

Leaksite ID# 2519	Tank Facility ID 13755
MCCOYS STATION	MCCOYS STATION
Site Name	Responsible Party

LEAKSITE REMARKS

DJF 12/16/92 Kathy Orner, Applied Engineering called to see if we had reviewed their status report. This report contains the 1 year of quarterly monitoring that we had approved as a CAD. They recommend another year of monitoring. I asked her to continue to monitor quarterly, and that we would review the report as priority allows.

9/11/97:(JME)Rec'd voice mail message from Tom Greene w/Applied Eng. He called to say that the work we requested in our 10/11/96 letter has not been completed yet but plan to proceed this month. Call if question 939-9095.

10/14/98:(JME)Rec'd voice mail message from Tom Greene in response to 10/12 letter. Will also fax written update. Said that they did a Geoprobe survey and defined extent of contamination except in one area where there are two different gw flow directions. Need to put in at least 1 more probe. Still actively working on the site.

11/6/98:(JME)Rec'd call from Tom Greene. Did additional geoprobe borings in middle of street and still did not find downgradient extent of plume. River is 50' away, with only 20' to the edge of the steep river bank. Will discuss further with Steve Geyen how to further define downgradient extent and assess risk to river.

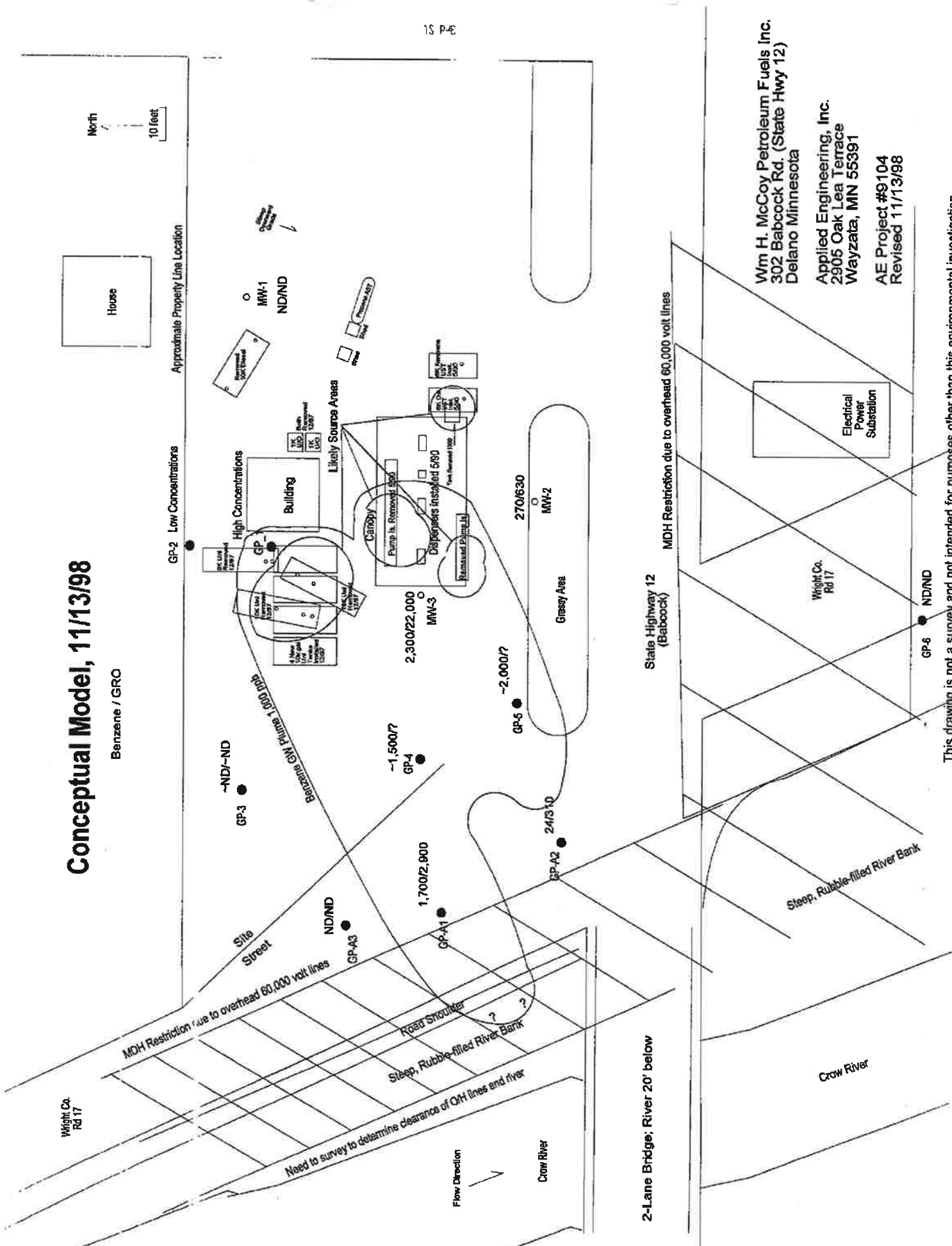
11/30/98 SGG recommend closure. Geoprobos completed at the site indicate that the plume has reach equilibrium since it was first investigated back in 1990. contamination remains near the pump island however the levles of contamination in the down gradient direction have not increased significantly. The Crow river is a class 2b water , the levels of contamination near the river are a concern but are unlikely to reach levels that should be treated.

