



July 1, 1993

Alameda County Health Agency
Division of Hazardous Materials
Department of Environmental Health
80 Swan Way, Room 200
Oakland, CA 94621

Attention: Scott Seery

Subject: Groundwater Monitoring Report, San Antonio Pump Station

Dear Mr. Seery:

Please find enclosed the first of our quarterly monitoring reports from the San Antonio Pump Station in Sunol. This report is submitted in conformance with your requirements following our removal of an underground tank and some contaminated soil from this site. I hope that you will find our methods satisfactory and the results encouraging.

I am also sending a copy to the Regional Water Quality Control Board.

Unless you have some concerns, you may expect our next quarterly report in October. If you do have concerns, please call me at 415-871-2027 or Paul Mazza at 510-862-2180.

Sincerely,

A handwritten signature in cursive script, appearing to read "Robert B. Hickman".

Robert B. Hickman, Manager
Environmental and Regulation Affairs

RBH

Enclosure

cc: John Mullane w/o enc.
Lester Feldman
John Roddy w/o enc.
Steve Mullinnex w/o enc.

SAPS71.wp

Report of
Groundwater Monitoring
Second Quarter
San Antonio Pump Station

City and County of San Francisco

September 1993

Prepared For:

City and County of San Francisco
Bureau of Construction Management
3801 3rd Street, Suite 600
San Francisco, California 94214

Prepared By:

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



*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

October 14, 1993

City and County of San Francisco
Bureau of Construction Management
Site Assessment and Remediation
3801 3rd Street, Suite 600
San Francisco, California 94124

Attention: Mr. Ron Krzyzanowski
Environmental Project Coordinator

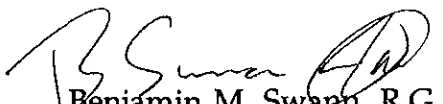
Subject: Groundwater Monitoring Report
San Antonio Pump Station


Dear Mr. Krzyzanowski:

Enclosed are the results of the second quarter of groundwater monitoring conducted at the San Antonio Pump Station in rural Sunol, California. The results of this groundwater sampling confirm past sampling results which indicate that petroleum compounds currently and previously stored on the site have not been detected in the groundwater.

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

Sincerely,


Benjamin M. Swan, R.G.
Project Geologist


Jeff Willett, P.E.
Project Manager

Enclosure

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San Antonio Pump Station Groundwater Monitoring Report Second Quarter

Introduction

This report presents the result of the second 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. Results from this sampling again indicated that tank constituents had not impacted groundwater.

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

Groundwater Sampling

On September 24, 1993, 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 and was purged of two well volumes using a combination of the 3.5-inch diameter bailer and a disposable 1-inch diameter bailer. Groundwater samples were collected with disposal 1-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 Precision Analytical Laboratories in Richmond, California.

Table 1

Groundwater Depth & Elevation Data

	MW-1 ^{14.82?}			MW-2			MW-3		
	6-92	6-93	9-93	6-92	6-93	9-93	6-92	6-93	9-93
Depth to Groundwater	14.95	14.28	19.82	14.74	14.62	15.18	15.43	15.30	15.50
Groundwater Elevation	274.55	275.22	274.68	274.24	274.36	273.80	274.31	274.44	274.24
Well Elevation	289.50			288.98			289.74		
Total Well Depth	15.90			21.20			21.22		

Analytical Procedures

Groundwater samples were analyzed for the compounds listed below with the exception of sample MW-1 which was not analyzed for acid and base neutral extractables. Only 0.5 liters of groundwater was obtained from this well. The minimum sample volume required to perform all analyses is 1.1 liters. 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 with the exception of chloroform, detected at a concentration varying from 0.9 to 10 µg/l in samples from the three groundwater monitoring wells, and bromodichloromethane detected at a concentration of 0.57 µg/l in monitoring well MW-1 (see Appendix A). Results of analysis conducted in June 1993 also evidenced low ppb levels of chloroform. Groundwater samples collected in June 1992 were non-detect for all compounds including chloroform. Chloroform is a common analytical laboratory chemical and is also present in the municipal water supply along with various other halogenated compounds used as disinfecting agents. Its presence in the samples is likely the result of laboratory sample contamination.

The results of the groundwater elevation data is presented in Table 1 and displayed in Figure 1. The groundwater elevation has dropped in all the groundwater monitoring wells since the last sampling in June 1993. The groundwater flow continues to be to the southwest.

