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Delta
Environmental
Consultants, Inc.

SUMMARY OF RESULTS - SECOND HALF 1991
GROUND WATER MONITORING PROGRAM

SUPERIOR TERMINAL

SUPERIOR, WISCONSIN

LOCATION CODE: 00406-058

DELTA NO. 10-88-457

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SUPERIOR TERMINAL

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DELTA NO. 10-88-457

EXECUTIVE SUMMARY

This report presents the results of the product recovery and ground water monitoring programs at the Amoco Oil Company bulk petroleum storage terminal located in Superior, Wisconsin. Information collected through field investigation work during the summer of 1991 is also presented. The conclusions of the report are summarized below:

- Ground water elevations measured during July and August of 1991 show the water table to be at the highest levels recorded since monitoring began in 1988.
- Measured free product thickness have decreased in the majority of the wells, however, several wells showed an increase in product thickness. Free product has been measured in one well which previously did not contain free product.
- Concentrations of dissolved phase hydrocarbons in wells outside the product plume have remained essentially unchanged since monitoring began in 1988.
- The monitoring wells installed downgradient from the free product plume in July 1991 did not contain detectable concentrations of dissolved phase hydrocarbons.
- Approximately 1,150 gallons of product have been recovered over the six month period from January 30 to August 6, 1991.
- The next monitoring report will be prepared in February 1992.

1.0 INTRODUCTION

The purpose of this report is to present site monitoring data collected from February through August 1991 at the Amoco Oil Company petroleum storage terminal located at 2904 Winter Street in Superior, Wisconsin (Figure 1). The information in this report covers three principal areas of the ongoing environmental investigation and clean-up at the site: data generated by the ground water monitoring program; remediation system monitoring data; and additional subsurface investigation data.

Previous reports regarding this project which have been presented to the Wisconsin Department of Natural Resources include:

- May 8, 1989 Remedial Investigation Report
- March 14, 1991 Supplemental Site Investigation Report
- April 23 , 1991 Summary of Results - First Quarter 1991 Ground Water Monitoring Program
- June 10, 1991 Interim Product Recovery System Report

2.0 GROUND WATER MONITORING

2.1 Ground Water Elevation and Free Product Thickness Measurements

Ground water elevation and free product thickness measurements were collected from the site monitoring wells on April 24 and July 9, 1991, (Figures 1 and 2). Additional measurements were collected from the monitoring wells and recovery well RW-4, which are located near the operating Interim Product Recovery Systems (IPRS), on June 6 and August 6, 1991, during the monthly operation and maintenance site visits.

A summary of the ground water elevations and measured free product thicknesses are presented in Table 1. Hydrographs for monitoring wells that did not contain free product are shown in Figures 3A and 3B. The hydrographs indicate that ground water elevations at the site are the highest since ground water monitoring began in 1988. The ground water elevations have been steadily increasing since April 1991, in response to rainfall during May, June, and July 1991. The average increase in ground water elevations outside of the free product plume was 2.09 feet from April to July 1991. The average increase of ground water elevations within the plume, which were corrected for the presence of free product, was 2.35 feet from April to July 1991. Measured free product thicknesses decreased in monitoring wells MW-1, MW-12, MW-14, MW-22, and MW-27 from April to July 1991 while measured free product thicknesses increased in monitoring wells MW-2, MW-23, MW-24, MW-25, and MW-26 during the same time period. Measurable free product was recorded for the first time in monitoring well MW-16 on August 6, 1991 (1.5 feet); a film of product was present in July 1991.

Figure 4 is a contour map of ground water elevations collected at the site in July 1991. Measured ground water elevations within the free product plume were corrected for the presence of free product in order to construct the contour map. The map indicates that the direction of ground water flow and the hydraulic gradient across the site are similar to previous flow and gradient estimations. Historical records of water level elevations and free product thickness are presented in Appendix A.

2.2 Ground Water Sampling and Analyses

Ground water samples were collected from all of the site monitoring wells that did not contain free product on July 10, 1991; copies of the sampling information sheets are contained in Appendix B. Each sample was analyzed by Amoco's Ground Water Management Section (GMS) laboratory for benzene, toluene, ethylbenzene, total xylenes (BTEX), methyl tertiary-butyl ether (MTBE), and total petroleum hydrocarbons (TPH) as gasoline and distillate. Duplicates of samples collected from monitoring wells MW-6 and MW-10, and a travel blank, were also analyzed by GMS. Additional samples collected from monitoring wells MW-6, MW-15, MW-16, MW-17, MW-19, and MW-30, and a travel blank, were analyzed by Pace, Incorporated (Pace), for purgeable halocarbons and aromatics using EPA Methods 601 and 602, and polynuclear aromatic hydrocarbons (PAHs) using EPA Method 610. The wells selected for 601/602/610 analyses were selected based on the direction of ground water flow, previous analytical results, and the well locations relative to known release areas. Three of the four new monitoring wells (MW-33, MW-34, and MW-35) installed on July 23 and 24, 1991, were developed and sampled on August 6, 1991. The ground water samples collected from the new wells were analyzed by GMS for BTEX, MTBE, and TPH as gasoline and distillate. Copies of the analytical reports are contained in Appendix C. Appendix D presents historical records of ground water analytical results.

Tables 2 and 3 present a summary of ground water analytical results from GMS and Pace, respectively. Analyses of ground water samples collected from monitoring wells MW-4, MW-5, MW-6, MW-7, MW-8, MW-13, MW-15, MW-17, MW-18, MW-19, MW-20, MW-28, MW-31, MW-33, MW-34, and MW-35 did not detect BTEX or MTBE above WDNR enforcement standards (ES) for individual compounds; 1,2 dichloroethane (1,2 DCA) was detectable above the ES in the sample collected from MW-6. Of significance is the decrease in detected BTEX in ground water collected from MW-15 since 1988, and the lack of detected BTEX in the sample collected from MW-18; analytical results of ground water samples collected

from MW-18 in the past have shown detected compounds above individual compound ES. Also, the analytical results of the ground water samples collected from the newly installed wells MW-33, MW-34, and MW-35, indicate that the extent of dissolved-phase petroleum hydrocarbons is more closely defined.

Benzene and toluene and/or total xylenes, were detected above individual compound ES in ground water samples collected from monitoring wells MW-3, MW-9, MW-10, MW-11, MW-16, MW-21, and MW-30; 1,2 dichloroethane (1,2 DCA) was detected above the ES in the sample collected from MW-16. MTBE was detected in ground water samples collected from all of these monitoring wells except MW-21. The concentrations of BTEX detected in the ground water samples collected from these wells are all within the high and low ranges of detected BTEX recorded since 1988. A duplicate sample collected from MW-10 indicates that the BTEX/MTBE analytical data is reproducible.

Analyses did not detect PAHs in ground water samples collected from MW-6, MW-15, or MW-17 on July 10, 1991. The sample collected from MW-16, which now contains free product, showed an increase in the number of detected PAHs.

3.0 SYSTEM MONITORING

Operational data from the interim product recovery system (IPRS) was recorded monthly during the monitoring period and is contained in Appendix E. From April 24 to July 9, 1991, recovery wells RW-1, RW-2, and RW-6 recovered approximately 110, 41, and 143 gallons of product, respectively. RW-1, RW-2, and RW-6 recovered 81, 10, and 8 gallons of product, respectively, from July 9 to August 6, 1991. The total volumes of product recovered since the system began operation on January 30, 1991, are 653-gallons from MW-1, 82-gallons from RW-2, and 412-gallons from RW-6.

4.0 RESULTS OF ADDITIONAL SUBSURFACE INVESTIGATION

4.1 Evaluation of the Extent of Free and Dissolved - Phase Product

Four monitoring wells (MW-32, MW-33, MW-34, and MW-35) were installed on July 23 and 24, 1991, to help evaluate the extent of free and dissolved-phase product to the east and north of the terminal (Figure 2). All of the monitoring wells were constructed with two-inch PVC casing and screens, and completed above grade with lockable, four-inch steel protective caps. Monitoring well construction details are presented in

Appendix F. Soil boring logs are presented in Appendix G. Wisconsin Department of Natural Resources (WDNR) monitoring well construction forms were completed by Exploration Technology, Inc. (ETI), and reviewed by Delta prior to being submitted to the WDNR with soil boring forms.

Monitoring well MW-32 (soil boring SB-32) was completed approximately 140 feet south of MW-30 and 200 feet north-northwest of MW-26 on Burlington Northern Railroad (BNRR) property to more closely estimate the northern perimeter of the free product plume. Based on soils sampled during completion of the boring, the soil stratigraphy is consistent with data collected during completion of previous borings at the site (Appendix G). From ground surface to 13 feet below ground surface the soils consisted of approximately ten feet of dense, red plastic clay, and three feet of alternating layers of red silt, silty fine-grained sand, and laminated red clay and silty clay. A water-saturated light brown colored, silty fine-grained sand was logged at 13 feet below ground surface. The well was completed at approximately 24 feet below ground surface. The soil samples collected from 9 to 13 feet below ground surface were impacted by product based on field screening for volatiles with a photoionization detector (PID). Approximately 0.5 foot of free product was measured in MW-32 on August 6, 1991.

Monitoring well MW-33 (SB-33) was completed approximately 190 feet north-northwest of MW-30 on BNRR property. MW-34 (SB-34) was completed approximately 450 feet northwest of MW-19, on city property, to evaluate the downgradient extent of dissolved-phase petroleum hydrocarbons. Soil samples were not collected from SB-33 or SB-34 during drilling because of damage to the drilling rig. Monitoring wells MW-33 and MW-34 were completed at approximately 23.5 and 28.5 feet below ground surface, respectively. Volatiles were not detected in the soil cuttings with a PID. Analytical results of ground water samples collected from MW-33 and MW-34 on August 16, 1991, show that BTEX, MTBE, and TPH were not detected.

Monitoring well MW-35 (SB-35) was completed approximately 140 feet southeast of MW-23, on the former Stott Briquet property, to evaluate the upgradient extent of free and dissolved-phase petroleum hydrocarbons. Soil was sampled continuously from 10 to 24 feet below ground surface during drilling. The soil consisted of the same dense, red plastic clay logged during drilling of the existing monitoring wells at the site. Red clayey silt was interlayered with the clay at approximately 23 feet below ground surface. Soil

samples were collected from 25 to 27 feet below ground surface for permeability testing of the fine-grained sand that underlies the upper clay unit. Eighteen inches of light brown colored, fine-grained sand were recovered from 25.5 to 27 feet below ground surface; the lower 6-inches of the sand were selected for permeability testing. The well was completed at approximately 28 feet below ground surface. Volatiles were not detected in the split-spoon samples by field screening with a PID. Analytical results of the ground water samples collected from MW-35 on August 6, 1991, show that BTEX, MTBE, and TPH were all below the analytical detection limits.

The extent of free and dissolved-phase product is shown in Figure 5. Figure 5 is based on free product measurements and analyses of ground water samples collected in July and August 1991.

4.2 Evaluation of Soil Impacts Near Tank 38

Two soil borings were completed to approximately 19 feet below ground surface inside the berm surrounding Tank 38 to evaluate the extent of impacts to soil in this area. Soil boring SB-36 was completed immediately southwest of Tank 38; SB-37 was completed immediately east of monitoring well MW-3. Soil was screened in the field for volatiles with a PID. Soil collected during the completion of SB-36 showed volatiles and product odor from near ground surface to approximately six feet below ground surface. A sample collected from eight to ten feet below ground surface and screened with a PID did not show total volatiles above 10 parts per million (ppm) or an obvious product odor. A strong product odor was recognized in a sand seam at 13.5 below ground surface and 50 ppm total volatiles were measured with a PID. The tan and gray colored fine-grained sand sampled at 16 feet below ground surface showed up to 130 ppm total volatiles. Soil sampled during the drilling of SB-37 showed decreasing volatile content with depth (see Appendix G). Product odor and volatiles were detected (up to 60 ppm) to at least 10 feet below ground surface during completion of SB-37.

5.0 SUMMARY OF RESULTS

Ground water monitoring data indicates that the direction of ground water flow during July 1991, which was a period of increased ground water elevations at the site, is similar to previous estimates of the direction of flow. Product thicknesses have increased in some wells and decreased in others. The northern perimeter of the free product plume is located between MW-30 and MW-32; the northwest perimeter of the free

product plume has migrated northwest and beyond MW-16, but has not reached MW-17. The southeast perimeter of the free product plume is located between MW-23 and MW-35. Analytical results of ground water samples indicate that the present extent of dissolved-phase petroleum hydrocarbons is similar to previous estimates; analytical results of ground water samples collected from MW-33, MW-34, and MW-35 show that the upgradient and downgradient extent of dissolved-phase petroleum hydrocarbons is more closely defined. These recently installed monitoring wells have provided downgradient monitoring points that do not contain dissolved phase hydrocarbons.

Soil sampled during the completion of SB-36 near Tank 38 appears to be impacted by petroleum hydrocarbons from near ground surface to the water table. Soil sampled during the completion of SB-37, upgradient of Tank 38 in the southeast corner of the berm, showed soil impacts from near ground surface to ten feet below ground surface.

The next monitoring report will be completed in February 1992.

6.0 REMARKS

The recommendations contained in this report represent our professional opinions. These opinions are based on currently available information and are arrived at in accordance with currently accepted hydrogeologic and engineering practices at this time and location. Other than this, no warranty is implied or intended.

This report was prepared by DELTA ENVIRONMENTAL CONSULTANTS, INC.

Paul Carter

Date: 10-15-91

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Reviewed by:

John C. Grams

Date: 10-15-91

John C. Grams
Project Manager

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TABLE 1

Summary of Ground Water Elevations
Superior Terminal
Superior, Wisconsin
Delta No. 10-88-457

Well Number	Top of Casing Elevation (ft)	04/24/91	06/06/91	07/09/91	08/06/91
MW-1	637.68	614.00(3.32)	615.61(3.14)	617.43(2.70)	617.80(2.98)
MW-2	637.23	613.94(2.99)	614.11(4.20)	614.19(5.41)	614.21(6.32)
MW-3	636.13	620.17	NM	622.36	NM
MW-4	636.71	618.60	NM	621.11	621.41
MW-5	636.78	617.87	NM	620.04	NM
MW-6	636.77	616.12	NM	617.57	NM
MW-7	636.73	615.30	NM	616.54	616.90
MW-8	634.61	613.17	NM	614.50	NM
MW-9	631.57	616.10	NM	618.72	NM
MW-10	633.54	615.35	NM	617.38	NM
MW-11	632.40	615.09	NM	616.84	NM
MW-12	633.04	613.87(2.34)	NM	616.16(1.18)	NM
MW-13	636.01	615.90	NM	617.60	NM
MW-14	636.31	612.26(3.27)	614.79(1.70)	616.03(1.37)	617.07(1.22)
MW-15	632.65	612.69	NM	614.52	NM
MW-16	636.17	613.71	615.07	615.85	615.31(1.45)
MW-17	632.83	613.88	NM	616.88	NM
MW-18	636.77	615.95	NM	617.72	NM
MW-19	635.29	611.82	NM	613.57	NM
MW-20	636.26	616.00	NM	617.43	NM
MW-21	637.11	616.07	617.05	617.93	618.62
MW-22	638.82	613.38(3.02)	NM	616.91(0.50)	NM
MW-23	636.73	615.77(3.78)	616.95(4.67)	617.04(5.93)	616.76(7.10)
MW-24	638.32	613.17(4.43)	NM	613.39(7.66)	NM
MW-25	637.49	612.28(4.72)	NM	614.10(5.97)	NM
MW-26	635.83	613.00(2.42)	NM	615.31(2.59)	NM
MW-27	637.96	612.06(4.73)	614.81(2.90)	615.98(2.63)	616.92(2.60)
MW-28	638.08	NM	NM	619.24	NM

Table 1 (continued)
Page 2

Well Number	Top of Casing Elevation (ft)	04/24/91	06/06/91	07/09/91	08/06/91
MW-30	632.74	614.36	NM	618.08	NM
MW-31	635.05	614.73	NM	617.93	NM
MW-32	633.76	NM	NM	NM	617.78(0.55)
MW-33	632.42	NM	NM	NM	619.64
MW-34	629.10	NM	NM	NM	616.55
MW-35	639.60	NM	NM	NM	622.64

Elevations in feet relative to MGVD.
Ground water elevations for wells containing free product were not corrected for product thickness.
Measured free product thicknesses shown in parentheses.
NM = No measurement
Monitoring wells MW-32, MW-33, MW-34, and MW-35 were installed July 23-24, 1991.

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Summary of Ground Water Analytical Results - GMS Laboratory
Superior Terminal
Superior, Wisconsin
Delta No. 10-88-457

Data Reported as mg/L or Parts Per Million

Well	Benzene[1]	Toluene[1]	Ethyl-benzene[1]	Total Xylenes[1]	Sum BTEX	MTBE[2]	TPH as Gasoline[3]	TPH as Distillate[3]
Samples Collected July 9, 1991								
ES	0.005	0.343	1.360	0.620	None	0.060	None	None
MW-3	0.381	0.477	0.063	0.675	1.60	0.03	6	1
MW-4	ND	ND	0.002	ND	0.002	ND	ND	ND
MW-5	ND	ND	ND	ND	ND	ND	ND	ND
MW-6	ND	ND	ND	ND	ND	ND	ND	ND
MW-7	ND	ND	ND	ND	ND	ND	ND	ND
MW-8	ND	ND	ND	ND	ND	ND	ND	ND
MW-9	0.627	0.255	0.794	1.13	2.81	0.75	69	7
MW-10	0.026	0.013	0.031	0.022	0.093	0.03	2	ND
MW-11	0.087	0.010	0.020	0.009	0.127	0.03	2	ND
MW-13	ND	ND	ND	ND	ND	ND	ND	ND
MW-15	ND	ND	ND	ND	ND	ND	ND	1
MW-16	0.689	4.26	0.817	3.80	9.56	0.55	57	12
MW-17	ND	ND	ND	ND	ND	ND	ND	ND
MW-18	ND	ND	ND	ND	ND	ND	ND	ND
MW-19	0.001	0.001	0.007	0.028	0.038	ND	ND	3
MW-20	ND	ND	ND	ND	ND	ND	ND	ND
MW-21	0.085	0.001	ND	0.003	0.089	ND	ND	ND
MW-28	ND	ND	ND	ND	ND	ND	ND	ND
MW-30	0.904	0.059	ND	0.090	1.05	0.16	9	2
MW-31	ND	ND	ND	ND	ND	ND	ND	ND
Dup. #1	ND	ND	ND	ND	ND	ND	ND	ND
Dup. #2	0.026	0.013	0.029	0.022	0.090	0.03	2	ND
Travel Blank	ND	ND	ND	ND	ND	ND	ND	ND
Samples Collected August 6, 1991								
MW-33	ND	ND	ND	ND	ND	ND	ND	ND
MW-34	ND	ND	ND	ND	ND	ND	ND	ND
MW-35	ND	ND	ND	ND	ND	ND	ND	ND
Dup #3	ND	ND	ND	ND	ND	ND	ND	ND
Travel Blank	ND	ND	ND	ND	ND	ND	ND	ND

[1]Method Detection Limit = 0.001 mg/L.
[2]Method Detection Limit = 0.02 mg/L.
[3]Method Detection Limit = 1.0 mg/L.
ND = Not detected at or above detection limits.
Dup #1 = Duplicate sample from MW-6.
Dup #2 = Duplicate sample from MW-10.
Dup #3 = Duplicate sample from MW-34.
ES = Enforcement Standard, MTBE ES is proposed.

TA [redacted] 3

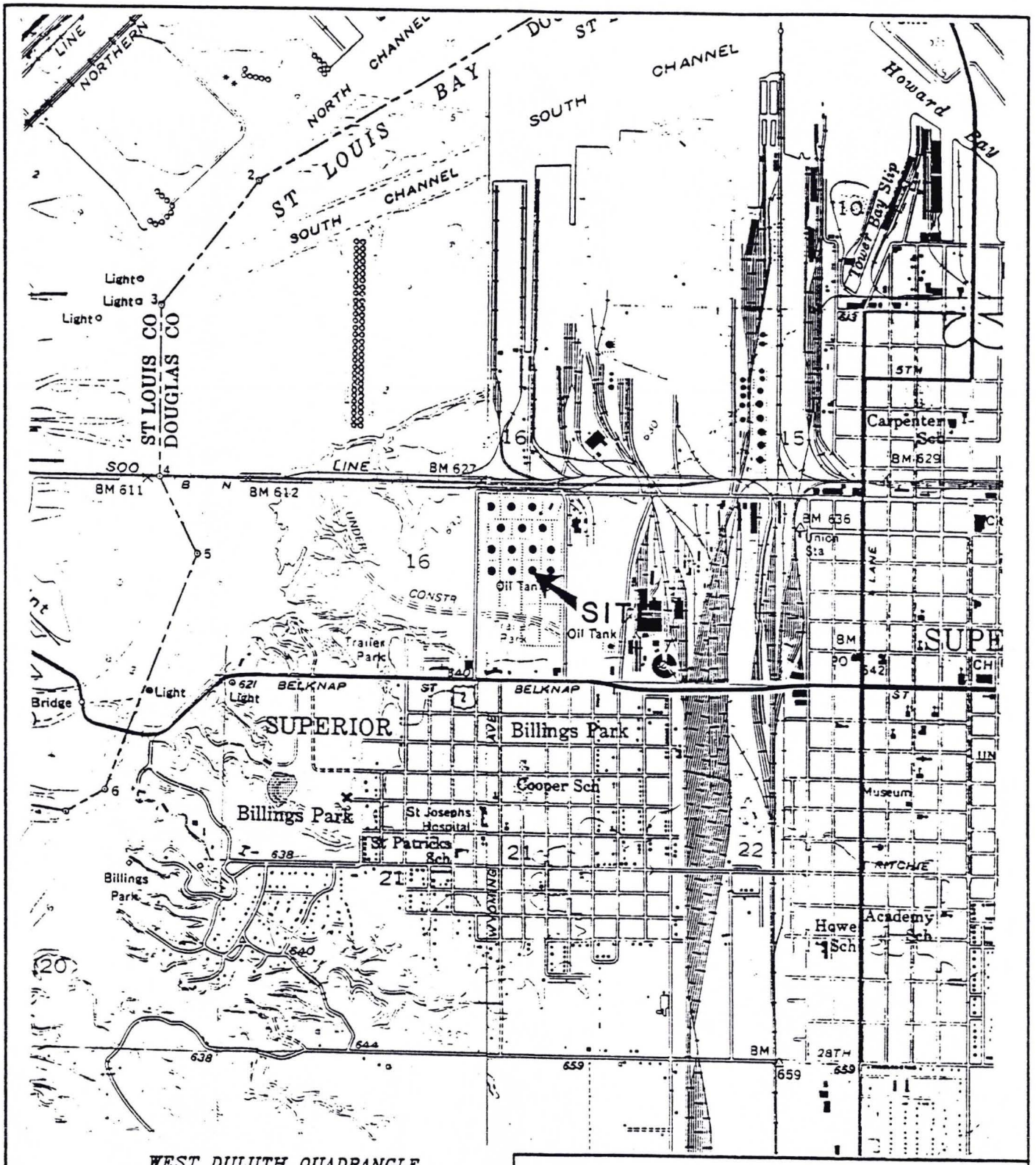
Summary of Ground Water Analytical Results - Pace, Incorporated
Superior Terminal
Superior, Wisconsin
Delta No. 10-88-457

Data Reported as mg/L or Parts Per Million

Compounds	MW-6	MW-15	MW-16	MW-17	MW-19	MW-30	Travel Blank	ES
Benzene	<0.001	<0.001	0.360	<0.001	0.0022	1.400	<0.001	0.005
Toluene	<0.001	<0.001	0.320	<0.001	<0.001	<0.100	<0.001	0.343
Ethylbenzene	<0.001	<0.001	0.660	<0.001	0.0088	<0.100	<0.001	1.360
Total Xylenes	<0.001	<0.001	2.800	<0.001	0.022	<0.100	<0.001	0.620
Naphthalene	<0.0015	<0.0015	<0.0075	<0.0015	0.033	<0.0015	NA	0.040
Acenaphthylene	<0.0015	<0.0015	<0.0075	<0.0015	<0.0015	0.013	NA	None
Acenaphthene	<0.002	<0.002	<0.010	<0.002	0.010	0.012	NA	None
Fluorene	<0.00031	<0.00031	0.023	<0.00031	0.0012	0.00032	NA	None
Phenanthrene	<0.0002	<0.0002	0.018	<0.0002	0.00031	<0.0002	NA	None
Anthracene	<0.00005	<0.00005	0.0046	<0.00005	<0.00005	<0.00005	NA	None
Fluoranthene	<0.0003	<0.0003	0.013	<0.0003	<0.0003	<0.0003	NA	None
Pyrene	<0.0001	<0.0001	0.0076	<0.0001	<0.0001	<0.0001	NA	None
Benzo(a) anthracene	<0.0001	<0.0001	0.002	<0.0001	<0.0001	<0.0001	NA	None
Chrysene	<0.0001	<0.0001	0.0023	<0.0001	<0.0001	<0.0001	NA	None
Benzo(b) fluoranthene	<0.0002	<0.0002	0.0013	<0.0002	<0.0002	<0.0002	NA	None
Benzo(k) fluoranthene	<0.00005	<0.00005	0.00049	<0.00005	<0.00005	<0.00005	NA	None
Benzo(a)pyrene	<0.0001	<0.0001	0.00058	<0.0001	<0.0001	<0.0001	NA	$3X10^{-6}$
1,2-Dichloro-ethane	0.002	<0.0002	0.024	<0.0002	<0.0002	<0.020	<0.0002	0.005
Methylene Chloride	<0.001	<0.001	0.120	<0.001	<0.001	<0.100	<0.001	0.150

ES = Enforcement Standand, polynuclear aromatic hydrocarbon ES are proposed.
NA = Not analyzed.

kak/knr.81291



WEST DULUTH QUADRANGLE
MINNESOTA
7.5 MINUTE SERIES (TOPOGRAPHIC)

NORTH

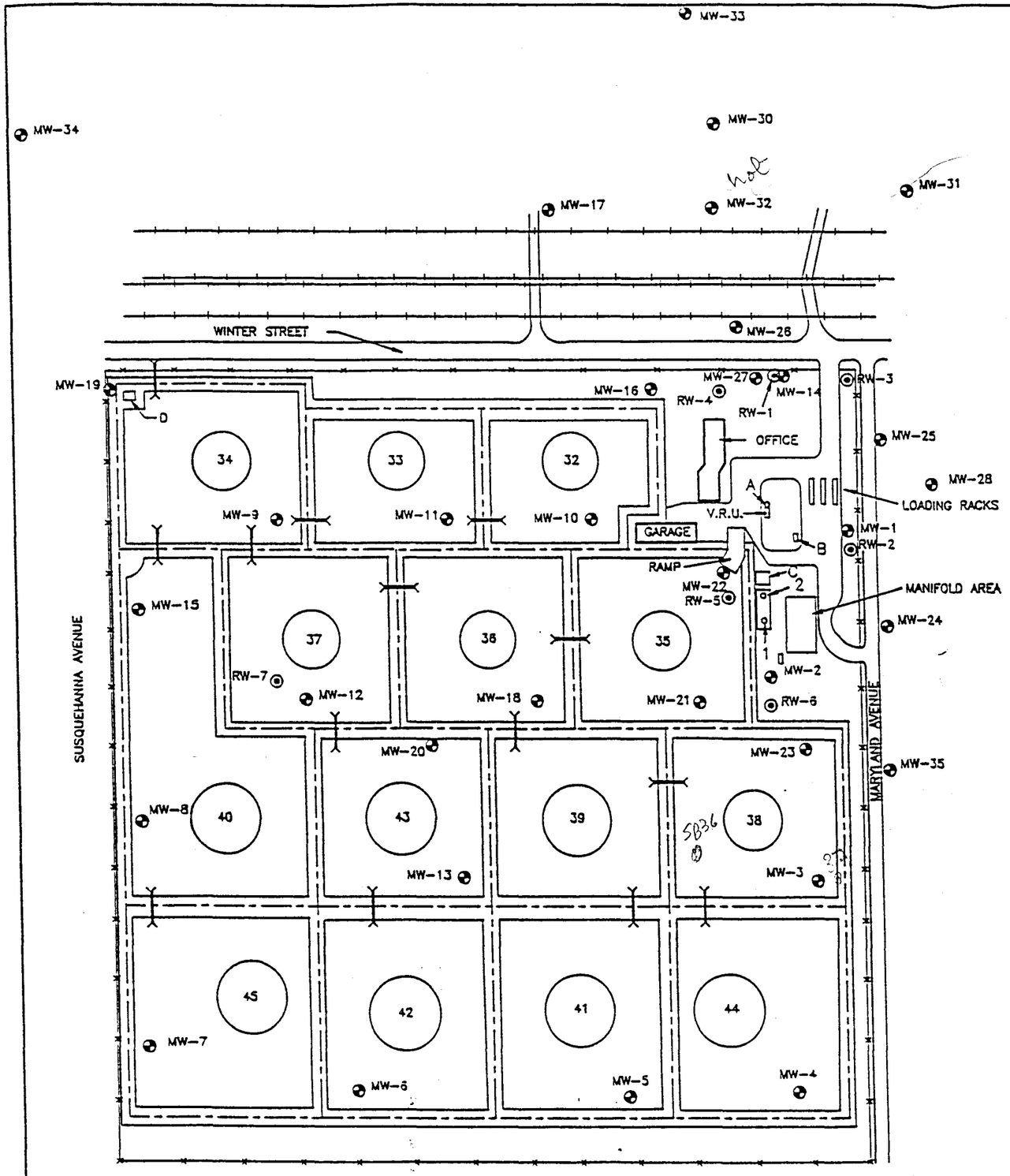
0 2000

SCALE IN FEET

FIGURE 1
SITE LOCATION MAP
SUPERIOR TERMINAL
SUPERIOR, WISCONSIN

PROJECT NO.	PREPARED BY
10-88-457	JCG/PAJ
DATE	REVIEWED BY
4/1/91	HCH

Delta Environmental Consultants, Inc.



LEGEND:

- MONITORING WELL LOCATION
- RECOVERY WELL LOCATION
- RAILROAD TRACKS
- DRAINAGE CULVERT
- FENCE LINE
- A — UNDERGROUND STORAGE TANK LOCATION
- 38 — ABOVE GROUND STORAGE TANK LOCATION

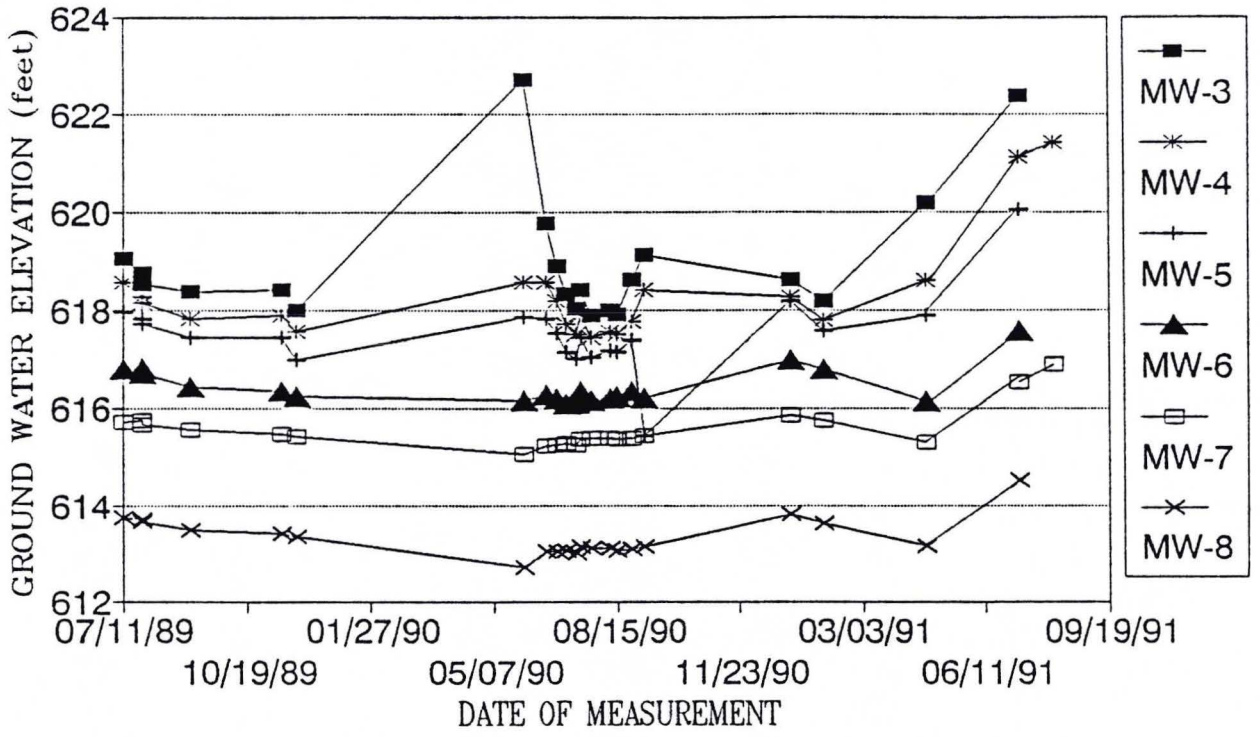
NORTH

0 200

SCALE IN FEET

FIGURE 2
MONITORING WELL LOCATIONS MAP
SUPERIOR TERMINAL
SUPERIOR, WISCONSIN

PROJECT NO.	PREPARED BY	REVIEWED BY	
10-88-457	PLC/PAJ		Delta Environmental Consultants, Inc.
DATE	REVISION NO.	FILE NAME	
8/8/91		88457-2	



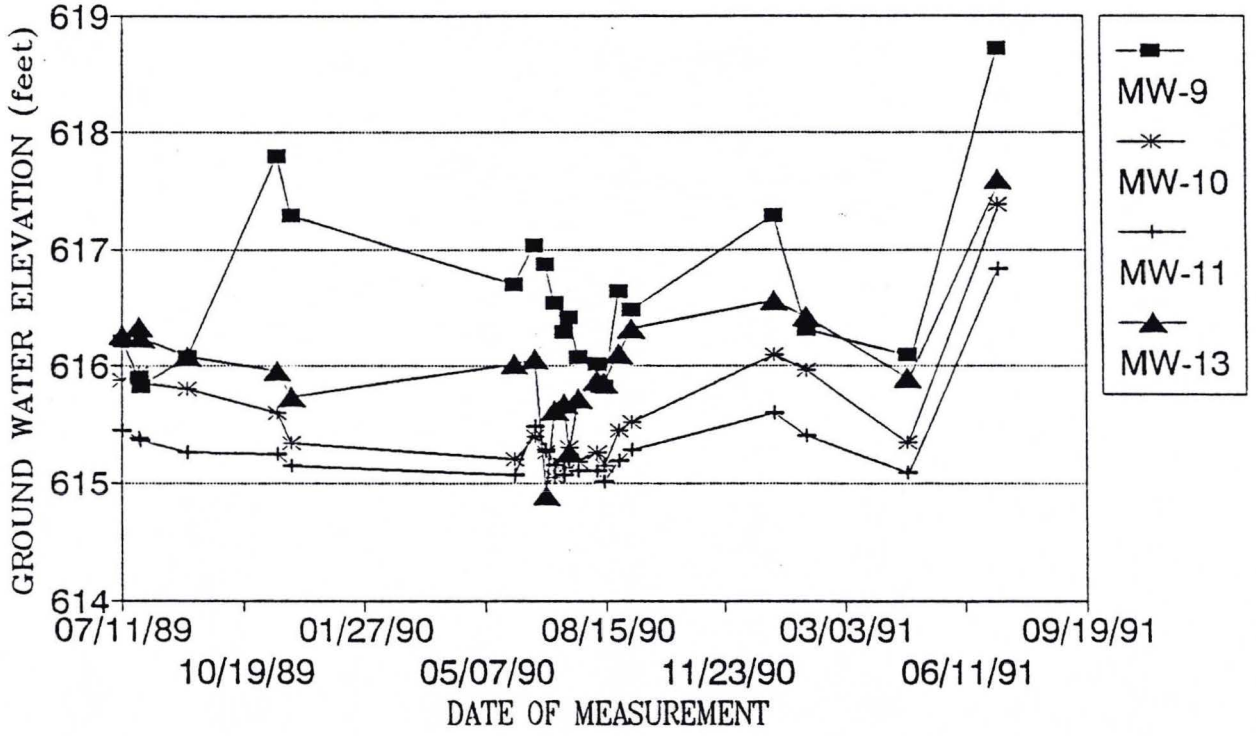
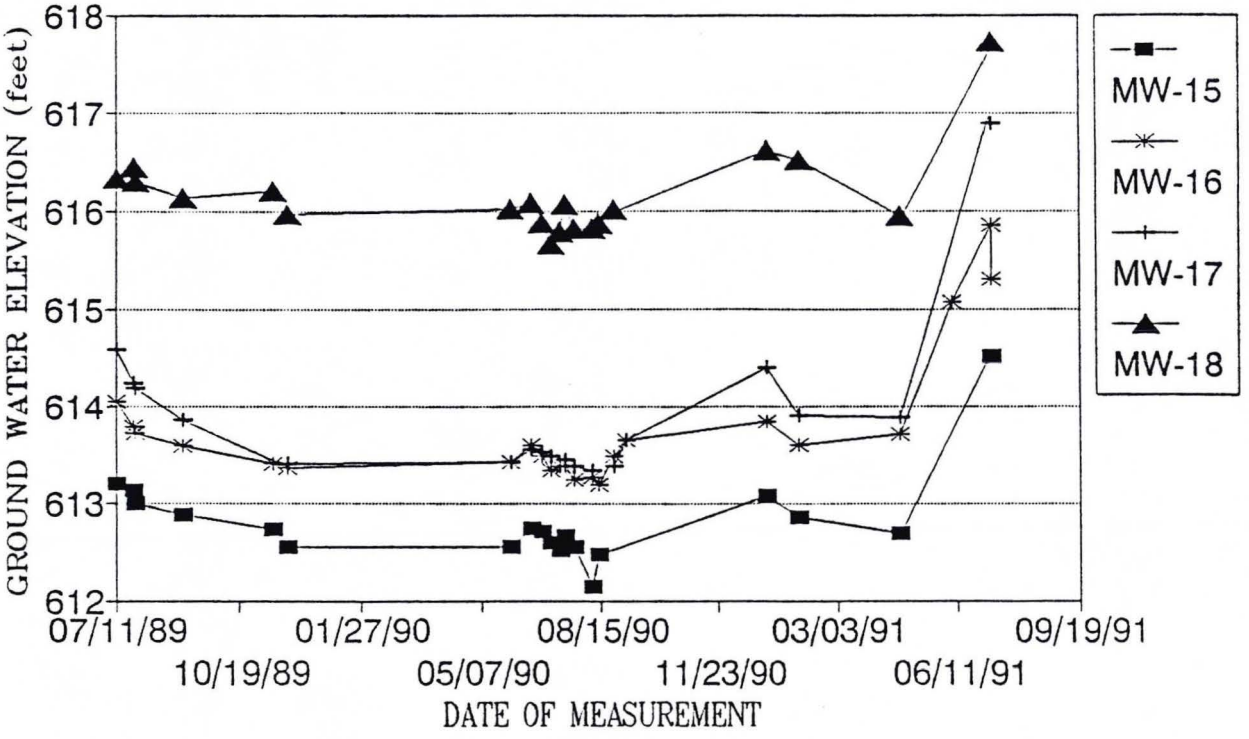


FIGURE 3A
WELL HYDROGRAPHS
SUPERIOR TERMINAL
SUPERIOR, WISCONSIN

PROJECT NO.	PREPARED BY	REVIEWED BY
10-88-457	PLC/PAJ	
DATE	REVISION NO.	FILE NAME
8/23/91		LOGOA1

Delta Environmental Consultants, Inc.