End of Remarks

15 P-4

# Conceptual Model, 11/13/98

Benzene / GRC



Wm H. McCoy Petroleum Fuels Inc.  
 302 Babcock Rd. (State Hwy 12)  
 Delano Minnesota

Applied Engineering, Inc.  
 2905 Oak Lea Terrace  
 Wayzata, MN 55391

AE Project #9104  
 Revised 11/13/98

This drawing is not a survey and not intended for purposes other than this environmental investigation

Fax Transmittal

**Applied Engineering, Inc.**

2905 Oak Lea Terrace  
Wayzata, MN 55391-2533  
Ph 612-939-9095  
Fax 939-0178

October 30, 1998

**To: Jessie Ebertz, MPCA Project Manager**

MD-Rem

Fax #

Number of Pages to follow: 1

From: Tom Greene

AE # 9104

RE: MPCA Leak #2519; Wm. H. McCoy Petroleum Fuels, Inc.

Jessie,

In response to your recent letter and as a follow-up to my voice mail message on 10/14/98, the following status is provided for the referenced location:

- The original release source was the tank removed in 1990, east of the pump island. Three monitoring wells were installed and monitoring was accomplished.
- Tanks northwest of the pump island were removed in Dec 97. Soil samples from beneath the tanks indicated a release, resulting in a second release source at this site.
- Geoprobe soil borings were accomplished in Jan, 1998 on-site and off-site to comprehend the MPCA request and the data from the newly identified tank release source. Soil borings were placed where indicated on attached sketch, borings GP-1 - GP-6. Data indicates the extent of the plume appears adequately defined in all directions except to the southwest where benzene concentrations were identified at concentrations of up to 1200 ppb in GP-5.
- In order to further define the extent, we have obtained permission from the City of Delano to install a minimum of three additional borings (P-O - P-Q) on their property to the southwest. This work is scheduled for 11/6/98. Pending results, a report will be prepared for your review.

Please call me if you'd like to discuss this further, 612-939-9095.

  
Applied Engineering, Inc.  
Thomas A. Greene, P.E.

Atch: Site Sketch

cc: Jim McCoy

Long Term Monitoring;>

CAD Implemented:

>

Petro Fund Comments:

>

Justification for closure:

>

Hydro Comments 01/19/94;

Spoke with Tom Greene, Applied Engr, regarding a lost annual report. He said he'd send another copy of the 8/92 annual report.