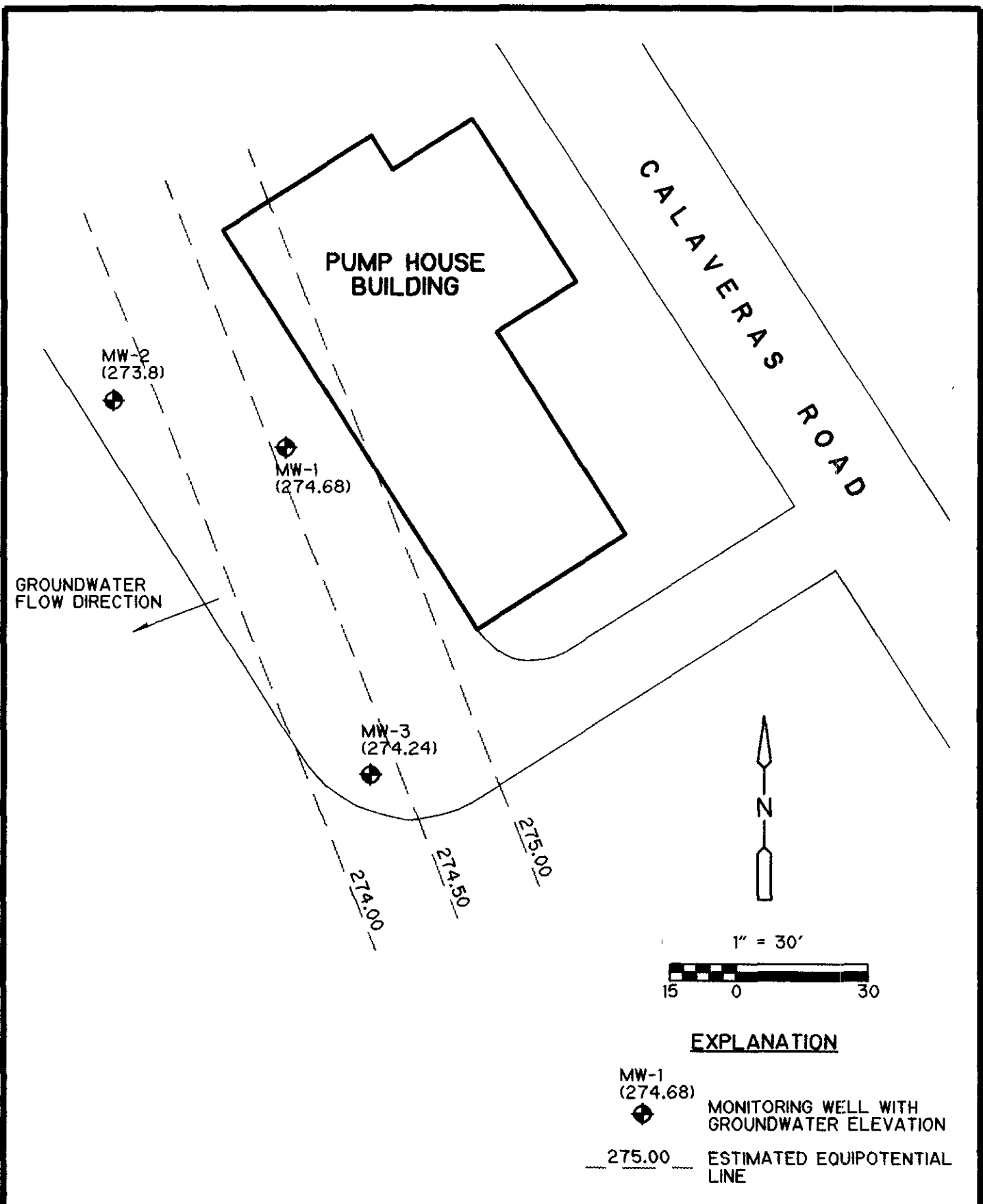
These results confirm that the contaminants released from the underground storage tanks have had no detectable impact on groundwater quality beneath the site.

NOWCADD ST6-CAMP DREESER MCKEE



09/27/93 2:15:30

PLAN0002

0:\5800-110\



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
2nd QUARTER SAMPLING

CDM
environmental engineers, scientists,
planners, & management consultants

Figure No. 1

Appendix A
Laboratory Results and Chain of Custody

Precision Analytical Laboratory, Inc.

4136 LAKESIDE DRIVE, RICHMOND, CA 94806

PHONE (510) 222-3002

FAX (510) 222-1251

CERTIFICATE OF ANALYSIS

STATE LICENSE NO. 1150

Date Received: 09/27/93
Date Analyzed: 10/07/93
Date Reported: 10/08/93
Job #: 75082

Attn: Ben Swan
Camp Dresser & McKee, Inc.
One Walnut Creek Center
100 Pringle Ave, Suite 300
Walnut Creek, CA 94596

Project: #9005 116 BI-FLD/San Antonio Pump
Matrix: Water

Total Hydrocarbons Analysis
Standard Methods, 17th Edition, 5520F
mg/L

<u>Lab I.D.</u>	<u>Client I.D.</u>	<u>Total Hydrocarbons</u>	<u>MDL</u>
75082-1	MW-1	ND<5	5
75082-2	MW-2	ND<5	5
75082-3	MW-3	ND<5	5

QA/QC: Matrix Spike Recovery: 99%

MDL: Method Detection Limit. Compound below this level would not be detected.



Jaime Chow
Laboratory Director

JC/dwc

Precision Analytical Laboratory, Inc.

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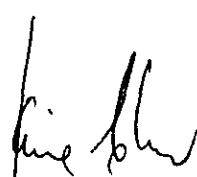
Project: #9005 116 BI-FLD/San Antonio Pump
Matrix: Water

Total Oil & Grease Analysis
EPA Method 5520D
mg/L

<u>Lab I.D.</u>	<u>Client I.D.</u>	<u>Total Oil & Grease</u>	<u>MDL</u>
75082-1	MW-1	ND<5	5
75082-2	MW-2	ND<5	5
75082-3	MW-3	ND<5	5

QA/QC: Matrix Spike Recovery: 90%

MDL: Method Detection Limit. Compound below this level would not be detected.