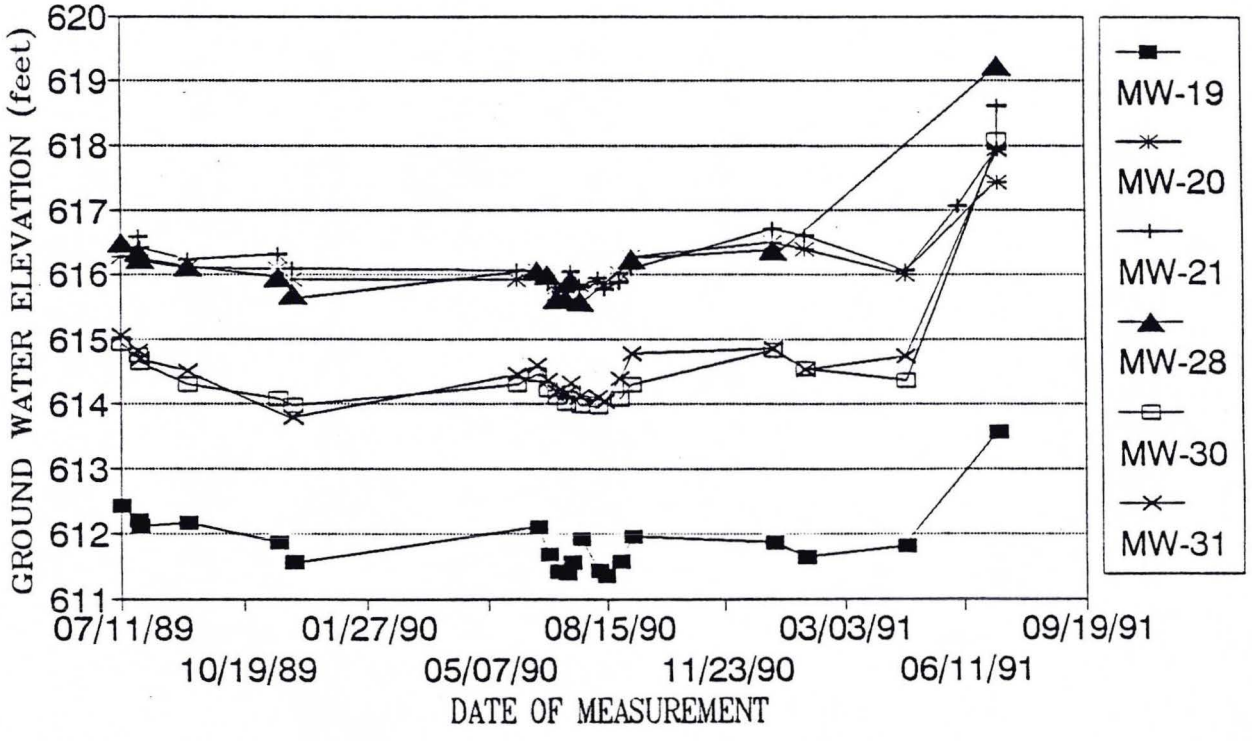
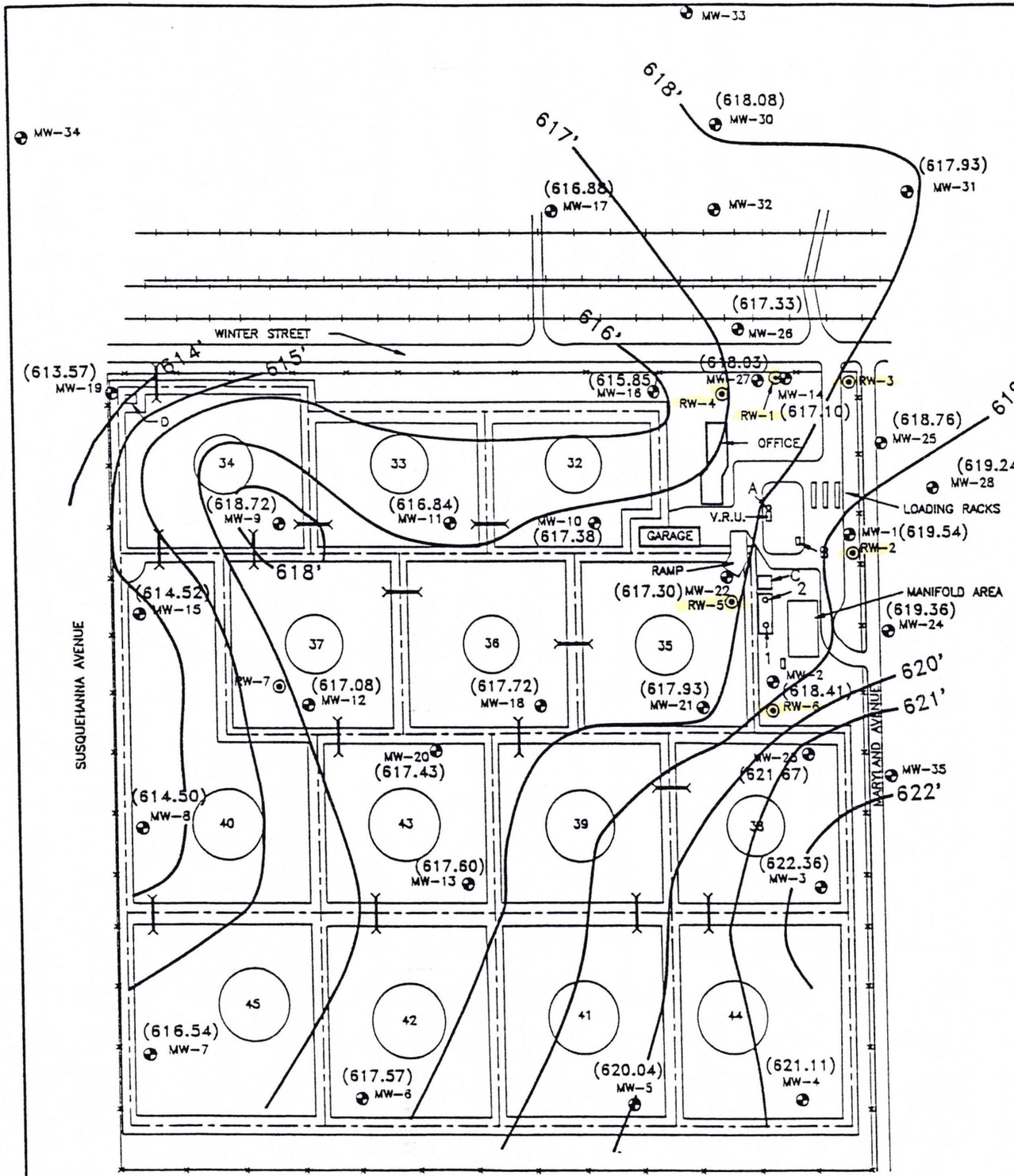


FIGURE 3B
WELL HYDROGRAPHS
SUPERIOR TERMINAL
SUPERIOR, WISCONSIN

PROJECT NO.	PREPARED BY	REVIEWED BY
10-88-457	PLC/PAJ	
DATE	REVISION NO.	FILE NAME
8/23/91		LOGOA1

Delta Environmental Consultants, Inc.



LEGEND:

- MONITORING WELL LOCATION
- RECOVERY WELL LOCATION
- RAILROAD TRACKS
- DRAINAGE CULVERT
- FENCE LINE
- A — UNDERGROUND STORAGE TANK LOCATION
- 38 — ABOVE GROUND STORAGE TANK LOCATION
- (617.38) — WATER TABLE ELEVATION (IN FEET)
- 618' — WATER TABLE CONTOUR

NOTES:

1. WATER TABLE ELEVATIONS EXPRESSED IN FEET ABOVE MEAN SEA LEVEL.
2. DATA FROM WELLS CONTAINING FREE PRODUCT WERE CORRECTED USING A PRODUCT SPECIFIC GRAVITY OF 0.78.

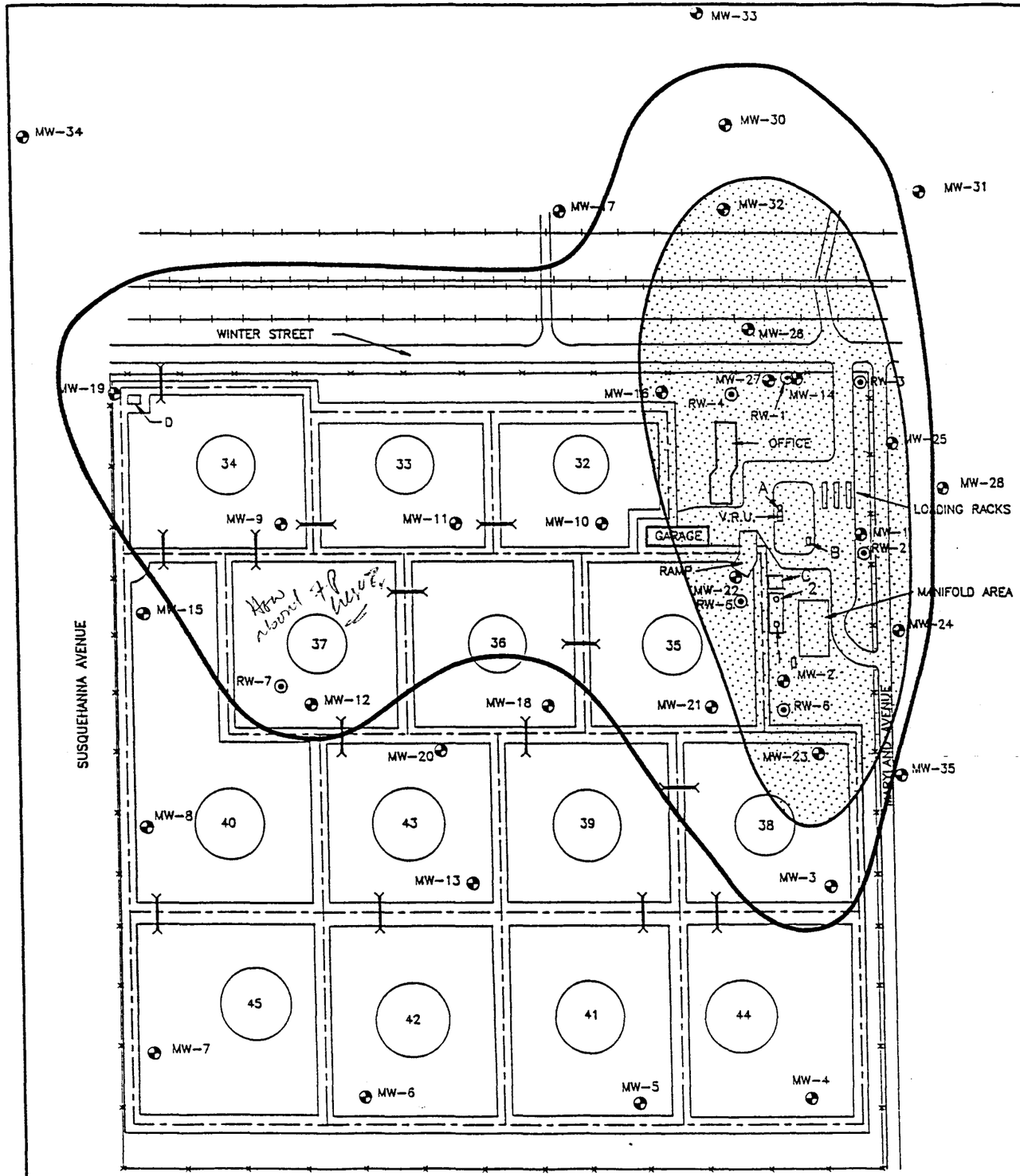
NORTH

0 200

SCALE IN FEET

FIGURE 4
GROUND WATER ELEVATION CONTOUR MAP
JULY 9, 1991
SUPERIOR TERMINAL
SUPERIOR, WISCONSIN

PROJECT NO.	PREPARED BY	REVIEWED BY	
10-88-457	PLC/PAJ		Delta Environmental Consultants, Inc.
DATE	REVISION NO.	FILE NAME	
8/23/91		88457-2	



LEGEND:

- MONITORING WELL LOCATION
- RECOVERY WELL LOCATION
- RAILROAD TRACKS
- DRAINAGE CULVERT
- FENCE LINE
- A — UNDERGROUND STORAGE TANK LOCATION
- 38 — ABOVE GROUND STORAGE TANK LOCATION
- INFERRED EXTENT OF FREE PRODUCT
- INFERRED EXTENT OF DISSOLVED-PHASE HYDROCARBONS

NORTH

0 200

SCALE IN FEET

FIGURE 5
EXTENT OF FREE PRODUCT AND DISSOLVED PHASE HYDROCARBONS- JULY 9, 1991
SUPERIOR TERMINAL
SUPERIOR, WISCONSIN

PROJECT NO.	PREPARED BY	REVIEWED BY	
10-88-457	PLC/PAJ		Delta Environmental Consultants, Inc.
DATE	REVISION NO.	FILE NAME	
8/23/91		88457-2	

APPENDIX A

GROUND WATER LEVEL AND FREE PRODUCT THICKNESS RECORDS

WELL NO.:MW-1 WELL DEPTH: 31.80

TOP OF CASING ELEVATION : 637.68 GROUND ELEV: 635.18

DATE MM/DD/YY	DEPTH TO PROD	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	PROD. CHANGE	GW DEPTH GROUND
03/23/88		25.59	612.09		8.71	*	4.97	615.97		23.09
09/08/88		25.25	612.43	0.34	9.05	*	4.95	616.29	-0.02	22.75
09/20/88		24.98	612.70	0.27	9.32	*	4.42	616.15	-0.53	22.48
04/27/89		22.81	614.87	2.17	11.49	*	2.25	616.63	-2.17	20.31
05/18/89		25.08	612.60	-2.27	9.22	*	5.02	616.52	2.77	22.58
06/30/89		23.53	614.15	1.55	10.77	*	4.10	617.35	-0.92	21.03
07/12/89		24.04	613.64	-0.51	10.26	*	4.22	616.93	0.12	21.54
07/26/89		26.29	611.39	-2.25	8.01	*	6.31	616.31	2.09	23.79
07/27/89		26.90	610.78	-0.61	7.40	*	6.87	616.14	0.56	24.40
09/03/89		24.16	613.52	2.74	10.14	*	3.97	616.62	-2.90	21.66
11/16/89		29.64	608.04	-5.48	4.66	*	9.52	615.47	5.55	27.14
11/29/89		29.94	607.74	-0.30	4.36	*	9.62	615.24	0.10	27.44
12/01/89		31.12	606.56	-1.18	3.18	*	10.71	614.91	1.09	28.62
12/02/89		28.47	609.21	2.65	5.83	*	8.01	615.46	-2.70	25.97
05/04/90		24.78	612.90	3.69	9.52	*	3.54	615.66	-4.47	22.28
06/01/90		20.85	616.83	3.93	13.45	*	8.75	623.66	5.21	18.35
06/19/90		23.81	613.87	-2.96	10.49	*	3.17	616.34	-5.58	21.31
06/27/90	20.70	24.67	613.01	-0.86	9.63	*	3.97	616.11	0.80	22.17
07/05/90	20.90	21.34	616.34	3.33	12.96	*	0.44	616.68	-3.53	18.84
07/13/90	20.81	24.58	613.10	-3.24	9.72	*	3.77	616.04	3.33	22.08
07/17/90	20.59	25.58	612.10	-1.00	8.72	*	4.99	615.99	1.22	23.08
07/25/90	20.80	25.10	612.58	0.48	9.20	*	4.30	615.93	-0.69	22.60
08/09/90	20.70	25.02	612.66	0.08	9.28	*	4.32	616.03	0.02	22.52
08/14/90	nm	25.24								
08/27/90	20.72	23.84	613.84	613.84	10.46	*	3.12	616.27	3.12	21.34
09/06/90	20.35	24.05	613.63	-0.21	10.25	*	3.70	616.52	0.58	21.55
01/04/91	20.00	25.89	611.79	-1.84	8.41	*	5.89	616.38	2.19	23.39
01/30/91	20.25	28.73	608.95	-2.84	5.57	*	8.48	615.56	2.59	26.23
04/24/91	20.36	23.68	614.00	5.05	10.62	*	3.32	616.59	-5.16	21.18
06/06/91	18.93	22.07	615.61	1.61	12.23	*	3.14	618.06	-0.18	19.57
07/09/91	17.55	20.25	617.43	1.82	14.05	*	2.70	619.54	-0.44	17.75
08/06/91	16.90	19.88	617.80	0.37	14.42	*	2.98	620.12	0.28	17.38

WELL NO.:MW-2 WELL DEPTH: 24.50

TOP OF CASING ELEVATION : 637.23 GROUND ELEV: 634.83

DATE MM/DD/YY	DEPTH TO PROD	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	PROD. CHANGE	GW DEPTH GROUND
03/23/88		23.13	614.10		3.77	*	2.79	616.28		20.73
09/08/88		23.10	614.13	0.03	3.80	*	2.53	616.10	-0.26	20.70
09/20/88		23.25	613.98	-0.15	3.65	*	2.55	615.97	0.02	20.85
04/27/89		23.09	614.14	0.16	3.81	*	2.33	615.96	-0.22	20.69
05/18/89		22.48	614.75	0.61	4.42	*	2.20	616.47	-0.13	20.08
06/30/89		22.68	614.55	-0.20	4.22	*	2.52	616.52	0.32	20.28
07/12/89		23.05	614.18	-0.37	3.85	*	2.00	615.74	-0.52	20.65
07/26/89		22.73	614.50	0.32	4.17	*	2.72	616.62	0.72	20.33
07/27/89		22.78	614.45	-0.05	4.12	*	2.72	616.57	0.00	20.38
09/03/89		22.57	614.66	0.21	4.33	*	2.20	616.38	-0.52	20.17
11/16/89		22.70	614.53	-0.13	4.20	*	2.57	616.53	0.37	20.30
11/29/89		22.25	614.98	0.45	4.65	*	2.02	616.56	-0.55	19.85
12/01/89		22.85	614.38	-0.60	4.05	*	2.40	616.25	0.38	20.45
12/02/89		23.06	614.17	-0.21	3.84	*	2.56	616.17	0.16	20.66
05/04/90	20.95	22.98	614.25	0.08	3.92	*	2.03	615.83	-0.53	20.58
06/01/90		23.30	613.93	-0.32	3.60	*	2.85	616.15	0.82	20.90
06/19/90	20.47	22.92	614.31	0.38	3.98	*	2.45	616.22	-0.40	20.52
06/27/90	20.64	23.37	613.86	-0.45	3.53	*	2.73	615.99	0.28	20.97
07/05/90	21.09	23.47	613.76	-0.10	3.43	*	2.38	615.62	-0.35	21.07
07/13/90	20.85	23.30	613.93	0.17	3.60	*	2.45	615.84	0.07	20.90
07/17/90	20.58	23.22	614.01	0.08	3.68	*	2.64	616.07	0.19	20.82
07/25/90	20.84	23.42	613.81	-0.20	3.48	*	2.58	615.82	-0.06	21.02
08/09/90	20.54	23.36	613.87	0.06	3.54	*	2.82	616.07	0.24	20.96
08/14/90	nm	23.37	613.86							
08/27/90	20.81	23.31	613.92	0.06	3.59	*	2.50	615.87	2.50	20.91
09/06/90	20.19	23.55	613.68	-0.24	3.35	*	3.36	616.30	0.86	21.15
01/04/91	19.66	23.28	613.95	0.27	3.62	*	3.62	616.77	0.26	20.88
01/30/91	19.88	23.32	613.91	-0.04	3.58	*	3.44	616.59	-0.18	20.92
04/24/91	20.30	23.29	613.94	0.03	3.61	*	2.99	616.27	-0.45	20.89
06/06/91	18.92	23.12	614.11	0.17	3.78	*	4.20	617.39	1.21	20.72
07/09/91	17.63	23.04	614.19	0.08	3.86	*	5.41	618.41	1.21	20.64
08/06/91	16.70	23.02	614.21	0.02	3.88	*	6.32	619.14	0.91	20.62

WELL NO.:MW-3 WELL DEPTH (ground): 24.30 WELL DEPTH (TOC): 26.60

TOP OF CASING ELEVATION : 636.13 GROUND ELEV: 633.83

DATE MM/DD/YY	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	PROD. CHANGE	GW DEPTH GROUND	Recorded By
03/23/88	18.15	617.98		8.45	*		617.98		15.85	
09/08/88	17.89	618.24	0.26	8.71	*		618.24	0.00	15.59	
09/20/88	17.38	618.75	0.51	9.22	*		618.75	0.00	15.08	
04/27/89	16.37	619.76	1.01	10.23	*		619.76	0.00	14.07	
05/18/89	15.80	620.33	0.57	10.80	*		620.33	0.00	13.50	
06/30/89	16.33	619.80	-0.53	10.27	*		619.80	0.00	14.03	
07/12/89	17.07	619.06	-0.74	9.53	*		619.06	0.00	14.77	
07/26/89	17.38	618.75	-0.31	9.22	*		618.75	0.00	15.08	
07/27/89	17.60	618.53	-0.22	9.00	*		618.53	0.00	15.30	
09/03/89	17.76	618.37	-0.16	8.84	*		618.37	0.00	15.46	
11/16/89	17.72	618.41	0.04	8.88	*		618.41	0.00	15.42	
11/28/89	18.15	617.98	-0.43	8.45	*		617.98	0.00	15.85	
06/01/90	13.42	622.71	4.73	13.18	*		622.71	0.00	11.12	
06/19/90	16.35	619.78	-2.93	10.25	*		619.78	0.00	14.05	
06/27/90	17.23	618.90	-0.88	9.37	*		618.90	0.00	14.93	
07/05/90	17.81	618.32	-0.58	8.79	*		618.32	0.00	15.51	
07/13/90	18.11	618.02	-0.30	8.49	*		618.02	0.00	15.81	
07/17/90	17.72	618.41	0.39	8.88	*		618.41	0.00	15.42	
07/25/90	18.26	617.87	-0.54	8.34	*		617.87	0.00	15.96	
08/09/90	18.14	617.99	0.12	8.46	*		617.99	0.00	15.84	
08/14/90	18.23	617.90	-0.09	8.37	*		617.90	0.00	15.93	
08/27/90	17.51	618.62	0.72	9.09	*		618.62	0.00	15.21	
09/06/90	17.02	619.11	0.49	9.58	*		619.11	0.00	14.72	
01/04/91	17.51	618.62	-0.49	9.09	*		618.62	0.00	15.21	
01/30/91	17.96	618.17	-0.45	8.64	*		618.17	0.00	15.66	
04/24/91	15.96	620.17	2.00	10.64	*		620.17	0.00	13.66	
06/06/91										
07/09/91	13.77	622.36	2.19	12.83	*		622.36	0.00	11.47	
08/06/91										

WELL NO.:MW-4 WELL DEPTH (ground): 24.30 WELL DEPTH (TOC): 26.80

TOP OF CASING ELEVATION : 636.71 GROUND ELEV: 634.21

DATE MM/DD/YY	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	PROD. CHANGE	GW DEPTH GROUND	Recorded By
03/23/88	19.02	617.69		7.78	*		617.69		16.52	
09/08/88	19.00	617.71	0.02	7.80	*		617.71	0.00	16.50	
09/20/88	19.21	617.50	-0.21	7.59	*		617.50	0.00	16.71	
04/27/89	17.80	618.91	1.41	9.00	*		618.91	0.00	15.30	
05/18/89	17.05	619.66	0.75	9.75	*		619.66	0.00	14.55	
06/30/89	17.47	619.24	-0.42	9.33	*		619.24	0.00	14.97	
07/12/89	18.14	618.57	-0.67	8.66	*		618.57	0.00	15.64	
07/26/89	18.44	618.27	-0.30	8.36	*		618.27	0.00	15.94	
07/27/89	18.57	618.14	-0.13	8.23	*		618.14	0.00	16.07	
09/03/89	18.89	617.82	-0.32	7.91	*		617.82	0.00	16.39	
11/16/89	18.83	617.88	0.06	7.97	*		617.88	0.00	16.33	
11/28/89	19.15	617.56	-0.32	7.65	*		617.56	0.00	16.65	
06/01/90	18.14	618.57	1.01	8.66	*		618.57	0.00	15.64	
06/19/90	18.16	618.55	-0.02	8.64	*		618.55	0.00	15.66	
06/27/90	18.52	618.19	-0.36	8.28	*		618.19	0.00	16.02	
07/05/90	19.00	617.71	-0.48	7.80	*		617.71	0.00	16.50	
07/13/90	19.21	617.50	-0.21	7.59	*		617.50	0.00	16.71	
07/17/90	18.82	617.89	0.39	7.98	*		617.89	0.00	16.32	
07/25/90	19.27	617.44	-0.45	7.53	*		617.44	0.00	16.77	
08/09/90	19.15	617.56	0.12	7.65	*		617.56	0.00	16.65	
08/14/90	19.21	617.50	-0.06	7.59	*		617.50	0.00	16.71	
08/27/90	18.94	617.77	0.27	7.86	*		617.77	0.00	16.44	
09/06/90	18.32	618.39	0.62	8.48	*		618.39	0.00	15.82	
01/04/91	18.46	618.25	-0.14	8.34	*		618.25	0.00	15.96	
01/30/91	18.92	617.79	-0.46	7.88	*		617.79	0.00	16.42	
04/24/91	18.11	618.60	0.81	8.69	*		618.60	0.00	15.61	
06/06/91										
07/09/91	15.60	621.11	621.11	11.20	*		621.11	0.00	13.10	
08/06/91	15.30	621.41	0.30	11.50	*		621.41	0.00	12.80	

WELL NO.:MW-5 WELL DEPTH (ground): 24.90 WELL DEPTH (TOC): 27.50

TOP OF CASING ELEVATION : 636.78 GROUND ELEV: 634.18

DATE MM/DD/YY	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	PROD. CHANGE	GW DEPTH GROUND	Recorded By
03/23/88	19.45	617.33		8.05	*		617.33		16.85	
09/08/88	19.50	617.28	-0.05	8.00	*		617.28	0.00	16.90	
09/20/88	19.50	617.28	0.00	8.00	*		617.28	0.00	16.90	
04/27/89	18.81	617.97	0.69	8.69	*		617.97	0.00	16.21	
05/18/89	18.06	618.72	0.75	9.44	*		618.72	0.00	15.46	
06/30/89	18.35	618.43	-0.29	9.15	*		618.43	0.00	15.75	
07/12/89	18.81	617.97	-0.46	8.69	*		617.97	0.00	16.21	
07/26/89	18.96	617.82	-0.15	8.54	*		617.82	0.00	16.36	
07/27/89	19.07	617.71	-0.11	8.43	*		617.71	0.00	16.47	
09/03/89	19.35	617.43	-0.28	8.15	*		617.43	0.00	16.75	
11/16/89	n/a	617.43	0.00	27.50	*		617.43	0.00	-2.60	
11/28/89	19.82	616.96	-0.47	7.68	*		616.96	0.00	17.22	
06/01/90	18.92	617.86	0.90	8.58	*		617.86	0.00	16.32	
06/19/90	18.95	617.83	-0.03	8.55	*		617.83	0.00	16.35	
06/27/90	19.25	617.53	-0.30	8.25	*		617.53	0.00	16.65	
07/05/90	19.65	617.13	-0.40	7.85	*		617.13	0.00	17.05	
07/13/90	19.78	617.00	-0.13	7.72	*		617.00	0.00	17.18	
07/17/90	19.33	617.45	0.45	8.17	*		617.45	0.00	16.73	
07/25/90	19.76	617.02	-0.43	7.74	*		617.02	0.00	17.16	
08/09/90	19.61	617.17	0.15	7.89	*		617.17	0.00	17.01	
08/14/90	19.63	617.15	-0.02	7.87	*		617.15	0.00	17.03	
08/27/90	19.40	617.38	0.23	8.10	*		617.38	0.00	16.80	
09/06/90	21.34	615.44	-1.94	6.16	*		615.44	0.00	18.74	
01/04/91	18.60	618.18	2.74	8.90	*		618.18	0.00	16.00	
01/30/91	19.20	617.58	-0.60	8.30	*		617.58	0.00	16.60	
04/24/91	18.91	617.87	0.29	8.59	*		617.87	0.00	16.31	
06/06/91										
07/09/91	16.74	620.04	2.17	10.76	*		620.04	0.00	14.14	
08/06/91										

WELL NO.:MW-6 WELL DEPTH (ground): 24.20 WELL DEPTH (TOC): 26.80

TOP OF CASING ELEVATION : 637.77 GROUND ELEV: 635.17

DATE MM/DD/YY	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	PROD. CHANGE	GW DEPTH GROUND	Recorded By
03/23/88	21.34	616.43		5.46	*		616.43		18.74	
09/08/88	21.61	616.16	-0.27	5.19	*		616.16	0.00	19.01	
09/20/88	21.97	615.80	-0.36	4.83	*		615.80	0.00	19.37	
04/27/89	21.61	616.16	0.36	5.19	*		616.16	0.00	19.01	
05/18/89	21.21	616.56	0.40	5.59	*		616.56	0.00	18.61	
06/30/89	20.90	616.87	0.31	5.90	*		616.87	0.00	18.30	
07/12/89	21.00	616.77	-0.10	5.80	*		616.77	0.00	18.40	
07/26/89	20.97	616.80	0.03	5.83	*		616.80	0.00	18.37	
07/27/89	21.07	616.70	-0.10	5.73	*		616.70	0.00	18.47	
09/03/89	21.34	616.43	-0.27	5.46	*		616.43	0.00	18.74	
11/16/89	21.42	616.35	-0.08	5.38	*		616.35	0.00	18.82	
11/28/89	21.54	616.23	-0.12	5.26	*		616.23	0.00	18.94	
06/01/90	21.61	616.16	-0.07	5.19	*		616.16	0.00	19.01	
06/19/90	21.51	616.26	0.10	5.29	*		616.26	0.00	18.91	
06/27/90	21.60	616.17	-0.09	5.20	*		616.17	0.00	19.00	
07/05/90	21.71	616.06	-0.11	5.09	*		616.06	0.00	19.11	
07/13/90	21.68	616.09	0.03	5.12	*		616.09	0.00	19.08	
07/17/90	21.43	616.34	0.25	5.37	*		616.34	0.00	18.83	
07/25/90	21.61	616.16	-0.18	5.19	*		616.16	0.00	19.01	
08/09/90	21.56	616.21	0.05	5.24	*		616.21	0.00	18.96	
08/14/90	21.54	616.23	0.02	5.26	*		616.23	0.00	18.94	
08/27/90	21.42	616.35	0.12	5.38	*		616.35	0.00	18.82	
09/06/90	21.57	616.20	-0.15	5.23	*		616.20	0.00	18.97	
01/04/91	20.81	616.96	0.76	5.99	*		616.96	0.00	18.21	
01/30/91	21.00	616.77	-0.19	5.80	*		616.77	0.00	18.40	
04/24/91	21.65	616.12	-0.65	5.15	*		616.12	0.00	19.05	
06/06/91										
07/09/91	20.20	617.57	1.45	6.60	*		617.57	0.00	17.60	
08/06/91										

WELL NO.:MW-7 WELL DEPTH (ground): 24.40 WELL DEPTH (TOC): 26.90

TOP OF CASING ELEVATION : 636.73 GROUND ELEV: 634.23

DATE MM/DD/YY	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	PROD. CHANGE	GW DEPTH GROUND	Recorded By
03/23/88	21.28	615.45		5.62	*		615.45		18.78	
09/08/88	21.54	615.19	-0.26	5.36	*		615.19	0.00	19.04	
09/20/88	21.70	615.03	-0.16	5.20	*		615.03	0.00	19.20	
04/27/89	21.61	615.12	0.09	5.29	*		615.12	0.00	19.11	
05/18/89	21.36	615.37	0.25	5.54	*		615.37	0.00	18.86	
06/30/89	20.98	615.75	0.38	5.92	*		615.75	0.00	18.48	
07/12/89	21.03	615.70	-0.05	5.87	*		615.70	0.00	18.53	
07/26/89	21.00	615.73	0.03	5.90	*		615.73	0.00	18.50	
07/27/89	21.08	615.65	-0.08	5.82	*		615.65	0.00	18.58	
09/03/89	21.17	615.56	-0.09	5.73	*		615.56	0.00	18.67	
11/16/89	21.27	615.46	-0.10	5.63	*		615.46	0.00	18.77	
11/28/89	21.31	615.42	-0.04	5.59	*		615.42	0.00	18.81	
06/01/90	21.68	615.05	-0.37	5.22	*		615.05	0.00	19.18	
06/19/90	21.50	615.23	0.18	5.40	*		615.23	0.00	19.00	
06/27/90	21.47	615.26	0.03	5.43	*		615.26	0.00	18.97	
07/05/90	21.46	615.27	0.01	5.44	*		615.27	0.00	18.96	
07/13/90	21.49	615.24	-0.03	5.41	*		615.24	0.00	18.99	
07/17/90	21.37	615.36	0.12	5.53	*		615.36	0.00	18.87	
07/25/90	21.36	615.37	0.01	5.54	*		615.37	0.00	18.86	
08/09/90	21.34	615.39	0.02	5.56	*		615.39	0.00	18.84	
08/14/90	21.38	615.35	-0.04	5.52	*		615.35	0.00	18.88	
08/27/90	21.34	615.39	0.04	5.56	*		615.39	0.00	18.84	
09/06/90	21.30	615.43	0.04	5.60	*		615.43	0.00	18.80	
01/04/91	20.89	615.84	0.41	6.01	*		615.84	0.00	18.39	
01/30/91	20.98	615.75	-0.09	5.92	*		615.75	0.00	18.48	
04/24/91	21.43	615.30	-0.45	5.47	*		615.30	0.00	18.93	
06/06/91										
07/09/91	20.19	616.54	616.54	6.71	*		616.54	0.00	17.69	
08/06/91	19.83	616.90	0.36	7.07	*		616.90	0.00	17.33	

WELL NO.:MW-8 WELL DEPTH (ground): 25.90 WELL DEPTH (TOC): 28.40

TOP OF CASING ELEVATION : 634.61 GROUND ELEV: 632.11

DATE MM/DD/YY	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	ELEV. DIFF.	GW DEPTH GROUND	Recorded By
03/23/88	20.97	613.64		7.43	*		613.64		18.47	
09/08/88	21.52	613.09	-0.55	6.88	*		613.09	-0.55	19.02	
09/20/88	21.62	612.99	-0.10	6.78	*		612.99	-0.10	19.12	
04/27/89	21.30	613.31	0.32	7.10	*		613.31	0.32	18.80	
05/18/89	21.04	613.57	0.26	7.36	*		613.57	0.26	18.54	
06/30/89	20.85	613.76	0.19	7.55	*		613.76	0.19	18.35	
07/12/89	20.87	613.74	-0.02	7.53	*		613.74	-0.02	18.37	
07/26/89	20.90	613.71	-0.03	7.50	*		613.71	-0.03	18.40	
07/27/89	20.96	613.65	-0.06	7.44	*		613.65	-0.06	18.46	
09/03/89	21.13	613.48	-0.17	7.27	*		613.48	-0.17	18.63	
11/16/89	21.21	613.40	-0.08	7.19	*		613.40	-0.08	18.71	
11/28/89	21.25	613.36	-0.04	7.15	*		613.36	-0.04	18.75	
06/01/90	21.92	612.69	-0.67	6.48	*		612.69	-0.67	19.42	
06/19/90	21.59	613.02	0.33	6.81	*		613.02	0.33	19.09	
06/27/90	21.57	613.04	0.02	6.83	*		613.04	0.02	19.07	
07/05/90	21.56	613.05	0.01	6.84	*		613.05	0.01	19.06	
07/13/90	21.60	613.01	-0.04	6.80	*		613.01	-0.04	19.10	
07/17/90	21.47	613.14	0.13	6.93	*		613.14	0.13	18.97	
07/25/90	21.50	613.11	-0.03	6.90	*		613.11	-0.03	19.00	
08/09/90	21.51	613.10	-0.01	6.89	*		613.10	-0.01	19.01	
08/14/90	21.55	613.06	-0.04	6.85	*		613.06	-0.04	19.05	
08/27/90	21.53	613.08	0.02	6.87	*		613.08	0.02	19.03	
09/06/90	21.47	613.14	0.06	6.93	*		613.14	0.06	18.97	
01/04/91	20.80	613.81	0.67	7.60	*		613.81	0.67	18.30	
01/30/91	20.97	613.64	-0.17	7.43	*		613.64	-0.17	18.47	
04/24/91	21.44	613.17	-0.47	6.96	*		613.17	-0.47	18.94	
06/06/91										
07/09/91	20.11	614.50	1.33	8.29	*		614.50	1.33	17.61	
08/06/91										