He has some concerns regarding the monitoring. Ginny Yingling had approved a CAD for monitoring only but the levels have since gone up. Also there is contamination evident in an upgradient well with no other sites nearby.

I told Tom that I would begin the review and that he should hold off any additional sampling until I have a chance at the recommendations. I told him that I should be able to make recommendations based upon results in the latest report. He agreed but will still send copy of old report.

Site was given CAD approval for monitoring only by Jon Pollock Nov 18, 1991.

Investigation indicated extent of contamination is limited with the highest levels near the pump islands.

MW-3 is a worst case well located near the pump islands.

MW-2 is a well located approx 20 ft downgradient of the pump islands.

MW-1 is located lateral (NE) 80 ft from the pump islands. GW flow is to the SE.

GW samples have been collected quarterly since 8/90.

MW-1 has been consistently ND except for a minor hit of xylene in the 1/93 sampling. The 5/93 sampling was back to ND. Nothing to worry about.

MW-2 continues to be impacted. Benzene levels are somewhat fluctuating with a high of 240 ppb (7/92) and a low of 3.8 (1/93). No discernible trend in concentrations. No trend in GRO results either.

MW-3 has had high levels of contamination since the beginning. The first 4 quarters indicated an increasing trend, 11/90-12/91, however since 12/91 benzene levels have dropped from 7.5 to 4 ppm and GRO levels have dropped from 33 to 14 ppm. Water levels have fluctuated throughout the period so there is no correlation between conc vs water level.

The downgradient well MW-2, does not currently exceed the 100xRAL goal so no reason yet to implement active remediation.

The consultant is recommending additional <sup>semi-annual</sup> quarterly monitoring ~~for one year and if nothing changes to close the site.~~

I called Tom Greene and told him that it would be best to discontinue quarterly monitoring and sample annually 2 more times and if nothing changes we'll close the site. That sounded fine with him. He said he'd talked with his client and the client was all for it. I told Tom that I would get a letter out.

B. Scope:

This report covers groundwater monitoring that has been accomplished since the November 18, 1991 MPCA Corrective Action Design Approval.

The tasks performed at this site were monthly groundwater level measurements and quarterly sampling. The water sampling parameters are benzene, ethylbenzene, toluene, xylene and total hydrocarbons.

C. DATES

Date release reported to MPCA: 5/10/90

Dates Site Work Performed:

<u>Work Performed:</u>	<u>Date:</u>
Renovation Work Started	5/07/90
Tank Installation/Contamination Discovered	5/10/90
Soil test borings installed	8/23/90
Monitoring Wells Installed	9/18/90

After the three monitoring wells were installed in September, 1990, groundwater levels were measured monthly, except February, March and April of 1991.

Groundwater Level Monitoring

Based on the data collected through April of 1992, the groundwater elevations have shown fluctuations of up to eight feet. The groundwater reached the lowest level in January of 1991, and steadily increased up to June of 1991. The change of water table elevations could be the result snow melting and storm events affecting the nearby Crow River. This fluctuation of groundwater elevations may have a significant impact on the dissolution of soluble components of retained petroleum in the subsoil into the groundwater.

Groundwater Quality Monitoring

The initial groundwater sampling was conducted on November 7, 1990 for all three monitoring wells. MW #1 and MW #2 showed non-detectable levels, but MW #3 indicated gasoline contamination of 13,000 ug/L. Results are tabulated in Table 1.

According to the laboratory analyses, only MW #3 has shown gasoline contamination throughout the each sampling event, with total dissolved hydrocarbons between 920 in December of 1990 and

33,000 ug/L in december of 1992 in the water. On July 18, 1991 MW #2 for the first time was found containing detectable benzene levels (58 ug/L benzene, nondetectable total hydrocarbons). 530 ug/L were detected in April of 1992. No contaminants have been identified in MW #1.