Jaime Chow
Laboratory Director

JC/dwc

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Walnut Creek, CA 94596

Date Received: 09/27/93
Date Analyzed: 09/29/93
Date Reported: 10/05/93
Job #: 75082

Project: #9005 116 BI-FLD/San Antonio Pump
Matrix: Water

Aromatic Volatile Hydrocarbon Analysis
EPA Method 8020
 $\mu\text{g/L}$

Lab I.D.: 75082-1
Client I.D.: MW-1

	<u>Result</u>	<u>MDL</u>
Benzene	ND<0.3	0.3
Toluene	ND<0.3	0.3
Chlorobenzene	ND<0.3	0.3
Ethylbenzene	ND<0.3	0.3
M + P Xylene	ND<0.6	0.6
o-xylene	ND<0.3	0.3
1,3-Dichlorobenzene	ND<0.3	0.3
1,4-Dichlorobenzene	ND<0.3	0.3
1,2-Dichlorobenzene	ND<0.3	0.3

QA/QC: Matrix Spike Recovery for Benzene: 97%
Matrix Spike Recovery for Toluene: 106%
Matrix Spike Recovery for o-xylene: 99%
Matrix Spike Recovery for Chlorobenzene: 106%

Matrix Spike Duplicate Recovery for Benzene: 99%
Matrix Spike Duplicate Recovery for Toluene: 106%
Matrix Spike Duplicate Recovery for o-xylene: 102%
Matrix Spike Duplicate Recovery for Chlorobenzene: 111%

MDL: Method Detection Limit. Compound below this level would not be detected.



Jaime Chow

Laboratory Director

OUTSTANDING QUALITY AND SERVICE
CALIFORNIA STATE CERTIFIED LABORATORY

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Date Analyzed: 09/29/93
Date Reported: 10/05/93
Job #: 75082

Project: #9005 116 BI-FLD/San Antonio Pump
Matrix: Water

Aromatic Volatile Hydrocarbon Analysis
EPA Method 8020
 $\mu\text{g/L}$

Lab I.D.: 75082-2

Client I.D.: MW-2

	<u>Result</u>	<u>MDL</u>
Benzene	ND<0.3	0.3
Toluene	ND<0.3	0.3
Chlorobenzene	ND<0.3	0.3
Ethylbenzene	ND<0.3	0.3
M + P Xylene	ND<0.6	0.6
o-xylene	ND<0.3	0.3
1,3-Dichlorobenzene	ND<0.3	0.3
1,4-Dichlorobenzene	ND<0.3	0.3
1,2-Dichlorobenzene	ND<0.3	0.3

QA/QC: Matrix Spike Recovery for Benzene: 97%
Matrix Spike Recovery for Toluene: 106%
Matrix Spike Recovery for o-xylene: 99%
Matrix Spike Recovery for Chlorobenzene: 106%

Matrix Spike Duplicate Recovery for Benzene: 99%
Matrix Spike Duplicate Recovery for Toluene: 106%
Matrix Spike Duplicate Recovery for o-xylene: 102%
Matrix Spike Duplicate Recovery for Chlorobenzene: 111%

MDL: Method Detection Limit. Compound below this level would not be detected.


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Date Reported: 10/05/93
Job #: 75082

Project: #9005 116 BI-FLD/San Antonio Pump
Matrix: Water

Aromatic Volatile Hydrocarbon Analysis
EPA Method 8020
 $\mu\text{g/L}$

Lab I.D.: 75082-3
Client I.D.: MW-3

	<u>Result</u>	<u>MDL</u>
Benzene	ND<0.3	0.3
Toluene	ND<0.3	0.3
Chlorobenzene	ND<0.3	0.3
Ethylbenzene	ND<0.3	0.3
M + P Xylene	ND<0.6	0.6
o-xylene	ND<0.3	0.3
1,3-Dichlorobenzene	ND<0.3	0.3
1,4-Dichlorobenzene	ND<0.3	0.3
1,2-Dichlorobenzene	ND<0.3	0.3

QA/QC: Matrix Spike Recovery for Benzene: 97%
Matrix Spike Recovery for Toluene: 106%
Matrix Spike Recovery for o-xylene: 99%
Matrix Spike Recovery for Chlorobenzene: 106%

Matrix Spike Duplicate Recovery for Benzene: 99%
Matrix Spike Duplicate Recovery for Toluene: 106%
Matrix Spike Duplicate Recovery for o-xylene: 102%
Matrix Spike Duplicate Recovery for Chlorobenzene: 111%

MDL: Method Detection Limit. Compound below this level would not be detected.



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Walnut Creek, CA 94596

Date Received: 09/27/93
Date Analyzed: 09/28/93
Date Reported: 10/05/93
Job #: 75082