WELL NO.:MW-9 WELL DEPTH (ground): 24.50 WELL DEPTH (TOC): 27.00

TOP OF CASING ELEVATION : 631.57 GROUND ELEV: 629.07

DATE MM/DD/YY	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	ELEV. DIFF.	GW DEPTH GROUND	Recorded By
03/23/88	16.19	615.38		10.81	*		615.38		13.69	
09/08/88	15.22	616.35	0.97	11.78	*		616.35	0.97	12.72	
09/20/88	15.27	616.30	-0.05	11.73	*		616.30	-0.05	12.77	
04/27/89	15.72	615.85	-0.45	11.28	*		615.85	-0.45	13.22	
05/18/89	15.09	616.48	0.63	11.91	*		616.48	0.63	12.59	
06/30/89	15.00	616.57	0.09	12.00	*		616.57	0.09	12.50	
07/12/89	15.36	616.21	-0.36	11.64	*		616.21	-0.36	12.86	
07/26/89	15.67	615.90	-0.31	11.33	*		615.90	-0.31	13.17	
07/27/89	15.74	615.83	-0.07	11.26	*		615.83	-0.07	13.24	
09/03/89	15.50	616.07	0.24	11.50	*		616.07	0.24	13.00	
11/16/89	13.77	617.80	1.73	13.23	*		617.80	1.73	11.27	
11/28/89	14.28	617.29	-0.51	12.72	*		617.29	-0.51	11.78	
06/01/90	14.87	616.70	-0.59	12.13	*		616.70	-0.59	12.37	
06/19/90	14.54	617.03	0.33	12.46	*		617.03	0.33	12.04	
06/27/90	14.70	616.87	-0.16	12.30	*		616.87	-0.16	12.20	
07/05/90	15.03	616.54	-0.33	11.97	*		616.54	-0.33	12.53	
07/13/90	15.28	616.29	-0.25	11.72	*		616.29	-0.25	12.78	
07/17/90	15.15	616.42	0.13	11.85	*		616.42	0.13	12.65	
07/25/90	15.50	616.07	-0.35	11.50	*		616.07	-0.35	13.00	
08/09/90	15.56	616.01	-0.06	11.44	*		616.01	-0.06	13.06	
08/14/90	15.75	615.82	-0.19	11.25	*		615.82	-0.19	13.25	
08/27/90	14.93	616.64	0.82	12.07	*		616.64	0.82	12.43	
09/06/90	15.09	616.48	-0.16	11.91	*		616.48	-0.16	12.59	
01/04/91	14.28	617.29	0.81	12.72	*		617.29	0.81	11.78	
01/30/91	15.26	616.31	-0.98	11.74	*		616.31	-0.98	12.76	
04/24/91	15.47	616.10	-0.21	11.53	*		616.10	-0.21	12.97	
06/06/91										
07/09/91	12.85	618.72	2.62	14.15	*		618.72	2.62	10.35	
08/06/91										

WELL NO.:MW-10 WELL DEPTH (ground): 24.50 WELL DEPTH (TOC): 27.10

TOP OF CASING ELEVATION : 633.54 GROUND ELEV: 630.94

DATE MM/DD/YY	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	ELEV. DIFF.	GW DEPTH GROUND	Recorded By
03/23/88	17.68	615.86		9.42	*		615.86		15.08	
09/08/88	18.38	615.16	-0.70	8.72	*		615.16	-0.70	15.78	
09/20/88	18.60	614.94	-0.22	8.50	*		614.94	-0.22	16.00	
04/27/89	18.37	615.17	0.23	8.73	*		615.17	0.23	15.77	
05/18/89	18.10	615.44	0.27	9.00	*		615.44	0.27	15.50	
06/30/89	17.55	615.99	0.55	9.55	*		615.99	0.55	14.95	
07/12/89	17.66	615.88	-0.11	9.44	*		615.88	-0.11	15.06	
07/26/89	17.61	615.93	0.05	9.49	*		615.93	0.05	15.01	
07/27/89	17.68	615.86	-0.07	9.42	*		615.86	-0.07	15.08	
09/03/89	17.73	615.81	-0.05	9.37	*		615.81	-0.05	15.13	
11/16/89	17.94	615.60	-0.21	9.16	*		615.60	-0.21	15.34	
11/28/89	18.20	615.34	-0.26	8.90	*		615.34	-0.26	15.60	
06/01/90	18.34	615.20	-0.14	8.76	*		615.20	-0.14	15.74	
06/19/90	18.14	615.40	0.20	8.96	*		615.40	0.20	15.54	
06/27/90	18.28	615.26	-0.14	8.82	*		615.26	-0.14	15.68	
07/05/90	18.50	615.04	-0.22	8.60	*		615.04	-0.22	15.90	
07/13/90	18.40	615.14	0.10	8.70	*		615.14	0.10	15.80	
07/17/90	18.23	615.31	0.17	8.87	*		615.31	0.17	15.63	
07/25/90	18.36	615.18	-0.13	8.74	*		615.18	-0.13	15.76	
08/09/90	18.28	615.26	0.08	8.82	*		615.26	0.08	15.68	
08/14/90	18.39	615.15	-0.11	8.71	*		615.15	-0.11	15.79	
08/27/90	18.09	615.45	0.30	9.01	*		615.45	0.30	15.49	
09/06/90	18.02	615.52	0.07	9.08	*		615.52	0.07	15.42	
01/04/91	17.44	616.10	0.58	9.66	*		616.10	0.58	14.84	
01/30/91	17.57	615.97	-0.13	9.53	*		615.97	-0.13	14.97	
04/24/91	18.19	615.35	-0.62	8.91	*		615.35	-0.62	15.59	
06/06/91										
07/09/91	16.16	617.38	2.03	10.94	*		617.38	2.03	13.56	
08/06/91										

WELL NO.:MW-11 WELL DEPTH (ground): 24.20 WELL DEPTH (TOC): 26.70

TOP OF CASING ELEVATION : 632.40 GROUND ELEV: 629.90

DATE MM/DD/YY	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	ELEV. DIFF.	GW DEPTH GROUND	Recorded By
03/23/88	17.13	615.27		9.57	*		615.27		14.63	
09/08/88	17.50	614.90	-0.37	9.20	*		614.90	-0.37	15.00	
09/20/88	17.55	614.85	-0.05	9.15	*		614.85	-0.05	15.05	
04/27/89	17.93	614.47	-0.38	8.77	*		614.47	-0.38	15.43	
05/18/89	17.36	615.04	0.57	9.34	*		615.04	0.57	14.86	
06/30/89	16.88	615.52	0.48	9.82	*		615.52	0.48	14.38	
07/12/89	16.95	615.45	-0.07	9.75	*		615.45	-0.07	14.45	
07/26/89	17.01	615.39	-0.06	9.69	*		615.39	-0.06	14.51	
07/27/89	17.04	615.36	-0.03	9.66	*		615.36	-0.03	14.54	
09/03/89	17.14	615.26	-0.10	9.56	*		615.26	-0.10	14.64	
11/16/89	17.15	615.25	-0.01	9.55	*		615.25	-0.01	14.65	
11/28/89	17.25	615.15	-0.10	9.45	*		615.15	-0.10	14.75	
06/01/90	17.33	615.07	-0.08	9.37	*		615.07	-0.08	14.83	
06/19/90	16.91	615.49	0.42	9.79	*		615.49	0.42	14.41	
06/27/90	17.12	615.28	-0.21	9.58	*		615.28	-0.21	14.62	
07/05/90	17.24	615.16	-0.12	9.46	*		615.16	-0.12	14.74	
07/13/90	17.33	615.07	-0.09	9.37	*		615.07	-0.09	14.83	
07/17/90	17.19	615.21	0.14	9.51	*		615.21	0.14	14.69	
07/25/90	17.30	615.10	-0.11	9.40	*		615.10	-0.11	14.80	
08/09/90	17.30	615.10	0.00	9.40	*		615.10	0.00	14.80	
08/14/90	17.39	615.01	-0.09	9.31	*		615.01	-0.09	14.89	
08/27/90	17.21	615.19	0.18	9.49	*		615.19	0.18	14.71	
09/06/90	17.12	615.28	0.09	9.58	*		615.28	0.09	14.62	
01/04/91	16.80	615.60	0.32	9.90	*		615.60	0.32	14.30	
01/30/91	16.99	615.41	-0.19	9.71	*		615.41	-0.19	14.49	
04/24/91	17.31	615.09	-0.32	9.39	*		615.09	-0.32	14.81	
06/06/91										
07/09/91	15.56	616.84	1.75	11.14	*		616.84	1.75	13.06	
08/06/91										

WELL NO.:MW-12 WELL DEPTH: 22.50

TOP OF CASING ELEVATION : 633.04 GROUND ELEV: 630.54

DATE MM/DD/YY	DEPTH TO PROD	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	PROD. CHANGE	GW DEPTH GROUND
03/23/88		18.01	615.03		6.99	*	0.73	615.60		15.51
09/08/88		18.45	614.59	-0.44	6.55	*	1.31	615.61	0.58	15.95
09/20/88		18.90	614.14	-0.45	6.10	*	1.72	615.48	0.41	16.40
04/27/89		19.81	613.23	-0.91	5.19	*	2.45	615.14	0.73	17.31
05/18/89		18.81	614.23	1.00	6.19	*	1.77	615.61	-0.68	16.31
06/30/89		17.33	615.71	1.48	7.67	*	0.63	616.20	-1.14	14.83
07/12/89		17.83	615.21	-0.50	7.17	*	1.07	616.04	0.44	15.33
07/26/89		17.61	615.43	0.22	7.39	*	0.88	616.12	-0.19	15.11
07/27/89		18.23	614.81	-0.62	6.77	*	1.49	615.97	0.61	15.73
09/03/89		18.82	614.22	-0.59	6.18	*	2.01	615.79	0.52	16.32
11/16/89		18.68	614.36	0.14	6.32	*	2.51	616.32	0.50	16.18
11/29/89		18.35	614.69	0.33	6.65	*	1.59	615.93	-0.92	15.85
12/01/89		17.97	615.07	0.38	7.03	*	1.11	615.94	-0.48	15.47
12/02/89		19.42	613.62	-1.45	5.58	*	2.42	615.51	1.31	16.92
05/04/90	17.11	18.95	614.09	0.47	6.05	*	1.84	615.53	-0.58	16.45
06/01/90	nm	18.75	614.29							
06/19/90	16.95	18.30	614.74	0.45	6.70	*	1.35	615.79	1.35	15.80
06/27/90	17.05	18.58	614.46	-0.28	6.42	*	1.53	615.65	0.18	16.08
07/05/90	17.05	19.38	613.66	-0.80	5.62	*	2.33	615.48	0.80	16.88
07/13/90	17.00	18.80	614.24	0.58	6.20	*	1.80	615.64	-0.53	16.30
07/17/90	16.97	18.70	614.34	0.10	6.30	*	1.73	615.69	-0.07	16.20
07/25/90	17.05	19.32	613.72	-0.62	5.68	*	2.27	615.49	0.54	16.82
08/09/90	17.13	19.47	613.57	-0.15	5.53	*	2.34	615.40	0.07	16.97
08/14/90	nm	19.23	613.81							
08/27/90	nm	nm								
09/06/90	nm	nm								
01/04/91	16.68	17.91	615.13	615.13	7.09	*	1.23	616.09	1.23	15.41
01/30/91	19.72	18.67	614.37	-0.76	6.33	*	-1.05	613.55	-2.28	16.17
04/24/91	16.83	19.17	613.87	-0.50	5.83	*	2.34	615.70	3.39	16.67
06/06/91										
07/09/91	15.70	16.88	616.16		8.12	*	1.18	617.08	1.18	14.38
08/06/91										

WELL NO.:MW-13 WELL DEPTH (ground): 24.60 WELL DEPTH (TOC): 27.00

TOP OF CASING ELEVATION : 636.01 GROUND ELEV: 633.61

DATE MM/DD/YY	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	ELEV. DIFF.	GW DEPTH GROUND	Recorded By
03/23/88	19.86	616.15		7.14	*		616.15		17.46	
09/08/88	20.07	615.94	-0.21	6.93	*		615.94	-0.21	17.67	
09/20/88	20.30	615.71	-0.23	6.70	*		615.71	-0.23	17.90	
04/27/89	20.19	615.82	0.11	6.81	*		615.82	0.11	17.79	
05/18/89	19.82	616.19	0.37	7.18	*		616.19	0.37	17.42	
06/30/89	18.57	617.44	1.25	8.43	*		617.44	1.25	16.17	
07/12/89	19.74	616.27	-1.17	7.26	*		616.27	-1.17	17.34	
07/26/89	19.67	616.34	0.07	7.33	*		616.34	0.07	17.27	
07/27/89	19.77	616.24	-0.10	7.23	*		616.24	-0.10	17.37	
09/03/89	19.93	616.08	-0.16	7.07	*		616.08	-0.16	17.53	
11/16/89	20.05	615.96	-0.12	6.95	*		615.96	-0.12	17.65	
11/28/89	20.27	615.74	-0.22	6.73	*		615.74	-0.22	17.87	
06/01/90	20.00	616.01	0.27	7.00	*		616.01	0.27	17.60	
06/19/90	19.95	616.06	0.05	7.05	*		616.06	0.05	17.55	
06/27/90	21.11	614.90	-1.16	5.89	*		614.90	-1.16	18.71	
07/05/90	20.38	615.63	0.73	6.62	*		615.63	0.73	17.98	
07/13/90	20.33	615.68	0.05	6.67	*		615.68	0.05	17.93	
07/17/90	20.75	615.26	-0.42	6.25	*		615.26	-0.42	18.35	
07/25/90	20.28	615.73	0.47	6.72	*		615.73	0.47	17.88	
08/09/90	20.13	615.88	0.15	6.87	*		615.88	0.15	17.73	
08/14/90	20.15	615.86	-0.02	6.85	*		615.86	-0.02	17.75	
08/27/90	19.90	616.11	0.25	7.10	*		616.11	0.25	17.50	
09/06/90	19.69	616.32	0.21	7.31	*		616.32	0.21	17.29	
01/04/91	19.45	616.56	0.24	7.55	*		616.56	0.24	17.05	
01/30/91	19.58	616.43	-0.13	7.42	*		616.43	-0.13	17.18	
04/24/91	20.11	615.90	-0.53	6.89	*		615.90	-0.53	17.71	
06/06/91										
07/09/91	18.41	617.60	1.70	8.59	*		617.60	1.70	16.01	
08/06/91										

WELL NO.:MW-14 WELL DEPTH: 25.85

TOP OF CASING ELEVATION : 636.31 GROUND ELEV: 634.33

DATE MM/DD/YY	DEPTH TO PROD	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	PROD. CHANGE	GW DEPTH GROUND
03/23/88		N/A			27.83	*				-1.98
09/08/88		25.10	611.21	611.21	2.73	*	4.35	614.60	4.35	23.12
09/20/88		26.90	609.41	-1.80	0.93	*	6.23	614.27	1.88	24.92
04/27/89		27.43	608.88	-0.53	0.40	*	6.75	614.15	0.52	25.45
05/18/89		25.35	610.96	2.08	2.48	*	5.14	614.97	-1.61	23.37
06/30/89		24.78	611.53	0.57	3.05	*	5.28	615.65	0.14	22.80
07/12/89		25.23	611.08	-0.45	2.60	*	5.30	615.21	0.02	23.25
07/26/89		24.68	611.63	0.55	3.15	*	4.78	615.36	-0.52	22.70
07/27/89		27.83	608.48	-3.15	-0.00	*	7.58	614.39	2.80	25.85
09/03/89		27.68	608.63	0.15	0.15	*	7.03	614.11	-0.55	25.70
11/16/89		27.38	608.93	0.30	0.45	*	6.79	614.23	-0.24	25.40
11/29/89		25.30	611.01	2.08	2.53	*	4.90	614.83	-1.89	23.32
12/01/89		24.84	611.47	0.46	2.99	*	4.24	614.78	-0.66	22.86
12/02/89		24.52	611.79	0.32	3.31	*	3.85	614.79	-0.39	22.54
05/04/90	21.17	26.42	609.89	-1.90	1.41	*	5.25	613.99	1.40	24.44
06/01/90		25.90	610.41	0.52	1.93	*	5.00	614.31	-0.25	23.92
06/19/90	20.78	25.20	611.11	0.70	2.63	*	4.42	614.56	-0.58	23.22
06/27/90	20.88	26.41	609.90	-1.21	1.42	*	5.53	614.21	1.11	24.43
07/05/90	21.17	26.16	610.15	0.25	1.67	*	4.99	614.04	-0.54	24.18
07/13/90	20.88	26.50	609.81	-0.34	1.33	*	5.62	614.19	0.63	24.52
07/17/90	20.75	26.65	609.66	-0.15	1.18	*	5.90	614.26	0.28	24.67
07/25/90	20.87	27.78	608.53	-1.13	0.05	*	6.91	613.92	1.01	25.80
08/09/90	20.83	27.10	609.21	0.68	0.73	*	6.27	614.10	-0.64	25.12
08/14/90	nm	27.51								
08/27/90	20.82	26.65	609.66	609.66	1.18	*	5.83	614.21	5.83	24.67
09/06/90	20.68	25.15	611.16	1.50	2.68	*	4.47	614.65	-1.36	23.17
01/04/91	20.11	24.87	611.44	0.28	2.96	*	4.76	615.15	0.29	22.89
01/30/91	20.25	25.77	610.54	-0.90	2.06	*	5.52	614.85	0.76	23.79
04/24/91	20.78	24.05	612.26	1.72	3.78	*	3.27	614.81	-2.25	22.07
06/06/91	19.82	21.52	614.79	2.53	6.31	*	1.70	616.12	-1.57	19.54
07/09/91	18.91	20.28	616.03	1.24	7.55	*	1.37	617.10	-0.33	18.30
08/06/91	18.02	19.24	617.07	1.04	8.59	*	1.22	618.02	-0.15	17.26

WELL NO.:MW-15 WELL DEPTH (ground): 25.00 WELL DEPTH (TOC): 27.85

TOP OF CASING ELEVATION : 632.65 GROUND ELEV: 629.80

DATE MM/DD/YY	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	ELEV. DIFF.	GW DEPTH GROUND	Recorded By
03/23/88	N/A -			27.85	*	0.00	0.00		-2.85	
09/08/88	19.92	612.73	612.73	7.93	*	0.00	612.73	612.73	17.07	
09/20/88	20.25	612.40	-0.33	7.60	*	0.00	612.40	-0.33	17.40	
04/27/89	19.84	612.81	0.41	8.01	*	0.00	612.81	0.41	16.99	
05/18/89	19.61	613.04	0.23	8.24	*	0.00	613.04	0.23	16.76	
06/30/89	19.34	613.31	0.27	8.51	*		613.31	0.27	16.49	
07/12/89	19.45	613.20	-0.11	8.40	*		613.20	-0.11	16.60	
07/26/89	19.52	613.13	-0.07	8.33	*		613.13	-0.07	16.67	
07/27/89	19.66	612.99	-0.14	8.19	*		612.99	-0.14	16.81	
09/03/89	19.76	612.89	-0.10	8.09	*		612.89	-0.10	16.91	
11/16/89	19.92	612.73	-0.16	7.93	*		612.73	-0.16	17.07	
11/28/89	20.09	612.56	-0.17	7.76	*		612.56	-0.17	17.24	
06/01/90	20.09	612.56	0.00	7.76	*		612.56	0.00	17.24	
06/19/90	19.91	612.74	0.18	7.94	*		612.74	0.18	17.06	
06/27/90	19.94	612.71	-0.03	7.91	*		612.71	-0.03	17.09	
07/05/90	20.05	612.60	-0.11	7.80	*		612.60	-0.11	17.20	
07/13/90	20.14	612.51	-0.09	7.71	*		612.51	-0.09	17.29	
07/17/90	19.98	612.67	0.16	7.87	*		612.67	0.16	17.13	
07/25/90	20.09	612.56	-0.11	7.76	*		612.56	-0.11	17.24	
08/09/90	20.50	612.15	-0.41	7.35	*		612.15	-0.41	17.65	
08/14/90	20.18	612.47	0.32	7.67	*		612.47	0.32	17.33	
08/27/90			-612.47	27.85	*		0.00	-612.47	-2.85	
09/06/90			0.00	27.85	*		0.00	0.00	-2.85	
01/04/91	19.57	613.08	613.08	8.28	*		613.08	613.08	16.72	
01/30/91	19.80	612.85	-0.23	8.05	*		612.85	-0.23	16.95	
04/24/91	19.96	612.69	-0.16	7.89	*		612.69	-0.16	17.11	
06/06/91										
07/09/91	18.13	614.52	1.83	9.72	*		614.52	1.83	15.28	
08/06/91										

WELL NO.:MW-16 WELL DEPTH (ground): 30.00 (15 foot screen)

TOP OF CASING ELEVATION : 636.17 GROUND ELEV: 633.47 WELL DEPTH (TOC): 32.70

DATE MM/DD/YY	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	ELEV. DIFF.	GW DEPTH GROUND	Recorded By
03/23/88	N/A -			32.70	*		0.00		-2.70	
09/08/88	22.60	613.57	613.57	10.10	*		613.57	613.57	19.90	
09/20/88	22.76	613.41	-0.16	9.94	*		613.41	-0.16	20.06	
04/27/89	22.44	613.73	0.32	10.26	*		613.73	0.32	19.74	
05/18/89	22.19	613.98	0.25	10.51	*		613.98	0.25	19.49	
06/30/89	21.91	614.26	0.28	10.79	*		614.26	0.28	19.21	
07/12/89	22.12	614.05	-0.21	10.58	*		614.05	-0.21	19.42	
07/26/89	22.38	613.79	-0.26	10.32	*		613.79	-0.26	19.68	
07/27/89	22.45	613.72	-0.07	10.25	*		613.72	-0.07	19.75	
09/03/89	22.59	613.58	-0.14	10.11	*		613.58	-0.14	19.89	
11/16/89	22.76	613.41	-0.17	9.94	*		613.41	-0.17	20.06	
11/28/89	22.81	613.36	-0.05	9.89	*		613.36	-0.05	20.11	
06/01/90	22.75	613.42	0.06	9.95	*		613.42	0.06	20.05	
06/19/90	22.57	613.60	0.18	10.13	*		613.60	0.18	19.87	
06/27/90	22.68	613.49	-0.11	10.02	*		613.49	-0.11	19.98	
07/05/90	22.83	613.34	-0.15	9.87	*		613.34	-0.15	20.13	
07/13/90	22.80	613.37	0.03	9.90	*		613.37	0.03	20.10	
07/17/90	22.80	613.37	0.00	9.90	*		613.37	0.00	20.10	
07/25/90	22.93	613.24	-0.13	9.77	*		613.24	-0.13	20.23	
08/09/90	22.90	613.27	0.03	9.80	*		613.27	0.03	20.20	
08/14/90	22.99	613.18	-0.09	9.71	*		613.18	-0.09	20.29	
08/27/90	22.68	613.49	0.31	10.02	*		613.49	0.31	19.98	
09/06/90	22.52	613.65	0.16	10.18	*		613.65	0.16	19.82	
01/04/91	22.33	613.84	0.19	10.37	*		613.84	0.19	19.63	
01/30/91	22.57	613.60	-0.24	10.13	*		613.60	-0.24	19.87	
04/24/91	22.46	613.71	0.11	10.24	*		613.71	0.11	19.76	
06/06/91	21.10	615.07	1.36	11.60	*		615.07	1.36	18.40	
07/09/91	20.32	615.85	0.78	12.38	*		615.85	0.78	17.62	
08/06/91	20.86	615.31	-0.54	11.84	*	1.45	616.47	0.62	18.16	

WELL NO.:MW-17 WELL DEPTH (ground): 24.00 WELL DEPTH (TOC): 26.70

TOP OF CASING ELEVATION : 632.83 GROUND ELEV: 630.13

DATE MM/DD/YY	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	ELEV. DIFF.	GW DEPTH GROUND	Recorded By
03/23/88	N/A			26.70	*		0.00		-2.70	
09/08/88	19.26	613.57	613.57	7.44	*		613.57	613.57	16.56	
09/20/88	19.74	613.09	-0.48	6.96	*		613.09	-0.48	17.04	
04/27/89	19.28	613.55	0.46	7.42	*		613.55	0.46	16.58	
05/18/89	18.81	614.02	0.47	7.89	*		614.02	0.47	16.11	
06/30/89	18.10	614.73	0.71	8.60	*		614.73	0.71	15.40	
07/12/89	18.25	614.58	-0.15	8.45	*		614.58	-0.15	15.55	
07/26/89	18.59	614.24	-0.34	8.11	*		614.24	-0.34	15.89	
07/27/89	18.64	614.19	-0.05	8.06	*		614.19	-0.05	15.94	
09/03/89	18.98	613.85	-0.34	7.72	*		613.85	-0.34	16.28	
11/16/89			-613.85	26.70	*		0.00	-613.85	-2.70	
11/28/89	19.43	613.40	613.40	7.27	*		613.40	613.40	16.73	
06/01/90	19.41	613.42	0.02	7.29	*		613.42	0.02	16.71	
06/19/90	19.28	613.55	0.13	7.42	*		613.55	0.13	16.58	
06/27/90	19.30	613.53	-0.02	7.40	*		613.53	-0.02	16.60	
07/05/90	19.35	613.48	-0.05	7.35	*		613.48	-0.05	16.65	
07/13/90			-613.48	26.70	*		0.00	-613.48	-2.70	
07/17/90	19.39	613.44	613.44	7.31	*		613.44	613.44	16.69	
07/25/90	19.46	613.37	-0.07	7.24	*		613.37	-0.07	16.76	
08/09/90	19.50	613.33	-0.04	7.20	*		613.33	-0.04	16.80	
08/14/90			-613.33	26.70	*		0.00	-613.33	-2.70	
08/27/90	19.45	613.38	613.38	7.25	*		613.38	613.38	16.75	
09/06/90	19.18	613.65	0.27	7.52	*		613.65	0.27	16.48	
01/04/91	18.42	614.41	0.76	8.28	*		614.41	0.76	15.72	
01/30/91	18.93	613.90	-0.51	7.77	*		613.90	-0.51	16.23	
04/24/91	18.95	613.88	-0.02	7.75	*		613.88	-0.02	16.25	
06/06/91										
07/09/91	15.95	616.88	3.00	10.75	*		616.88	3.00	13.25	
08/06/91										

WELL NO.:MW-18 WELL DEPTH (ground): 25.00 WELL DEPTH (TOC): 27.29

TOP OF CASING ELEVATION : 636.77 GROUND ELEV: 634.48

DATE MM/DD/YY	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	ELEV. DIFF.	GW DEPTH GROUND	Recorded By
03/23/88	N/A -			27.29	*		0.00		-2.29	
09/08/88	20.90	615.87	615.87	6.39	*		615.87	615.87	18.61	
09/20/88	21.20	615.57	-0.30	6.09	*		615.57	-0.30	18.91	
04/27/89	20.93	615.84	0.27	6.36	*		615.84	0.27	18.64	
05/18/89	20.56	616.21	0.37	6.73	*		616.21	0.37	18.27	
06/30/89	20.27	616.50	0.29	7.02	*		616.50	0.29	17.98	
07/12/89	20.43	616.34	-0.16	6.86	*		616.34	-0.16	18.14	
07/26/89	20.32	616.45	0.11	6.97	*		616.45	0.11	18.03	
07/27/89	20.48	616.29	-0.16	6.81	*		616.29	-0.16	18.19	
09/03/89	20.64	616.13	-0.16	6.65	*		616.13	-0.16	18.35	
11/16/89	20.57	616.20	0.07	6.72	*		616.20	0.07	18.28	
11/28/89	20.81	615.96	-0.24	6.48	*		615.96	-0.24	18.52	
06/01/90	20.75	616.02	0.06	6.54	*		616.02	0.06	18.46	
06/19/90	20.70	616.07	0.05	6.59	*		616.07	0.05	18.41	
06/27/90	20.89	615.88	-0.19	6.40	*		615.88	-0.19	18.60	
07/05/90	21.11	615.66	-0.22	6.18	*		615.66	-0.22	18.82	
07/13/90	20.98	615.79	0.13	6.31	*		615.79	0.13	18.69	
07/17/90	20.71	616.06	0.27	6.58	*		616.06	0.27	18.42	
07/25/90	20.95	615.82	-0.24	6.34	*		615.82	-0.24	18.66	
08/09/90	20.96	615.81	-0.01	6.33	*		615.81	-0.01	18.67	
08/14/90	20.90	615.87	0.06	6.39	*		615.87	0.06	18.61	
08/27/90	20.76	616.01	0.14	6.53	*		616.01	0.14	18.47	
09/06/90			-616.01	27.29	*		0.00	-616.01	-2.29	
01/04/91	20.16	616.61	616.61	7.13	*		616.61	616.61	17.87	
01/30/91	20.25	616.52	-0.09	7.04	*		616.52	-0.09	17.96	
04/24/91	20.82	615.95	-0.57	6.47	*		615.95	-0.57	18.53	
06/06/91										
07/09/91	19.05	617.72	1.77	8.24	*		617.72	1.77	16.76	
08/06/91										

WELL NO.:MW-19 WELL DEPTH (ground): 31.70 WELL DEPTH (TOC): 34.60

TOP OF CASING ELEVATION : 635.29 GROUND ELEV: 632.39

DATE MM/DD/YY	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	ELEV. DIFF.	GW DEPTH GROUND	Recorded By
03/23/88	N/A -			34.60	*		0.00		-2.90	
09/08/88	N/A -		0.00	34.60	*		0.00	0.00	-2.90	
09/20/88	N/A -		0.00	34.60	*		0.00	0.00	-2.90	
04/27/89	N/A -		0.00	34.60	*		0.00	0.00	-2.90	
05/18/89	N/A -		0.00	34.60	*		0.00	0.00	-2.90	
06/30/89	20.95	614.34	614.34	13.65	*		614.34	614.34	18.05	
07/12/89	22.86	612.43	-1.91	11.74	*		612.43	-1.91	19.96	
07/26/89	23.09	612.20	-0.23	11.51	*		612.20	-0.23	20.19	
07/27/89	23.17	612.12	-0.08	11.43	*		612.12	-0.08	20.27	
09/03/89	23.13	612.16	0.04	11.47	*		612.16	0.04	20.23	
11/16/89	23.42	611.87	-0.29	11.18	*		611.87	-0.29	20.52	
11/28/89	23.72	611.57	-0.30	10.88	*		611.57	-0.30	20.82	
06/01/90					*		0.00	-611.57	-2.90	
06/19/90	23.20	612.09	0.52	11.40	*		612.09	612.09	20.30	
06/27/90	23.61	611.68	-0.41	10.99	*		611.68	-0.41	20.71	
07/05/90	23.86	611.43	-0.25	10.74	*		611.43	-0.25	20.96	
07/13/90	23.88	611.41	-0.02	10.72	*		611.41	-0.02	20.98	
07/17/90	23.72	611.57	0.16	10.88	*		611.57	0.16	20.82	
07/25/90	23.38	611.91	0.34	11.22	*		611.91	0.34	20.48	
08/09/90	23.85	611.44	-0.47	10.75	*		611.44	-0.47	20.95	
08/14/90	23.93	611.36	-0.08	10.67	*		611.36	-0.08	21.03	
08/27/90	23.70	611.59	0.23	10.90	*		611.59	0.23	20.80	
09/06/90	23.34	611.95	0.36	11.26	*		611.95	0.36	20.44	
01/04/91	23.42	611.87	-0.08	11.18	*		611.87	-0.08	20.52	
01/30/91	23.64	611.65	-0.22	10.96	*		611.65	-0.22	20.74	
04/24/91	23.47	611.82	0.17	11.13	*		611.82	0.17	20.57	
06/06/91										
07/09/91	21.72	613.57	1.75	12.88	*		613.57	1.75	18.82	
08/06/91										

WELL NO.:MW-20 WELL DEPTH (ground): 24.80 WELL DEPTH (TOC): 27.60

TOP OF CASING ELEVATION : 636.26 GROUND ELEV: 633.46

DATE MM/DD/YY	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	ELEV. DIFF.	GW DEPTH GROUND	Recorded By
03/23/88	N/A	-		27.60	*		0.00		-2.80	
09/08/88	N/A	-	0.00	27.60	*		0.00	0.00	-2.80	
09/20/88	N/A	-	0.00	27.60	*		0.00	0.00	-2.80	
04/27/89	N/A	-	0.00	27.60	*		0.00	0.00	-2.80	
05/18/89	N/A	-	0.00	27.60	*		0.00	0.00	-2.80	
06/30/89	19.86	616.40	616.40	7.74	*		616.40	616.40	17.06	
07/12/89	19.98	616.28	-0.12	7.62	*		616.28	-0.12	17.18	
07/26/89	19.92	616.34	0.06	7.68	*		616.34	0.06	17.12	
07/27/89	20.05	616.21	-0.13	7.55	*		616.21	-0.13	17.25	
09/03/89	20.16	616.10	-0.11	7.44	*		616.10	-0.11	17.36	
11/16/89	20.17	616.09	-0.01	7.43	*		616.09	-0.01	17.37	
11/28/89	20.33	615.93	-0.16	7.27	*		615.93	-0.16	17.53	
06/01/90	20.33	615.93	0.00	7.27	*		615.93	0.00	17.53	
06/19/90	20.20	616.06	0.13	7.40	*		616.06	0.13	17.40	
06/27/90	20.27	615.99	-0.07	7.33	*		615.99	-0.07	17.47	
07/05/90	20.47	615.79	-0.20	7.13	*		615.79	-0.20	17.67	
07/13/90	20.46	615.80	0.01	7.14	*		615.80	0.01	17.66	
07/17/90	20.24	616.02	0.22	7.36	*		616.02	0.22	17.44	
07/25/90	20.43	615.83	-0.19	7.17	*		615.83	-0.19	17.63	
08/09/90	20.35	615.91	0.08	7.25	*		615.91	0.08	17.55	
08/14/90	20.41	615.85	-0.06	7.19	*		615.85	-0.06	17.61	
08/27/90	20.24	616.02	0.17	7.36	*		616.02	0.17	17.44	
09/06/90	19.98	616.28	0.26	7.62	*		616.28	0.26	17.18	
01/04/91	19.76	616.50	0.22	7.84	*		616.50	0.22	16.96	
01/30/91	19.86	616.40	-0.10	7.74	*		616.40	-0.10	17.06	
04/24/91	20.26	616.00	-0.40	7.34	*		616.00	-0.40	17.46	
06/06/91										
07/09/91	18.83	617.43	1.43	8.77	*		617.43	1.43	16.03	
08/06/91										

WELL NO.:MW-21 WELL DEPTH (ground): 26.60 WELL DEPTH (TOC): 29.20

TOP OF CASING ELEVATION : 637.11 GROUND ELEV: 634.51

DATE MM/DD/YY	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	ELEV. DIFF.	GW DEPTH GROUND	Recorded By
03/23/88	N/A	-		29.20	*		0.00		-2.60	
09/08/88	N/A	-	0.00	29.20	*		0.00	0.00	-2.60	
09/20/88	N/A	-	0.00	29.20	*		0.00	0.00	-2.60	
04/27/89	N/A	-	0.00	29.20	*		0.00	0.00	-2.60	
05/18/89	N/A	-	0.00	29.20	*		0.00	0.00	-2.60	
06/30/89	20.53	616.58	616.58	8.67	*		616.58	616.58	17.93	
07/12/89	20.66	616.45	-0.13	8.54	*		616.45	-0.13	18.06	
07/26/89	20.53	616.58	0.13	8.67	*		616.58	0.13	17.93	
07/27/89	20.69	616.42	-0.16	8.51	*		616.42	-0.16	18.09	
09/03/89	20.89	616.22	-0.20	8.31	*		616.22	-0.20	18.29	
11/16/89	20.80	616.31	0.09	8.40	*		616.31	0.09	18.20	
11/28/89	21.03	616.08	-0.23	8.17	*		616.08	-0.23	18.43	
06/01/90	21.05	616.06	-0.02	8.15	*		616.06	-0.02	18.45	
06/19/90	21.06	616.05	-0.01	8.14	*		616.05	-0.01	18.46	
06/27/90	21.25	615.86	-0.19	7.95	*		615.86	-0.19	18.65	
07/05/90	21.50	615.61	-0.25	7.70	*		615.61	-0.25	18.90	
07/13/90	21.37	615.74	0.13	7.83	*		615.74	0.13	18.77	
07/17/90	21.06	616.05	0.31	8.14	*		616.05	0.31	18.46	
07/25/90	21.30	615.81	-0.24	7.90	*		615.81	-0.24	18.70	
08/09/90	21.17	615.94	0.13	8.03	*		615.94	0.13	18.57	
08/14/90	21.33	615.78	-0.16	7.87	*		615.78	-0.16	18.73	
08/27/90	21.24	615.87	0.09	7.96	*		615.87	0.09	18.64	
09/06/90	21.02	616.09	0.22	8.18	*		616.09	0.22	18.42	
01/04/91	20.41	616.70	0.61	8.79	*		616.70	0.61	17.81	
01/30/91	20.52	616.59	-0.11	8.68	*		616.59	-0.11	17.92	
04/24/91	21.04	616.07	-0.52	8.16	*		616.07	-0.52	18.44	
06/06/91	20.06	617.05	0.98	9.14	*		617.05	0.98	17.46	
07/09/91	19.18	617.93	0.88	10.02	*		617.93	1.86	16.58	
08/06/91	18.49	618.62	0.69	10.71	*		618.62	1.57	15.89	

WELL NO.:MW-22 WELL DEPTH: 27.70

TOP OF CASING ELEVATION : 638.82 GROUND ELEV: 636.02

DATE MM/DD/YY	DEPTH TO PROD	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	PROD. CHANGE	GW DEPTH GROUND
03/23/88			638.82		30.50	*		638.82		-2.80
09/08/88			638.82	0.00	30.50	*		638.82	0.00	-2.80
09/20/88			638.82	0.00	30.50	*		638.82	0.00	-2.80
04/27/89			638.82	0.00	30.50	*		638.82	0.00	-2.80
05/18/89			638.82	0.00	30.50	*		638.82	0.00	-2.80
06/30/89		23.71	615.11	-23.71	6.79	*	1.50	616.28	1.50	20.91
07/12/89		24.60	614.22	-0.89	5.90	*	2.50	616.17	1.00	21.80
07/26/89		24.72	614.10	-0.12	5.78	*	2.71	616.21	0.21	21.92
07/27/89		24.84	613.98	-0.12	5.66	*	2.78	616.15	0.07	22.04
09/03/89		24.89	613.93	-0.05	5.61	*	2.64	615.99	-0.14	22.09
11/16/89		24.69	614.13	0.20	5.81	*	2.61	616.17	-0.03	21.89
11/29/89		24.64	614.18	0.05	5.86	*	2.62	616.22	0.01	21.84
12/01/89		24.80	614.02	-0.16	5.70	*	2.45	615.93	-0.17	22.00
12/02/89		24.60	614.22	0.20	5.90	*	2.05	615.82	-0.40	21.80
05/04/90	22.78	26.34	612.48	-1.74	4.16	*	3.56	615.26	1.51	23.54
06/01/90		26.05	612.77	0.29	4.45	*	3.53	615.52	-0.03	23.25
06/19/90	22.52	25.76	613.06	0.29	4.74	*	3.24	615.59	-0.29	22.96
06/27/90	22.69	25.76	613.06	0.00	4.74	*	3.07	615.45	-0.17	22.96
07/05/90	22.85	26.07	612.75	-0.31	4.43	*	3.22	615.26	0.15	23.27
07/13/90	22.65	25.76	613.06	0.31	4.74	*	3.11	615.49	-0.11	22.96
07/17/90	22.46	25.57	613.25	0.19	4.93	*	3.11	615.68	-0.00	22.77
07/25/90	22.65	25.80	613.02	-0.23	4.70	*	3.15	615.48	0.04	23.00
08/09/90	nm	nm								
08/14/90	nm	nm								
08/27/90	22.60	25.68	613.14	613.14	4.82	*	3.08	615.54	3.08	22.88
09/06/90	22.50	25.44	613.38	0.24	5.06	*	2.94	615.67	-0.14	22.64
01/04/91	22.02	24.01	614.81	1.43	6.49	*	1.99	616.36	-0.95	21.21
01/30/91	22.10	24.39	614.43	-0.38	6.11	*	2.29	616.22	0.30	21.59
04/24/91	22.42	25.44	613.38	-1.05	5.06	*	3.02	615.74	0.73	22.64
06/06/91										
07/09/91	21.41	21.91	616.91		8.59	*	0.50	617.30		19.11
08/06/91										