A general trend of decreasing total hydrocarbons in MW #3 is shown between November of 1990 when the total hydrocarbons decreased from 13 mg/l in November of 1990 to 0.92 mg/l in December of the same year (Figure 2). A sudden increase was identified in December of 1991 when the concentrations increased to 33 mg/l. The dissolved benzene also followed a similar pattern (Figure 2).

The change in the amount of dissolved hydrocarbons in the water has corresponded the groundwater level change in MW #3. As indicated in the Remedial Investigation (RI) Report, gasoline contaminated subsoil (possibly caused by a line leak at the removed old pump island, its volume unknown) was suspected near MW #3. Due to the site's location near the Crow River, the water level in MW #3 is significantly influenced by the river level. It appears that as the groundwater level increases, the contaminated subsoil becomes saturated, dissolving more hydrocarbons into the groundwater.

The groundwater contour maps, constructed using the water level measurements collected in July of 1991 and March of 1992, shows that the groundwater flows towards SE direction (Figure 3 and 4). The contamination found in the down gradient well MW #2 indicates that the contaminant plume has just reached the southern property boundary at the present time.

## Conclusions

- After a period of approximately 18 Months, MW #2 has shown hydrocarbon contamination. The localized contaminated subsoil near MW #3 is probably responsible for this contamination.

- Contamination concentration trends in the up gradient well MW #3 is not totally clear at present time due to lack information on the extent and level of contaminated subsoil.

- The contaminant plume of groundwater has just reached the southern property boundary. However, due to no immediate downgradient groundwater receptors identified, it appears more cost effective to continue monitoring at this time.

Laboratory Results of Groundwater in Monitoring Wells  
 --- at McCoy's, Delano, Minnesota

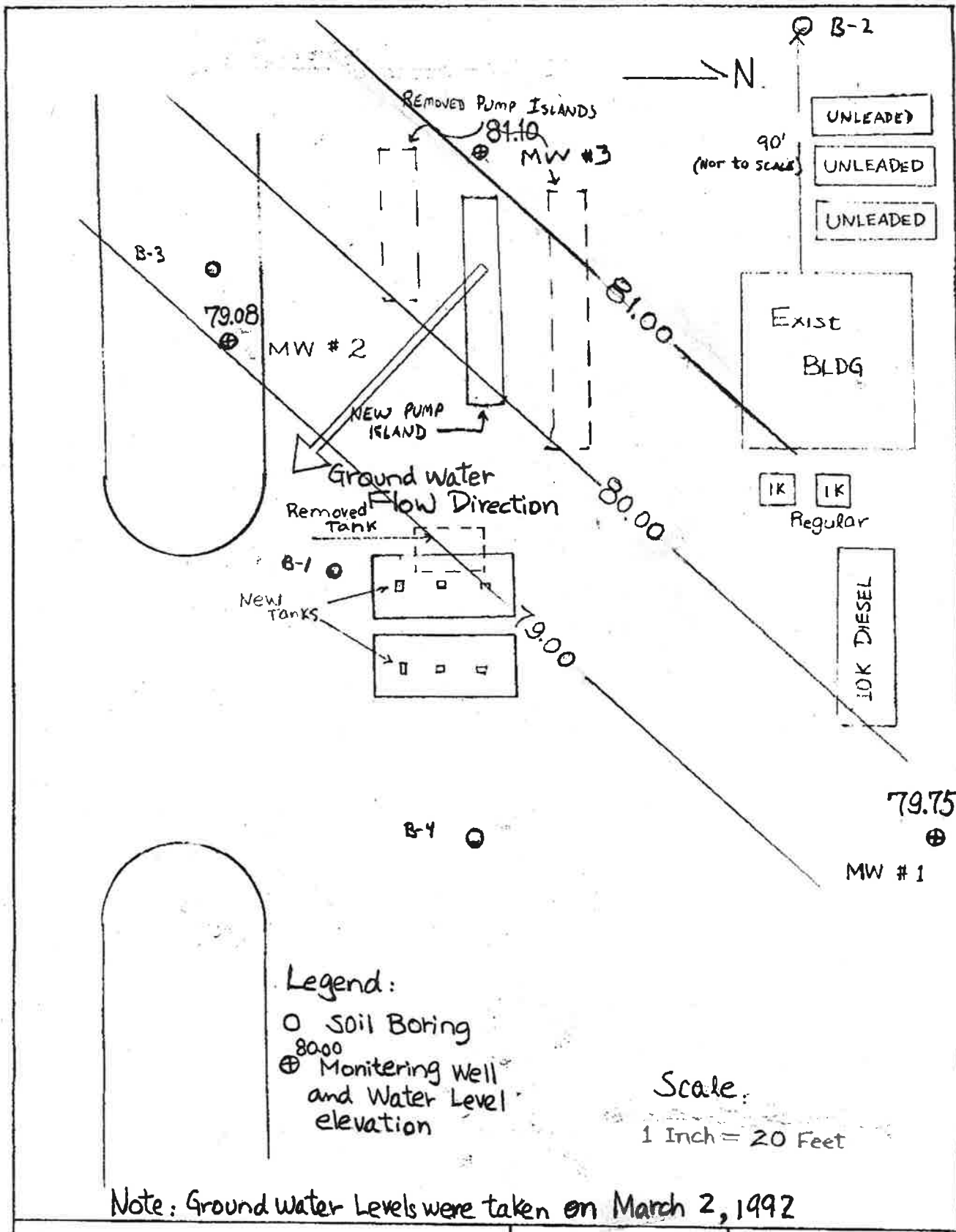
Analysis	MW-1			
	11/7/90	7/18/91	12/23/91	4/3/92
THC	ND	ND	ND	ND
Tetrahydrofuran	ND	-	-	-
Ethyl ether	ND	-	-	-
1,2-Dichloroetha	ND	-	-	-
Benzene	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
m-Xylene	ND	-	-	-
p-Xylene	ND	-	-	-
o-Xylene	ND	-	-	-
Total Xylene	-	ND	ND	ND
Ethylbenzene	-	ND	ND	ND
MTBE	-	-	ND	ND