Project: #9005 116 BI-FLD/San Antonio Pump
Matrix: Water

PURGEABLE HALOCARBONS
EPA Method 601
 $\mu\text{g/L}$

Lab I.D.: 75082-1

Client I.D.: MW-1

	<u>Result</u>	<u>MDL</u>
Bromomethane & Chloroethane	ND<2.0	2.0
Vinyl Chloride & Chloromethane	ND<1.0	1.0
Freon 113	ND<1.0	1.0
1,1-Dichloroethene	ND<0.4	0.4
Methylene Chloride	ND<1.0	1.0
Trans-1,2-Dichloroethene	ND<0.2	0.2
1,1-Dichloroethane	ND<0.3	0.3
Cis-1,2-Dichloroethene	ND<0.3	0.3
Chloroform	10	0.2
1,1,1-Trichloroethane	ND<0.3	0.3
Carbon Tetrachloride	ND<0.2	0.2
1,2-Dichloroethane	ND<0.2	0.2
Trichloroethene	ND<0.3	0.3
1,2-Dichloropropene	ND<0.3	0.3
2-Chloro-vinyl ether	ND<0.4	0.4
Bromodichloromethane	0.57	0.2
T-1,3-Dichloropropene	ND<0.3	0.3
Cis-1,3-Dichloropropene	ND<0.2	0.2
1,1,2-Trichloroethane	ND<0.3	0.3
Tetrachloroethene	ND<0.3	0.3
Dibromochloromethane	ND<0.3	0.3
Chlorobenzene	ND<0.2	0.2
Bromoform	ND<0.3	0.3
1,1,2,2-Tetrachloroethane	ND<0.3	0.3
1,3-Dichlorobenzene	ND<0.3	0.3
1,4-Dichlorobenzene	ND<0.2	0.2
1,2-Dichlorobenzene	ND<0.2	0.2

MDL: Method Detection Limit


Jaime Chow

Laboratory Director

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Date Reported: 10/05/93
Job #: 75082

Project: #9005 116 BI-FLD/San Antonio Pump
Matrix: Water

PURGEABLE HALOCARBONS
EPA Method 601
 $\mu\text{g/L}$

Lab I.D.: 75082-1
Client I.D.: MW-1

QA/QC: Matrix Spike Recovery for 1,1-Dichloroethane: 79%
Matrix Spike Recovery for Trichloroethene: 114%
Matrix Spike Recovery for Chlorobenzene: 98%

Matrix Spike Duplicate Recovery for 1,1-Dichloroethane: 88%
Matrix Spike Duplicate Recovery for Trichloroethene: 115%
Matrix Spike Duplicate Recovery for Chlorobenzene: 98%

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Date Reported: 10/05/93
Job #: 75082

Project: #9005 116 BI-FLD/San Antonio Pump
Matrix: Water

PURGEABLE HALOCARBONS
EPA Method 601
 $\mu\text{g/L}$

Lab I.D.: 75082-2
Client I.D.: MW-2

	<u>Result</u>	<u>MDL</u>
Bromomethane & Chloroethane	ND<2.0	2.0
Vinyl Chloride & Chloromethane	ND<1.0	1.0
Freon 113	ND<1.0	1.0
1,1-Dichloroethene	ND<0.4	0.4
Methylene Chloride	ND<1.0	1.0
Trans-1,2-Dichloroethene	ND<0.2	0.2
1,1-Dichloroethane	ND<0.3	0.3
Cis-1,2-Dichloroethene	ND<0.3	0.3
Chloroform	2.2	0.2
1,1,1-Trichloroethane	ND<0.3	0.3
Carbon Tetrachloride	ND<0.2	0.2
1,2-Dichloroethane	ND<0.2	0.2
Trichloroethene	ND<0.3	0.3
1,2-Dichloropropene	ND<0.3	0.3
2-Chloro-vinyl ether	ND<0.4	0.4
Bromodichloromethane	ND<0.2	0.2
T-1,3-Dichloropropene	ND<0.3	0.3
Cis-1,3-Dichloropropene	ND<0.2	0.2
1,1,2-Trichloroethane	ND<0.3	0.3
Tetrachloroethene	ND<0.3	0.3
Dibromochloromethane	ND<0.3	0.3
Chlorobenzene	ND<0.2	0.2
Bromoform	ND<0.3	0.3
1,1,2,2-Tetrachloroethane	ND<0.3	0.3
1,3-Dichlorobenzene	ND<0.3	0.3
1,4-Dichlorobenzene	ND<0.2	0.2
1,2-Dichlorobenzene	ND<0.2	0.2

MDL: Method Detection Limit


Jaime Chow

Laboratory Director

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Date Received: 09/27/93
Date Analyzed: 09/28/93
Date Reported: 10/05/93
Job #: 75082

Project: #9005 116 BI-FLD/San Antonio Pump
Matrix: Water

PURGEABLE HALOCARBONS
EPA Method 601
 $\mu\text{g/L}$

Lab I.D.: 75082-3
Client I.D.: MW-3

	<u>Result</u>	<u>MDL</u>
Bromomethane & Chloroethane	ND<2.0	2.0
Vinyl Chloride & Chloromethane	ND<1.0	1.0
Freon 113	ND<1.0	1.0
1,1-Dichloroethene	ND<0.4	0.4
Methylene Chloride	ND<1.0	1.0
Trans-1,2-Dichloroethene	ND<0.2	0.2
1,1-Dichloroethane	ND<0.3	0.3
Cis-1,2-Dichloroethene	ND<0.3	0.3
Chloroform	0.90	0.2
1,1,1-Trichloroethane	ND<0.3	0.3
Carbon Tetrachloride	ND<0.2	0.2
1,2-Dichloroethane	ND<0.2	0.2
Trichloroethene	ND<0.3	0.3
1,2-Dichloropropene	ND<0.3	0.3
2-Chloro-vinyl ether	ND<0.4	0.4
Bromodichloromethane	ND<0.2	0.2
T-1,3-Dichloropropene	ND<0.3	0.3
Cis-1,3-Dichloropropene	ND<0.2	0.2
1,1,2-Trichloroethane	ND<0.3	0.3
Tetrachloroethene	ND<0.3	0.3
Dibromochloromethane	ND<0.3	0.3
Chlorobenzene	ND<0.2	0.2
Bromoform	ND<0.3	0.3
1,1,2,2-Tetrachloroethane	ND<0.3	0.3
1,3-Dichlorobenzene	ND<0.3	0.3
1,4-Dichlorobenzene	ND<0.2	0.2
1,2-Dichlorobenzene	ND<0.2	0.2