WELL NO.:MW-23 WELL DEPTH: 24.20 (15' screen)

TOP OF CASING ELEVATION : 636.73 GROUND ELEV: 633.53

DATE MM/DD/YY	DEPTH TO PROD	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	PROD. CHANGE	GW DEPTH GROUND
03/23/88			636.73		27.40	*		636.73		-3.20
09/08/88			636.73	0.00	27.40	*		636.73	0.00	-3.20
09/20/88			636.73	0.00	27.40	*		636.73	0.00	-3.20
04/27/89			636.73	0.00	27.40	*		636.73	0.00	-3.20
05/18/89			636.73	0.00	27.40	*		636.73	0.00	-3.20
06/30/89		20.27	616.46	-20.27	7.13	*	3.20	618.96	3.20	17.07
07/12/89		17.58	619.15	2.69	9.82	*	2.50	621.10	-0.70	14.38
07/26/89		20.54	616.19	-2.96	6.86	*	2.73	618.32	0.23	17.34
07/27/89		20.60	616.13	-0.06	6.80	*	2.77	618.29	0.04	17.40
09/03/89		21.67	615.06	-1.07	5.73	*	3.72	617.96	0.95	18.47
11/16/89		22.35	614.38	-0.68	5.05	*	5.15	618.40	1.43	19.15
11/29/89		21.53	615.20	0.82	5.87	*	3.98	618.30	-1.17	18.33
12/01/89		20.47	616.26	1.06	6.93	*	2.27	618.03	-1.71	17.27
12/02/89		19.82	616.91	0.65	7.58	*	1.41	618.01	-0.86	16.62
05/04/90	18.03	22.29	614.44	-2.47	5.11	*	4.26	617.76	2.85	19.09
06/01/90		21.00	615.73	1.29	6.40	*	3.65	618.58	-0.61	17.80
06/19/90	17.49	20.86	615.87	0.14	6.54	*	3.37	618.50	-0.28	17.66
06/27/90	17.78	21.06	615.67	-0.20	6.34	*	3.28	618.23	-0.09	17.86
07/05/90	18.10	21.53	615.20	-0.47	5.87	*	3.43	617.88	0.15	18.33
07/13/90	18.02	21.67	615.06	-0.14	5.73	*	3.65	617.91	0.22	18.47
07/17/90	17.78	21.35	615.38	0.32	6.05	*	3.57	618.16	-0.08	18.15
07/25/90	18.10	21.89	614.84	-0.54	5.51	*	3.79	617.80	0.22	18.69
08/09/90	20.68	23.33	613.40	-1.44	4.07	*	2.65	615.47	-1.14	20.13
08/14/90	nm	21.83	614.90							
08/27/90	18.29	22.00	614.73	-0.17	5.40	*	3.71	617.62	3.71	18.80
09/06/90	17.75	20.82	615.91	1.18	6.58	*	3.07	618.30	-0.64	17.62
01/04/91	17.84	20.40	616.33	0.42	7.00	*	2.56	618.33	-0.51	17.20
01/30/91	18.05	21.23	615.50	-0.83	6.17	*	3.18	617.98	0.62	18.03
04/24/91	17.18	20.96	615.77	0.27	6.44	*	3.78	618.72	0.60	17.76
06/06/91	15.11	19.78	616.95	1.18	7.62	*	4.67	620.59	0.89	16.58
07/09/91	13.76	19.69	617.04	0.09	7.71	*	5.93	621.67	1.26	16.49
08/06/91	12.87	19.97	616.76	-0.28	7.43	*	7.10	622.30	1.17	16.77

WELL NO.:MW-24 WELL DEPTH: 28.00 (15' screen)

TOP OF CASING ELEVATION : 638.32 GROUND ELEV: 635.82

DATE MM/DD/YY	DEPTH TO PROD	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	PROD. CHANGE	GW DEPTH GROUND
03/23/88			638.32		30.50	*		638.32		-2.50
09/08/88			638.32	0.00	30.50	*		638.32	0.00	-2.50
09/20/88			638.32	0.00	30.50	*		638.32	0.00	-2.50
04/27/89			638.32	0.00	30.50	*		638.32	0.00	-2.50
05/18/89			638.32	0.00	30.50	*		638.32	0.00	-2.50
06/30/89		25.20	613.12	-25.20	5.30	*	5.40	617.33	5.40	22.70
07/12/89		25.36	612.96	-0.16	5.14	*	4.97	616.84	-0.43	22.86
07/26/89		25.23	613.09	0.13	5.27	*	4.83	616.86	-0.14	22.73
07/27/89		25.27	613.05	-0.04	5.23	*	4.69	616.71	-0.14	22.77
09/03/89		25.23	613.09	0.04	5.27	*	4.42	616.54	-0.27	22.73
11/16/89		25.35	612.97	-0.12	5.15	*	4.52	616.50	0.10	22.85
11/29/89		25.33	612.99	0.02	5.17	*	4.60	616.58	0.08	22.83
12/01/89		25.29	613.03	0.04	5.21	*	4.11	616.24	-0.49	22.79
12/02/89		25.32	613.00	-0.03	5.18	*	4.05	616.16	-0.06	22.82
05/04/90	21.81	25.24	613.08	0.08	5.26	*	3.43	615.76	-0.62	22.74
06/01/90		25.25	613.07	-0.01	5.25	*	4.20	616.35	0.77	22.75
06/19/90	20.98	25.20	613.12	0.05	5.30	*	4.22	616.41	0.02	22.70
06/27/90	21.36	25.14	613.18	0.06	5.36	*	3.78	616.13	-0.44	22.64
07/05/90	21.80	25.23	613.09	-0.09	5.27	*	3.43	615.77	-0.35	22.73
07/13/90	21.55	25.18	613.14	0.05	5.32	*	3.63	615.97	0.20	22.68
07/17/90	21.22	25.15	613.17	0.03	5.35	*	3.93	616.24	0.30	22.65
07/25/90	21.70	25.18	613.14	-0.03	5.32	*	3.48	615.85	-0.45	22.68
08/09/90	21.46	25.20	613.12	-0.02	5.30	*	3.74	616.04	0.26	22.70
08/14/90	nm	25.20	613.12							
08/27/90	21.39	25.17	613.15	0.03	5.33	*	3.78	616.10	3.78	22.67
09/06/90	20.86	25.12	613.20	0.05	5.38	*	4.26	616.52	0.48	22.62
01/04/91	20.47	25.27	613.05	-0.15	5.23	*	4.80	616.79	0.54	22.77
01/30/91	20.78	25.25	613.07	0.02	5.25	*	4.47	616.56	-0.33	22.75
04/24/91	20.72	25.15	613.17	0.10	5.35	*	4.43	616.63	-0.04	22.65
06/06/91										
07/09/91	17.27	24.93	613.39		5.57	*	7.66	619.36		22.43
08/06/91										

WELL NO.:MW-25 WELL DEPTH: 32.00 (15' screen)

TOP OF CASING ELEVATION : 637.49 GROUND ELEV: 634.49

DATE MM/DD/YY	DEPTH TO PROD	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	PROD. CHANGE	GW DEPTH GROUND
03/23/88			637.49		35.00	*		637.49		-3.00
09/08/88			637.49	0.00	35.00	*		637.49	0.00	-3.00
09/20/88			637.49	0.00	35.00	*		637.49	0.00	-3.00
04/27/89			637.49	0.00	35.00	*		637.49	0.00	-3.00
05/18/89			637.49	0.00	35.00	*		637.49	0.00	-3.00
06/30/89		21.50	615.99	-21.50	13.50	*	1.15	616.89	1.15	18.50
07/12/89		22.48	615.01	-0.98	12.52	*	1.63	616.28	0.48	19.48
07/26/89		22.80	614.69	-0.32	12.20	*	1.97	616.23	0.34	19.80
07/27/89		23.09	614.40	-0.29	11.91	*	2.24	616.15	0.27	20.09
09/03/89		24.30	613.19	-1.21	10.70	*	3.52	615.94	1.28	21.30
11/16/89		24.76	612.73	-0.46	10.24	*	4.04	615.88	0.52	21.76
11/29/89		24.43	613.06	0.33	10.57	*	3.56	615.84	-0.48	21.43
12/01/89		23.51	613.98	0.92	11.49	*	2.18	615.68	-1.38	20.51
12/02/89		22.71	614.78	0.80	12.29	*	1.17	615.69	-1.01	19.71
05/04/90	21.48	27.15	610.34	-4.44	7.85	*	5.67	614.76	4.50	24.15
06/01/90		24.90	612.59	2.25	10.10	*	3.70	615.48	-1.97	21.90
06/19/90	20.94	24.82	612.67	0.08	10.18	*	3.88	615.70	0.18	21.82
06/27/90	21.09	24.70	612.79	0.12	10.30	*	3.61	615.61	-0.27	21.70
07/05/90	21.23	25.08	612.41	-0.38	9.92	*	3.85	615.41	0.24	22.08
07/13/90	21.30	24.67	612.82	0.41	10.33	*	3.37	615.45	-0.48	21.67
07/17/90	21.08	24.51	612.98	0.16	10.49	*	3.43	615.66	0.06	21.51
07/25/90	21.27	24.92	612.57	-0.41	10.08	*	3.65	615.42	0.22	21.92
08/09/90	21.13	24.88	612.61	0.04	10.12	*	3.75	615.54	0.10	21.88
08/14/90	nm	25.02	612.47							
08/27/90	20.80	25.76	611.73	-0.74	9.24	*	4.96	615.60	4.96	22.76
09/06/90	20.65	24.81	612.68	0.95	10.19	*	4.16	615.92	-0.80	21.81
01/04/91	20.68	23.55	613.94	1.26	11.45	*	2.87	616.18	-1.29	20.55
01/30/91	20.93	23.69	613.80	-0.14	11.31	*	2.76	615.95	-0.11	20.69
04/24/91	20.40	25.21	612.28	-1.52	9.79	*	4.81	616.03	2.05	22.21
06/06/91										
07/09/91	17.42	23.39	614.10		11.61	*	5.97	618.76		20.39
08/06/91										

WELL NO.:MW-26 WELL DEPTH: 28.50 (15' screen)

TOP OF CASING ELEVATION : 635.83 GROUND ELEV: 633.03

DATE MM/DD/YY	DEPTH TO PROD	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	PROD. CHANGE	GW DEPTH GROUND
03/23/88					31.30	*		0.00		-2.80
09/08/88			635.83	635.83	31.30	*		635.83	0.00	-2.80
09/20/88			635.83	0.00	31.30	*		635.83	0.00	-2.80
04/27/89			635.83	0.00	31.30	*		635.83	0.00	-2.80
05/18/89			635.83	0.00	31.30	*		635.83	0.00	-2.80
06/30/89		22.05	613.78	-22.05	9.25	*	2.50	615.73	2.50	19.25
07/12/89		22.30	613.53	-0.25	9.00	*	2.40	615.40	-0.10	19.50
07/26/89		22.36	613.47	-0.06	8.94	*	2.40	615.34	0.00	19.56
07/27/89		22.51	613.32	-0.15	8.79	*	2.44	615.22	0.04	19.71
09/03/89		22.96	612.87	-0.45	8.34	*	2.64	614.93	0.20	20.16
11/16/89		23.20	612.63	-0.24	8.10	*	2.78	614.80	0.14	20.40
11/29/89		23.11	612.72	0.09	8.19	*	2.81	614.91	0.03	20.31
12/01/89		23.10	612.73	0.01	8.20	*	2.63	614.78	-0.18	20.30
12/02/89		23.11	612.72	-0.01	8.19	*	2.63	614.77	0.00	20.31
05/04/90	21.16	24.39	611.44	-1.28	6.91	*	3.23	613.96	0.60	21.59
06/01/90		29.90	605.93	-5.51	1.40	*	6.40	610.92	3.17	27.10
06/19/90	20.82	23.28	612.55	6.62	8.02	*	2.46	614.47	-3.94	20.48
06/27/90	20.81	23.23	612.60	0.05	8.07	*	2.42	614.49	-0.04	20.43
07/05/90	20.80	23.25	612.58	-0.02	8.05	*	2.45	614.49	0.03	20.45
07/13/90	20.80	23.28	612.55	-0.03	8.02	*	2.48	614.48	0.03	20.48
07/17/90	20.78	23.23	612.60	0.05	8.07	*	2.45	614.51	-0.03	20.43
07/25/90	20.80	23.38	612.45	-0.15	7.92	*	2.58	614.46	0.13	20.58
08/09/90	20.77	23.40	612.43	-0.02	7.90	*	2.63	614.48	0.05	20.60
08/14/90	nm	23.51	612.32							
08/27/90	20.83	23.40	612.43	0.11	7.90	*	2.57	614.43	2.57	20.60
09/06/90	20.67	23.18	612.65	0.22	8.12	*	2.51	614.61	-0.06	20.38
01/04/91	19.95	22.42	613.41	0.76	8.88	*	2.47	615.34	-0.04	19.62
01/30/91	20.18	22.78	613.05	-0.36	8.52	*	2.60	615.08	0.13	19.98
04/24/91	20.41	22.83	613.00	-0.05	8.47	*	2.42	614.89	-0.18	20.03
06/06/91										
07/09/91	17.93	20.52	615.31		10.78	*	2.59	617.33		17.72
08/06/91										

WELL NO.:MW-27 WELL DEPTH: 28.50 (15' screen)

TOP OF CASING ELEVATION : 637.96 GROUND ELEV: 634.96

DATE MM/DD/YY	DEPTH TO PROD	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	PROD. CHANGE	GW DEPTH GROUND
03/23/88			637.96		31.50	*		637.96		-3.00
09/08/88			637.96	0.00	31.50	*		637.96	0.00	-3.00
09/20/88			637.96	0.00	31.50	*		637.96	0.00	-3.00
04/27/89			637.96	0.00	31.50	*		637.96	0.00	-3.00
05/18/89			637.96	0.00	31.50	*		637.96	0.00	-3.00
06/30/89	21.60	26.00	611.96	-26.00	5.50	*	4.40	615.39	4.40	23.00
07/12/89	21.70	26.20	611.76	-0.20	5.30	*	4.50	615.27	0.10	23.20
07/26/89	21.80	25.94	612.02	0.26	5.56	*	4.14	615.25	-0.36	22.94
07/27/89	21.94	29.56	608.40	-3.62	1.94	*	7.62	614.34	3.48	26.56
09/03/89	22.10	30.59	607.37	-1.03	0.91	*	8.49	613.99	0.87	27.59
11/16/89	21.95	30.22	607.74	0.37	1.28	*	8.27	614.19	-0.22	27.22
11/29/89	22.03	29.95	608.01	0.27	1.55	*	7.92	614.19	-0.35	26.95
12/01/89	22.15	30.27	607.69	-0.32	1.23	*	8.12	614.02	0.20	27.27
12/02/89	22.19	30.35	607.61	-0.08	1.15	*	8.16	613.97	0.04	27.35
05/04/90	22.84	31.70	606.26	-1.35	-0.20	*	8.86	613.17	0.70	28.70
06/01/90	22.65	30.20	607.76	1.50	1.30	*	7.55	613.65	-1.31	27.20
06/19/90	22.60	29.27	608.69	0.93	2.23	*	6.67	613.89	-0.88	26.27
06/27/90	21.55	28.06	609.90	1.21	3.44	*	6.51	614.98	-0.16	25.06
07/05/90	21.58	28.94	609.02	-0.88	2.56	*	7.36	614.76	0.85	25.94
07/13/90	21.50	28.50	609.46	0.44	3.00	*	7.00	614.92	-0.36	25.50
07/17/90	21.49	28.43	609.53	0.07	3.07	*	6.94	614.94	-0.06	25.43
07/25/90	21.50	28.76	609.20	-0.33	2.74	*	7.26	614.86	0.32	25.76
08/09/90	21.47	28.77	609.19	-0.01	2.73	*	7.30	614.88	0.04	25.77
08/14/90	nm	28.54	609.42							
08/27/90	21.49	28.04	609.92	0.50	3.46	*	6.55	615.03	6.55	25.04
09/06/90	21.40	25.10	612.86	2.94	6.40	*	3.70	615.75	-2.85	22.10
01/04/91	20.70	24.82	613.14	0.28	6.68	*	4.12	616.35	0.42	21.82
01/30/91	20.81	27.82	610.14	-3.00	3.68	*	7.01	615.61	2.89	24.82
04/24/91	21.17	25.90	612.06	1.92	5.60	*	4.73	615.75	-2.28	22.90
06/06/91	20.25	23.15	614.81	2.75	8.35	*	2.90	617.07	-1.83	20.15
07/09/91	19.35	21.98	615.98	1.17	9.52	*	2.63	618.03	-0.27	18.98
08/06/91	18.44	21.04	616.92	0.94	10.46	*	2.60	618.95	-0.03	18.04
09/04/91	18.47	20.94	617.02	0.10	10.56	*	2.47	618.95	-0.13	17.94

WELL NO.:MW-28 WELL DEPTH (ground): 26.62 (15' screen)

TOP OF CASING ELEVATION : 638.08 GROUND ELEV: 635.60 WELL DEPTH (TOC): 29.10

DATE MM/DD/YY	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	ELEV. DIFF.	GW DEPTH GROUND	Recorded By
03/23/88	N/A -			29.10	*		0.00		-2.48	
09/08/88	N/A -		0.00	29.10	*		0.00	0.00	-2.48	
09/20/88	N/A -		0.00	29.10	*		0.00	0.00	-2.48	
04/27/89	N/A -		0.00	29.10	*		0.00	0.00	-2.48	
05/18/89	N/A -		0.00	29.10	*		0.00	0.00	-2.48	
06/30/89	21.10	616.98	616.98	8.00	*		616.98	616.98	18.62	
07/12/89	21.59	616.49	-0.49	7.51	*		616.49	-0.49	19.11	
07/26/89	21.73	616.35	-0.14	7.37	*		616.35	-0.14	19.25	
07/27/89	21.84	616.24	-0.11	7.26	*		616.24	-0.11	19.36	
09/03/89	21.95	616.13	-0.11	7.15	*		616.13	-0.11	19.47	
11/16/89	22.11	615.97	-0.16	6.99	*		615.97	-0.16	19.63	
11/28/89	22.39	615.69	-0.28	6.71	*		615.69	-0.28	19.91	
06/01/90					*		0.00	-615.69	-2.48	
06/19/90	22.01	616.07	0.38	7.09	*		616.07	616.07	19.53	
06/27/90	22.07	616.01	-0.06	7.03	*		616.01	-0.06	19.59	
07/05/90	22.45	615.63	-0.38	6.65	*		615.63	-0.38	19.97	
07/13/90	22.45	615.63	0.00	6.65	*		615.63	0.00	19.97	
07/17/90	22.16	615.92	0.29	6.94	*		615.92	0.29	19.68	
07/25/90	22.48	615.60	-0.32	6.62	*		615.60	-0.32	20.00	
08/09/90			-615.60	29.10	*		0.00	-615.60	-2.48	
08/14/90			0.00	29.10	*		0.00	0.00	-2.48	
08/27/90			0.00	29.10	*		0.00	0.00	-2.48	
09/06/90	21.83	616.25	616.25	7.27	*		616.25	616.25	19.35	
01/04/91	21.71	616.37	0.12	7.39	*		616.37	0.12	19.23	
01/30/91			-616.37	29.10	*		0.00	-616.37	-2.48	
04/24/91										
06/06/91										
07/09/91	18.84	619.24	619.24	10.26	*		619.24	619.24	16.36	
08/06/91										

WELL NO.:MW-30 WELL DEPTH (ground): 24.70

TOP OF CASING ELEVATION : 632.74 GROUND ELEV: 629.09 WELL DEPTH (TOC): 28.35

DATE MM/DD/YY	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	ELEV. DIFF.	GW DEPTH GROUND	Recorded By
03/23/88	N/A	-		28.35	*		0.00		-3.65	
09/08/88	N/A	-	0.00	28.35	*		0.00	0.00	-3.65	
09/20/88	N/A	-	0.00	28.35	*		0.00	0.00	-3.65	
04/27/89	N/A	-	0.00	28.35	*		0.00	0.00	-3.65	
05/18/89	N/A	-	0.00	28.35	*		0.00	0.00	-3.65	
06/30/89	17.40	615.34	615.34	10.95	*		615.34	615.34	13.75	
07/12/89	17.80	614.94	-0.40	10.55	*		614.94	-0.40	14.15	
07/26/89	17.98	614.76	-0.18	10.37	*		614.76	-0.18	14.33	
07/27/89	18.12	614.62	-0.14	10.23	*		614.62	-0.14	14.47	
09/03/89	18.44	614.30	-0.32	9.91	*		614.30	-0.32	14.79	
11/16/89	18.66	614.08	-0.22	9.69	*		614.08	-0.22	15.01	
11/28/89	18.77	613.97	-0.11	9.58	*		613.97	-0.11	15.12	
06/01/90	18.44	614.30	0.33	9.91	*		614.30	0.33	14.79	
06/19/90	18.30	614.44	0.14	10.05	*		614.44	0.14	14.65	
06/27/90	18.53	614.21	-0.23	9.82	*		614.21	-0.23	14.88	
07/05/90	18.65	614.09	-0.12	9.70	*		614.09	-0.12	15.00	
07/13/90	18.72	614.02	-0.07	9.63	*		614.02	-0.07	15.07	
07/17/90	18.56	614.18	0.16	9.79	*		614.18	0.16	14.91	
07/25/90	18.78	613.96	-0.22	9.57	*		613.96	-0.22	15.13	
08/09/90	18.80	613.94	-0.02	9.55	*		613.94	-0.02	15.15	
08/14/90			-613.94	28.35	*		0.00	-613.94	-3.65	
08/27/90	18.67	614.07	614.07	9.68	*		614.07	614.07	15.02	
09/06/90	18.44	614.30	0.23	9.91	*		614.30	0.23	14.79	
01/04/91	17.90	614.84	0.54	10.45	*		614.84	0.54	14.25	
01/30/91	18.20	614.54	-0.30	10.15	*		614.54	-0.30	14.55	
04/24/91	18.38	614.36	-0.18	9.97	*		614.36	-0.18	14.73	
06/06/91										
07/09/91	14.66	618.08	3.72	13.69	*		618.08	3.72	11.01	
08/06/91										

WELL NO.:MW-31 WELL DEPTH (ground): 28.70 WELL DEPTH (TOC): 30.30

TOP OF CASING ELEVATION : 635.05 GROUND ELEV: 633.45

DATE MM/DD/YY	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	ELEV. DIFF.	GW DEPTH GROUND	Recorded By
03/23/88	N/A -			30.30	*		0.00		-3.65	
09/08/88	N/A -		0.00	30.30	*		0.00	0.00	-3.65	
09/20/88	N/A -		0.00	30.30	*		0.00	0.00	-3.65	
04/27/89	N/A -		0.00	30.30	*		0.00	0.00	-3.65	
05/18/89	N/A -		0.00	30.30	*		0.00	0.00	-3.65	
06/30/89	19.60	615.45	615.45	10.70	*		615.45	615.45	15.95	
07/12/89	19.99	615.06	-0.39	10.31	*		615.06	-0.39	16.34	
07/26/89	20.23	614.82	-0.24	10.07	*		614.82	-0.24	16.58	
07/27/89	20.37	614.68	-0.14	9.93	*		614.68	-0.14	16.72	
09/03/89	20.54	614.51	-0.17	9.76	*		614.51	-0.17	16.89	
11/16/89			-614.51	30.30	*		0.00	-614.51	-3.65	
11/28/89	21.26	613.79	613.79	9.04	*		613.79	613.79	17.61	
06/01/90	20.61	614.44	0.65	9.69	*		614.44	0.65	16.96	
06/19/90	20.46	614.59	0.15	9.84	*		614.59	0.15	16.81	
06/27/90	20.70	614.35	-0.24	9.60	*		614.35	-0.24	17.05	
07/05/90	20.88	614.17	-0.18	9.42	*		614.17	-0.18	17.23	
07/13/90	20.89	614.16	-0.01	9.41	*		614.16	-0.01	17.24	
07/17/90	20.73	614.32	0.16	9.57	*		614.32	0.16	17.08	
07/25/90	20.94	614.11	-0.21	9.36	*		614.11	-0.21	17.29	
08/09/90	20.96	614.09	-0.02	9.34	*		614.09	-0.02	17.31	
08/14/90	21.01	614.04	-0.05	9.29	*		614.04	-0.05	17.36	
08/27/90	20.67	614.38	0.34	9.63	*		614.38	0.34	17.02	
09/06/90	20.27	614.78	0.40	10.03	*		614.78	0.40	16.62	
01/04/91	20.19	614.86	0.08	10.11	*		614.86	0.08	16.54	
01/30/91	20.53	614.52	-0.34	9.77	*		614.52	-0.34	16.88	
04/24/91	20.32	614.73	0.21	9.98	*		614.73	0.21	16.67	
06/06/91										
07/09/91	17.12	617.93	3.20	13.18	*		617.93	3.20	13.47	
08/06/91										

WELL NO.:MW-32 WELL DEPTH: 26.90

TOP OF CASING ELEVATION : 633.76 GROUND ELEV: 631.06

DATE MM/DD/YY	DEPTH TO PROD	GW DEPTH	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	PROD. CHANGE	GW DEPTH GROUND
08/06/91	15.43	15.98	617.78		13.62	*	0.55	618.21		13.28

WELL NO.:MW-33 WELL DEPTH (ground): 23.60 WELL DEPTH (TOC): 25.90

TOP OF CASING ELEVATION : 632.42 GROUND ELEV: 630.12

DATE MM/DD/YY	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	ELEV. DIFF.	GW DEPTH GROUND	Recorded By
08/06/91	12.78	619.64		13.12	*		619.64		9.13	

WELL NO.:MW-34 WELL DEPTH (ground): 28.60 WELL DEPTH (TOC): 30.40

TOP OF CASING ELEVATION : 629.10 GROUND ELEV: 627.30

DATE MM/DD/YY	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	ELEV. DIFF.	GW DEPTH GROUND	Recorded By
08/06/91	12.55	616.55		13.35	*		616.55		8.90	

WELL NO.:MW-35 WELL DEPTH (ground): 28.10 WELL DEPTH (TOC): 30.50

TOP OF CASING ELEVATION : 639.60 GROUND ELEV: 637.20

DATE MM/DD/YY	GW DEPTH T.O.C.	GW ELEV.	ELEV DIFF.	WATER IN WELL	*	PROD. THICK.	CORRECTED GW ELEV.	ELEV. DIFF.	GW DEPTH GROUND	Recorded By
08/06/91	16.96	622.64		8.94	*		622.64		13.31	

APPENDIX B

SAMPLING INFORMATION SHEETS

SAMPLING INFORMATION SHEET

Weather Conditions:
Cloud Cover: Partly
Wind Speed: 10 mph
Temperature: 80°

GENERAL CONDITIONS

Sampling point: MW-3 Project: Amoco Terminal
Location: Superior, WI W.O. #: 10-88-457
Sample ID #: 71091-1610-3 Date sampled: 7/10/91 Time: 16:10
Describe sampling point: 2" PVC. Top of water column.

Well depth: ≈24.3' ft. below MP Casing diameter: 2" inches
Depth to water (below MP): 13.77' ft. Date: 7/9/91 Time: 14:27
Discharge rate = ___ gpm x 0.002228 = ___ cfs.
At least 3 bore volumes have been evacuated before sampling.
Sampling method: ___ Tap ___ Submersible pump (disp) Bailer ___ Other: ___
Pump intake or bailer set at ___ ft. below MP
Tubing (type: ___), (new or previously used) was used to collect all samples (___ Yes ___ No)
and all field measurements (___ Yes ___ No). Tubing used only for ___
Sample appearance: yellowish clear w/ bacteria suspended Odor: None
Note any sampling problems: ___
Note any cleaning performed in field: ___
Samples collected: 1-40 ml vial for BTEX, MTBE, & TPH.

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)

Bailing start time: 15:55 WL: ___
Bailing stop time: 16:10 WL: ___

Comments: 24.3 - 13.77 = 10.53 x .163 = 1.7 x 3 = 5.1 gals minimum to be evacuated.

Transportation (thermal preservation): rigid cooler
Form Completed by: MAL Sampled by: MAL

1011/9-88

SAMPLING INFORMATION SHEET

Weather Conditions:
Cloud Cover: None
Wind Speed: 5mph
Temperature: 70°

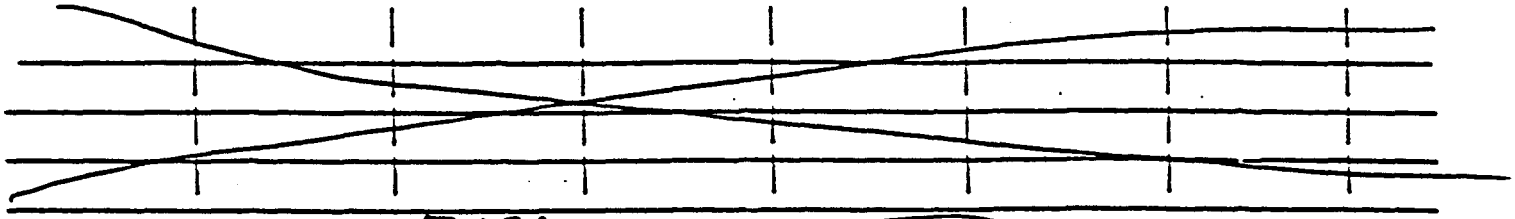
GENERAL CONDITIONS

Sampling point MW-4 Project Amoco Terminal
Location Superior, WI W.O. # 10-88-457
Sample ID # 7/091-0740-4' Date sampled: 7/10/91 Time: 7:40
Describe sampling point: 2" PVC - Top of water column

Well depth ≈ 24.3' ft. below MP Casing diameter: 2" inches
Depth to water (below MP) 15.60' ft. Date: 7/9/91 Time: 11:25
Discharge rate = ~~~ gpm x 0.00223 = ~~~ cfs.
At least 3 bore volumes have been evacuated before sampling.
Sampling method: ___ Tap ___ Submersible pump (disp Bailer) ___ Other: ~~~
Pump intake or bailer set at ~~~ ft. below MP
Tubing (type: ~~~), (new or previously used) was used to collect all samples (~~~ Yes ___ No)
and all field measurements (~~~ Yes ___ No). Tubing used only for ~~~
Sample appearance: Tan Odor: None
Note any sampling problems: ~~~
Note any cleaning performed in field: ~~~
Samples collected: 1-40ml vial for BTEX, MTBE, TPH.

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)



Bailing start time 7:30 WL ~~~
Bailing stop time 7:40 WL ~~~

Comments: 24.3 - 15.60 = 8.7 x .163 = 1.42 x 3 = 4.3 gals minimum to be evacuated.

Transportation (thermal preservation) rigid cooler
Form Completed by: MAL Sampled by: MAL

SAMPLING INFORMATION SHEET

Weather Conditions:
Cloud Cover: Partly Cloudy
Wind Speed: 5 mph
Temperature: 80 °F

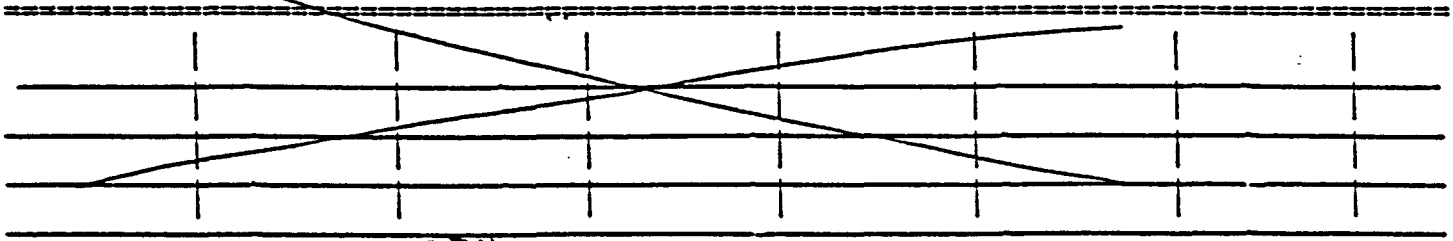
GENERAL CONDITIONS

Sampling point MW-5 Project Amoco Superior Terminal
Location Superior WI W.O. # 10-88-457
Sample ID # 7/091-1301-5 Date sampled: 5/10/91 Time: 1301
Describe sampling point: 2" PVC top of water column

Well depth 24.9 ft. below MP Casing diameter: 2" inches
Depth to water (below MP) 16.74 ft. Date: 7/9/91 Time: 1127
Discharge rate = _____ gpm x 0.00223 = _____ cfs.
At least 3 bore volumes have been evacuated before sampling.
Sampling method: ___ Tap ___ Submersible pump (Disp) Bailer ___ Other: _____
Pump intake or bailer set at _____ ft. below MP
Tubing (type: _____), (new or previously used) was used to collect all samples (___ Yes ___ No)
and all field measurements (___ Yes ___ No). Tubing used only for _____
Sample appearance: Slightly Cloudy Reddish Odor: None
Note any sampling problems: _____
Note any cleaning performed in field: _____
Samples collected: 1 40M vial (Amoco) for BTEX, MTBE, TPH

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umnos/cm)	Temperature (°C)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)



Bailing start time 1254 WL _____
Bailing stop time 1301 WL _____

Comments: 24.9 - 16.74 = 8.16 X 0.163 X 3 = 3.99

Transportation (thermal preservation) Fed Cooler
Form Completed by: WAN Sampled by: WAN

1011/9-88

SAMPLING INFORMATION SHEET

Weather Conditions:
Cloud Cover: Partly
Wind Speed: 5mph
Temperature: 80°

GENERAL CONDITIONS

Sampling point: MW-6 Project: Amoco Terminal
Location: Superior, WI W.O. #: 10-88-457
Sample ID #: 71091-1315-6 Date sampled: 7/10/91 Time: 13:15
Describe sampling point: 2" PVC - Top of water column.

Well depth: =24.2' ft. below MP Casing diameter: 2" inches
Depth to water (below MP): 20.20' ft. Date: 7/9/91 Time: 11:35
Discharge rate = _____ gpm x 0.002228 = _____ cfs.
At least 3 bore volumes have been evacuated before sampling.
Sampling method: ___ Tap ___ Submersible pump (disp Bailer) ___ Other: _____
Pump intake or bailer set at _____ ft. below MP
Tubing (type: _____), (new or previously used) was used to collect all samples (___ Yes ___ No)
and all field measurements (___ Yes ___ No). Tubing used only for _____
Sample appearance: Clear Odor: None
Note any sampling problems: _____
Note any cleaning performed in field: _____
Samples collected: (Amoco)* 1-40ml vial for BTEX, MTBE, and TPH.
(PACE) 3-40ml vials for 601/602 w/xylenes and 1-liter amber for EPA 61C
*MW-6 is Duplicate #1

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)

Bailing start time: 13:00 WL: _____
Bailing stop time: 13:15 WL: _____

Comments: 24.2 - 20.20 = 4 x .163 = .65 x 3 = 2.0 gals minimum to be evacuated.
(*MW-6 is Duplicate #1)

Transportation (thermal preservation): rigid cooler, ice
Form Completed by: MAL Sampled by: MAL

1011/9-88

SAMPLING INFORMATION SHEET

Weather Conditions:
Cloud Cover: Partly
Wind Speed: 10 mph
Temperature: 80°

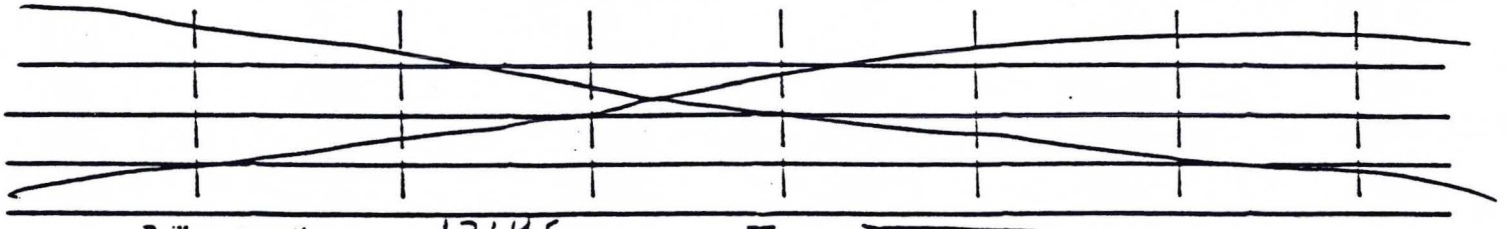
GENERAL CONDITIONS

Sampling point: MW-7 Project: Amoco Terminal
Location: Superior, WI W.O. #: 10-88-457
Sample ID #: 71091-1355-17 Date sampled: 7/10/91 Time: 13:55
Describe sampling point: 2" PVC - Top of water column.

Well depth: =24.4' ft. below MP Casing diameter: 2" inches
Depth to water (below MP): 20.19' ft. Date: 7/9/91 Time: 11:45
Discharge rate = ~~gpm x 0.00223 = cfs.~~
At least 3 bore volumes have been evacuated before sampling.
Sampling method: ___ Tap ___ Submersible pump (disp Bailer) ___ Other:
Pump intake or bailer set at ~~ft. below MP~~
Tubing (type: ~~), (new or previously used) was used to collect all samples (~~Yes~~ ___ No)
and all field measurements (~~Yes~~ ___ No). Tubing used only for
Sample appearance: clear w/ suspended bacteria Odor: None
Note any sampling problems:
Note any cleaning performed in field:
Samples collected: 1-40ml vial for BTEX, MTBE, and TPH.