Analysis	MW-2			
	11/7/90	7/18/91	12/23/91	4/3/92
THC	ND	ND	ND	530
Tetrahydrofuran	ND	-	-	-
Ethyl ether	ND	-	-	-
1,2-Dichloroetha	ND	-	-	-
Benzene	ND	58	41	93
Toluene	ND	ND	ND	ND
m-Xylene	ND	-	-	-
p-Xylene	ND	-	-	-
o-Xylene	ND	-	-	-
Total Xylene	-	ND	9	32
Ethylbenzene	-	ND	ND	-
MTBE	-	-	86	ND

Analysis	MW-3				
	11/7/90	12/15/90	7/18/91	12/23/91	4/3/92
THC	13000	920	3500	33000	22000
Tetrahydrofuran	700	-	-	-	-
Ethyl ether	630	-	-	-	-
1,2-Dichloroetha	690	-	-	-	-
Benzene	1500	300	660	7500	5900
Toluene	100	18	93	4100	2600
m-Xylene	24	-	-	-	-
p-Xylene	25	-	-	-	-
o-Xylene	37	-	-	-	-
Total Xylene	62	15	85	3100	2900
Ethylbenzene	-	-	-	860	660
MTBE	-	-	-	5600	1200

Note:  
 - Concentration unit:ug/L;  
 "-" Not available;  
 "ND" Below the detection limit.