MDL: Method Detection Limit


Jaime Chow

Laboratory Director *OUTSTANDING QUALITY AND SERVICE*
CALIFORNIA STATE CERTIFIED LABORATORY

JC/dwc

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Date Received: 09/27/93
Date Extracted: 09/28/93
Date Analyzed: 09/29/93
Date Reported: 10/08/93
Job #: 75082

Project: #9005 116 BI-FLD/San Antonio Pump
Matrix: Water

EPA Method 625
Acid & Base/Neutral Extractables (Low Level)
µg/L

Lab I.D.: 75082-2

Client I.D.: MW-2

<u>ACID COMPOUNDS</u>	<u>CONCENTRATION</u>	<u>LIMIT OF DETECTION</u>
Phenol	ND<10	10
2-chlorophenol	ND<6	6
2-nitrophenol	ND<4	4
2,4-dimethylphenol	ND<4	4
2,4-dichlorophenol	ND<6	6
4-chloro-3-methylphenol	ND<8	8
2,4,6-trichlorophenol	ND<6	6
2,4-dinitrophenol	ND<10	10
4-nitrophenol	ND<12	12
2-methyl-4,6-dinitrophenol	ND<6	6
Pentachlorophenol	ND<10	10
2-methyl phenol	ND<6	6
4-methyl phenol	ND<6	6

BASE/NEUTRAL COMPOUNDS

N-nitrosodimethylamine	ND<8	8
Bis(2-chloroethyl) ether	ND<8	8
1,3-dichlorobenzene	ND<4	4
1,4-dichlorobenzene	ND<6	6
1,2-dichlorobenzene	ND<6	6
Bis-(2-chloroisopropyl) ether	ND<16	16

ND = Not Detected


Jaime Chow
Laboratory Director

Precision Analytical Laboratory, Inc.

4136 LAKESIDE DRIVE, RICHMOND CA 94806

PHONE (510) 222-3002

FAX (510) 222-1251

STATE LICENSE NO. 1150

Attn: Ben Swan
Camp Dresser & McKee, Inc
One Walnut Creek Center
100 Pringle Ave, Suite 300
Walnut Creek, CA 94596

Date Received: 09/27/93
Date Extracted: 09/28/93
Date Analyzed: 09/29/93
Date Reported: 10/08/93
Job #: 75082

Project: #9005 116 BI-FLD/San Antonio Pump
Matrix: Water

EPA Method 625
Acid & Base/Neutral Extractables (Low Level)
µg/L

Lab I.D.: 75082-2

Client I.D.: MW-2

<u>ACID COMPOUNDS</u>	<u>CONCENTRATION</u>	<u>LIMIT OF DETECTION</u>
N-nitrosodi-n-propylamine	ND<10	10
Hexachloroethane	ND<6	6
Nitrobenzene	ND<6	6
Isophorone	ND<4	4
Bis-(2-chloroethoxy)methane	ND<4	4
1,2,4-trichlorobenzene	ND<6	6
Napthalene	ND<4	4
Hexachlorobutadiene	ND<4	4
2-chloronaphthalene	ND<6	6
2-methyl naphthalene	ND<4	4
4-chloroaniline	ND<6	6
2-nitroaniline	ND<8	8
3-nitroaniline	ND<10	10
4-nitroaniline	ND<18	18
Hexachlorocyclopentadiene	ND<8	8
Dimethyl phthalate	ND<6	6
Acenaphthylene	ND<4	4
Acenaphthene	ND<4	4
2,4-dinitrotoluene	ND<10	10
2,6-dinitrotoluene	ND<6	6
Diethyl phthalate	ND<4	4
4-chlorophenylphenylether	ND<4	4
Fluorene	ND<6	6
N-nitrosodiphenylamine	ND<4	4
4-bromophenylphenylether	ND<4	4
Hexachlorobenzene	ND<4	4

ND = Not Detected

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Job #: 75082

Project: #9005 116 BI-FLD/San Antonio Pump
Matrix: Water

EPA Method 625
Acid & Base/Neutral Extractables (Low Level)
 $\mu\text{g/L}$

Lab I.D.: 75082-2
Client I.D.: MW-2

<u>ACID COMPOUNDS</u>	<u>CONCENTRATION</u>	<u>LIMIT OF DETECTION</u>
Phenanthrene	ND<4	4
Anthracene	ND<4	4
Di-n-butylphthalate	ND<4	4
Fluoranthene	ND<6	6
Pyrene	ND<10	10
Benzylbutylphthalate	ND<2	2
3,3'-dichlorobenzidine	ND<80	80
Benzo(a)anthracene	ND<4	4
Bis-(2-ethylhexyl)phthalate	ND<20	20
Chrysene	ND<2	2
Di-n-octylphthalate	ND<4	4
Benzo(b)fluoranthene	ND<10	10
Benzo(k)fluoranthene	ND<8	8
Benzo(a)pyrene	ND<4	4
Indeno(1,2,3-cd)pyrene	ND<10	10
Dibenzo(a,h)anthracene	ND<16	16
Benzo(ghi)perylene	ND<16	16