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)



Bailing start time: 13:45 WL:
Bailing stop time: 13:55 WL:

Comments: 24.4 - 20.19' = 4.21 x .163 = .69 x 3 = 2.1 gal/s minimum to be evacuated.

Transportation (thermal preservation): rigid cooler
Form Completed by: MAL Sampled by: MAL

SAMPLING INFORMATION SHEET

Weather Conditions:
Cloud Cover: Partly Cloudy
Wind Speed: 5 mph
Temperature: 80 °F

GENERAL CONDITIONS

Sampling point MW-8 Project Amoco Terminal
Location ~~MW-3~~ Superior WI W.O. # 10-88-457
Sample ID # 71091-1337-8 Date sampled: 7/10/91 Time: 1337
Describe sampling point: 2" PVC top of water column

Well depth 25.9' ft. below MP Casing diameter: 2 inches
Depth to water (below MP) 20.11 ft. Date: 7/9/91 Time: 1150
Discharge rate = _____ gpm x 0.00223 = _____ cfs.
At least 3 bore volumes have been evacuated before sampling.
Sampling method: ___ Tap ___ Submersible pump (Disp Bailer) ___ Other: _____
Pump intake or bailer set at _____ ft. below MP
Tubing (type: _____), (new or previously used) was used to collect all samples (___ Yes ___ No)
and all field measurements (~~___ Yes ___ No~~) ~~Tubing used only for~~ _____
Sample appearance: Somewhat Cloudy Reddish Brown Odor: None
Note any sampling problems: _____
Note any cleaning performed in field: _____
Samples collected: (Amoco) 1 40 ml for BTEX, MTBE, TPH

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)

Bailing start time 1325 WL _____
Bailing stop time 1337 WL _____

Comments: 25.9 − 20.11 = 5.79 X 0.163 X 3 = 2.83 gal

Transportation (thermal preservation) Rigid Cooler
Form Completed by: WAN Sampled by: WAN

1011/9-88

SAMPLING INFORMATION SHEET

Weather Conditions:
Cloud Cover: partly
Wind Speed: 10 mph
Temperature: 80°

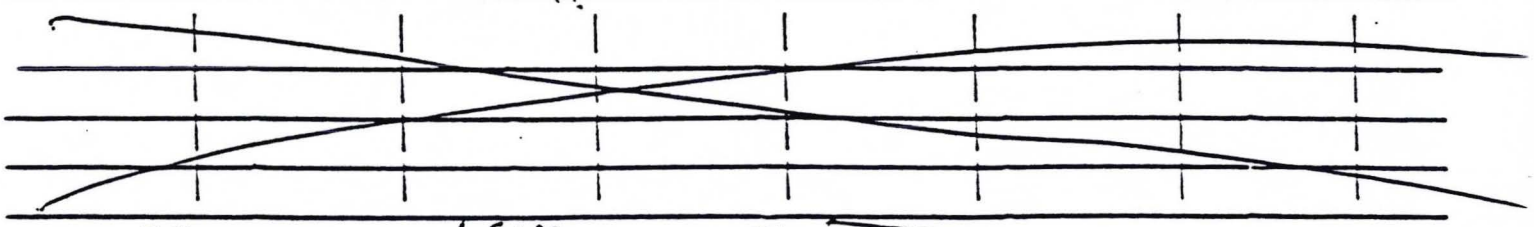
GENERAL CONDITIONS

Sampling point: MW-9 Project: Amoco Terminal
Location: Superior, WI W.O. #: 10-88-457
Sample ID #: 7/09/91-1510-9 Date sampled: 7/10/91 Time: 15:10
Describe sampling point: 2" PVC - Top of water column.

Well depth: ≈24.5' ft. below MP Casing diameter: 2" inches
Depth to water (below MP): 12.85' ft. Date: 7/9/91 Time: 12:22
Discharge rate = ____ gpm x 0.00223 = ____ cfs.
At least 3 bore volumes have been evacuated before sampling.
Sampling method: ____ Tap ____ Submersible pump disp Bailer ____ Other: ____
Pump intake or bailer set at ____ ft. below MP
Tubing (type: ____), (new or previously used) was used to collect all samples (Yes ___ No)
and all field measurements (___ Yes ___ No). Tubing used only for ____
Sample appearance: tan Odor: slight hydrocarbon
Note any sampling problems: ____
Note any cleaning performed in field: ____
Samples collected: 1-40ml vial for BTEX, TPH, & MTBE.

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)



Bailing start time: 15:00 WL: ____
Bailing stop time: 15:10 WL: ____

Comments: 24.5 - 12.85 = 11.65 x .163 = 1.9 x 3 = 5.7 gals minimum to be evacuated.

Transportation (thermal preservation): rigid cooler
Form Completed by: MAL Sampled by: MAL

1011/9-88

SAMPLING INFORMATION SHEET

Weather Conditions:
Cloud Cover: partly
Wind Speed: 10 mph
Temperature: 80°

GENERAL CONDITIONS

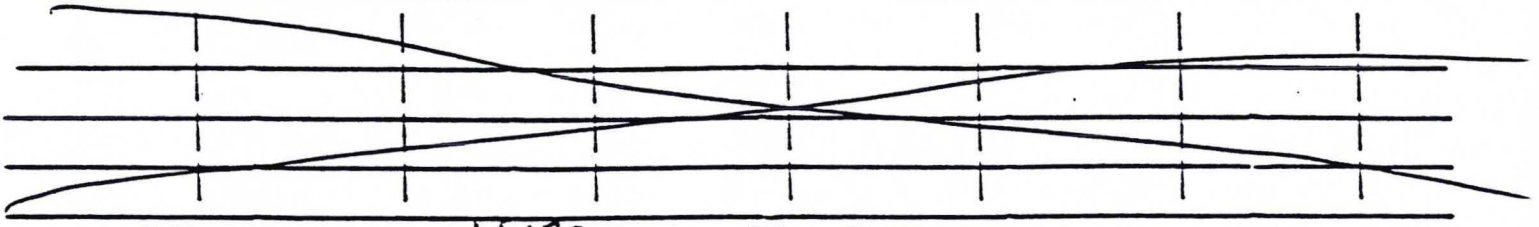
Sampling point: MW-10 Project: Amoco Terminal
Location: Superior, WI W.O. #: 10-88-457
Sample ID #: T1091-1645-10 Date sampled: 7/10/91 Time: 16:45
Describe sampling point: 2" PVC - Top of water column.

Well depth: 24.5' ft. below MP Casing diameter: 2" inches
Depth to water (below MP): 16.16' ft. Date: 7/9/91 Time: 12:30
Discharge rate = ___ gpm x 0.00223 = ___ cfs.
At least 3 bore volumes have been evacuated before sampling.
Sampling method: ___ Tap ___ Submersible pump (disp Bailer) ___ Other: ___
Pump intake or bailer set at ___ ft. below MP
Tubing (type: ___), (new or previously used) was used to collect all samples (___ Yes ___ No)
and all field measurements (___ Yes ___ No). Tubing used only for ___
Sample appearance: clear Odor: None
Note any sampling problems: ___
Note any cleaning performed in field: ___
Samples collected: 1-40 ml vial for BTEX, MTBE, TPH.

EVACUATION/STABILIZATION TEST DATA

Dup #2

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)



Bailing start time: 16:30 WL: ___
Bailing stop time: 16:45 WL: ___

Comments: 24.5 - 16.16 = 8.34 x .163 = 1.36 x 3 = 4.1 gal minimum to be evacuated.

Transportation (thermal preservation): Rigid cooler
Form Completed by: MAL Sampled by: MAL

SAMPLING INFORMATION SHEET

Weather Conditions:
Cloud Cover: Partly Cloudy
Wind Speed: 5-10 mph
Temperature: 80 °F

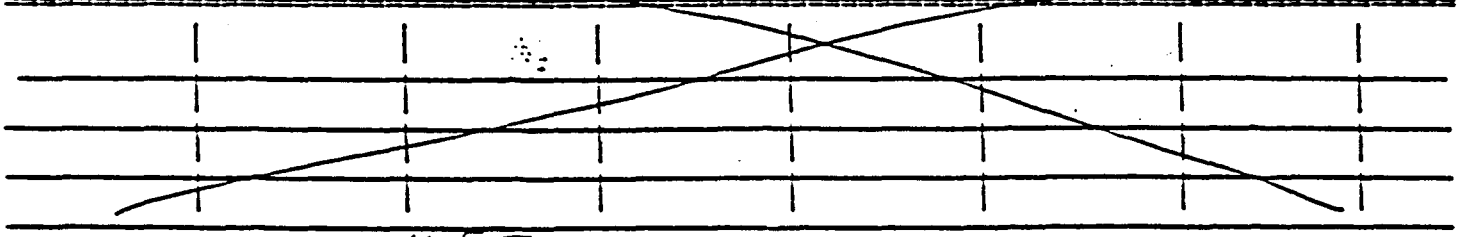
GENERAL CONDITIONS

Sampling point MW-11 Project Amoco Terminal to 88-457
Location Superior Terminal W.O. # 10-88-457
Sample ID # 2/09/-1507-11 Date sampled: 2/10/91 Time: 1507
Describe sampling point: 2" PVC Top of water column

Well depth 24.2 ft. below MP Casing diameter: 2 inches
Depth to water (below MP) 15.56 ft. Date: 2/9/91 Time: 1226
Discharge rate = ____ gpm x 0.00223 = ____ cfs.
At least 3 bore volumes have been evacuated before sampling.
Sampling method: ____ Tap ____ Submersible pump (Disp) Bailer ____ Other: ____
Pump intake or bailer set at ____ ft. below MP
Tubing (type: ____), (new or previously used) was used to collect all samples (___ Yes ___ No) and all field measurements (___ Yes ___ No). Tubing used only for ____
Sample appearance: Cloudy Reddish Brown Odor: Slight
Note any sampling problems: ____
Note any cleaning performed in field: ____
Samples collected: 1-40ml vial (Amoco) BTEX, TPH, MTBE

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)



Bailing start time 1455 WL ____
Bailing stop time 1507 WL ____

Comments: 24.2 - 15.56 = 8.64 X 0.163 x 3 = 4.22

Transportation (thermal preservation) Rigid Cooler
Form Completed by: WAN Sampled by: WAN

SAMPLING INFORMATION SHEET

Weather Conditions:
Cloud Cover: None
Wind Speed: 5mph
Temperature: 70°

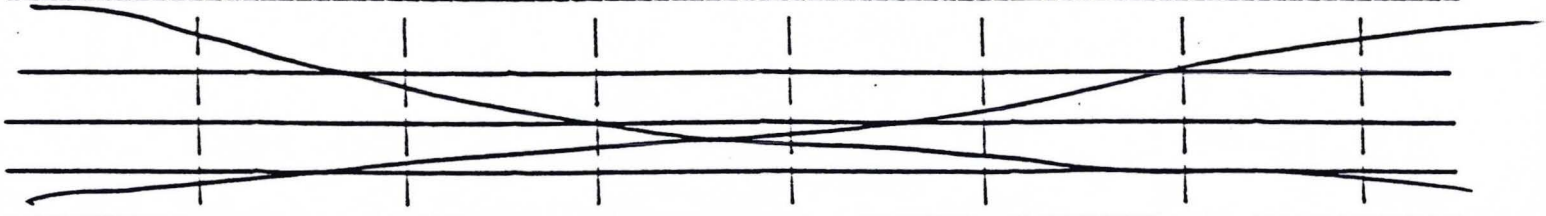
GENERAL CONDITIONS

Sampling point MW-13 Project Amoco Terminal
Location Superior, WI W.O. # 10-88-457
Sample ID # 71091-0810-13 Date sampled: 7/10/91 Time: 8:10
Describe sampling point: 2" PVC - Top of water column.

Well depth ≈ 24.6' ft. below MP Casing diameter: 2" inches
Depth to water (below MP) 18.41' ft. Date: 7/9/91 Time: 11:55
Discharge rate = _____ gpm x 0.00223 = _____ cfs.
At least 3 bore volumes have been evacuated before sampling.
Sampling method: ___ Tap ___ Submersible pump (disp Bailer) ___ Other: _____
Pump intake or bailer set at _____ ft. below MP
Tubing (type: _____), (new or previously used) was used to collect all samples (___ Yes ___ No)
and all field measurements (___ Yes ___ No). Tubing used only for _____
Sample appearance: lt orange brown Odor: None
Note any sampling problems: _____
Note any cleaning performed in field: _____
Samples collected: 1-40ml vial for BTEX, MTBE, and TPH.

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)



Bailing start time 8:00 WL _____
Bailing stop time 8:10 WL _____

Comments: 24.6 - 18.41 = 6.19 x .163 - 1.0 x 3 = 3.0 gals Minimum to be evacuated.

Transportation (thermal preservation) rigid cooler
Form Completed by: MAL Sampled by: MAL

SAMPLING INFORMATION SHEET

Weather Conditions:
Cloud Cover: partly
Wind Speed: 10 m/h
Temperature: 80°

GENERAL CONDITIONS

Sampling point: MW-15 Project: Amoco Terminal
Location: Superior, WI W.O. #: 10-88-457
Sample ID #: 71091-14:30-15 Date sampled: 7/10/91 Time: 14:30
Describe sampling point: 2" PVC - Top of water column

Well depth: ≃ 25.0' ft. below MP Casing diameter: 2" inches
Depth to water (below MP): 18.13' ft. Date: 7/9/91 Time: 12:13
Discharge rate = ~~~ gpm x 0.002228 = ~~~ cfs.
At least 3 bore volumes have been evacuated before sampling.
Sampling method: ___ Tap ___ Submersible pump (disp) Bailer ___ Other: ~~~
Pump intake or bailer set at ~~~ ft. below MP
Tubing (type: ~~~), (new or previously used) was used to collect all samples (~~~ Yes ___ No)
and all field measurements (~~~ Yes ___ No). Tubing used only for ~~~
Sample appearance: Sediment ted reddish brown Odor: None
Note any sampling problems: ~~~
Note any cleaning performed in field: ~~~
Samples collected: (Amoco)* 1-40ml vial for BTEX, MTBE, & TPH.
(PACE)* 3-40ml vials for 601/602 w/xylenes and 1-liter amber for EPA 610.

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)

Bailing start time: 14:20 WL: ~~~
Bailing stop time: 14:30 WL: ~~~

Comments: 25.0 - 18.13 = 6.87 x .163 = 1.12 x 3 = 3.4 gals. minimum to be evacuated.

Transportation (thermal preservation): rigid cooler, ice
Form Completed by: MAL Sampled by: MAL

1011/9-88

SAMPLING INFORMATION SHEET

Weather Conditions: Partly Cloudy
Cloud Cover: Cloudy
Wind Speed: 5-10 mpH
Temperature: >5°F

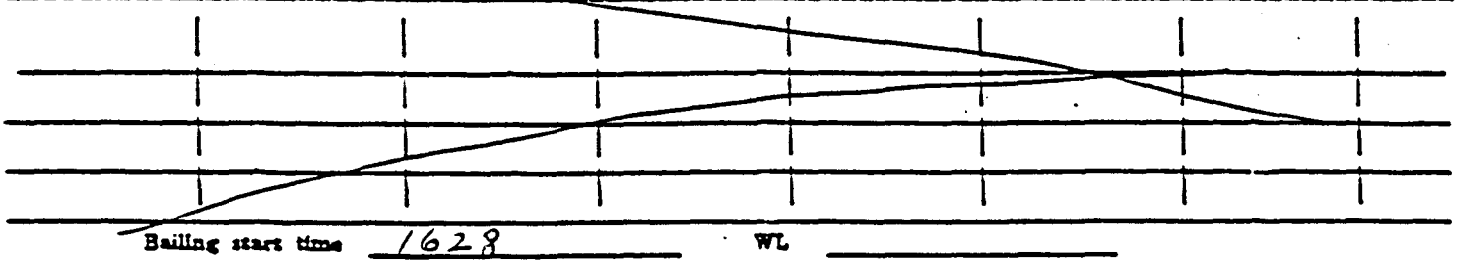
GENERAL CONDITIONS

Sampling point MW-16 Project Amoco Terminal
Location Superior WI W.O. # 10-88-457
Sample ID # 21091-1645-16 Date sampled: 2/10/21 Time: 1645
Describe sampling point: 2" PVC Top of water column

Well depth 30.00 ft. below MP Casing diameter: 2 inches
Depth to water (below MP) 20.32 ft. Date: 2/12/21 Time: 1048
Discharge rate = _____ gpm x 0.00223 = _____ cfs.
At least 3 bore volumes have been evacuated before sampling.
Sampling method: ___ Tap ___ Submersible pump (Disp Bailer) ___ Other: _____
Pump intake or bailer set at _____ ft. below MP
Tubing (type: _____), (new or previously used) was used to collect all samples (___ Yes ___ No)
and all field measurements (___ Yes ___ No). Tubing used only for _____
Sample appearance: Clear Odor: Strong
Note any sampling problems: _____
Note any cleaning performed in field: _____
Samples collected: 1-40ml (Amoco) BTEX, MTBE, TPH
3-40m vials (PACE) for 601/602, Xylenes
1 Liter Bottle (PACE) for 610

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)



Bailing start time 1628 WL _____
Bailing stop time 1645 WL _____

Comments: 30.0 − 20.32 = 9.68 X 0.163 X 3 = 4.73

Transportation (thermal preservation) Rigid Cooler (Amoco), (PACE) Rigid Cooler ice
Form Completed by: WAN Sampled by: WAN

SAMPLING INFORMATION SHEET

Weather Conditions:
Cloud Cover: Partly
Wind Speed: 5mph
Temperature: 80°

GENERAL CONDITIONS

Sampling point: MW-17 Project: Amoco Terminal
Location: Superior, WI W.O. #: 10-88-457
Sample ID #: 91091-1130-17 Date sampled: 7/10/91 Time: 11:30
Describe sampling point: 2" PVC — Top of water column

Well depth: ≈24.0' ft. below MP Casing diameter: 2" inches
Depth to water (below MP): 15.95' ft. Date: 7/9/91 Time: 13:50
Discharge rate = ____ gpm x 0.00223 = ____ cfs.
At least 3 bore volumes have been evacuated before sampling.
Sampling method: ____ Tap ____ Submersible pump (disp Bailer) ____ Other: ____
Pump intake or bailer set at ____ ft. below MP
Tubing (type: ____), (new or previously used) was used to collect all samples (~~Yes~~ ____ No)
and all field measurements (~~Yes~~ ____ No). Tubing used only for ____
Sample appearance: lt orange brown Odor: None
Note any sampling problems: ____
Note any cleaning performed in field: ____
Samples collected: 1-40ml vial for BTEX, MTBE, and TPH. (Amoco)
(PACE) 3-40ml vials for 601/602 w/xylenes, and 1-liter amber for EPA 610.

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)

Bailing start time: 11:10 WL: ____
Bailing stop time: 11:25 WL: ____

Comments: 24.0 - 15.95 = 8.05 x .163 = 1.3 x 3 = 3.9 gals minimum to be evacuated.

Transportation (thermal preservation): rigid cooler, ice
Form Completed by: MAL Sampled by: MAL

1011/9-88

SAMPLING INFORMATION SHEET

Weather Conditions:
Cloud Cover: Partly Cloudy
Wind Speed: 5-10 mph
Temperature: 80°F

GENERAL CONDITIONS

Sampling point MW-18 Project Amoco Terminal ~~10-88-45~~

Location Superior Terminal W.O. # 10-88-45

Sample ID # 210991-1538-18 Date sampled: 2/10/91 Time: 1538

Describe sampling point: 2" PVC top of water Column

Well depth 25.0 ft. below MP Casing diameter: 2 inches

Depth to water (below MP) 19.05 ft. Date: 2/8/91 Time: 1200

Discharge rate = _____ gpm x 0.00223 = _____ cfs.

At least 3 bore volumes have been evacuated before sampling.

Sampling method: ____ Tap ____ Submersible pump (Disp Bailer) ____ Other: _____

Pump intake or bailer set at _____ ft. below MP

Tubing (type: _____), (new or previously used) was used to collect all samples (___ Yes ___ No)

and all field measurements (___ Yes ___ No). Tubing used only for _____

Sample appearance: Cloudy slightly reddish-brown Odor: Strong

Note any sampling problems: _____

Note any cleaning performed in field: _____

Samples collected: 1-40ml (Amoco) for BTEX, MTBE, TPH

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)

Bailing start time 1533 WL _____

Bailing stop time 1538 WL _____

Comments: 25 - 19.05 = 5.95 X 0.163 X 3 = 2.9 gallons

Transportation (thermal preservation) Rigid Cooler

Form Completed by: WAN Sampled by: WAN

SAMPLING INFORMATION SHEET

Weather Conditions:
Cloud Cover: Partly Cloudy
Wind Speed: 5-8 mph
Temperature: >5 °F

GENERAL CONDITIONS

Sampling point MW-19 Project Amoco Terminal
Location Superior WI W.O. # 10-88-4D
Sample ID # 21091-1420-19 Date sampled: 2/10/91 Time: 1420
Describe sampling point: 2" PVC Top of water column

Well depth 31.7' ft. below MP Casing diameter: 2" inches
Depth to water (below MP) 21.72 ft. Date: 2/9/91 Time: 1217
Discharge rate = _____ gpm x 0.00223 = _____ cfs.
At least 3 bore volumes have been evacuated before sampling.
Sampling method: ____ Tap ____ Submersible pump (Disp) Bailer ____ Other: _____
Pump intake or bailer set at _____ ft. below MP
Tubing (type: _____), (new or previously used) was used to collect all samples (____ Yes ____ No)
and all field measurements (____ Yes ____ No). Tubing used only for _____
Sample appearance: Cloudy - Reddish Brown Odor: None
Note any sampling problems: _____
Note any cleaning performed in field: _____
Samples collected: 1-40ml for BTEX, ~~TOX~~, MTBE, TPH
3-40ml for 601/602, xylenes
1-1 Liter for 610

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)

Bailing start time 1405 WL _____
Bailing stop time 1420 WL _____

Comments: 31.7 - 21.72 = 9.98 X 0.163 x 3 = 4.88 gallons

Transportation (thermal preservation) Rigid cooler (Amoco), Rigid Cooler Ice (BACE)
Form Completed by: WAN Sampled by: WAN

SAMPLING INFORMATION SHEET

Weather Conditions:
Cloud Cover: partly
Wind Speed: 10 mph
Temperature: 80°

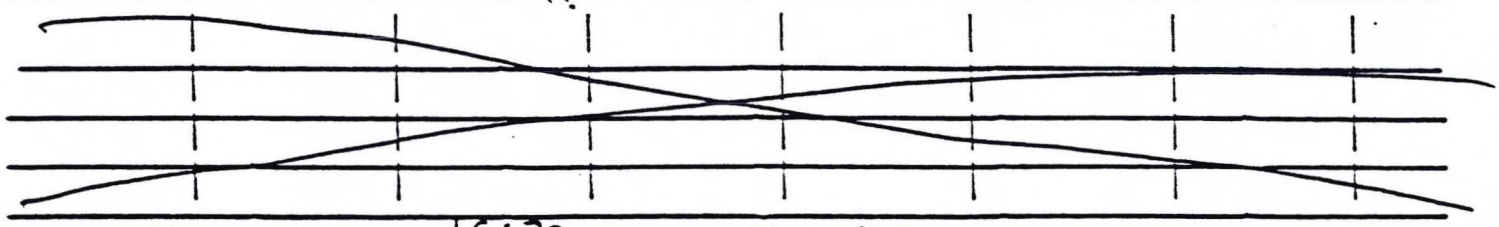
GENERAL CONDITIONS

Sampling point: MW-20 Project: Amoco Terminal
Location: Superior, WI W.O. #: 10-88-457
Sample ID #: 7/09/1-1540-20 Date sampled: 7/10/91 Time: 15:40
Describe sampling point: 2" PVC - Top of water column.

Well depth: ≈ 24.8' ft. below MP Casing diameter: 2" inches
Depth to water (below MP): 18.83' ft. Date: 7/9/91 Time: 12:05
Discharge rate = ____ gpm x 0.002228 = ____ cfs.
At least 3 bore volumes have been evacuated before sampling.
Sampling method: ____ Tap ____ Submersible pump disp Bailer ____ Other: ____
Pump intake or bailer set at ____ ft. below MP
Tubing (type: ____), (new or previously used) was used to collect all samples (Yes ____ No)
and all field measurements (Yes ____ No). Tubing used only for ____
Sample appearance: Clear Odor: None
Note any sampling problems: ____
Note any cleaning performed in field: ____
Samples collected: 1-40ml vial for BTEX, MTBE, & TPH.

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)



Bailing start time: 15:30 WL: ____
Bailing stop time: 15:40 WL: ____

Comments: 24.8 - 18.83 = 5.97 x .163 = .973 x 3 = 2.9 gal/s Minimum to be evacuated.

Transportation (thermal preservation): rigid cooler
Form Completed by: MAL Sampled by: MAL

1011/9-88

SAMPLING INFORMATION SHEET

Weather Conditions:
Cloud Cover: Cloudy
Wind Speed: 5-10 mph
Temperature: 80°F

GENERAL CONDITIONS

Sampling point MW-21 Project Amoco Terminal
Location Superior WI W.O. # 10-88-457
Sample ID # 710191-1604-21 Date sampled: 7/10/91 Time: 1604
Describe sampling point: 2" PVC Top of water column

Well depth 26.60 ft. below MP Casing diameter: 2 inches
Depth to water (below MP) 19.18' ft. Date: 7/9/91 Time: 1421
Discharge rate = ~~gpm x 0.00223 = cfs~~
At least 3 bore volumes have been evacuated before sampling.
Sampling method: ___ Tap ___ Submersible pump (Disp Bailer) ___ Other:
Pump intake or bailer set at ~~ft. below MP~~
Tubing (~~type:~~), (~~new or previously used~~) was used to collect ~~all samples~~ (~~Yes~~ ~~No~~)
and all field measurements (~~Yes~~ ~~No~~). ~~Tubing used only for~~
Sample appearance: Fairly Clear Odor: None
Note any sampling problems:
Note any cleaning performed in field:
Samples collected: 1 -40ml for BTEX, MTBE, TPH

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)

Bailing start time 1558 WL
Bailing stop time 1604 WL

Comments: 26.60 - 19.18 = 7.42 x 0.163 x 3 = 3.63 gal/1545

Transportation (thermal preservation) Iced Cooler
Form Completed by: WAN Sampled by: WAN

SAMPLING INFORMATION SHEET

Weather Conditions:
Cloud Cover: None
Wind Speed: 5 mph
Temperature: 75°F

GENERAL CONDITIONS

Sampling point MW-28 Project Amoco Terminal
Location Superior, WI W.O. # 10-88-457
Sample ID # 71091-0950-28 Date sampled: 7/10/91 Time: 9:50
Describe sampling point: 2" PVC - Top of water column.

Well depth ≈ 29.3' ft. below MP Casing diameter: 2" inches
Depth to water (below MP) 18.84' ft. Date: 7/9/91 Time: 14:16
Discharge rate = ~~~ gpm x 0.00223 = ~~~ cfs.
At least 3 bore volumes have been evacuated before sampling.
Sampling method: ___ Tap ___ Submersible pump (disp Bailer) ___ Other: ~~~
Pump intake or bailer set at ~~~ ft. below MP
Tubing (type: ~~~), (new or previously used) was used to collect all samples (~~~ Yes ~~~ No)
and all field measurements (~~~ Yes ~~~ No). Tubing used only for ~~~
Sample appearance: med orange brown Odor: None
Note any sampling problems: ~~~
Note any cleaning performed in field: ~~~
Samples collected: 1-40 ml vial for BTEX, MTBE, and TPH.

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)

Bailing start time 9:40 WL ~~~
Bailing stop time 9:50 WL ~~~

Comments: 29.3 - 18.84 = 10.46 x .163 = 1.7 x 3 = 5.1 gal = Minimum to be evacuated.

Transportation (thermal preservation) rigid cooler
Form Completed by: MAL Sampled by: MAL

SAMPLING INFORMATION SHEET

Weather Conditions:
Cloud Cover: Partly Cloudy
Wind Speed: 0-5 mph
Temperature: 30°F

GENERAL CONDITIONS

Sampling point MW-30 Project Amoco Terminal
Location Superior WI W.O. # 10-98-457
Sample ID # 7109-1145-30 Date sampled: 7/10/71 Time: 11:45
Describe sampling point: 2" PVC well Top of water column

Well depth 24.7 ft. below MP Casing diameter: 2 inches
Depth to water (below MP) 14.66 ft. Date: 7/7/71 Time: ~~14~~ 1357
Discharge rate = _____ gpm x 0.00223 = _____ cfs.
At least 3 bore volumes have been evacuated before sampling.
Sampling method: ___ Tap ___ Submersible pump (Disp) Bailer ___ Other: _____
Pump intake or bailer set at _____ ft. below MP
Tubing (type: _____), (new or previously used) was used to collect all samples (___ Yes ___ No)
and all field measurements (___ Yes ___ No). Tubing used only for _____
Sample appearance: Very Silty/Cloudy Red Odor: Slight Odor
Note any sampling problems: _____
Note any cleaning performed in field: _____
Samples collected: 1 40 ml vial for BTEX, MTBE, TPH (Amoco)
(PACE) 3 40ml vials for 602/601 with xylenes, one liter amber EPA 610

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umnos/cm)	Temperature (°C)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)

Bailing start time 1133 WL _____
Bailing stop time 1145 WL _____

Comments: 24.7 − 14.66 = 10.04 × 0.163 = 1.6 × 3 = 4.9 Gallons

Transportation (thermal preservation) Rigid Cooler Ice (PACE); Fridgid cooler (Amoco)
Form Completed by: WAN Sampled by: WAN

1011/9-88

SAMPLING INFORMATION SHEET

Weather Conditions:
Cloud Cover: Partly Cloudy
Wind Speed: 0-5 mph
Temperature: 80 °F

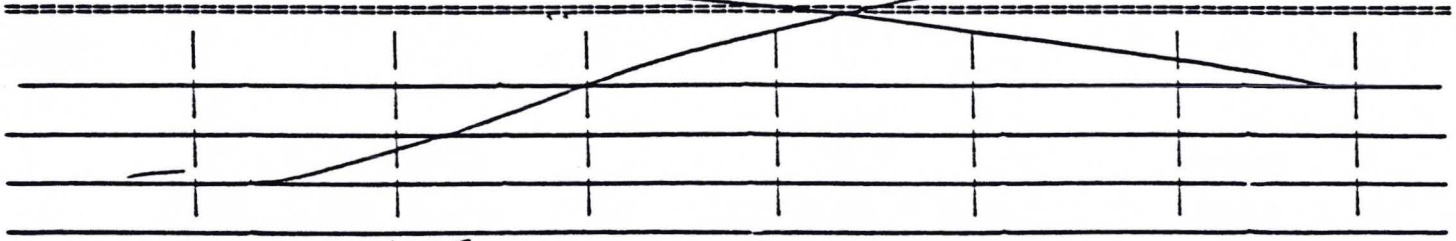
GENERAL CONDITIONS

Sampling point MW-31 Project Amoco Terminal
Location Superior WI W.O. # 10-88-45>
Sample ID # 71091-1116-31 Date sampled: 7/10/91 Time: 1116
Describe sampling point: 2" PVC well top of water column

Well depth 28.7 ft. below MP Casing diameter: 2 inches
Depth to water (below MP) 17.12 ft. Date: 7/9/91 Time: 1405
Discharge rate = ——— gpm x 0.00223 = ——— cfs.
At least 3 bore volumes have been evacuated before sampling.
Sampling method: ___ Tap ___ Submersible pump (Disp) Bailer ___ Other: ———
Pump intake or bailer set at ——— ft. below MP
Tubing (type: ———), (new or previously used) was used to collect all samples (~~Yes~~ No)
and all field measurements (~~Yes~~ No). Tubing used only for ———
Sample appearance: Relatively Clear Odor: None
Note any sampling problems: ———
Note any cleaning performed in field: ———
Samples collected: 1 40ml vial for BTEX, MTBE, TPH (Amoco)

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)



Bailing start time 1106 WL ———
Bailing stop time 1116 WL ———

Comments: 28.7 − 17.12 = 11.58 × 0.163 = 1.89 × 3 = 5.7

Transportation (thermal preservation) Rigid Cooler (Amoco) ~~Ice~~
Form Completed by: WAN Sampled by: WAN

1011/9-88

CHAIN-OF-CUSTODY RECORD

Delta Environmental Consultants, Inc. St. Paul, MN

DELTA PROJECT NO: 10-88-457 | INVOICE CODE: A | PAGE 1 OF 1

PROJECT NAME: Amoco Terminal

PROJECT LOCATION: Superior, Wisconsin

Results to John Grams

SAMPLER'S SIGNATURE: Michael D. Lee, William A. Peterson

TURN AROUND REQUESTED: [X] NORMAL [ ] RUSH _____ [ ] OTHER _____

SAMPLE ID	SAMPLE LOCATION/DESCRIPTION	DATE/TIME SAMPLED	SAMPLE MATRIX: SOIL(S): AIR(A): BULK(B): AQUEOUS(Q): SLUDGE(L): OTHER(O)	ANALYSIS REQUESTED: BTEX, MTBE	ANALYSIS REQUESTED: TPH	NUMBER OF CONTAINERS	ACCEPT (A) REJECT (R)	SAMPLE CONDITION AS RECEIVED: CHILLED YES/NO; SEALED YES/NO; SAMPLE CONDITION/ COMMENTS	LABORATORY SAMPLE NUMBER
MW-3	2"PVC - Top of water column	71091-1610	Q	✓	✓	1			
MW-4		71091-0740	Q	✓	✓	1			
MW-5		71091-1301	Q	✓	✓	1			
MW-6		71091-1315	Q	✓	✓	1			
MW-7		71091-1355	Q	✓	✓	1			
MW-8		71091-1337	Q	✓	✓	1			
MW-9		71091-1510	Q	✓	✓	1			
MW-10		71091-1645	Q	✓	✓	1			
MW-11		71091-1507	Q	✓	✓	1			
MW-13		71091-0810	Q	✓	✓	1			
Duplicate #1		71091-Dup #1	Q	✓	✓	1			

GENERAL COMMENTS: *Send results to John Grams*, sealed # 8457 — 11 ◀ TOTAL NUMBER OF CONTAINERS

LAB USE ONLY — LABORATORY PROJECT NO.

1 RELINQUISHED BY (SIGNATURE): Michael D. Lee	DATE: 7-11-91	3 RELINQUISHED BY (SIGNATURE):	DATE	5 RELINQUISHED BY (SIGNATURE):	DATE
COMPANY: Delta Environmental	TIME	COMPANY	TIME	COMPANY	TIME
2 RECEIVED BY (SIGNATURE)	DATE	4 RECEIVED BY (SIGNATURE)	DATE	6 RECEIVED BY (SIGNATURE)	DATE
COMPANY	TIME	COMPANY	TIME	COMPANY	TIME

Original - Return with Report • Yellow - Lab Copy • Pink - Sampler Copy

CHAIN-OF-CUSTODY RECORD

Delta Environmental Consultants, Inc. St. Paul, MN

DELTA PROJECT NO. 10-88-457 | INVOICE CODE A | PAGE 2 OF 1

PROJECT NAME Amoco Terminal

PROJECT LOCATION Superior, Wisconsin

Results to John Grams

SAMPLER'S SIGNATURE Michael D. Lee, William A. Krumm

TURN AROUND REQUESTED: [X] NORMAL [ ] RUSH _____ [ ] OTHER _____

SAMPLE ID	SAMPLE LOCATION/DESCRIPTION	DATE/TIME SAMPLED	SAMPLE MATRIX: SOIL(S); AIR(A); BULK(B); AQUEOUS(Q); SLUDGE(L); OTHER(O)	ANALYSIS REQUESTED: BTEX, MTBE	ANALYSIS REQUESTED: TPH	NUMBER OF CONTAINERS	ACCEPT (A) REJECT (R)	SAMPLE CONDITION AS RECEIVED / SAMPLE CONDITION/ COMMENTS	LABORATORY SAMPLE NUMBER
MW-15	2" PVC - Top of water column	71091-1430	Q	✓	✓	1			
MW-16		71091-1645	Q	✓	✓	1			
MW-17		71091-1130	Q	✓	✓	1			
MW-18		71091-1538	Q	✓	✓	1			
MW-19		71091-1420	Q	✓	✓	1			
MW-20		71091-1540	Q	✓	✓	1			
MW-21		71091-1604	Q	✓	✓	1			
MW-28		71091-0950	Q	✓	✓	1			
MW-30		71091-1145	Q	✓	✓	1			
MW-31		71091-1116	Q	✓	✓	1			
Duplicate #2		71091-Dup #2	Q	✓	✓	1			
Travel Blank	2 ml vial of Freon	Travel Blank	O	✓	✓	1			

LAB USE ONLY

LABORATORY PROJECT NO.