TABLE 1




 <b>APPLIED ENGINEERING</b> 2905 Oak Lea Terrace Wayzata, MN 55391	By: _____	Approved: _____
	Date: _____	

FIG 3



Tank Information:

Tank#	Contents	Capacity	Type	Removed	Condition/Leaks	Age
1	gas	8,000	steel	no	8/90 tested tight	UK
2	gas	8,000	steel	no	8/90 tested tight	UK
3	gas	10,000	steel	no	8/90 tested tight	UK
4	diesel	10,000	steel	no	8/90 tested tight	UK
5	diesel	6,000	steel	no	8/90 tested tight	1
6	kerosene	6,000	steel	no	8/90 tested tight	1
7	WO* former gas	1,000	steel	no	UK	UK
8	WO former gas	1,000	steel	no	UK	UK
9	UK	450	steel	1990	No visible holes	UK

WO- waste oil

UK-Unknown

The tanks that were tested also had the lines tested. The numbering of the tanks is from the tank tightness report; not the excavation report.

Leak Information (cause):

The exact source of the release and the estimated volume is unknown. However laboratory analysis seems to indicate that both diesel fuel and gasoline have been released.

The laboratory results from sample taken near the 450 gallon tank indicated heavier end constituents similar to fuel oil or diesel fuel. The laboratory results from other samples indicate gasoline contamination.

The two new tanks, four of the previously existing six tanks, and the new product lines were tested tight after the installation was complete. Therefore it is possible that the gasoline release may have been caused by line leaks, in the former lines or from overfills. It should be noted that two of the existing tanks have not been tested.

Status of Soils (excavation, treatment, soil borings, maximum levels remaining):

On May 24, 1990, the excavation at the site was completed. The dimensions of the excavation were 25'x25'x11' deep. Excavation report says 323 cubic yards of soil were removed from excavation. (Given the 25x25x11 dimensions only 250 cubic yards of soil could have been removed.) No groundwater was encountered during the excavation; however, the previously unknown tank did contain water.

Twelve field readings and two soil samples were taken from the stockpiled soils. The highest field reading from the stockpiled soil was 110 ppm. The highest laboratory result from the stockpiled soil was 54 mg/kg THFO.

Eleven field readings one soil sample were taken from the excavation. The highest field reading was 200ppm. The soil sample had a THFO level of 1300 mg/kg. The soil sample was taken from the middle of the excavation 10 feet east of the UGST (no samples were collected from below the UGST). the tank).

On September 8, 1990, four soil borings were drilled. The borings ranged in depth from 26 to 37 feet.

Boring number	Depth (feet)	DTW (feet)	HEADSPACE/LAB (PPM)						
			5	10	15	20	25	30	35
SB-1	34	32	ND	3	64/1.6	20	10	10	-/1.2
SB-2	26	25	ND	ND	ND	ND	-/ <DL	-	-
SB-3	27	25	12	-/5.6	120	30	60/3.6	-	-
SB-4	37	?	T	T	3.5/3.6	ND	<1	ND	ND/<DL

/LAB-TOTAL HYDROCARBONS AS GASOLINE

ND-NOT DETECTED

T- Trace

DL-detection limit

The soil profile consists of brown sandy clay, blue clay and brown silty sand. The material below the water table is made up of interbedded silty sand and fine to medium sand. The water table was found to be between approximately 25 to 35 feet below grade.

Three monitoring wells were installed in borings other than the four above. There is no information on these borings.

Vapor Impacts (results and risks):

Location of potential vapor receptors not addressed.

Status of Ground Water (no. of wells, maximum contaminant levels):

Three monitoring wells were installed to assess the groundwater quality. The groundwater flow direction is to the southeast and the gradient is approximately 0.04. Slug tests indicate that the hydraulic conductivity is approximately 0.0002.

