and Bottom of Screen Interval: 10 to 16'
 Depth to LNAPL: NA Depth to DNAPL: NA Orig. DTW: 14.57 Final DTW: 15.90

LNAPL/DNAPL Thickness: NA LNAPL/DNAPL Sample # and Volume: NA

Measured Well TD: 16.00

(-) Orig. DTW: 14.57

(=) Wtr Col. Thick.: 1.43 (X) (4) - 0.16
(4) - 0.65 G/ft (=) .9295 G/Csg Vol. (X) (3) Csg Vol. (=) 2.8 Total Purge Gals
 6" - 1.47
 5

Purge Method:

Submersible Pump Dedicated Bladder Pump Bladder Pump Bailor Tef Centrifugal Pump
 Peristaltic Pump Hand Pump Gas Lift/Displacement Pump PVC Other: _____

Purging Equipment (Make, Model, etc.) disposable Purge Equipment Decon'd? (Y/N)

Purge Wtr Containerized? (Y/N) (N) Avge Purge Rate: _____ gpm

Weather: Sunny (68°F)

Actual Time	Elapsed Time	Vols. Purged (Gals)	Depth To Wtr (ft)	Depth Of Pump Intake (ft)	Temp (°C)	pH (s.a)	Cond. ($\mu\text{mhos/m}$)	Turbidity (NTU)	Other	Comment
1100			14.57							Sampled
1104	4	1			16.1	8.18	1700	Low		
1111	11	1.75	15.75		16.1	8.24	2000	Mod		
1133	33		15.65							
1301	121		15.41							

* All Depths in Feet below Ref. Point on Wellhead - generally Top of Casing (TOC)

MONITORING WELL PURGING LOG		Sample ID No.: <u>MW-3</u>
Well No.: <u>MW-3</u>		
Installation:		Site: <u>San Antonio Pump Station</u>
HAZWRAP Contractor:		Project No.: <u>9005-116-BI-FLD</u>
Purge Start: (Date) <u>1/13/94</u> (Time) <u>944</u>	Purge End: (Date) <u>1/13/94</u> (Time) <u>1030</u>	
Purged by: <u>Jason Greer</u>		

Depth Measurement Ref. Point: * 200.98 Well Csg ID: 2" (4") 6" Other _____

Well Hdspace/Odor: NA LNAPL Check (Y/) DNAPL Check (Y/)

Equipment Used To Measure Thickness and Sample Free Product (Make, Model, etc.)
NA

Depth to Top and Bottom of Screen Interval: 10 to 22'
Depth to LNAPL: NA Depth to DNAPL: NA Orig. DTW: 15.58 Final DTW: 16.42

LNAPL/DNAPL Thickness: NA LNAPL/DNAPL Sample No. and Volume: NA

Measured Well TD: 21.437

(-) Orig. DTW: 15.58

(=) Wtr Col. Thick.: 5.19 (X) $\frac{G}{ft} (=) 37635 G/Csg Vol. (X) 5 Csg Vol. (=) 11.3$ Total Purge Gals

2" - 0.16	1
4" - 0.65	2
6" - 1.47	3
	4
	5

Purge Method:

- Submersible Pump Dedicated Bladder Pump Bladder Pump Bailor Tef Centrifugal Pump
 Peristaltic Pump Hand Pump Gas Lift/Displacement Pump PVC Other: _____

Purging Equipment (Make, Model, etc.) disposable Purge Equipment Decon'd? N

Purge Wtr Containerized? (Y/N) Avg Purge Rate: _____ gpm

Weather: Sunny (65°F)

Actual Time	Elapsed Time	Vols. Purged (Gals)	Depth To Wtr (ft)	Depth Of Pump Intake (ft)	Temp (°C)	pH (s.a)	Cond. (umhos/m)	Turbidity (NTU)	Other	Comment
7:14										
7:18	4	2.5			16.0	9.37	1480	low		
7:23	9	5	16.13		16.3	9.45	1520			
7:29	17	7.5			16.7	9.37	1510	low		
10:25	24	10.0	16.10		16.2	9.78	1520	low		
10:28	34	12.5	16.67		16.7	8.76	1500			
10:29	40	15.0			16.6	8.72	1510			
10:30	46	17.5	16.42		16.6	8.74	1500	low		Sampled

* All Depths in Feet below Ref. Point on Wellhead - generally Top of Casing (TOC)

Sample ID No.: <u>MW-82</u>	
Well No.: <u>MW-82</u>	
Installation:	Site: <u>San Antonio Pump Station</u>
HAZWRAP Contractor:	Project No.: <u>9005-116-BI-FLD</u>
Purge Start: (Date) <u>1/13/94</u> (Time) <u>8:17a</u> Purge End: (Date) <u>1/13/94</u> (Time) <u>7:08</u>	
Purged by: <u>Jason Kreece</u>	

Depth Measurement Ref. Point: * 289.74 Well Csg ID: 2" 4" 6" Other _____

Well Hdspace/Odor: NA LNAPL Check (Y/) DNAPL Check (Y/)

Equipment Used To Measure Thickness and Sample Free Product (Make, Model, etc.)
NA

Depth to Top and Bottom of Screen Interval: 10 to 22'
Depth to LNAPL: NA Depth to DNAPL: NA Orig. DTW: 14.86 Final DTW: 14.99

LNAPL/DNAPL Thickness: NA LNAPL/DNAPL Sample^{No} and Volume: NA

Measured Well TD: 21.44

(-) Orig. DTW: 14.86

(=) Wtr Col. Thick.: 6.58 (X) 0.16 0.65 1.47
G/ft (=) 4.277 G/Csg Vol. (X) 1 2 3 4 5
Csg Vol. (=) 12.8 Total Purge Gals

Purge Method:

Submersible Pump Dedicated Bladder Pump Bladder Pump Bailer Tef Centrifugal Pump
PVC Other: _____
Peristaltic Pump Hand Pump Gas Lift/Displacement Pump

Purging Equipment (Make, Model, etc.) disposable Purge Equipment Decon'd? N

Purge Wtr Containerized? (Y/N) _____ Avge Purge Rate: _____ gpm

Weather: Sunny (55°F)

Actual Time	Elapsed Time	Vols. Purged (Gals)	Depth To Wtr (ft)	Depth Of Pump Intake (ft)	Temp (°C)	pH (s.a)	Cond. (umhos/m)	Turbidity (NTa)	Other	Comment
8:17	0		14.86							sampled
8:27	10		14.92		15.2	6.89	700	low		
8:37	20				16.2	6.93	700			
8:43	26				16.2	6.99	700	low		
3:49	32		14.99		15.2	7.00	710			
9:00	43				16.2	7.04	710			
9:06	51		14.94		16.2	7.03	710	low		

* All Depths in Feet below Ref. Point on Wellhead - generally Top of Casing (TOC)