SAMPLE CONDITION AS RECEIVED: CHILLED YES/NO SEALED YES/NO

GENERAL COMMENTS: * Send result to John Grams *, Sealed # 8457

12 ◀ TOTAL NUMBER OF CONTAINERS

1 RELINQUISHED BY (SIGNATURE)	DATE	3 RELINQUISHED BY (SIGNATURE)	DATE	5 RELINQUISHED BY (SIGNATURE)	DATE
Michael A. Lee	7-11-91				
COMPANY: Delta Environmental	TIME	COMPANY	TIME	COMPANY	TIME
2 RECEIVED BY (SIGNATURE)	DATE	4 RECEIVED BY (SIGNATURE)	DATE	6 RECEIVED BY (SIGNATURE)	DATE
COMPANY	TIME	COMPANY	TIME	COMPANY	TIME

Original - Return with Report • Yellow - Lab Copy • Pink - Sampler Copy

CHAIN–OF–CUSTODY RECORD

Delta Environmental Consultants, Inc. St. Paul, MN

DELTA PROJECT NO. 10-88-457 | INVOICE CODE A | PAGE 1 OF

PROJECT NAME Amoco Terminal

PROJECT LOCATION Superior, Wisconsin

Results to John Grams

SAMPLER'S SIGNATURE Michael A. Lee, William A. Lawrence

TURN AROUND REQUESTED: [X] NORMAL [ ] RUSH _____ [ ] OTHER _____

SAMPLE ID	SAMPLE LOCATION/DESCRIPTION	DATE/TIME SAMPLED	SAMPLE MATRIX: SOIL(S); AIR(A); BULK(B); AQUEOUS(); SLUDGE(L); OTHER()	ANALYSIS REQUESTED: 601/602 w/xylenes	EPA 610	NUMBER OF CONTAINERS	LAB USE ONLY: ACCEPT (A) REJECT (R)	SAMPLE CONDITION AS RECEIVED: CHILLED YES/NO SEALED YES/NO SAMPLE CONDITION/ COMMENTS	LABORATORY SAMPLE NUMBER
MW-6	2"PVC - Top of water column	71091-1315	Q	✓	✓	4			
MW-15		71091-1430	Q	✓	✓	4			
MW-16		71091-1645	Q	✓	✓	4			
MW-17		71091-1130	Q	✓	✓	4			
MW-19		71091-1420	Q	✓	✓	4			
MW-30		71091-1145	Q	✓	✓	4			
Travel Blank	De-ionized H_2O	Travel Blank	Q	✓		2			

GENERAL COMMENTS: * Send results to John Grams*, Sealed # 8457 — 26 ◀ TOTAL NUMBER OF CONTAINERS

1 RELINQUISHED BY (SIGNATURE)	DATE	3 RELINQUISHED BY (SIGNATURE)	DATE	5 RELINQUISHED BY (SIGNATURE)	DATE
Michael A. Lee	7-11-91				
COMPANY Delta Environmental	TIME	COMPANY	TIME	COMPANY	TIME
2 RECEIVED BY (SIGNATURE)	DATE	4 RECEIVED BY (SIGNATURE)	DATE	6 RECEIVED BY (SIGNATURE)	DATE
COMPANY	TIME	COMPANY	TIME	COMPANY	TIME

Original - Return with Report • Yellow - Lab Copy • Pink - Sampler Copy

GROUNDWATER MANAGEMENT SECTION
STANDARD OIL (INDIANA)
ENVIRONMENTAL AFFAIRS AND SAFETY

FLUID SAMPLE TRANSMITTAL
AND REQUEST FOR ANALYSES

ATTENTION: DIRECTOR, GROUNDWATER MANAGEMENT
RESEARCH CENTER
502 E 41ST ST.
TULSA, OKLAHOMA 74135

PLEASE PROVIDE COMPLETE INFORMATION
IDENTIFY ALL ESTIMATES

FROM:(ORIGINATING LOCATION)
OFFICE: Superior Terminal
FILE: 10-88-457.05
SAMPLE NO. (20) monitoring wells
RESULTS TO: Keaven P. Heaton

ANALYSES REQUESTED: ☒ DISSOLVED HYDROCARBONS ☐ PRODUCT IDENTIFICATION OTHER: BTEX, MTBE, TPH chromatograms

STATEMENT OF PROBLEM: Ground water contamination from gasoline and fuel oil releases.

PRIORITY REQUESTED: URGENT ☐ ROUTINE ☒ DATE RESULTS REQUIRED ASAP

LOCATION SAMPLED:
REGION Wisconsin DISTRICT Chicago
FACILITY Superior Amoco Terminal
LOCATION ADDRESS 2904 Winter St.
STATE Wisconsin 54880 CITY Superior
SERVICE STATION NUMBER N/A

SAMPLE TYPES: PRODUCT ☐ WATER ☒ OTHER —
NO. OF SAMPLES FROM TESTED INTERVAL OR LOCATION (20) MW's
COLLECTED FROM: OBSERVATION WELL ☒ RECOVERY WELL ☐ WATER WELL ☐ SEPARATOR ☐
TANK ☐ PIT ☐ STREAM ☐ DISCHARGE POINT ☐ WATER TAP ☐ OTHER —

DATE COLLECTED 7-10-91 BY Mike Lee & Bill Newman DEPT. Environmental Tec
DATE SHIPPED 7-11-91 BY Mike Lee VIA Airborne Express
SAMPLE DATA: FLUID SAMPLES FROM Miller Creek FORMATION (IF KNOWN)
INTERVAL SAMPLED 13' TO 31' ☒ FT LITHOLOGY silty sand
ADDITIONAL INFORMATION OR REMARKS: * Send results to John Grams *
* Chromatograms please

CC:
REQUESTED BY: [signature] DATE 7-11-91
SIGNATURE

SAMPLING INFORMATION SHEET

Weather Conditions:
Cloud Cover: Partly
Wind Speed: 15 mph
Temperature: 68°

GENERAL CONDITIONS

Sampling point: MW-32 Project: Amoco Superior Terminal
Location: Superior, WI W.O. #: 10-88-457
Sample ID #: 80691-1720-32 Date sampled: 8/6/91 Time: 17:20
Describe sampling point: 2" PVC - Top of water column.

Well depth: ≈ 26.9' ft. below MP Casing diameter: 2" inches
Depth to water (below MP): 15.98' ft. Date: 8/6/91 Time: 10:25
Discharge rate = ____ gpm x 0.002228 = ____ cfs.
At least N/A bore volumes have been evacuated before sampling.
Sampling method: ____ Tap ____ Submersible pump (disp) Bailer ____ Other: ____
Pump intake or bailer set at ____ ft. below MP
Tubing (type: ____), (new or previously used) was used to collect all samples (____ Yes ____ No)
and all field measurements (____ Yes ____ No). Tubing used only for ____
Sample appearance: yellow product Odor: gasoline or fuel oil
Note any sampling problems: ____
Note any cleaning performed in field: ____
Samples collected: 1-40ml vial of "free product" for PID and lead.

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)

Bailing start time ____ WL ____
Bailing stop time ____ WL ____

Comments: Lowered bailer into MW and collected free product from top of water column. ("NO PRESERVATIVE")

Transportation (thermal preservation): rigid container
Form Completed by: MAL Sampled by: MAL

1011/9-88

SAMPLING INFORMATION SHEET

Weather Conditions:
Cloud Cover: partly
Wind Speed: 15mph
Temperature: 68°

GENERAL CONDITIONS

Sampling point: MW-33 Project: Amoco Superior Terminal
Location: Superior, WI W.O. #: 10-88-457
Sample ID #: 80691-1650-33 Date sampled: 8,6,91 Time: 16:50
Describe sampling point: 2" PVC - Top of water column.

Well depth: ≈25.9' ft. below MP Casing diameter: 2" inches
Depth to water (below MP): 12.78' ft. Date: 8,6,91 Time: 10:14
Discharge rate = ____ gpm x 0.002228 = ____ cfs.
At least 5 bore volumes have been evacuated before sampling.
Sampling method: ___ Tap ___ Submersible pump (disp Bailer) ___ Other: ____
Pump intake or bailer set at ____ ft. below MP
Tubing (type: ____), (new or previously used) was used to collect all samples (~~Yes~~ / No)
and all field measurements (~~Yes~~ / No). Tubing used only for: ____
Sample appearance: med brown (sedimented) Odor: None
Note any sampling problems: ____
Note any cleaning performed in field: ____
Samples collected: 1-40ml vial For BTEX, MTBE, TPH.

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)

Bailing start time: 16:30 WL: ____
Bailing stop time: 16:50 WL: ____

Comments: 25.9 - 12.78 = 13.12 x .163 = 2.14 x 5 = 10.7 gals Minimum to be evacuated for well development. *(Bailed = 11.0 gals)

Transportation (thermal preservation): rigid cooler
Form Completed by: MAL Sampled by: MAL

1011/9-88

SAMPLING INFORMATION SHEET

Weather Conditions:
Cloud Cover: partly
Wind Speed: 15 mph
Temperature: 70°

GENERAL CONDITIONS

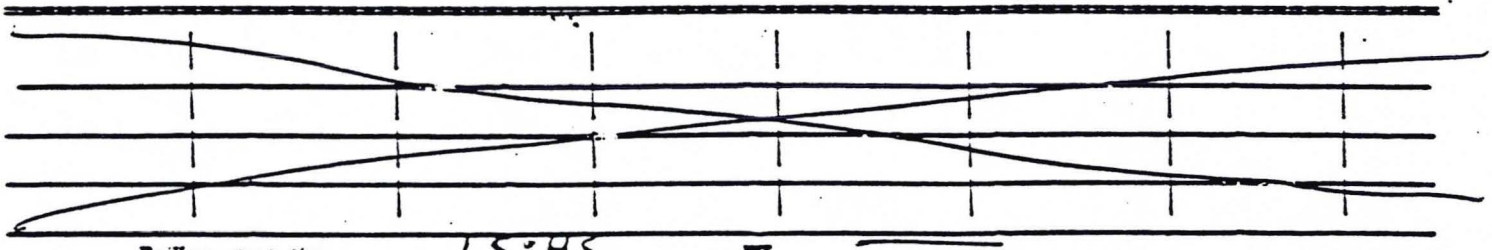
Sampling point: MW-34 Project: Amoco Superior Terminal
Location: Superior, WI W.O. #: 10-88-457
Sample ID #: 80691-1615-34 Date sampled: 8/6/91 Time: 16:15
Describe sampling point: 2" PVC - Top of water column

Well depth: ≈ 30.4' ft. below MP Casing diameter: 2" inches
Depth to water (below MP): 12.55' ft. Date: 8/6/91 Time: 10:00
Discharge rate = _____ gpm x 0.002228 = _____ cfs.
At least 5 bore volumes have been evacuated before sampling.
Sampling method: ___ Tap ___ Submersible pump (disp Bailer) ___ Other: _____
Pump intake or bailer set at _____ ft. below MP
Tubing (type: _____), (new or previously used) was used to collect all samples (___ Yes ___ No)
and all field measurements (___ Yes ___ No). Tubing used only for _____
Sample appearance: lt brown Odor: None
Note any sampling problems: _____
Note any cleaning performed in field: _____
Samples collected: 1-40 ml vial for BTEX, MTBE, TPH.

*MW-34 is the "Duplicate"

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)



Bailing start time: 15:45 WL: _____
Bailing stop time: 16:15 WL: _____

Comments: 30.4 - 12.55 = 17.85 x .163 = 2.9 x 5 = 14.5 gals minimum to be evacuated for well development. *(well bailed dry at ≈ 4.0 gals total) (*MW-34 is the Duplicate*) 1st recharge & collected samp
Transportation (thermal preservation): rigid cooler
Form Completed by: MAL Sampled by: MAL

1011/9-88

SAMPLING INFORMATION SHEET

Weather Conditions:
Cloud Cover: partly
Wind Speed: 15mph
Temperature: 70°

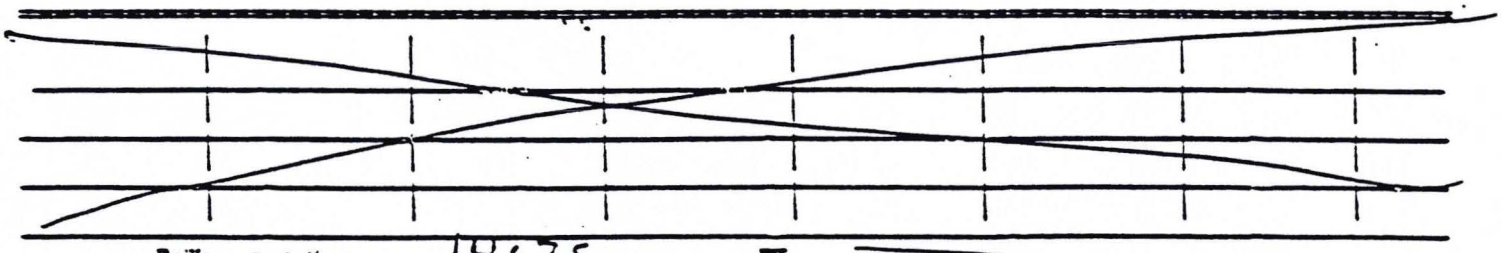
GENERAL CONDITIONS

Sampling point: MW-35 Project: Amoco Superior Terminal
Location: Superior, WI W.O. #: 10-88-457
Sample ID #: 80691-1445-L35 Date sampled: 8/6/91 Time: 14:45
Describe sampling point: 2" PVC - Top of water column.

Well depth: ≈30.5' ft. below MP Casing diameter: 2" inches
Depth to water (below MP): 16.96' ft. Date: 8/6/91 Time: 10:45
Discharge rate = ___ gpm x 0.002228 = ___ cfs.
At least 5 bore volumes have been evacuated before sampling.
Sampling method: ___ Tap ___ Submersible pump (disp Bailer) ___ Other: ___
Pump intake or bailer set at ___ ft. below MP
Tubing (type: ___), (new or previously used) was used to collect all samples (___ Yes ___ No)
and all field measurements (___ Yes ___ No). Tubing used only for ___
Sample appearance: med brown (sedimented) Odor: None
Note any sampling problems: ___
Note any cleaning performed in field: ___
Samples collected: 1-40ml vial for BTEX, MTBE, TPH.

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (°C)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)



Bailing start time: 14:25 WL: ___
Bailing stop time: 14:45 WL: ___

Comments: 30.5 - 16.96' = 13.54 x .163 = 2.20 x 5 = 11.0 gal/5 minimum to develop a well (evacuated). (*Bailed = 11.0 gal/5)

Transportation (thermal preservation): rigid cooler
Form Completed by: MAL Sampled by: MAL

Delta
Environmental
Consultants, Inc.
3900 Northwoods Dr., Suite 200
St. Paul, MN 55112

CHAIN-OF-CUSTODY RECORD

DELTA PROJECT NO: 10-88-457 | INVOICE CODE: A | PAGE: 1 | OF:

PROJECT MANAGER: John C. Grams

PROJECT NAME: Amoco Terminal

PROJECT LOCATION: Superior, Wisconsin

SAMPLER'S SIGNATURE: Michael A. Lee

TURN AROUND REQUESTED:
- [x] NORMAL
- [ ] RUSH _____
- [ ] OTHER _____

LAB NAME

LAB USE ONLY

LABORATORY PROJECT NO.

SAMPLE ID	SAMPLE LOCATION/DESCRIPTION	DATE/TIME SAMPLED	SAMPLE MATRIX: SOIL(S): AIR(A): BULK(B): AQUEOUS(Q): SLUDGE(L): OTHER(O)	ANALYSIS REQUESTED: P.I.D.	ANALYSIS REQUESTED: Lead	NUMBER OF CONTAINERS	ACCEPT (A) REJECT (R)	SAMPLE CONDITION AS RECEIVED: CHILLED YES/NO; SEALED YES/NO; SAMPLE CONDITION/ COMMENTS	LABORATORY SAMPLE NUMBER
MW-32	2" PVC - Free product	80691-1720	O	✓	✓	1			
	"PRODUCT IDENTIFICATION"								

GENERAL COMMENTS: * Send results to John Grams*, Sealed # 8457

1 | TOTAL NUMBER OF CONTAINERS

1 RELINQUISHED BY (SIGNATURE): Michael A. Lee	DATE: 8-7-91	3 RELINQUISHED BY (SIGNATURE)	DATE	5 RELINQUISHED BY (SIGNATURE)	DATE
COMPANY: Delta Environmental	TIME: 13:00	COMPANY	TIME	COMPANY	TIME
2 RECEIVED BY (SIGNATURE)	DATE	4 RECEIVED BY (SIGNATURE)	DATE	6 RECEIVED BY (SIGNATURE)	DATE
COMPANY	TIME	COMPANY	TIME	COMPANY	TIME

Original - Return with Report • Yellow - Lab Copy • Pink - Sampler Copy

GROUNDWATER MANAGEMENT SECTION
STANDARD OIL (INDIANA)
ENVIRONMENTAL AFFAIRS AND SAFETY

FLUID SAMPLE TRANSMITTAL
AND REQUEST FOR ANALYSES

ATTENTION: DIRECTOR, GROUNDWATER MANAGEMENT
RESEARCH CENTER
4502 E 41ST ST.
TULSA, OKLAHOMA 74135

PLEASE PROVIDE COMPLETE INFORMATION
IDENTIFY ALL ESTIMATES

FROM:(ORIGINATING LOCATION)
OFFICE: Superior Terminal
FILE: 10-88-457.05
SAMPLE NO. (1) MW
RESULTS TO: Keaven P. Heaton

ANALYSES REQUESTED: ☐ DISSOLVED HYDROCARBONS ☒ PRODUCT IDENTIFICATION OTHER: P.I.D. and lead chromatograms

STATEMENT OF PROBLEM: Ground water contamination from gasoline and fuel oil releases.

PRIORITY REQUESTED: URGENT ☐ ROUTINE ☒ DATE RESULTS REQUIRED ASAP

LOCATION SAMPLED:
REGION Wisconsin DISTRICT Chicago
FACILITY Superior Amoco Terminal
LOCATION ADDRESS 2904 Winter St.
STATE Wisconsin, 54880 CITY Superior
SERVICE STATION NUMBER N/A

SAMPLE TYPES: PRODUCT ☒ WATER ☐ OTHER —
NO. OF SAMPLES FROM TESTED INTERVAL OR LOCATION (1) MW
COLLECTED FROM: OBSERVATION WELL ☒ RECOVERY WELL ☐ WATER WELL ☐ SEPARATOR ☐
TANK ☐ PIT ☐ STREAM ☐ DISCHARGE POINT ☐ WATER TAP ☐ OTHER —

DATE COLLECTED 8-6-91 BY Mike Lee DEPT. Environmental Tec
DATE SHIPPED 8-7-91 BY Mike Lee VIA Airborne Express

SAMPLE DATA: FLUID SAMPLES FROM Miller Creek FORMATION (IF KNOWN)
INTERVAL SAMPLED 15' TO 16' ☐ FT LITHOLOGY Silty Sand

ADDITIONAL INFORMATION OR REMARKS: * Send results to John Grams

CC:

REQUESTED BY: John Grams DATE 8-7-91
SIGNATURE

CHAIN–OF–CUSTODY RECORD

Delta
Environmental
Consultants, Inc.
3900 Northwoods Dr., Suite 200
St. Paul, MN 55112

DELTA PROJECT NO. 10-88-457 INVOICE CODE A
PROJECT MANAGER John C. Grams
PROJECT NAME Amoco Terminal
PROJECT LOCATION Superior, Wisconsin
SAMPLER'S SIGNATURE Michael A. Lee

PAGE 1 OF

TURN AROUND REQUESTED:
- [x] NORMAL
- [ ] RUSH
- [ ] OTHER

LAB NAME
LAB USE ONLY
LABORATORY PROJECT NO.

SAMPLE ID	SAMPLE LOCATION/DESCRIPTION	DATE/TIME SAMPLED	SAMPLE MATRIX: SOIL(S): AIR(A): BULK(B): AQUEOUS(Q): SLUDGE(L): OTHER(O)	ANALYSIS REQUESTED: BTEX, MTBE	ANALYSIS REQUESTED: TPH	NUMBER OF CONTAINERS	ACCEPT (A) REJECT (R)	SAMPLE CONDITION AS RECEIVED: CHILLED YES/NO, SEALED YES/NO; SAMPLE CONDITION/ COMMENTS	LABORATORY SAMPLE NUMBER
MW-33	2" PVC – Top of water column	80691-1650	Q	✓	✓	1			
MW-34		80691-1615	Q	✓	✓	1			
MW-35		80691-1445	Q	✓	✓	1			
Duplicate		80691-Dup	Q	✓	✓	1			
Travel Blank	2-ml Freon vial	Travel Blank	O	✓	✓	1			

GENERAL COMMENTS: * Send results to John Grams *, Sealed * 8457

5 ◀ TOTAL NUMBER OF CONTAINERS

1 RELINQUISHED BY (SIGNATURE)	DATE	3 RELINQUISHED BY (SIGNATURE)	DATE	5 RELINQUISHED BY (SIGNATURE)	DATE
Michael A. Lee	8-7-91				
COMPANY Delta Environmental	TIME 13:00	COMPANY	TIME	COMPANY	TIME
2 RECEIVED BY (SIGNATURE)	DATE	4 RECEIVED BY (SIGNATURE)	DATE	6 RECEIVED BY (SIGNATURE)	DATE
COMPANY	TIME	COMPANY	TIME	COMPANY	TIME

Original - Return with Report • Yellow - Lab Copy • Pink - Sampler Copy

GROUNDWATER MANAGEMENT SECTION
STANDARD OIL (INDIANA)
ENVIRONMENTAL AFFAIRS AND SAFETY

FLUID SAMPLE TRANSMITTAL
AND REQUEST FOR ANALYSES

TTENTION: DIRECTOR, GROUNDWATER MANAGEMENT
ESEARCH CENTER
4502 E 41 ST ST.
TULSA, OKLAHOMA 74135

LEASE PROVIDE COMPLETE INFORMATION
IDENTIFY ALL ESTIMATES

FROM:(ORIGINATING LOCATION)
OFFICE: Superior Terminal
FILE: 10-88-457.05
SAMPLE NO. (3) MW's and Duplicate
RESULTS TO: Keaven P. Heaton

ANALYSES REQUESTED: ☒ DISSOLVED HYDROCARBONS ☐ PRODUCT IDENTIFICATION OTHER: BTEX, MTBE, TPH chromatograms

STATEMENT OF PROBLEM: Ground water contamination from gasoline and fuel oil releases.

PRIORITY REQUESTED: URGENT ☐ ROUTINE ☒ DATE RESULTS REQUIRED ASAP

LOCATION SAMPLED:

REGION Wisconsin DISTRICT Chicago

FACILITY Superior Amoco Terminal

LOCATION ADDRESS 2904 Winter St.

STATE Wisconsin 54880 CITY Superior

SERVICE STATION NUMBER N/A

SAMPLE TYPES: PRODUCT ☐ WATER ☒ OTHER —

NO. OF SAMPLES FROM TESTED INTERVAL OR LOCATION (3) MW's and Duplicate

COLLECTED FROM: OBSERVATION WELL ☒ RECOVERY WELL ☐ WATER WELL ☐ SEPARATOR ☐

TANK ☐ PIT ☐ STREAM ☐ DISCHARGE POINT ☐ WATER TAP ☐ OTHER —

DATE COLLECTED 8-6-91 BY Mike Lee DEPT. Environmental Tec

DATE SHIPPED 8-7-91 BY Mike Lee VIA Airborne Express

SAMPLE DATA: FLUID SAMPLES FROM Miller Creek FORMATION (IF KNOWN)

INTERVAL SAMPLED 13' TO 31' ☒ FT LITHOLOGY silty sand

ADDITIONAL INFORMATION OR REMARKS: * Send results to John Grams

CC:

REQUESTED BY: John Grams DATE 8-7-91
SIGNATURE

APPENDIX C

ANALYTICAL REPORTS

AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR DISSOLVED HYDROCARBONS

Location: Amoco Terminal, 2904 Winter St., Superior, WI

Lab#: 91W1436 Method: Freon Extract

Sampling date: 7/10/91 Analysis date: 7/13/91

Sample ID	Benz	Tolu	EtBz	Xyls	BTEX TOTAL	MTBE
Trip blank	ND	ND	ND	ND	ND	ND
Duplicate #1	ND	ND	ND	ND	ND	ND
Duplicate #2	0.026	0.013	0.029	0.022	0.090	0.03
MW-3	0.381	0.477	0.063	0.675	1.60	0.03
MW-4	ND	ND	0.002	ND	0.002	ND
MW-5	ND	ND	ND	ND	ND	ND
MW-6	ND	ND	ND	ND	ND	ND
MW-7	ND	ND	ND	ND	ND	ND
MW-8	ND	ND	ND	ND	ND	ND
MW-9	0.627	0.255	0.794	1.13	2.81	0.75
MW-10	0.026	0.013	0.031	0.022	0.093	0.03
MW-11	0.087	0.010	0.020	0.009	0.127	0.03
MW-13	ND	ND	ND	ND	ND	ND
MW-15	ND	ND	ND	ND	ND	ND
MW-16	0.689	4.26	0.817	3.80	9.56	0.55
MW-17	ND	ND	ND	ND	ND	ND
MW-18	ND	ND	ND	ND	ND	ND

MW-19	0.001	0.001	0.007	0.028	0.038	ND
MW-20	ND	ND	ND	ND	ND	ND
MW-21	0.085	0.001	ND	0.003	0.089	ND
MW-28	ND	ND	ND	ND	ND	ND
MW-30	0.904	0.059	ND	0.090	1.05	0.16
MW-31	ND	ND	ND	ND	ND	ND

NOTES
1. ND = not detected at or above detection limits.
2. Unit of data is mg/L.
3. Benz = benzene, Tolu = toluene, EtBz = ethylbenzene, Xyls = xylenes, and MTBE = methyl tertiary butyl ether.
4. Detection limit for benzene, toluene, ethylbenzene, and each xylene is 0.001 mg/L.
5. Detection limit for MTBE is 0.02 mg/L.

Comments:

Checked by: T. G. Miller

AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR TOTAL PETROLEUM HYDROCARBONS

Location: Amoco Terminal, 2904 Winter St., Superior, WI

Sampling Date: 7/10/91 Lab#: 91W1436 Method: TPH by GC

Sample ID	TPH as Gasoline	TPH as Distillate
Trip blank	ND	ND
Duplicate	ND	ND
Duplicate	2	ND
MW-3	6	1
MW-4	ND	ND
MW-5	ND	ND
MW-6	ND	ND
MW-7	ND	ND
MW-8	ND	ND
MW-9	69	7
MW-10	2	ND
MW-11	2	ND
MW-13	ND	ND
MW-15	ND	1
MW-16	57	12
MW-17	ND	ND
MW-18	ND	ND
MW-19	ND	3
MW-20	ND	ND

MW-21	ND	ND
MW-28	ND	ND
MW-30	9	2
MW-31	ND	ND

NOTES
1. ND = Not Detected.
2. The detection limit for TPH by GC is 1 mg/L for gasoline and distillate.

Analysis date: 7/14/91 Checked by: T. G. Miller

GROUNDWATER MANAGEMENT SECTION
STANDARD OIL (INDIANA)
ENVIRONMENTAL AFFAIRS AND SAFETY

FLUID SAMPLE TRANSMITTAL
AND REQUEST FOR ANALYSES

ATTENTION: DIRECTOR, GROUNDWATER MANAGEMENT
RESEARCH CENTER
4502 E 41ST ST.
TULSA, OKLAHOMA 74135

PLEASE PROVIDE COMPLETE INFORMATION
IDENTIFY ALL ESTIMATES

FROM:(ORIGINATING LOCATION)
OFFICE: Superior Terminal
FILE: 10-88-457.05
SAMPLE NO. (20) monitoring wells
RESULTS TO: Keaven P. Heaton

ANALYSES REQUESTED: ☒ DISSOLVED HYDROCARBONS ☐ PRODUCT IDENTIFICATION
OTHER: BTEX, MTBE, TPH chromatograms

STATEMENT OF PROBLEM: Ground water contamination from gasoline and fuel oil releases.

PRIORITY REQUESTED: URGENT ☐ ROUTINE ☒ DATE RESULTS REQUIRED ASAP

LOCATION SAMPLED:
REGION Wisconsin DISTRICT Chicago
FACILITY Superior Amoco Terminal
LOCATION ADDRESS 2904 Winter St.
STATE Wisconsin 54880 CITY Superior
SERVICE STATION NUMBER N/A

SAMPLE TYPES: PRODUCT ☐ WATER ☒ OTHER
NO. OF SAMPLES FROM TESTED INTERVAL OR LOCATION (20) MW's
COLLECTED FROM: OBSERVATION WELL ☒ RECOVERY WELL ☐ WATER WELL ☐ SEPARATOR ☐
TANK ☐ PIT ☐ STREAM ☐ DISCHARGE POINT ☐ WATER TAP ☐ OTHER

DATE COLLECTED 7-10-91 BY Mike Lee & Bill Newman DEPT. Environmental Tec
DATE SHIPPED 7-11-91 BY Mike Lee VIA Airborne Express
SAMPLE DATA: FLUID SAMPLES FROM Miller Creek FORMATION (IF KNOWN)
INTERVAL SAMPLED 13' TO 31' ☒ FT LITHOLOGY silty sand
ADDITIONAL INFORMATION OR REMARKS: * Send results to John Grams *
* Chromatograms please

CC:
REQUESTED BY: John C. Grams SIGNATURE DATE 7-11-91

CHAIN–OF–CUSTODY RECORD

Delta Environmental Consultants, Inc. St. Paul, MN

DELTA PROJECT NO. 10-88-457 | INVOICE CODE A | PAGE 1 OF 1

PROJECT NAME Amoco Terminal

PROJECT LOCATION Superior, Wisconsin

Results to John Grams

SAMPLER'S SIGNATURE Michael O. Lee, William A. Nelson

TURN AROUND REQUESTED: [X] NORMAL [ ] RUSH _____ [ ] OTHER _____

LAB USE ONLY

LABORATORY PROJECT NO.

SAMPLE ID	SAMPLE LOCATION/DESCRIPTION	DATE/TIME SAMPLED	SAMPLE MATRIX: SOIL(S): AIR(A): BULK(B): AQUEOUS(Q): SLUDGE(L): OTHER(O)	ANALYSIS REQUESTED: BTEX, MTBE	ANALYSIS REQUESTED: TPH	NUMBER OF CONTAINERS	ACCEPT (A) REJECT (R)	SAMPLE CONDITION AS RECEIVED: CHILLED YES/NO; SEALED YES/NO; SAMPLE CONDITION/ COMMENTS	LABORATORY SAMPLE NUMBER
MW-3	2" PVC – Top of water column	71091-1610	Q	✓	✓	1			
MW-4		71091-0740	Q	✓	✓	1			
MW-5		71091-1301	Q	✓	✓	1			
MW-6		71091-1315	Q	✓	✓	1			
MW-7		71091-1355	Q	✓	✓	1			
MW-8		71091-1337	Q	✓	✓	1			
MW-9		71091-1510	Q	✓	✓	1			
MW-10		71091-1645	Q	✓	✓	1			
MW-11		71091-1507	Q	✓	✓	1			
MW-13		71091-0810	Q	✓	✓	1			
Duplicate #1		71091-Dup #1	Q	✓	✓	1			

GENERAL COMMENTS * Send results to John Grams*, sealed # 8457 — 11 ◀ TOTAL NUMBER OF CONTAINERS

1 RELINQUISHED BY (SIGNATURE)	DATE	3 RELINQUISHED BY (SIGNATURE)	DATE	5 RELINQUISHED BY (SIGNATURE)	DATE
Michael A. Lee	7-11-91				
COMPANY Delta Environmental	TIME 14:00	COMPANY	TIME	COMPANY	TIME
2 RECEIVED BY (SIGNATURE) Robert Nguyen	DATE 7-12-91	4 RECEIVED BY (SIGNATURE)	DATE	6 RECEIVED BY (SIGNATURE)	DATE
COMPANY Amoco GRF	TIME 8:30AM	COMPANY	TIME	COMPANY	TIME

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CHAIN–OF–CUSTODY RECORD

Delta Environmental Consultants, Inc. St. Paul, MN

DELTA PROJECT NO. 10-88-457 | INVOICE CODE [A] | PAGE 2 OF 1

PROJECT NAME Amoco Terminal

PROJECT LOCATION Superior, Wisconsin

Results to John Grams

SAMPLER'S SIGNATURE Michael D. Lee, William A. Krumm

TURN AROUND REQUESTED: [X] NORMAL [ ] RUSH _____ [ ] OTHER _____

LAB USE ONLY — LABORATORY PROJECT NO.

SAMPLE ID	SAMPLE LOCATION/DESCRIPTION	DATE/TIME SAMPLED	SAMPLE MATRIX: SOIL(S); AIR(A); BULK(B); AQUEOUS(Q); SLUDGE(L); OTHER(O)	ANALYSIS REQUESTED: BTEX, MTBE	ANALYSIS REQUESTED: TPH	NUMBER OF CONTAINERS	ACCEPT (A) REJECT (R)	SAMPLE CONDITION AS RECEIVED: CHILLED YES/NO; SEALED YES/NO; SAMPLE CONDITION/ COMMENTS	LABORATORY SAMPLE NUMBER
MW-15	2" PVC - Top of water column	71091-1430	Q	✓	✓	1			
MW-16		71091-1645	Q	✓	✓	1			
MW-17		71091-1130	Q	✓	✓	1			
MW-18		71091-1538	Q	✓	✓	1			
MW-19		71091-1420	Q	✓	✓	1			
MW-20		71091-1540	Q	✓	✓	1			
MW-21		71091-1604	Q	✓	✓	1			
MW-28		71091-0950	Q	✓	✓	1			
MW-30		71091-1145	Q	✓	✓	1			
MW-31		71091-1116	Q	✓	✓	1			
Duplicate #2		71091-Dup #2	Q	✓	✓	1			
Travel Blank	2 ml vial of Freon	Travel Blank	O	✓	✓	1			

GENERAL COMMENTS: *Send result to John Grams*, Sealed # 8457

12 ◀ TOTAL NUMBER OF CONTAINERS

1 RELINQUISHED BY (SIGNATURE)	DATE	3 RELINQUISHED BY (SIGNATURE)	DATE	5 RELINQUISHED BY (SIGNATURE)	DATE
Michael D. Lee	7-11-91				
COMPANY: Delta Environmental	TIME	COMPANY	TIME	COMPANY	TIME
2 RECEIVED BY (SIGNATURE)	DATE	4 RECEIVED BY (SIGNATURE)	DATE	6 RECEIVED BY (SIGNATURE)	DATE
COMPANY	TIME	COMPANY	TIME	COMPANY	TIME

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CHAIN–OF–CUSTODY RECORD

Delta Environmental Consultants, Inc. St. Paul, MN

DELTA PROJECT NO: 10-88-457 | INVOICE CODE: A | PAGE: 1 OF

PROJECT NAME: Amoco Terminal

PROJECT LOCATION: Superior, Wisconsin

Results to John Grams

SAMPLER'S SIGNATURE: Michael A. Lee, William A. Hamm

TURN AROUND REQUESTED: [X] NORMAL [ ] RUSH _____ [ ] OTHER _____

LAB USE ONLY

LABORATORY PROJECT NO.

SAMPLE ID	SAMPLE LOCATION/DESCRIPTION	DATE/TIME SAMPLED	SAMPLE MATRIX: SOIL(S); AIR(A); BULK(B); AQUEOUS(Q); SLUDGE(L); OTHER(O)	ANALYSIS REQUESTED: 601/602 w/xylenes	ANALYSIS REQUESTED: EPA 610	NUMBER OF CONTAINERS	ACCEPT (A) REJECT (R)	SAMPLE CONDITION AS RECEIVED: CHILLED YES/NO, SEALED YES/NO; SAMPLE CONDITION/ COMMENTS	LABORATORY SAMPLE NUMBER
MW-6	2" PVC - Top of water column	71091-1315	Q	✓	✓	4			
MW-15		71091-1430	Q	✓	✓	4			
MW-16		71091-1645	Q	✓	✓	4			
MW-17		71091-1130	Q	✓	✓	4			
MW-19		71091-1420	Q	✓	✓	4			
MW-30		71091-1145	Q	✓	✓	4			
Travel Blank	De-ionized H_2O	Travel Blank	Q	✓		2			

GENERAL COMMENTS: * Send results to John Grams*, Sealed # 8457

26 ◀ TOTAL NUMBER OF CONTAINERS

1 RELINQUISHED BY (SIGNATURE)	DATE	3 RELINQUISHED BY (SIGNATURE)	DATE	5 RELINQUISHED BY (SIGNATURE)	DATE
Michael A. Lee	7-11-91				
COMPANY: Delta Environmental	TIME	COMPANY	TIME	COMPANY	TIME
2 RECEIVED BY (SIGNATURE)	DATE	4 RECEIVED BY (SIGNATURE)	DATE	6 RECEIVED BY (SIGNATURE)	DATE
COMPANY	TIME	COMPANY	TIME	COMPANY	TIME

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pace
INCORPORATED
THE ASSURANCE OF QUALITY

12 AUG 91 7:23

REPORT OF LABORATORY ANALYSIS

August 06, 1991

Mr. John Grams
Delta Environmental Consultants, Inc.
1801 Old Highway 8
Suite 114
New Brighton, MN 55112

RE: Delta Project No. 10-88-457 A
PACE Project No. 910712.514

Dear Mr. Grams:

Enclosed is the report of laboratory analyses for samples received July 11, 1991.

The organic analyses were performed July 15 - 24, 1991.

A copy of the chain of custody record for the samples and an invoice for services provided are also enclosed.

Please contact us if you have any questions regarding the enclosures.

Sincerely,

Lauren L. Larsen

Lauren L. Larsen
Project Manager

Enclosures

1710 Douglas Drive North
Minneapolis, MN 55422
TEL: 612-544-5543
FAX: 612-525-3377

pace INCORPORATED
THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

Delta Environmental Consultants, Inc.
1801 Old Highway 8
Suite 114
New Brighton, MN 55112

August 06, 1991
PACE Project Number: 910712514

Attn: Mr. John Grams

10-88-457 A

PACE Sample Number:			10 0247308	10 0247316	10 0247324
Date Collected:			07/10/91	07/10/91	07/10/91
Date Received:			07/11/91	07/11/91	07/11/91
Parameter	Units	MDL	MW-6	MW-15	MW-16
ORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Xylenes	ug/L	1.0	ND	ND	-
Xylenes	ug/L	50	-	-	2800
PURGEABLE HALOCARBONS AND AROMATICS					
Date Analyzed			F 07/18/91	F 07/19/91	F 07/18/91
Chloromethane	ug/L	1.0	ND	ND	-
Chloromethane	ug/L	50	-	-	ND
Bromomethane	ug/L	1.5	ND	ND	-
Bromomethane	ug/L	75	-	-	ND
Dichlorodifluoromethane	ug/L	1.5	ND	ND	-
Dichlorodifluoromethane	ug/L	75	-	-	ND
Vinyl chloride	ug/L	1.5	ND	ND	-
Vinyl chloride	ug/L	75	-	-	ND
Chloroethane	ug/L	1.0	ND	ND	-
Chloroethane	ug/L	50	-	-	ND
Methylene chloride	ug/L	1.0	ND	ND	-
Methylene chloride	ug/L	50	-	-	120
Trichlorofluoromethane	ug/L	0.4	ND	ND	-
Trichlorofluoromethane	ug/L	20	-	-	ND
1,1-Dichloroethylene	ug/L	0.3	ND	ND	-
1,1-Dichloroethylene	ug/L	15	-	-	ND
1,1-Dichloroethane	ug/L	0.2	ND	ND	-
1,1-Dichloroethane	ug/L	10	-	-	ND
trans-1,2-Dichloroethylene	ug/L	0.3	ND	ND	-
trans-1,2-Dichloroethylene	ug/L	15	-	-	ND
Chloroform	ug/L	0.5	ND	ND	-

MDL Method Detection Limit
ND Not detected at or above the MDL.