ND = Not Detected

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CERTIFICATE OF ANALYSIS

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Date Reported: 10/08/93
Job #: 75082

Project: #9005 116 BI-FLD/San Antonio Pump
Matrix: Water

EPA Method 625
Acid & Base/Neutral Extractables (Low Level)
µg/L

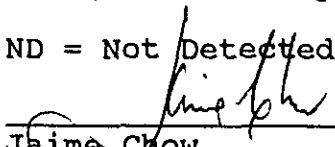
Lab I.D.: 75082-3
Client I.D.: MW-3

<u>ACID COMPOUNDS</u>	<u>CONCENTRATION</u>	<u>LIMIT OF DETECTION</u>
Phenol	ND<10	10
2-chlorophenol	ND<6	6
2-nitrophenol	ND<4	4
2,4-dimethylphenol	ND<4	4
2,4-dichlorophenol	ND<6	6
4-chloro-3-methylphenol	ND<8	8
2,4,6-trichlorophenol	ND<6	6
2,4-dinitrophenol	ND<10	10
4-nitrophenol	ND<12	12
2-methyl-4,6-dinitrophenol	ND<6	6
Pentachlorophenol	ND<10	10
2-methyl phenol	ND<6	6
4-methyl phenol	ND<6	6

BASE/NEUTRAL COMPOUNDS

N-nitrosodimethylamine	ND<8	8
Bis(2-chloroethyl) ether	ND<8	8
1,3-dichlorobenzene	ND<4	4
1,4-dichlorobenzene	ND<6	6
1,2-dichlorobenzene	ND<6	6
Bis-(2-chloroisopropyl) ether	ND<16	16

ND = Not Detected


Jaime Chow
Laboratory Director

Precision Analytical Laboratory, Inc.

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Date Analyzed: 09/29/93
Date Reported: 10/08/93
Job #: 75082

Project: #9005 116 BI-FLD/San Antonio Pump
Matrix: Water

EPA Method 625
Acid & Base/Neutral Extractables (Low Level)
µg/L

Lab I.D.: 75082-3
Client I.D.: MW-3

<u>ACID COMPOUNDS</u>	<u>CONCENTRATION</u>	<u>LIMIT OF DETECTION</u>
N-nitrosodi-n-propylamine	ND<10	10
Hexachloroethane	ND<6	6
Nitrobenzene	ND<6	6
Isophorone	ND<4	4
Bis-(2-chloroethoxy)methane	ND<4	4
1,2,4-trichlorobenzene	ND<6	6
Napthalene	ND<4	4
Hexachlorobutadiene	ND<4	4
2-chloronaphthalene	ND<6	6
2-methyl naphthalene	ND<4	4
4-chloroaniline	ND<6	6
2-nitroaniline	ND<8	8
3-nitroaniline	ND<10	10
4-nitroaniline	ND<18	18
Hexachlorocyclopentadiene	ND<8	8
Dimethyl phthalate	ND<6	6
Acenaphthylene	ND<4	4
Acenaphthene	ND<4	4
2,4-dinitrotoluene	ND<10	10
2,6-dinitrotoluene	ND<6	6
Diethyl phthalate	ND<4	4
4-chlorophenylphenylether	ND<4	4
Fluorene	ND<6	6
N-nitrosodiphenylamine	ND<4	4
4-bromophenylphenylether	ND<4	4
Hexachlorobenzene	ND<4	4

ND = Not Detected

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Date Reported: 10/08/93
Job #: 75082

Project: #9005 116 BI-FLD/San Antonio Pump
Matrix: Water

EPA Method 625
Acid & Base/Neutral Extractables (Low Level)
 $\mu\text{g/L}$

Lab I.D.: 75082-3
Client I.D.: MW-3

<u>ACID COMPOUNDS</u>	<u>CONCENTRATION</u>	<u>LIMIT OF DETECTION</u>
Phenanthrene	ND<4	4
Anthracene	ND<4	4
Di-n-butylphthalate	ND<4	4
Fluoranthene	ND<6	6
Pyrene	ND<10	10
Benzylbutylphthalate	ND<2	2
3,3'-dichlorobenzidine	ND<80	80
Benzo(a)anthracene	ND<4	4
Bis-(2-ethylhexyl)phthalate	ND<20	20
Chrysene	ND<2	2
Di-n-octylphthalate	ND<4	4
Benzo(b)fluoranthene	ND<10	10
Benzo(k)fluoranthene	ND<8	8
Benzo(a)pyrene	ND<4	4
Indeno(1,2,3-cd)pyrene	ND<10	10
Dibenzo(a,h)anthracene	ND<16	16
Benzo(ghi)perylene	ND<16	16

ND = Not Detected

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Job #: 75082

Project: #9005 116 BI-FLD/San Antonio Pump
Matrix: Water

EPA Method 625
Acid & Base/Neutral Extractables (Low Level)
µg/L

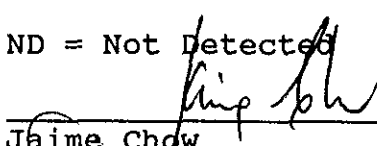
Lab I.D.: 75082-MB
Client I.D.: METHOD BLANK

<u>ACID COMPOUNDS</u>	<u>CONCENTRATION</u>	<u>LIMIT OF DETECTION</u>
Phenol	ND<5	5
2-chlorophenol	ND<3	3
2-nitrophenol	ND<2	2
2,4-dimethylphenol	ND<2	2
2,4-dichlorophenol	ND<3	3
4-chloro-3-methylphenol	ND<4	4
2,4,6-trichlorophenol	ND<3	3
2,4-dinitrophenol	ND<5	5
4-nitrophenol	ND<6	6
2-methyl-4,6-dinitrophenol	ND<3	3
Pentachlorophenol	ND<5	5
2-methyl phenol	ND<3	3
4-methyl phenol	ND<3	3

BASE/NEUTRAL COMPOUNDS

N-nitrosodimethylamine	ND<4	4
Bis(2-chloroethyl) ether	ND<4	4
1,3-dichlorobenzene	ND<2	2
1,4-dichlorobenzen	ND<3	3
1,2-dichlorobenzene	ND<3	3
Bis-(2-chloroisopropyl) ether	ND<8	8

ND = Not Detected


Jaime Chow
Laboratory Director

JC/dwc

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Job #: 75082

Project: #9005 116 BI-FLD/San Antonio Pump
Matrix: Water

EPA Method 625
Acid & Base/Neutral Extractables (Low Level)
 $\mu\text{g/L}$

Lab I.D.: 75082-MB

Client I.D.: METHOD BLANK

<u>ACID COMPOUNDS</u>	<u>CONCENTRATION</u>	<u>LIMIT OF DETECTION</u>
N-nitrosodi-n-propylamine	ND<5	5
Hexachloroethane	ND<3	3
Nitrobenzene	ND<3	3
Isophorone	ND<2	2
Bis-(2-chloroethoxy)methane	ND<2	2
1,2,4-trichlorobenzene	ND<3	3
Napthalene	ND<2	2
Hexachlorobutadiene	ND<2	2
2-chloronaphthalene	ND<3	3
2-methyl naphthalene	ND<2	2
4-chloroaniline	ND<3	3
2-nitroaniline	ND<4	4
3-nitroaniline	ND<5	5
4-nitroaniline	ND<9	9
Hexachlorocyclopentadiene	ND<4	4
Dimethyl phthalate	ND<3	3
Acenaphthylene	ND<2	2
Acenaphthene	ND<2	2
2,4-dinitrotoluene	ND<5	5
2,6-dinitrotoluene	ND<3	3
Diethyl phthalate	ND<2	2
4-chlorophenylphenylether	ND<2	2
Fluorene	ND<3	3
N-nitrosodiphenylamine	ND<2	2
4-bromophenylphenylether	ND<2	2
Hexachlorobenzene	ND<2	2

ND = Not Detected

Precision Analytical Laboratory, Inc.

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Walnut Creek, CA 94596

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Date Analyzed: 09/29/93
Date Reported: 10/08/93
Job #: 75082

Project: #9005 116 BI-FLD/San Antonio Pump
Matrix: Water

EPA Method 625
Acid & Base/Neutral Extractables (Low Level)
µg/L

Lab I.D.: 75082-MB
Client I.D.: METHOD BLANK

<u>ACID COMPOUNDS</u>	<u>CONCENTRATION</u>	<u>LIMIT OF DETECTION</u>
Phenanthrene	ND<2	2
Anthracene	ND<2	2
Di-n-butylphthalate	ND<2	2
Fluoranthene	ND<3	3
Pyrene	ND<5	5
Benzylbutylphthalate	ND<1	1
3,3'-dichlorobenzidine	ND<40	40
Benzo(a)anthracene	ND<2	2
Bis-(2-ethylhexyl)phthalate	ND<10	10
Chrysene	ND<1	1
Di-n-octylphthalate	ND<2	2
Benzo(b)fluoranthene	ND<5	5
Benzo(k)fluoranthene	ND<4	4
Benzo(a)pyrene	ND<2	2
Indeno(1,2,3-cd)pyrene	ND<5	5
Dibenzo(a,h)anthracene	ND<8	8
Benzo(ghi)perylene	ND<8	8

ND = Not Detected

CHAIN OF CUSTODY RECORD

Camp Dresser & McKee Inc.

PROJECT NAME San Antonio Pump

PROJECT NUMBER 9005 116 BI-FLD

Field Log Book Reference No. _____

933-2900

SAMPLE NUMBER	DATE	TIME	SAMPLE LOCATION	SAMPLE TYPE	ANALYSES							NUMBER OF CONTAINERS	LOG BOOK PG NO.	REMARKS
					EXTR. ORG.	VOA	PEST. PCB	TRACE METALS	8210-1020	215-1020	411-1			
MW-1	9-24-93		San Antonio Pump Station									3		
MW-2	↓		↓									↓		
MW-3	↓		↓									↓		

SAMPLED BY (SIGN) Debra M. [Signature]

RELINQUISHED BY (SIGN) ① <u>[Signature]</u> DATE/TIME (9-27-93)	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 (9-27-93 10:20 AM)	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
_____	_____	_____	(/ /)

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

Appendix B
Field Procedures and Field Logs

Appendix B Field Procedures and Field Logs

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 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. On some groundwater monitoring wells additional well volumes were removed to achieve stabilization of aquifer parameters. Removal of groundwater was performed with a 3.5-inch diameter, one gallon capacity PVC bailer. Aquifer parameters were collected at five gallon intervals for all wells. Field data sheets showing measured purge parameters, volumes, and time are included in this Appendix.

Groundwater samples were collected with a 1-inch diameter disposal bailer directly following purging. For each well, groundwater was transferred to a one liter glass bottle and two 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 VOA vials and half of the one liter bottle.