1710 Douglas Drive North
Minneapolis, MN 55422
TEL: 612-544-5543
FAX: 612-525-3377

REPORT OF LABORATORY ANALYSIS

Mr. John Grams
Page 2

August 06, 1991
PACE Project Number: 910712514

10-88-457 A

PACE Sample Number:			10 0247308	10 0247316	10 0247324
Date Collected:			07/10/91	07/10/91	07/10/91
Date Received:			07/11/91	07/11/91	07/11/91
Parameter	Units	MDL	MW-6	MW-15	MW-16
ORGANIC ANALYSIS					
PURGEABLE HALOCARBONS AND AROMATICS					
Chloroform	ug/L	25	-	-	ND
1,2-Dichloroethane	ug/L	0.2	2.0	ND	-
1,2-Dichloroethane	ug/L	10	-	-	24
1,1,1-Trichloroethane	ug/L	0.5	ND	ND	-
1,1,1-Trichloroethane	ug/L	25	-	-	ND
Carbon tetrachloride	ug/L	0.3	ND	ND	-
Carbon tetrachloride	ug/L	15	-	-	ND
Bromodichloromethane	ug/L	0.2	ND	ND	-
Bromodichloromethane	ug/L	10	-	-	ND
1,2-Dichloropropane	ug/L	0.2	ND	ND	-
1,2-Dichloropropane	ug/L	10	-	-	ND
cis-1,3-Dichloro-1-propene	ug/L	0.5	ND	ND	-
cis-1,3-Dichloro-1-propene	ug/L	25	-	-	ND
1,1,2-Trichloroethylene	ug/L	0.5	ND	ND	-
1,1,2-Trichloroethylene	ug/L	25	-	-	ND
Benzene	ug/L	1.0	ND	ND	-
Benzene	ug/L	50	-	-	360
Dibromochloromethane	ug/L	1.0	ND	ND	-
Dibromochloromethane	ug/L	50	-	-	ND
1,1,2-Trichloroethane	ug/L	1.0	ND	ND	-
1,1,2-Trichloroethane	ug/L	50	-	-	ND
trans-1,3-Dichloro-1-propene	ug/L	0.3	ND	ND	-
trans-1,3-Dichloro-1-propene	ug/L	15	-	-	ND
2-Chloroethylvinyl ether	ug/L	250	-	-	ND
2-Chloroethylvinyl ether	ug/L	5.0	ND	ND	-
Bromoform	ug/L	1.0	ND	ND	-
Bromoform	ug/L	50	-	-	ND
1,1,2,2-Tetrachloroethane	ug/L	1.0	ND	ND	-
1,1,2,2-Tetrachloroethane	ug/L	50	-	-	ND

MDL Method Detection Limit
ND Not detected at or above the MDL.

1710 Douglas Drive North
Minneapolis, MN 55422
TEL: 612-544-5543
FAX: 612-525-3377

Mr. John Grams
Page 3

August 06, 1991
PACE Project Number: 910712514

10-88-457 A

PACE Sample Number:			10 0247308	10 0247316	10 0247324
Date Collected:			07/10/91	07/10/91	07/10/91
Date Received:			07/11/91	07/11/91	07/11/91
Parameter	Units	MDL	MW-6	MW-15	MW-16
ORGANIC ANALYSIS					
PURGEABLE HALOCARBONS AND AROMATICS					
1,1,2,2-Tetrachloroethylene	ug/L	1.0	ND	ND	-
1,1,2,2-Tetrachloroethylene	ug/L	50	-	-	ND
Toluene	ug/L	1.0	ND	ND	-
Toluene	ug/L	50	-	-	3200
Chlorobenzene	ug/L	1.0	ND	ND	-
Chlorobenzene	ug/L	50	-	-	ND
Ethyl benzene	ug/L	1.0	ND	ND	-
Ethyl benzene	ug/L	50	-	-	660
1,3-Dichlorobenzene	ug/L	200	-	-	ND
1,3-Dichlorobenzene	ug/L	4.0	ND	ND	-
1,2-Dichlorobenzene	ug/L	200	-	-	ND
1,2-Dichlorobenzene	ug/L	4.0	ND	ND	-
1,4-Dichlorobenzene	ug/L	200	-	-	ND
1,4-Dichlorobenzene	ug/L	4.0	ND	ND	-
cis-1,2-Dichloroethylene	ug/L	0.5	ND	ND	-
cis-1,2-Dichloroethylene	ug/L	25	-	-	ND
POLYNUCLEAR AROMATIC HYDROCARBONS-610					
Date Analyzed			07/17/91	07/17/91	07/24/91
Date Extracted			07/15/91	07/15/91	07/15/91
Naphthalene	ug/L	1.5	ND	ND	-
Naphthalene	ug/L	7.5	-	-	ND
Acenaphthylene	ug/L	1.5	ND	ND	-
Acenaphthylene	ug/L	7.5	-	-	ND
Acenaphthene	ug/L	10	-	-	ND
Acenaphthene	ug/L	2.0	ND	ND	-
Fluorene	ug/L	0.31	ND	ND	-
Fluorene	ug/L	1.6	-	-	23
Phenanthrene	ug/L	0.20	ND	ND	-
Phenanthrene	ug/L	1.0	-	-	18

MDL Method Detection Limit
ND Not detected at or above the MDL.

REPORT OF LABORATORY ANALYSIS

August 06, 1991
PACE Project Number: 910712514

10-88-457 A

PACE Sample Number:			10 0247308	10 0247316	10 0247324
Date Collected:			07/10/91	07/10/91	07/10/91
Date Received:			07/11/91	07/11/91	07/11/91
Parameter	Units	MDL	MW-6	MW-15	MW-16
ORGANIC ANALYSIS					
POLYNUCLEAR AROMATIC HYDROCARBONS-610					
Anthracene	ug/L	0.050	ND	ND	-
Anthracene	ug/L	0.25	-	-	4.6
Fluoranthene	ug/L	0.30	ND	ND	-
Fluoranthene	ug/L	1.5	-	-	13
Pyrene	ug/L	0.10	ND	ND	-
Pyrene	ug/L	0.50	-	-	7.6
Benzo(a)anthracene	ug/L	0.10	ND	ND	-
Benzo(a)anthracene	ug/L	0.50	-	-	2.0
Chrysene	ug/L	0.10	ND	ND	-
Chrysene	ug/L	0.50	-	-	2.3
Benzo(b)fluoranthene	ug/L	0.20	ND	ND	-
Benzo(b)fluoranthene	ug/L	1.0	-	-	1.3
Benzo(k)fluoranthene	ug/L	0.050	ND	ND	-
Benzo(k)fluoranthene	ug/L	0.25	-	-	0.49
Benzo(a)pyrene	ug/L	0.10	ND	ND	-
Benzo(a)pyrene	ug/L	0.50	-	-	0.58
Dibenzo(a,h)anthracene	ug/L	0.20	ND	ND	-
Dibenzo(a,h)anthracene	ug/L	1.0	-	-	ND
Benzo(g,h,i)perylene	ug/L	0.20	ND	ND	-
Benzo(g,h,i)perylene	ug/L	1.0	-	-	ND
Indeno(1,2,3-cd)pyrene	ug/L	0.20	ND	ND	-
Indeno(1,2,3-cd)pyrene	ug/L	1.0	-	-	ND
Carbazole (Surrogate)	%		81	83	I
Terphenyl (Surrogate)	%		87	74	I

MDL Method Detection Limit
ND Not detected at or above the MDL.
I Surrogate recovery could not be quantified due to matrix interference.

REPORT OF LABORATORY ANALYSIS

Mr. John Grams
Page 5

August 06, 1991
PACE Project Number: 910712514

10-88-457 A

PACE Sample Number:			10 0247332	10 0247340	10 0247359
Date Collected:			07/10/91	07/10/91	07/10/91
Date Received:			07/11/91	07/11/91	07/11/91
Parameter	Units	MDL	MW-17	MW-19	MW-30
ORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
Xylenes	ug/L	1.0	ND	22	-
Xylenes	ug/L	100	-	-	ND
PURGEABLE HALOCARBONS AND AROMATICS					
Date Analyzed			F 07/23/91	F 07/23/91	F 07/23/91
Chloromethane	ug/L	1.0	ND	ND	-
Chloromethane	ug/L	100	-	-	ND
Bromomethane	ug/L	1.5	ND	ND	-
Bromomethane	ug/L	150	-	-	ND
Dichlorodifluoromethane	ug/L	1.5	ND	ND	-
Dichlorodifluoromethane	ug/L	150	-	-	ND
Vinyl chloride	ug/L	1.5	ND	ND	-
Vinyl chloride	ug/L	150	-	-	ND
Chloroethane	ug/L	1.0	ND	ND	-
Chloroethane	ug/L	100	-	-	ND
Methylene chloride	ug/L	1.0	ND	ND	-
Methylene chloride	ug/L	100	-	-	ND
Trichlorofluoromethane	ug/L	0.4	ND	ND	-
Trichlorofluoromethane	ug/L	40	-	-	ND
1,1-Dichloroethylene	ug/L	0.3	ND	ND	-
1,1-Dichloroethylene	ug/L	30	-	-	ND
1,1-Dichloroethane	ug/L	0.2	ND	ND	-
1,1-Dichloroethane	ug/L	20	-	-	ND
trans-1,2-Dichloroethylene	ug/L	0.3	ND	ND	-
trans-1,2-Dichloroethylene	ug/L	30	-	-	ND
Chloroform	ug/L	0.5	ND	ND	-
Chloroform	ug/L	50	-	-	ND
1,2-Dichloroethane	ug/L	0.2	ND	ND	-
1,2-Dichloroethane	ug/L	20	-	-	ND

MDL Method Detection Limit
ND Not detected at or above the MDL.

1710 Douglas Drive North
Minneapolis, MN 55422
TEL: 612-544-5543
FAX: 612-525-3377

10-88-457 A

PACE Sample Number:			10 0247332	10 0247340	10 0247359
Date Collected:			07/10/91	07/10/91	07/10/91
Date Received:			07/11/91	07/11/91	07/11/91
Parameter	Units	MDL	MW-17	MW-19	MW-30
ORGANIC ANALYSIS					
PURGEABLE HALOCARBONS AND AROMATICS					
1,1,1-Trichloroethane	ug/L	0.5	ND	ND	-
1,1,1-Trichloroethane	ug/L	50	-	-	ND
Carbon tetrachloride	ug/L	0.3	ND	ND	-
Carbon tetrachloride	ug/L	30	-	-	ND
Bromodichloromethane	ug/L	0.2	ND	ND	-
Bromodichloromethane	ug/L	20	-	-	ND
1,2-Dichloropropane	ug/L	0.2	ND	ND	-
1,2-Dichloropropane	ug/L	20	-	-	ND
cis-1,3-Dichloro-1-propene	ug/L	0.5	ND	ND	-
cis-1,3-Dichloro-1-propene	ug/L	50	-	-	ND
1,1,2-Trichloroethylene	ug/L	0.5	ND	ND	-
1,1,2-Trichloroethylene	ug/L	50	-	-	ND
Benzene	ug/L	1.0	ND	2.2	-
Benzene	ug/L	100	-	-	1400
Dibromochloromethane	ug/L	1.0	ND	ND	-
Dibromochloromethane	ug/L	100	-	-	ND
1,1,2-Trichloroethane	ug/L	1.0	ND	ND	-
1,1,2-Trichloroethane	ug/L	100	-	-	ND
trans-1,3-Dichloro-1-propene	ug/L	0.3	ND	ND	-
trans-1,3-Dichloro-1-propene	ug/L	30	-	-	ND
2-Chloroethylvinyl ether	ug/L	5.0	ND	ND	-
2-Chloroethylvinyl ether	ug/L	500	-	-	ND
Bromoform	ug/L	1.0	ND	ND	-
Bromoform	ug/L	100	-	-	ND
1,1,2,2-Tetrachloroethane	ug/L	1.0	ND	ND	-
1,1,2,2-Tetrachloroethane	ug/L	100	-	-	ND
1,1,2,2-Tetrachloroethylene	ug/L	1.0	ND	ND	-
1,1,2,2-Tetrachloroethylene	ug/L	100	-	-	ND
Toluene	ug/L	1.0	ND	ND	-

MDL Method Detection Limit
ND Not detected at or above the MDL.

REPORT OF LABORATORY ANALYSIS

August 06, 1991
PACE Project Number: 910712514

10-88-457 A

PACE Sample Number:			10 0247332	10 0247340	10 0247359
Date Collected:			07/10/91	07/10/91	07/10/91
Date Received:			07/11/91	07/11/91	07/11/91
Parameter	Units	MDL	MW-17	MW-19	MW-30
ORGANIC ANALYSIS					
PURGEABLE HALOCARBONS AND AROMATICS					
Toluene	ug/L	100	-	-	ND
Chlorobenzene	ug/L	1.0	ND	ND	-
Chlorobenzene	ug/L	100	-	-	ND
Ethyl benzene	ug/L	1.0	ND	8.8	-
Ethyl benzene	ug/L	100	-	-	ND
1,3-Dichlorobenzene	ug/L	4.0	ND	ND	-
1,3-Dichlorobenzene	ug/L	400	-	-	ND
1,2-Dichlorobenzene	ug/L	4.0	ND	ND	-
1,2-Dichlorobenzene	ug/L	400	-	-	ND
1,4-Dichlorobenzene	ug/L	4.0	ND	ND	-
1,4-Dichlorobenzene	ug/L	400	-	-	ND
cis-1,2-Dichloroethylene	ug/L	0.5	ND	ND	-
cis-1,2-Dichloroethylene	ug/L	50	-	-	ND
POLYNUCLEAR AROMATIC HYDROCARBONS-610					
Date Analyzed			07/17/91	07/17/91	07/17/91
Date Extracted			07/15/91	07/15/91	07/15/91
Naphthalene	ug/L	1.5	ND	33	ND
Acenaphthylene	ug/L	1.5	ND	ND	13
Acenaphthene	ug/L	2.0	ND	10	12
Fluorene	ug/L	0.31	ND	1.2	0.32
Phenanthrene	ug/L	0.20	ND	0.31	ND
Anthracene	ug/L	0.050	ND	ND	ND
Fluoranthene	ug/L	0.30	ND	ND	ND
Pyrene	ug/L	0.10	ND	ND	ND
Benzo(a)anthracene	ug/L	0.10	ND	ND	ND
Chrysene	ug/L	0.10	ND	ND	ND
Benzo(b)fluoranthene	ug/L	0.20	ND	ND	ND
Benzo(k)fluoranthene	ug/L	0.050	ND	ND	ND

MDL Method Detection Limit
ND Not detected at or above the MDL.

REPORT OF LABORATORY ANALYSIS

August 06, 1991
PACE Project Number: 910712514

10-88-457 A

PACE Sample Number:			10 0247332	10 0247340	10 0247359
Date Collected:			07/10/91	07/10/91	07/10/91
Date Received:			07/11/91	07/11/91	07/11/91
Parameter	Units	MDL	MW-17	MW-19	MW-30
ORGANIC ANALYSIS					
POLYNUCLEAR AROMATIC HYDROCARBONS-610					
Benzo(a)pyrene	ug/L	0.10	ND	ND	ND
Dibenzo(a,h)anthracene	ug/L	0.20	ND	ND	ND
Benzo(g,h,i)perylene	ug/L	0.20	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ug/L	0.20	ND	ND	ND
Carbazole (Surrogate)	%		80	95	73
Terphenyl (Surrogate)	%		77	80	63

MDL Method Detection Limit
ND Not detected at or above the MDL.

1710 Douglas Drive North
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REPORT OF LABORATORY ANALYSIS

Mr. John Grams
Page 9

August 06, 1991
PACE Project Number: 910712514

10-88-457 A

PACE Sample Number:			10 0247367
Date Collected:			07/10/91
Date Received:			07/11/91
			Travel
Parameter	Units	MDL	Blank
ORGANIC ANALYSIS			
INDIVIDUAL PARAMETERS			
Xylenes	ug/L	1.0	ND
PURGEABLE HALOCARBONS AND AROMATICS			
Date Analyzed			F 07/24/91
Chloromethane	ug/L	1.0	ND
Bromomethane	ug/L	1.5	ND
Dichlorodifluoromethane	ug/L	1.5	ND
Vinyl chloride	ug/L	1.5	ND
Chloroethane	ug/L	1.0	ND
Methylene chloride	ug/L	1.0	ND
Trichlorofluoromethane	ug/L	0.4	ND
1,1-Dichloroethylene	ug/L	0.3	ND
1,1-Dichloroethane	ug/L	0.2	ND
trans-1,2-Dichloroethylene	ug/L	0.3	ND
Chloroform	ug/L	0.5	ND
1,2-Dichloroethane	ug/L	0.2	ND
1,1,1-Trichloroethane	ug/L	0.5	ND
Carbon tetrachloride	ug/L	0.3	ND
Bromodichloromethane	ug/L	0.2	ND
1,2-Dichloropropane	ug/L	0.2	ND
cis-1,3-Dichloro-1-propene	ug/L	0.5	ND
1,1,2-Trichloroethylene	ug/L	0.5	ND
Benzene	ug/L	1.0	ND
Dibromochloromethane	ug/L	1.0	ND
1,1,2-Trichloroethane	ug/L	1.0	ND
trans-1,3-Dichloro-1-propene	ug/L	0.3	ND
2-Chloroethylvinyl ether	ug/L	5.0	ND
Bromoform	ug/L	1.0	ND

MDL Method Detection Limit
ND Not detected at or above the MDL.

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REPORT OF LABORATORY ANALYSIS

Mr. John Grams
Page 10

August 06, 1991
PACE Project Number: 910712514

10-88-457 A

PACE Sample Number:	10 0247367
Date Collected:	07/10/91
Date Received:	07/11/91

Parameter	Units	MDL	Travel Blank
ORGANIC ANALYSIS			
PURGEABLE HALOCARBONS AND AROMATICS			
1,1,2,2-Tetrachloroethane	ug/L	1.0	ND
1,1,2,2-Tetrachloroethylene	ug/L	1.0	ND
Toluene	ug/L	1.0	ND
Chlorobenzene	ug/L	1.0	ND
Ethyl benzene	ug/L	1.0	ND
1,3-Dichlorobenzene	ug/L	4.0	ND
1,2-Dichlorobenzene	ug/L	4.0	ND
1,4-Dichlorobenzene	ug/L	4.0	ND
cis-1,2-Dichloroethylene	ug/L	0.5	ND

MDL Method Detection Limit
ND Not detected at or above the MDL.

These data have been reviewed and are approved for release.

Liesa Shanahan

Liesa A. Shanahan
Organic Chemistry Manager

1710 Douglas Drive North
Minneapolis, MN 55422
TEL: 612-544-5543
FAX: 612-525-3377

9158Z4 9101Z514

CHAIN-OF-CUSTODY RECORD

Delta Environmental Consultants, Inc. St. Paul, MN

DELTA PROJECT NO: 10-88-457 | INVOICE CODE: A | PAGE 1 OF

PROJECT NAME: Amoco Terminal

PROJECT LOCATION: Superior, Wisconsin

Results to John Grams

SAMPLER'S SIGNATURE: Michael A. Lee, William A. Hammer

TURN AROUND REQUESTED: [X] NORMAL [ ] RUSH _____ [ ] OTHER _____

LAB USE ONLY

LABORATORY PROJECT NO.

SAMPLE ID	SAMPLE LOCATION/DESCRIPTION	DATE/TIME SAMPLED	SAMPLE MATRIX: SOIL(S) AIR(A): BULK(B): AQUEOUS(O): SLUDGE(L): OTHER(O)	ANALYSIS REQUESTED: 601/602 w/xylenes	ANALYSIS REQUESTED: EPA 610	NUMBER OF CONTAINERS	ACCEPT (A) REJECT (R)	SAMPLE CONDITION AS RECEIVED: CHILLED YES/NO; SEALED YES/NO; SAMPLE CONDITION/ COMMENTS	LABORATORY SAMPLE NUMBER
MW-6	2" PVC - Top of water column	71091-1315	Q	✓	✓	4			24730.8
MW-15		71091-1430	Q	✓	✓	4			24731.6
MW-16		71091-1645	Q	✓	✓	4			24732.4
MW-17		71091-1130	Q	✓	✓	4			24733.2
MW-19		71091-1420	Q	✓	✓	4			24734.0
MW-30		71091-1145	Q	✓	✓	4			24735.9
Travel Blank	De-ionized H_2O	Travel Blank	Q	✓		2			24736.7

GENERAL COMMENTS: * Send results to John Grams*, Sealed # 8457

26 ◀ TOTAL NUMBER OF CONTAINERS

1 RELINQUISHED BY (SIGNATURE)	DATE	3 RELINQUISHED BY (SIGNATURE)	DATE	5 RELINQUISHED BY (SIGNATURE)	DATE
Michael A. Lee	7-11-91				
COMPANY: Delta Environmental	TIME: 14:00	COMPANY	TIME	COMPANY	TIME
2 RECEIVED BY (SIGNATURE)	DATE	4 RECEIVED BY (SIGNATURE)	DATE	6 RECEIVED BY (SIGNATURE)	DATE
	7/11				
COMPANY	TIME	COMPANY	TIME	COMPANY	TIME

Original - Return with Report • Yellow - Lab Copy • Pink - Sampler Copy

AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR DISSOLVED HYDROCARBONS

Location: Amoco Terminal, 2904 Winter St., Superior, WI

Lab#: 91W1620 Method: Freon Extract

Date sampled: 8/6/91 Date received: 8/8/91

Sample ID	Benz	Tolu	EtBz	Xyls	BTEX TOTAL	MTBE
Trip blank	ND	ND	ND	ND	ND	ND
Duplicate	ND	ND	ND	ND	ND	ND
MW-33	ND	ND	ND	ND	ND	ND
MW-34	ND	ND	ND	ND	ND	ND
MW-35	ND	ND	ND	ND	ND	ND

NOTES
1. Unit of data is mg/L.
2. ND = not detected at or above reporting limit.
3. Benz = benzene, Tolu = toluene, EtBz = ethylbenzene, Xyls = xylenes, and MTBE = methyl tertiary butyl ether.
4. Reporting limit for benzene, toluene, ethylbenzene, and each xylene is 0.001 mg/L.
5. Reporting limit for MTBE is 0.02 mg/L.

Comments:

Date analyzed: 8/8/91 Checked by: T. G. Miller

AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR TOTAL PETROLEUM HYDROCARBONS

Location: Amoco Terminal, 2904 Winter St., Superior, WI

Sampling Date: 8/6/91 Lab#: 91W1620 Method: TPH by GC

Sample ID	TPH as Gasoline	TPH as Distillate
Trip blank	ND	ND
Duplicate	ND	ND
MW-33	ND	ND
MW-34	ND	ND
MW-35	ND	ND

NOTES
1. ND = Not Detected.
2. The detection limit for TPH by GC is 1 mg/L for gasoline and distillate.

Analysis Date: 8/8/91 Checked By: T. G. Miller

STANDARD OIL (INDIANA)
ENVIRONMENTAL AFFAIRS AND SAFETY

FLUID SAMPLE TRANSMITTAL
AND REQUEST FOR ANALYSES

ATTENTION: DIRECTOR. GROUNDWATER MANAGEMENT
RESEARCH CENTER
4502 E 41 ST ST.
TULSA. OKLAHOMA 74135

PLEASE PROVIDE COMPLETE INFORMATION
IDENTIFY ALL ESTIMATES

FROM:(ORIGINATING LOCATION)
OFFICE: Superior Terminal
FILE: 10-88-457.05
SAMPLE NO. (3) MW's and Duplicate
RESULTS TO: Keaven P. Heaton

ANALYSES REQUESTED: ☒ DISSOLVED HYDROCARBONS ☐ PRODUCT IDENTIFICATION OTHER: BTEX, MTBE, TPH chromatograms

STATEMENT OF PROBLEM: Ground water contamination from gasoline and fuel oil releases.

PRIORITY REQUESTED: URGENT ☐ ROUTINE ☒ DATE RESULTS REQUIRED ASAP

LOCATION SAMPLED:
REGION Wisconsin DISTRICT Chicago
FACILITY Superior Amoco Terminal
LOCATION ADDRESS 2904 Winter St.
STATE Wisconsin 54880 CITY Superior
SERVICE STATION NUMBER N/A

SAMPLE TYPES: PRODUCT ☐ WATER ☒ OTHER —
NO. OF SAMPLES FROM TESTED INTERVAL OR LOCATION (3) MW's and Duplicate
COLLECTED FROM: OBSERVATION WELL ☒ RECOVERY WELL ☐ WATER WELL ☐ SEPARATOR ☐
TANK ☐ PIT ☐ STREAM ☐ DISCHARGE POINT ☐ WATER TAP ☐ OTHER —

DATE COLLECTED 8-6-91 BY Mike Lee DEPT. Environmental Tec
DATE SHIPPED 8-7-91 BY Mike Lee VIA Airborne Express
SAMPLE DATA: FLUID SAMPLES FROM Miller Creek FORMATION (IF KNOWN)
INTERVAL SAMPLED 13' [redacted] TO 31' ☒ FT LITHOLOGY silty sand
ADDITIONAL INFORMATION OR REMARKS: * Send results to John Grams

CC:

REQUESTED BY: John Grams DATE 8-7-91
SIGNATURE
Michael A. Lee

Delta
Environmental
Consultants, Inc.
3900 Northwoods Dr., Suite 200
St. Paul, MN 55112

CHAIN-OF-CUSTODY RECORD

DELTA PROJECT NO. 10-88-457 | INVOICE CODE A | PAGE 1 OF

PROJECT MANAGER John C. Grams

PROJECT NAME Amoco Terminal

PROJECT LOCATION Superior, Wisconsin

SAMPLER'S SIGNATURE Michael A. Lee

TURN AROUND REQUESTED:
- [x] NORMAL
- [ ] RUSH _____
- [ ] OTHER _____

LAB NAME: LAB USE ONLY

LABORATORY PROJECT NO.

SAMPLE ID	SAMPLE LOCATION/DESCRIPTION	DATE/TIME SAMPLED	SAMPLE MATRIX: SOIL(S): AIR(A): BULK(B): AQUEOUS(Q): SLUDGE(L): OTHER(O)	ANALYSIS REQUESTED: BTEX, MTBE	ANALYSIS REQUESTED: TPH	NUMBER OF CONTAINERS	ACCEPT (A) REJECT (R)	SAMPLE CONDITION AS RECEIVED: CHILLED YES/NO; SEALED YES/NO; SAMPLE CONDITION/ COMMENTS	LABORATORY SAMPLE NUMBER
MW-33	2" PVC - Top of water column	80691-1650	Q	✓	✓	1			
MW-34		80691-1615	Q	✓	✓	1			
MW-35		80691-1445	Q	✓	✓	1			
uplicate		80691-Dup	Q	✓	✓	1			
rave/Blank	2-ml Freon vial	Travel Blank	O	✓	✓	1			

GENERAL COMMENTS: * Send results to John Grams *, Sealed # B457

5 ◀ TOTAL NUMBER OF CONTAINERS

RELINQUISHED BY (SIGNATURE)	DATE	3 RELINQUISHED BY (SIGNATURE)	DATE	5 RELINQUISHED BY (SIGNATURE)	DATE
Michael A. Lee	8-7-91				
COMPANY: Delta Environmental	TIME: 13:00	COMPANY	TIME	COMPANY	TIME
RECEIVED BY (SIGNATURE)	DATE: 8-8-91	4 RECEIVED BY (SIGNATURE)	DATE	6 RECEIVED BY (SIGNATURE)	DATE
COMPANY: Amoco GMS	TIME: 8:31am	COMPANY	TIME	COMPANY	TIME

Original - Return with Report • Yellow - Lab Copy • Pink - Sampler Copy

APPENDIX D

HISTORICAL GROUND WATER ANALYTICAL RECORDS

GROUND WATER CHEMISTRY DATA

PROJECT NAME: SUPERIOR TERMINAL
LOCATION: SUPERIOR, WISCONSIN
PROJECT NO.: 10-88-457

na=parameter not analyzed
nd=not detected at or above method detection
ns=not sampled

TPH analyses by Amoco listed under THC

WELL NO.:MW-3
UNITS:mg/L

DATE MM/DD/YY	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL HYDCARB	SUM BTEX	ANALYTICAL LABORATOR	MTBE
03/23/88	0.03	0.03	0.02	0.05	na	0.13	Amoco GMS	
09/21/88	<0.001	<0.001	<0.001	<0.001	<0.01	<0.004	Pace Labs	
04/27/89	3.73	5.01	0.049	7.18	na	16.0	Amoco GMS	
08/29/90	0.128	0.236	0.034	0.858	na	1.26	Amoco GMS	
01/31/91	0.012	0.003	0.012	0.049	na	0.106	Amoco GMS	
07/10/91	0.381	0.477	0.063	0.675	6	1.6	Amoco GMS	0.03 > PAL

WELL NO.:MW-4
UNITS:mg/L

DATE MM/DD/YY	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL HYDCARB	SUM BTEX	ANALYTICAL LABORATOR	MTBE
03/23/88	<0.001	<0.001	<0.001	<0.002	na	<0.005	Amoco GMS	
09/21/88	<0.001	<0.001	<0.001	<0.001	<0.01	<0.004	Pace Labs	
04/27/89	<0.002	<0.002	<0.002	<0.004	na	<0.01	Amoco GMS	
08/29/90	<0.002	<0.002	<0.002	<0.004	na	<0.01	Amoco GMS	
01/31/91	<0.001	<0.004	<0.002	<0.002	na	<0.004	Amoco GMS	
07/10/91	<0.001	<0.001	0.002	<0.001	<1.0	0.002	Amoco GMS	<0.02 > PAL

WELL NO.:MW-30
UNITS:mg/L

DATE MM/DD/YY	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL HYDCARB	SUM BTEX	1,2-DCA	1,1,2-TCE	1,2-DCP
07/11/89	2.67	0.282	0.008	0.368	na	3.33			
08/29/90	1.85	0.293	0.03	0.374	na	2.55			
08/29/90	1.7	0.25	0.023	0.28	na	2.25	0.0009	0.0015	0.0005
01/31/91	0.578	0.073	0.003	0.084	na	0.737			
01/31/91	0.85	0.1	<0.025	na	na	na			
07/10/91	0.904	0.059	<0.001	0.09	9	1.05	na	na	na
07/10/91	1.4	<0.100	<0.100	<0.100	na	na	<0.02		

Off-Site Contam. Not valid as these were not found in MW-33

WELL NO.:MW-31
UNITS:mg/L

DATE MM/DD/YY	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL HYDCARB	SUM BTEX	ANALYTICAL LABORATORY
07/11/89	0.003	<0.002	<0.002	<0.004	na	0.003	Amoco GMS
08/29/90	<0.002	0.032	0.005	0.029	na	0.066	Amoco GMS
01/31/91	<0.001	0.003	<0.001	0.003	na	0.006	Amoco GMS
07/10/91	<0.001	<0.001	<0.001	<0.001	<1		Amoco GMS

WELL NO.:MW-5
UNITS:mg/L

DATE MM/DD/YY	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL HYDCARB	SUM BTEX	ANALYTICAL LABORATOR	MTBE
03/23/88	<0.001	<0.001	<0.001	<0.002	na	<0.005	Amoco GMS	
09/21/88	<0.001	<0.001	<0.001	<0.001	<0.01	<0.004	Pace Labs	
04/27/89	<0.002	<0.002	<0.002	<0.004	na	<0.01	Amoco GMS	
08/29/90	<0.002	<0.002	<0.002	<0.004	na	<0.01	Amoco GMS	
01/31/91	ns							
07/10/91	<0.001	<0.001	<0.001	<0.001	<1.0		Amoco GMS	<0.02

WELL NO.:MW-6
UNITS:mg/L

DATE MM/DD/YY	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL HYDCARB	SUM BTEX	1,2-DCA	ANALYTICAL LABORATOR	MTBE
03/23/88	<0.001	<0.001	<0.001	<0.002	na	<0.005		Amoco GMS	
09/21/88	<0.001	<0.001	<0.001	<0.001	<0.01	<0.004		Pace Labs	
04/27/89	<0.002	<0.002	<0.002	<0.004	na	<0.01		Amoco GMS	
08/29/90	<0.002	<0.002	<0.002	<0.004	na	<0.01		Amoco GMS	
08/29/90	<0.001	<0.001	<0.001	<0.001	na	<0.004	0.0085	Pace Labs	
01/31/91	0.003	<0.001	<0.001	<0.002	na	0.003		Amoco GMS	
01/31/91	0.0026	<0.001	<0.001	na	na	na		Pace Labs	
07/10/91	<0.001	<0.001	<0.001	<0.001	<1.0			Amoco GMS	<0.02
07/10/91	<0.001	<0.001	<0.001	<0.001	na	na	0.002	Pace Labs	

WELL NO.:MW-7
UNITS:mg/L

DATE MM/DD/YY	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL HYDCARB	SUM BTEX	ANALYTICAL LABORATORY
03/23/88	<0.001	<0.001	<0.001	<0.002	na	<0.005	Amoco GMS
09/21/88	<0.001	<0.001	<0.001	<0.001	<0.01	<0.004	Pace Labs
04/27/89	<0.002	<0.002	<0.002	<0.004	na	<0.01	Amoco GMS
08/29/90	<0.002	<0.002	<0.002	<0.004	na	<0.01	Amoco GMS
01/31/91	<0.001	0.002	<0.001	0.003	na	0.005	Amoco GMS
07/10/91	<0.001	<0.001	<0.001	<0.001	<1.0		Amoco GMS

WELL NO.:MW-8
UNITS:mg/L

DATE MM/DD/YY	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL HYDCARB	SUM BTEX	ANALYTICAL LABORATORY
03/23/88	<0.001	<0.001	<0.001	<0.002	na	<0.005	Amoco GMS
09/21/88	<0.001	<0.001	<0.001	<0.001	<0.01	<0.004	Pace Labs
04/27/89	<0.002	<0.002	<0.002	<0.004	na	<0.01	Amoco GMS
08/29/90	<0.002	<0.002	<0.002	<0.004	na	<0.01	Amoco GMS
01/31/91	<0.001	<0.001	<0.001	<0.002	na	<0.005	Amoco GMS
07/10/91	<0.001	<0.001	<0.001	<0.001	<1.0		Amoco GMS

WELL NO.:MW-9
UNITS:mg/L

DATE MM/DD/YY	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL HYDCARB	SUM BTEX	ANALYTICAL LABORATORY
03/23/88	0.37	0.17	1.4	1.5	na	3.44	Amoco GMS
09/21/88	0.61	0.044	0.29	0.12	10.3	1.064	Pace Labs
04/27/89	0.261	1.28	1.6	3.65	na	6.79	Amoco GMS
08/29/90	13.8	14.2	5.71	19.1		52.7	Amoco GMS
01/31/91	1.24	0.701	1.3	2.23	na	5.47	Amoco GMS
01/31/91	<0.050	<0.050	0.67	na	na	na	Pace Labs
07/10/91	0.627	0.255	0.794	1.13	69	2.81	Amoco GMS

WELL NO.:MW-10
UNITS:mg/L

DATE MM/DD/YY	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL HYDCARB	SUM BTEX	ANALYTICAL LABORATORY
03/23/88	0.23	<0.001	0.09	0.04	na	0.36	Amoco GMS
09/21/88	0.08	0.011	0.003	0.015	0.6	0.109	Pace Labs
04/27/89	0.26	0.042	0.018	0.045	na	0.365	Amoco GMS
08/29/90	0.235	0.027	0.069	0.063	na	0.394	Amoco GMS
01/31/91	0.069	0.007	0.015	0.017	na	0.108	Amoco GMS
07/10/91	0.026	0.013	0.031	0.022	2	0.093	Amoco GMS

WELL NO.:MW-11
UNITS:mg/L

DATE MM/DD/YY	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL HYDCARB	SUM BTEX	ANALYTICAL LABORATORY
03/23/88	0.07	<0.001	0.007	0	na	0.077	Amoco GMS
09/21/88	<0.001	<0.001	<0.001	<0.001	0.01	<0.004	Pace Labs
04/27/89	0.147	0.019	0.018	0.019	na	0.203	Amoco GMS
08/29/90	0.069	0.003	0.024	0.009	na	0.104	Amoco GMS
01/31/91	0.125	0.014	0.04	0.012	na	0.191	Amoco GMS
07/10/91	0.087	0.01	0.02	0.009	2	0.127	Amoco GMS

WELL NO.:MW-13
UNITS:mg/L

DATE MM/DD/YY	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL HYDCARB	SUM BTEX	ANALYTICAL LABORATORY
03/23/88	<0.001	<0.001	<0.001	0.01	na	0.01	Amoco GMS
09/21/88	<0.001	<0.001	<0.001	<0.001	<0.01	<0.004	Pace Labs
04/27/89	<0.002	<0.002	<0.002	<0.004	na	<0.01	Amoco GMS
08/29/90	<0.002	<0.002	<0.002	<0.004	na	<0.01	Amoco GMS
01/31/91	<0.001	<0.001	<0.001	<0.002	na	<0.005	Amoco GMS
07/10/91	<0.001	<0.001	<0.001	<0.001	<1		Amoco GMS

Raza

WELL NO.:MW-15
UNITS:mg/L

DATE MM/DD/YY	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL HYDCARB	SUM BTEX	ANALYTICAL LABORATOR	MTBE
03/23/88	ns	ns	ns	ns	ns	0	Amoco GMS	
09/21/88	0.018	0.016	0.007	0.016	0.51	0.057	Pace Labs	
04/27/89	0.036	0.002	0.005	0.006	na	0.049	Amoco GMS	
08/29/90	0.004	<0.002	<0.002	<0.004	na	0.004	Amoco GMS	
01/31/91	0.002	0.003	<0.001	0.002	na	0.007	Amoco GMS	
01/31/91	0.0019	<0.001	0.0018	na	na	na	Pace Labs	
07/10/91	<0.001	<0.001	<0.001	<0.001	<1.0		Amoco GMS	<0.02
07/10/91	<0.001	<0.001	<0.001	<0.001	na	na	Pace Labs	

WELL NO.:MW-16
UNITS:mg/L

DATE MM/DD/YY	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL HYDCARB	SUM BTEX	ANALYTICAL LABORATOR	MTBE
03/23/88	ns	ns	ns	ns	ns	0	Amoco GMS	
09/21/88	0.77	3.4	0.71	2.8	37	7.68	Pace Labs	
04/27/89	1.54	2.38	0.358	3.41	na	7.69	Amoco GMS	
08/29/90	0.195	2.34	0.36	3.13	na	6.02	Amoco GMS	
08/29/90	1	3.4	0.66	3.5	na	8.56	Pace Labs	
01/31/91	0.169	2.869	0.599	3.41	na	7.05	Amoco GMS	
01/31/91	1.2	4.2	6.7	na	na	na	Pace Labs	
07/10/91	0.689	4.26	0.817	3.8	57	9.56	Amoco GMS	0.55
07/10/91	0.36	0.32	0.66	2.8	na	na	Pace Labs	

WELL NO.:MW-17
UNITS:mg/L

DATE MM/DD/YY	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL HYDCARB	SUM BTEX	ANALYTICAL LABORATOR	MTBE
03/23/88	ns	ns	ns	ns	ns	0	Amoco GMS	
09/21/88	<0.001	<0.001	<0.001	<0.001	<0.01	<0.004	Pace Labs	
04/27/89	<0.002	<0.002	<0.002	<0.004	na	<0.01	Amoco GMS	
08/29/90	<0.002	<0.002	<0.002	<0.004	na	<0.01	Amoco GMS	
08/29/90	<0.001	<0.001	<0.001	<0.001	na	<0.004	Pace Labs	
01/31/91	<0.001	<0.001	<0.001	<0.002	na	<0.005	Amoco GMS	
01/31/91	<0.001	<0.001	<0.001	na	na	na	Pace Labs	
07/10/91	<0.001	<0.001	<0.001	<0.001	<1.0		Amoco GMS	<0.02
07/10/91	<0.001	<0.001	<0.001	<0.001	na	na	Pace Labs	

WELL NO.:MW-18
UNITS:mg/L

DATE MM/DD/YY	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL HYDCARB	SUM BTEX	ANALYTICAL LABORATORY
03/23/88	ns	ns	ns	ns	ns	0	Amoco GMS
09/21/88	0.055	<0.001	0.001	0.009	0.33	0.065	Pace Labs
04/27/89	0.641	0.027	0.007	0.031	na	0.706	Amoco GMS
08/29/90	0.308	0.011	0.01	0.017	na	0.346	Amoco GMS
01/31/91	0.166	0.013	<0.001	0.015	na	0.194	Amoco GMS
07/10/91	<0.001	<0.001	<0.001	<0.001	<1		Amoco GMS

plume movement

WELL NO.:MW-19
UNITS:mg/L

DATE MM/DD/YY	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL HYDCARB	SUM BTEX	ANALYTICAL LABORATOR	MTBE
07/11/89	0.003	<0002	0.009	0.009	na	0.021	Amoco GMS	
08/29/90	<0.002	<0.002	0.009	0.036	na	0.045	Amoco GMS	
08/29/90	0.0023	<0.001	0.0063	0.035	na	0.044	Pace Labs	
01/31/91	<0.001	<0.001	0.003	0.003	na	0.006	Amoco GMS	
07/09/91	0.001	0.001	0.007	0.028	<1.0	0.038	Amoco GMS	<0.02
07/10/91	0.0022	<0.001	0.0088	0.022	na	na	Pace Labs	

WELL NO.:MW-20
UNITS:mg/L

DATE MM/DD/YY	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL HYDCARB	SUM BTEX	ANALYTICAL LABORATORY
07/11/89	<0.002	<0.002	<0.002	<0.004	na	<0.01	Amoco GMS
08/29/90	<0.002	<0.002	<0.002	<0.004	na	<0.01	Amoco GMS
01/31/91	<0.001	<0.001	<0.001	<0.002	na	<0.005	Amoco GMS
07/10/91	<0.001	<0.001	<0.001	<0.001	<1		Amoco GMS

WELL NO.:MW-21
UNITS:mg/L

DATE MM/DD/YY	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL HYDCARB	SUM BTEX	ANALYTICAL LABORATORY
07/11/89	1.97	0.031	0.027	0.05	na	2.08	Amoco GMS
08/29/90	0.045	<0.002	<0.002	0.007	na	0.052	Amoco GMS
01/31/91	0.075	0.003	<0.001	0.005	na	0.083	Amoco GMS
07/10/91	0.085	0.001	<0.001	0.003	<1	0.089	Amoco GMS

WELL NO.:MW-28
UNITS:mg/L

DATE MM/DD/YY	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL HYDCARB	SUM BTEX	ANALYTICAL LABORATORY
07/11/89	<0.002	<0.002	<0.002	<0.004	na	<0.01	Amoco GMS
08/29/90	<0.002	<0.002	<0.002	<0.004	na	<0.01	Amoco GMS
08/29/90	<0.001	<0.001	<0.001	<0.001	na	<0.004	Pace Labs
01/31/91	ns						
07/10/91	<0.001	<0.001	<0.001	<0.001	<1		Amoco GMS

WELL NO.:MW-33
UNITS:mg/L

DATE MM/DD/YY	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL HYDROCARBONS	
08/06/91	<0.001	<0.001	<0.001	<0.001	<1	Amoco GMS

WELL NO.:MW-34
UNITS:mg/L

DATE MM/DD/YY	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL HYDROCARBONS	
08/06/91	<0.001	<0.001	<0.001	<0.001	<1	Amoco GMS

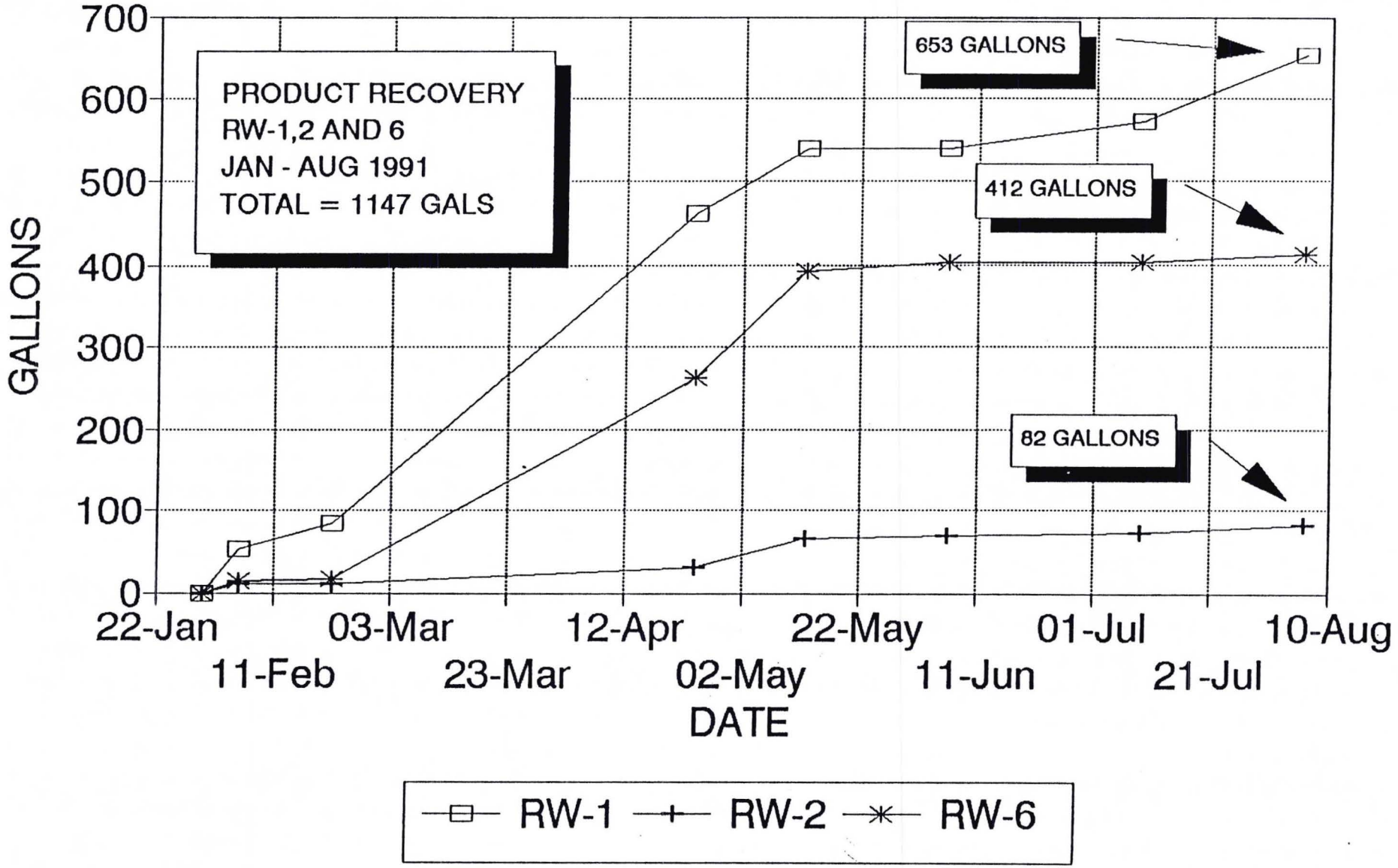
WELL NO.:MW-35
UNITS:mg/L

DATE MM/DD/YY	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TOTAL HYDROCARBONS	
08/06/91	<0.001	<0.001	<0.001	<0.001	<1	Amoco GMS

APPENDIX E

INTERIM PRODUCT RECOVERY SYSTEM OPERATIONAL DATA

INTERIM PRODUCT RECOVERY SYSTEM
AMOCO SUPERIOR TERMINAL



OPERATING DATA
INTERIM PRODUCT RECOVERY SYSTEM
AMOCO SUPERIOR TERMINAL
SUPERIOR, WI
DELTA NO 10-88-457

RECOVERY WELL #2

	RECOVERY WELL					PRD TANK		TOTAL	
DATE	PROD LVL	WTR LVL	PRD THK	CYCLES	HOURS	PROD LVL	PRD THK	PROD VOL	PROD REC
01/30/91	20.58	32.08	11.5	18	0.4	0	0	0	0
02/05/91				19	0.4	5.13	0.12	10	10
02/07/91				19	0.4				
02/09/91				19	0.4				
02/18/91				19	0.4				
02/21/91	21.1	30.85	9.65	19	0.4	5.14	0.11	10	10
03/05/91				30	0.6				
04/01/91				38	49.8				
04/16/91				42	49.9				
04/24/91	20.58	29.69	9.11	42	49.9	4.87	0.38	31	31
05/06/91				58	49.9				
05/13/91	19.42	27.75	8.33	71	49.9	4.62	0.63	65	65
05/20/91				73	49.9				
06/03/91				74	49.9				
06/06/91	19.56	25.4	5.84	75	49.9	4.61	0.64	68	68
06/06/91	22	24.16	2.16	87	50				
06/19/91				87	50				
07/09/91	18.3	23.78	5.48	87	50	4.56	0.69	72	72
07/10/91	21.05	22.9	1.85	99	50				
07/22/91				100	50				
08/06/91	18.11	20.29	2.18	100	50	4.52	0.73	82	82
08/19/91				100	50				

OPERATING DATA
INTERIM PRODUCT RECOVERY SYSTEM
AMOCO SUPERIOR TERMINAL
SUPERIOR, WI
DELTA NO 10-88-457

RECOVERY WELL #1

	RECOVERY WELL					PRD TANK		TOTAL	
DATE	PROD LVL	WTR LVL	PRD THK	CYCLES	HOURS	PROD LVL	PRD THK	PROD VOL	PROD REC
01/30/91	21.69	31.26	9.57	5499		0	0	0	0
02/05/91				5500	365.2	4.56	0.38	52	52
02/07/91				5500	365.2				
02/09/91				5500	365.2				
02/18/91				5502	365.3				
02/21/91	22.17	30.32	8.15	5503	365.4	4.48	0.46	83	83
03/05/91				5524	365.8				
04/01/91				5546	366.4				
04/16/91				5551	366.6				
04/24/91	22.2	28.26	6.06	5551	366.6	3.44	1.5	462	462
05/06/91				5570	366.9				
05/13/91	21.5	25.9	4.4	5570	366.9	3.25	1.69	540	540
05/20/91				5570	366.9				
06/03/91				5570	366.9				
06/06/91	21.31	24.95	3.64	5570	366.9	3.35	1.59	540	540
06/06/91	23.3	24.5	1.2	5579	366.9				
06/19/91				5583	367.1				
07/09/91	20.45	23.08	2.63	5584	367.1	3.17	1.77	572	572
07/10/91	21.28	22.52	1.24	5586	367.1				
07/22/91				5587	367.2				
08/06/91	19.63	22.17	2.54	5597	367.3	3.01	1.93	653	653
08/06/91	19.85	21.4	1.55	5600	367.4				
08/19/91				5605	367.5				

OPERATING DATA
INTERIM PRODUCT RECOVERY SYSTEM
AMOCO SUPERIOR TERMINAL
SUPERIOR, WI
DELTA NO 10-88-457

RECOVERY WELL #6

	RECOVERY WELL					PROD TANK			
DATE	PROD LVL	WTR LVL	PRD THK	CYCLES	HOURS	PROD LVL	PRD THK	PROD VOL	TOTAL PROD REC
01/30/91	20.47	26.61	6.14	34590	293	0	0	0	0
02/05/91				34592	293.05	5	0.12	13	13
02/07/91				34597	293.1				
02/09/91				34604	293.15				
02/18/91				34630	293.4				
02/21/91	21.56	24.92	3.36	34643	293.5	5	0.15	15	15
03/05/91				34649	293.5				
04/01/91				35632	298.4				
04/16/91				35632	298.4				
04/24/91	22.22	25.44	3.22	35645	298.5	4.34	0.96	261	261
05/06/91				35742	299.7				
05/13/91	21	23.45	2.45	35776	300	3.95	1.35	392	392
05/20/91				35797	300.3				
06/03/91				35819	300.5				
06/06/91	20.51	23.26	2.75	35819	300.6	3.94	1.36	404	404
06/19/91				35826	300.6				
07/09/91	19.32	22.92	3.6	35828	300.6	3.94	1.36	404	404
07/10/91	20.15	21.75	1.6	35836	300.7				
07/22/91				35858	300.8				
08/06/91	18.64	22.04	3.4	35868	300.9	3.92	1.38	412	412
08/06/91	18.9	21.3	2.4	35871	301				
08/19/91				35909	301.2				

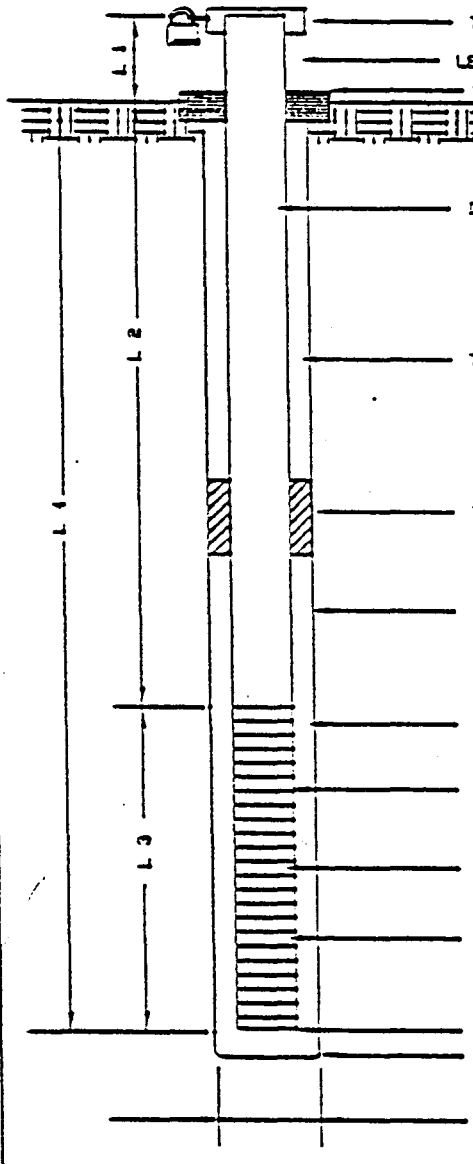
APPENDIX F

MONITORING WELL CONSTRUCTION INFORMATION

INSTALLATION OF ABOVE GROUND MONITORING WELL

PROJECT: Amoco Superior Terminal
Superior, Wisconsin
DELTA NO.: 10-88-457

MONITORING WELL NO.: MW-32
ELEVATIONS: TOP OF RISER 633.76
GROUND LEVEL 631.06



TYPE OF WELL CAP	4" locking pro. top - 6'
LENGTH ABOVE GROUND	2.7' to top of casing
THICKNESS AND TYPE OF SEAL	bentonite from filter pack
DIAMETER, MATERIAL AND JOINT TYPE OF RISER	2" Schedule 40 threaded PVC
TYPE OF BACKFILL AROUND RISER	bentonite granular
THICKNESS AND TYPE OF SEAL	as above
DISTANCE OF FILTER SAND ABOVE TOP OF SCREEN	2'
TYPE OF FILTER AROUND SCREEN	#30 red flint filter sand
WELL SCREEN MATERIAL	PVC
SCREEN GAUGE OR SIZE OF OPENINGS (SLOT SIZE)	10 slot (.01)
DIAMETER AND LENGTH OF SCREEN	2" x 10'
DEPTH TO THE BOTTOM OF MONITORING WELL	26.9 from top of casing
DEPTH TO THE BOTTOM OF FILTER SAND	
DIAMETER OF BOREHOLE	

L 1 = 2.7 FT.
L 2 = 9.2 FT.
L 3 = 15 FT.
L 4 = 24.2 FT.

INSTALLATION COMPLETED:
DATE: 7/23/91
TIME: 4:15 pm

MONITORING WELL WATER LEVEL MEASUREMENTS		
DATE	TIME	WATER LEVEL *
7/24/91	9:49	16.10 product odor

* MEASURE POINT: TOC

Delta Environmental Consultants, Inc.

T10-001G
Rev. 4/91

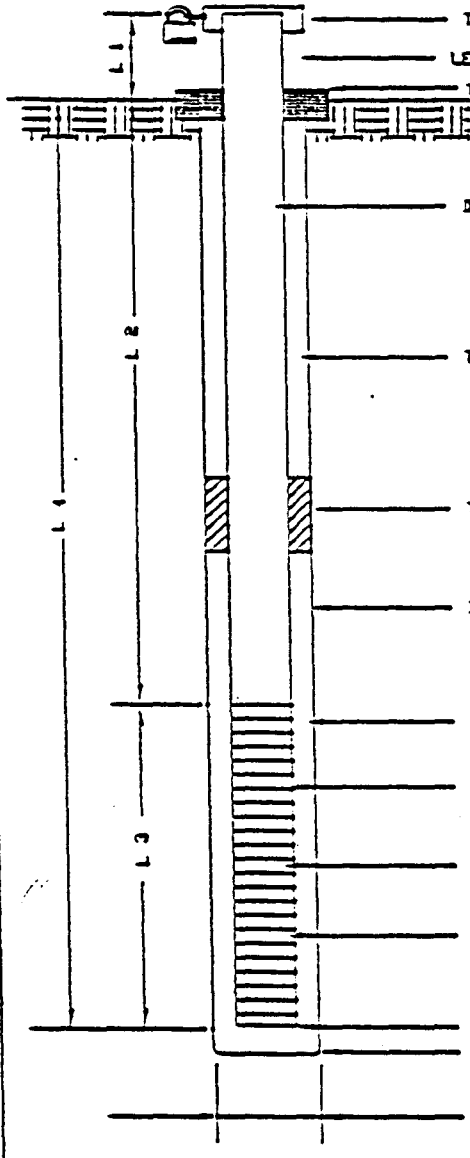
INSTALLATION OF ABOVE GROUND MONITORING WELL

PROJECT: Amoco Superior Terminal
Superior, Wisconsin

DELTA NO.: 10-88-457

MONITORING WELL NO.: MW-33

ELEVATIONS: TOP OF RISER 632.42
GROUND LEVEL 630.12



TYPE OF WELL CAP	4" locking pro top 6'
LENGTH ABOVE GROUND	2.3' to top of casing
THICKNESS AND TYPE OF SEAL	bentonite from filter pack
DIAMETER, MATERIAL AND JOINT TYPE OF RISER	2" Schedule 40 threaded PVC
TYPE OF BACKFILL AROUND RISER	bentonite granular
THICKNESS AND TYPE OF SEAL	as above
DISTANCE OF FILTER SAND ABOVE TOP OF SCREEN	2'
TYPE OF FILTER AROUND SCREEN	#30 red flint filter sand
WELL SCREEN MATERIAL	PVC
SCREEN GAUGE OR SIZE OF OPENINGS (SLOT SIZE)	10 slot (.010)
DIAMETER AND LENGTH OF SCREEN	2" x 10'
DEPTH TO THE BOTTOM OF MONITORING WELL	25.9 from top of casing
DEPTH TO THE BOTTOM OF FILTER SAND	
DIAMETER OF BOREHOLE	

L 1 = 2.3 FT.
L 2 = 8.6 FT.
L 3 = 15 FT.
L 4 = 23.6 FT.

INSTALLATION COMPLETED:
DATE: 7/23/91
TIME: 6:15 pm

MONITORING WELL WATER LEVEL MEASUREMENTS		
DATE	TIME	WATER LEVEL *
7/24/91	9:38	13.50

* MEASURE POINT: TOC

Delta Environmental Consultants, Inc.

T10-001G
Rev. 4/91

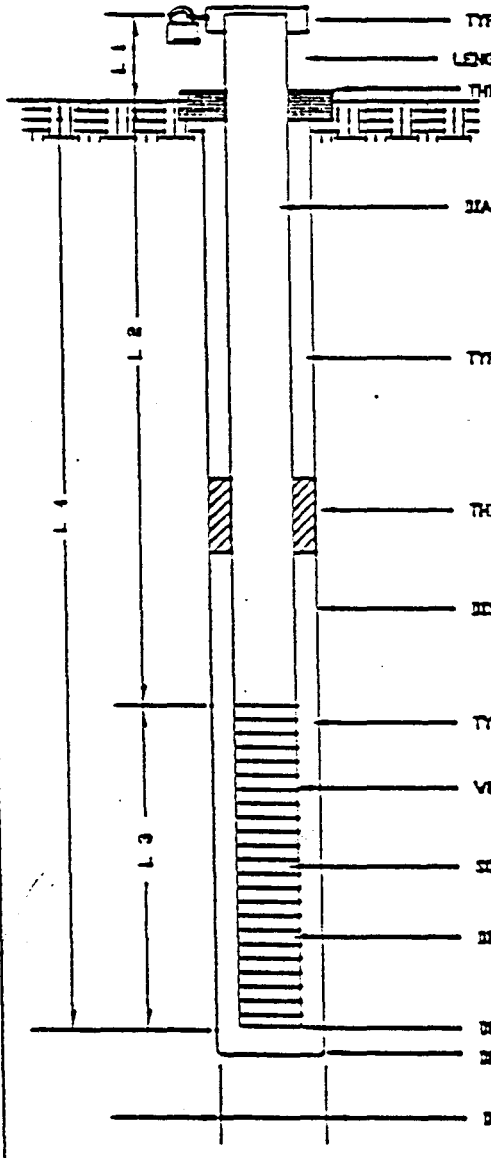
INSTALLATION OF ABOVE GROUND MONITORING WELL

PROJECT: Amoco Superior Terminal
Superior, Wisconsin

DELTA NO.: 10-88-457

MONITORING WELL NO.: MW-34

ELEVATIONS: TOP OF RISER 629.10
GROUND LEVEL 627.30



TYPE OF WELL CAP	4" locking pro top 6'
LENGTH ABOVE GROUND	1.8' to top of casing
THICKNESS AND TYPE OF SEAL	bentonite from filter pack
DIAMETER, MATERIAL AND JOINT TYPE OF RISER	2" Schedule 40 threaded PVC
TYPE OF BACKFILL AROUND RISER	bentonite granular
THICKNESS AND TYPE OF SEAL	as above
DISTANCE OF FILTER SAND ABOVE TOP OF SCREEN	2'
TYPE OF FILTER AROUND SCREEN	#30 red flint filter sand
WELL SCREEN MATERIAL	PVC
SCREEN GAUGE OR SIZE OF OPENINGS (SLOT SIZE)	10 slot (.010)
DIAMETER AND LENGTH OF SCREEN	2" x 10'
DEPTH TO THE BOTTOM OF MONITORING WELL	30.4 from top of casing
DEPTH TO THE BOTTOM OF FILTER SAND	
DIAMETER OF BOREHOLE	

L 1 = 1.8 FT.
L 2 = 18.6 FT.
L 3 = 10 FT.
L 4 = 28.6 FT.

INSTALLATION COMPLETED:
DATE: 7/24/91
TIME: 10:50 am

MONITORING WELL WATER LEVEL MEASUREMENTS

DATE	TIME	WATER LEVEL *
7/25/91	7:15 am	12.75

* MEASURE POINT: TOC

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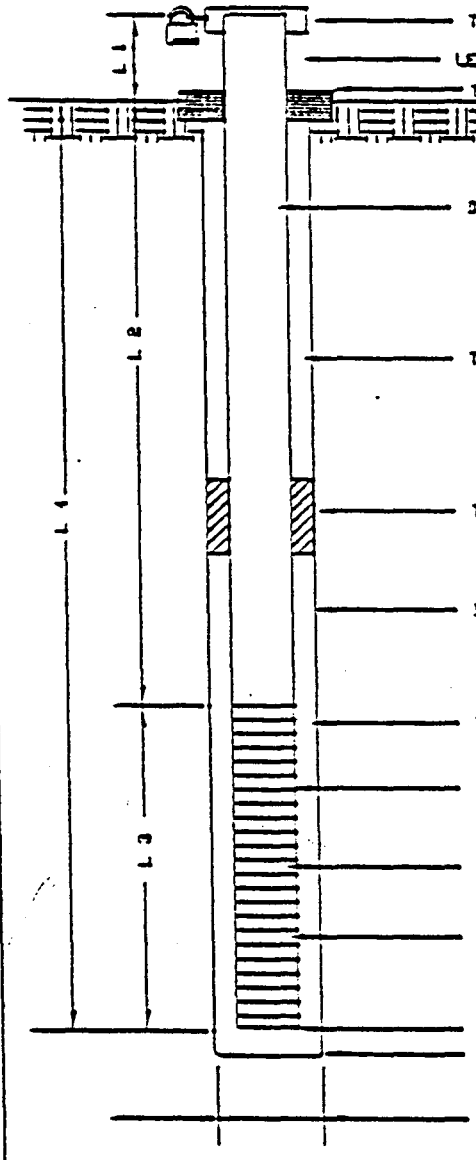
T10-001G
Rev. 4/91

INSTALLATION OF ABOVE GROUND MONITORING WELL

PROJECT: Amoco Superior Terminal
Superior, Wisconsin
DELTA NO.: 10-88-457

MONITORING WELL NO.: MW-35
ELEVATIONS: TOP OF RISER 639.60
GROUND LEVEL 637.20



TYPE OF WELL CAP	4" locking pro top
LENGTH ABOVE GROUND	2.4 to top of casing
THICKNESS AND TYPE OF SEAL	bentonite granular
DIAMETER, MATERIAL AND JOINT TYPE OF RISER	2" Schedule 40 threaded PVC
TYPE OF BACKFILL AROUND RISER	bentonite granular
THICKNESS AND TYPE OF SEAL	as above
DISTANCE OF FILTER SAND ABOVE TOP OF SCREEN	2'
TYPE OF FILTER AROUND SCREEN	#30 red flint filter sand
WELL SCREEN MATERIAL	PVC
SCREEN GAUGE OR SIZE OF OPENINGS (SLOT SIZE)	10 slot (.010)
DIAMETER AND LENGTH OF SCREEN	2" x 15'
DEPTH TO THE BOTTOM OF MONITORING WELL	30.5 from top of casing
DEPTH TO THE BOTTOM OF FILTER SAND	
DIAMETER OF BOREHOLE	

L 1 = 2.4 FT.
L 2 = 13.1 FT.
L 3 = 15 FT.
L 4 = 28.1 FT.

INSTALLATION COMPLETED:
DATE: 7/24/91
TIME: 6:00 pm

MONITORING WELL WATER LEVEL MEASUREMENTS		
DATE	TIME	WATER LEVEL *
7/25/91	7:25	17.30

* MEASURE POINT: TOC

Delta Environmental Consultants, Inc.

T10-001G
Rev. 4/91

APPENDIX G

SOIL BORING LOGS

PROJECT NAME / LOCATION	PROJECT NUMBER: 10-88-457	BORING NUMBER: SB-32	SHEET OF
Amoco Superior Wisconsin Superior, Wisconsin	CONTRACTOR: ETI	DRILLING METHOD: HSA	
	DRILLER: Greg Scanlan	DRILLING RIG: ATV	
	START: 10:30 AM 7/23/91	COMPLETED: 12N 7/23/91	
LAND OWNER: Burlington Northern Railraod	SURFACE ELEVATION:	LOGGED BY: PJC	

SAMPLE TYPE	SAMPLE NUMBER	BLOWN COUNTS	SAMPLE INTERVAL (ft)	SAMPLE RECOVERY (in)	DEPTH SCALE 1"=	DESCRIPTIONS OF MATERIALS AND CONDITIONS	CONTAMINANT OBSERVATIONS INSTRUMENT: UNITS:	NOTES:
					1 2 3 4 5 6 7 8	Augered to 9' bgs, dense red plastic clay, moist	Field Head Screen Space	
	1	pushed	24	18	9 10 11	Pushed shelby tube from 9-11' for permeability testing of clay red clay at top, red silt at base of spoon	3.0 3.0	
	2	21 21 29 42	24	18	12 13	Alternating silty fine sand and laninated red clay some silty clay strong prod odor, very moist	Will split inously fo uge for fp 150 160	spoon cont- w.t. to ga-
	3		24	18	14 15	Tan silty fine sand, saturated at 13', prod odor, no sheen on water	160 160	
					16 17 18 19 20 21 22 23	SB-32 finished 15' bgs. Will move further north to set well. SB-32 finished at 4:15 pm as MW-32 following rig problems and discussions with JCG.		

BOREHOLE WATER LEVEL DATA					
DATE					
TIME					
GWL					
CASING DEPTH					

Delta Environmental Consultants, Inc.

PROJECT NAME / LOCATION	PROJECT NUMBER: 10-88-457	BORING NUMBER: SB-33	SHEET 1 OF 1
Amoco Superior Terminal Superior, Wisconsin	CONTRACTOR: ETI		DRILLING METHOD: HSA
	DRILLER: Greg Scanlon		DRILLING RIG: ATV
	START: 4:45 pm 7/23/91		COMPLETED: 6:15 7/23/91
LAND OWNER: Burlington Northern Railroad	SURFACE ELEVATION:		LOGGED BY: PJC

SAMPLE TYPE	SAMPLE NUMBER	BLOWS COUNTS	SAMPLE INTERVAL(ft)	SAMPLE RECOVERY(in)	DEPTH SCALE 1"=	DESCRIPTIONS OF MATERIALS AND CONDITIONS	CONTAMINANT OBSERVATIONS INSTRUMENT: UNITS:	NOTES:
					1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23	PTO on rig is not operating we will auger to 25' and set 15' of screen - should be a clean well. Cuttings will be field screened.		

BOREHOLE WATER LEVEL DATA					
DATE					
TIME					
GWL					
CASING DEPTH					

Delta Environmental Consultants, Inc.

PROJECT NAME / LOCATION	PROJECT NUMBER: 10-88-457	BORING NUMBER: SB-34 MW-34	SHEET 1 OF 1
Amoco Superior Terminal Superior, Wisconsin	CONTRACTOR: ETI		DRILLING METHOD: HSA
	DRILLER: Greg Scanlon		DRILLING RIG: ATV
	START: 7:45 pm 7/24/91		COMPLETED: 10:15 am 7/24
LAND OWNER: City of Superior	SURFACE ELEVATION:		LOGGED BY: PJC

SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	SAMPLE INTERVAL (ft)	SAMPLE RECOVERY (in)	DEPTH SCALE 1"=	DESCRIPTIONS OF MATERIALS AND CONDITIONS	CONTAMINANT OBSERVATIONS INSTRUMENT: UNITS:	NOTES:
					1	Soil saturated at surface dense red silty clay		
					2			
					3			
					4	Fine sand and silt at aprox. 20'.		
					5			
					6			
					7	Drilled to 28', set 10' of screen		
					8			
					9			
					10			
					11			
					12			
					13			
					14			
					15			
					16			
					17			
					18			
					19			
					20			
					21			
					22			
					23			

BOREHOLE WATER LEVEL DATA					
DATE					
TIME					
GWL					
CASING DEPTH					

PROJECT NAME / LOCATION	PROJECT NUMBER: 10-88-457	BORING NUMBER: SB-35 / MW-35	SHEET 1 OF 2
Amoco Superior Terminal Superior, Wisconsin	CONTRACTOR: ETI	DRILLING METHOD: HSA	
	DRILLER: Greg Scanlon	DRILLING RIG: ATV	
	START: 1:30 pm 7/24/91	COMPLETED: 4:15 pm 7/24	
LAND OWNER: Gordon Carroll	SURFACE ELEVATION:	LOGGED BY: PJC	

STAMPLE	SNAMPBER	BCLOWNTS	SIAMPLE(ft)	SRAMCPLVE(in)	DEPTH SCALE 1"=	DESCRIPTIONS OF MATERIALS AND CONDITIONS	CONTAMINANT OBSERVATIONS INSTRUMENT: UNITS:	NOTES:
					1	Coal and crushed briquets at surface		
					2			
					3			
					4			
					5			
					6			
					7			
					8			
					9		Field Head Screen Space	
		3			10			
	1	4 7 12	24	24	11	Dense red clay - stiff w/some gray mottling and moist - no odor	<1	
		4			12			
	2	7 9 10	24	24	13	Same as above	<1	
		4			14			
	3	6 6 10	24	24	15	Same as above	<1	
		7			16			
	4	9 12 13	24	24	17	Same as above	<1	
		7			18			
	5	7 9 10	24	24	19	Same as above	<1	
		6			20			
	6	7 9 6	24	24	21	Same as Above	<1	
		10			22			
	7	12 15 20	24	24	23	As above and red clayey silt at 23' - stiff		

BOREHOLE WATER LEVEL DATA					
DATE					
TIME					
GWL					
CASING DEPTH					

PROJECT NAME / LOCATION	PROJECT NUMBER: 10-88-457	BORING NUMBER: SB-35 / MW-35	SHEET 2 OF 2
Amoco Superior Terminal Superior, Wisconsin	CONTRACTOR: ETI	DRILLING METHOD: HSA	
	DRILLER: Greg Scanlon	DRILLING RIG: ATV	
	START: 1:30 pm 7/24/91	COMPLETED: 4:15 7/24/91	
LAND OWNER: Gordon Carroll	SURFACE ELEVATION:	LOGGED BY: PJC	

SAMPLE TYPE	SAMPLE NUMBER	BLOWS	SAMPLE (ft)	SAMPLE (in)	DEPTH SCALE 1"=	DESCRIPTIONS OF MATERIALS AND CONDITIONS	CONTAMINANT OBSERVATIONS INSTRUMENT: UNITS:	NOTES:
						Will pound 3" spoon with 2.5" brass liners to collect samples for permability testing		
	8	45 50 50	18	22	25	Upper 4" silty clay, lower 18" is ver fine tan sand		
					27 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23	2-6" brass liners filled with very fine tan sand collected for perm. testing from 26-27 below g.s. Set 15 ' of screen at 28' b.g.s.		

BOREHOLE WATER LEVEL DATA					
DATE					
TIME					
GWL					
CASING DEPTH					

PROJECT NAME / LOCATION	PROJECT NUMBER: 10-88-457	BORING NUMBER: SB-36	SHEET 1 OF 1
Amoco Superior Terminal Superior, Wisconsin	CONTRACTOR: ETI		DRILLING METHOD: HSA
	DRILLER: Greg Scanlon		DRILLING RIG: ATV
	START: 8:30 am 7/25/91		COMPLETED: 9:45 7/25/91
LAND OWNER: Amoco	SURFACE ELEVATION:		LOGGED BY: PJC

SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	SAMPLE INTERVAL(ft)	SAMPLE RECOVERY(in)	DEPTH SCALE 1"=	DESCRIPTIONS OF MATERIALS AND CONDITIONS	CONTAMINANT OBSERVATIONS INSTRUMENT: UNITS:	NOTES:
					1	Auger cuttings from 1-3' showed <10 ppm fuel oil odor	Field Screen / Head Space	
	1	6 7 9 12	24	24	5	Dense stiff red clay, some well rounded gravel up to 3/4" dina, fuel oil odor	20 / 18	
	2	7 9 11 15	24	24	9	As above, no odor	6 / 5	
	3	5 5 10 13	24	24	13	As above, 1.5 ich fine gray sand seam at 13.5 smelled like fuel oil?	<1 in clay / 50 in sand	
	4	25 28 30 55	24	24	17	Tan and grey fine sand black-end by fuel strong prod odor water saturated.	Nm / up to 130	
	5	>100	18	18	19	Sample collected for permability testing, prod. odor 18.5 - 19 and 19 - 19.5	10 Probaly low based on odor	
					21	Grey and tan fine sand, water saturated 18 - 18.5 gray and tan sand interlayered with tan silt - very tight		

BOREHOLE WATER LEVEL DATA					
DATE					
TIME					
GWL					
CASING DEPTH					

PROJECT NAME / LOCATION	PROJECT NUMBER: 10-88-457	BORING NUMBER: SB-37	SHEET 1 OF 1
Amoco Superior Terminal Superior, Wisconsin	CONTRACTOR: ETI		DRILLING METHOD: HSA
	DRILLER: Greg Scanlon		DRILLING RIG: ATV
	START: 10:15 am 7/25/91		COMPLETED: 11:00 7/25/91
LAND OWNER: Amoco	SURFACE ELEVATION:		LOGGED BY: PJC

SAMPLE TYPE	SAMPLE NUMBER	BLOWCOUNTS	SAMPLE INTAKE (ft)	SAMPLE RECOVERY (in)	DEPTH SCALE 1"=	DESCRIPTIONS OF MATERIALS AND CONDITIONS	CONTAMINANT OBSERVATIONS INSTRUMENT: UNITS: Field Screen	Head Space	NOTES:
					1				
					2				
					3				
		6			4				
	1	8 10 14	24	24	5	Dense stiff red clay prod odor	130	135	
					6				
					7				
		8			8				
	2	10 9 12	24	24	9	Same as above, smelled like gasoline?	60	25	
					10				
					11				
		4			12				
	3	7 10 8	24	24	13	Same as above, no odor	2	6	
					14				
					15				
		7			16				
	4	18 25 25	24	24	17	Red clayey silt with some fine sand, no odor	2	7	
					18				
					19				
					20				
					21				
					22				
					23				

BOREHOLE WATER LEVEL DATA					
DATE					
TIME					
GWL					
CASING DEPTH					