Upon collection, samples bottles were capped with teflon lined caps, labeled and immediately placed on ice pending transport to a California state-certified laboratory, following EPA chain-of-custody protocol.

To minimize the risk of cross contamination, all groundwater sampling equipment was cleaned between purging and sampling groundwater monitoring wells. The cleaning procedure involved an initial wash of the 3.5-inch PVC bailer with water and trisodium phosphate followed by a double rinse involving tap water and distilled water.

Sample ID No.:	
MONITORING WELL PURGING LOG	
Well No.: MW-3	
Installation: N/A	Site: 301 S. ...
HAZWRAP Contractor: N/A	Project No.:
Purge Start: (Date) 9-24-93 (Time) 9:35	Purge End: (Date) 9-24-93 (Time) 10:10
Purged by:	

Depth Measurement Ref. Point: 284.74 Well Csg ID: 2" (4") 6" Other _____

Well Hdspace/Odor: N/A LNAPL Check (Y/N) (N) DNAPL Check (Y/N) (N)

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

Depth to Top and Bottom of Screen Interval: _____
Depth to LNAPL: N/A Depth to DNAPL: N/A Orig. DTW: 15.5 Final DTW: 17.6

LNAPL/DNAPL Thickness: N/A LNAPL/DNAPL Sample # and Volume: N/A

Measured Well TD: 21.44

(-) Orig. DTW: 15.50

(=) Wtr Col. Thick.: 5.94 (X) G/ft (=) 3.86 G/Csg Vol. (X) 3 Csg Vol. (=) 11.5 Total Purge Gals

2" - 0.16
4" - 0.65
6" - 1.47

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

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

Purge Wtr Containerized? (Y/N) _____ Avge Purge Rate: 5 gpm

Weather: Clear (85°F)

Actual Time	Elapsed Time	Vols. Purged (Gals)	Depth To Wtr (ft)	Depth Of Pump Intake (ft)	Temp (°C)	pH (s.a)	Cond. (µmhos/m)	Turbidity (NTU)	Other	Comment
9:35	5	5	15.5		25	8.1	130	high		
10:00	10	5			25	7.7	150			
10:35	15	10			25	7.7	140			
10:10	20	17.5	17.6		25	7.0	140	low		
10:15	Well Sampled									

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

Sample ID No.:	
MONITORING WELL PURGING LOG	
Well No.: MW-1	Installation: _____
Site: San Antonio Pump Station	HAZWRAP Contractor: _____
Project No.:	Purge Start: (Date) 9-24-93 (Time) 11:35
Purge End: (Date) 9-24-93 (Time) 1:00	Purged by: B. Swann

Depth Measurement Ref. Point: * 289.5 TOC Well Csg ID: 2" (4") 6" Other _____

Well Hdspace/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: _____
 Depth to LNAPL: NA Depth to DNAPL: NA Orig. DTW: 14.82 Final DTW: ≈ 15.8

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

Measured Well TD: 16.00

(-) Orig. DTW: _____

(=) Wtr Col. Thick.: 1.18 (X) 2" - 0.16 1
 4" - 0.65 2
 G/ft (=) 767 G/Csg Vol. (X) 3 Csg Vol. (=) 2.3 Total
 4 4 Gats.
 6" - 1.47 5
 - - -

Purge Method:

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

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

Purge Wtr Containerized? (Y/N) _____ Avg Purge Rate: 5 gpm

Weather: clear (85°F)

Actual Time	Elapsed Time	Vol. Purged (Gals)	Depth To Wtr (ft)	Depth Of Pump Intake (ft)	Temp (°C)	pH (s.a)	Cond. (umhos/m)	Turbidity (NTU)	Other	Comment
1135		2	15'	-	25	7.3	164	-		Insufficient water to check parameter or get complete sample, water is grey in color.
1:00	12.5	Sampled								

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

Sample ID No.:	
Well No.: MW-2	
Installation: N/A	Site: San Antonio
HAZWRAP Contractor: N/A	Project No.:
Purge Start: (Date) 2-23 (Time) 10:50	Purge End: (Date) 4-24-93 (Time) 11:10
Purged by: B. [Signature]	

Depth Measurement Ref. Point: * 23373 Well Csg ID: 2" 4" 6" Other _____

Well Hdspace/Odor: N/A LNAPL Check (Y/N) DNAPL Check (Y/N)

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

Depth to Top and Bottom of Screen Interval: _____
Depth to LNAPL: N/A Depth to DNAPL: N/A Orig. DTW: 15.18 Final DTW: 19.5

LNAPL/DNAPL Thickness: _____ LNAPL/DNAPL Sample No. and Volume: N/A

Measured Well TD: 21.44

(-) Orig. DTW: 15.18

(=) Wtr Col. Thick.: 6.30 (X) 2" - 0.16 1
4" - 0.65 2
6" - 1.47 3 Csg Vol. (=) 12.2 Total Purge Gals
4
5

Purge Method:

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

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

Purge Wtr Containerized? (Y/N) Avg Purge Rate: 5 gpm

Weather: Clear (85°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
10:50	-		15.18		25	7.8	165	High		20 of water left in well
10:55	5	5			25	7.2	151			
11:00	10	10			25	7.5	163	mod.		
11:05	15	15			25	7.0	162			
11:07	17	20			25	7.7	165			
11:10	20	22	19.5		25	7.6	163	low		
11:15	Well	Sampled								

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