#### MONITORING WELL DATA AND PARTIAL RESULTS

WELL NUMBER	DEPTH (ELEV)	DTW (ELEV)	TOS (ELEV)	BOS (ELEV)	B\T\E\X (UG/L)	THG (UG/L)
MW-1	69.5	~76	79.5	69.5	ND FOR ALL	ND
MW-2	68.54	~75	78.54	68.54	ND FOR ALL	ND
MW-3	69.73	~77	79.73	69.73	*	*

\*SEE BELOW

#### MONITORING WELL MW-3 LAB RESULTS UG/L

COMPOUND	11/8/90	12/15/90	RAL	High[]/RAL
THG	13000	920	1000	13
THF	700		100	7
ETHYL ETHER	630		1000	-
1,2 DICHLOROETHANE	690		4	172.5
BENZENE	1500	300	10	150
TOLUENE	100	18	1000	-
XYLENES	86	15	10000	-



**RECEIVED**

OCT 16 1995

**MPCA, HAZARDOUS  
WASTE DIVISION**

APPLIED ENGINEERING, INC.  
2905 OAK LEA TERRACE  
WAYZATA, MINNESOTA 55391-2533  
FAX/TEL (612) 939-9095

**MPCA ANNUAL PROGRESS REPORT**

**Location:**

**Wm H. McCoy Fuels  
302 Babcock Boulevard  
Delano, MN 55328**

**Applied Engineering Proj #9104  
MPCA Site Leak #2519**

**October 11, 1995**

event were: benzene, toluene, ethylbenzene, xylene (BTEX), and GRO.

B. Purpose:

The purpose of this Annual Progress Report is to document the MPCA request for two additional annual sampling events.

C. Authorization:

Applied Engineering Inc. performed this work for Pump and Meter Service Inc. who in turn was authorized to perform this work by the Property owner, Wm. H. McCoy Fuels.

D. Dates:

Groundwater samples were collected on June 12, 1994, and May 6, 1995. Groundwater elevations were measured on May 6, 1995.

## II. BACKGROUND

A Progress Report was submitted on November 8, 1993. It concluded that the exceptionally high water table experienced throughout 1993 may have resulted in increased petroleum concentrations; and conversely, when groundwater returns to more normal elevations, the concentrations may diminish. It was recommended that monitoring be continued. A review of electronic tank monitoring records was also recommended to identify any possible new release sources.

The MPCA agreed to the recommendations contained in the November 8, 1993 Annual Progress Report, with the following modifications:

- Conduct two annual monitoring events, spring of 1994 and spring of 1995. Results to be reported after completion of second sampling event.
- If the results indicate a stable or declining trend in concentrations, the site most likely will be closed.

### Reference

Figure 1. Site Location Map

### III. CORRECTIVE ACTION RESULTS

No further corrective action beyond the original soil excavation is proposed at this time.

### IV. GROUND WATER MONITORING RESULTS

#### A. Groundwater Elevation Monitoring:

Groundwater elevations decreased from 3.95 feet in MW-1 to 4.99 feet in MW-3 based on data collected from July 2, 1993 to May 6, 1995. Groundwater elevations remain above the top of the screen in MW-1 and MW-2. The elevation in MW-3 has dropped to just below the top of screen. Due to the relatively low hydraulic conductivity, the groundwater elevations drop to below the top of screen when three well volumes are purged prior to sampling.

The groundwater flow direction continues to be calculated to the southeast with a hydraulic gradient of 3.64%, based on data collected on May 6, 1995.

#### References

- Table 1. Groundwater Elevations
- Figure 2. Groundwater Elevation Graph
- Figure 3. Groundwater Contour Map

#### B. Groundwater Quality Monitoring

Petroleum hydrocarbons were detected in MW-2 and MW-3 for both sampling events, June 94, and May 95.

##### Monitoring Well MW-1

Lead was the only constituent identified in MW-1 at 100 ppb.

##### Monitoring Well MW-2

Concentration trends appear to be stabilizing in MW-2. GRO and BTEX concentrations for June 94 and May 95 samples were somewhat higher, but within the same order of magnitude as concentrations identified in October 93. As a result of VOC analyses, twelve additional constituents were identified in the June 94 sampling. Benzene and 1,2-dichloroethane were the only constituents identified with concentrations above their Minnesota Department of Health, Health Risk Limits (HRLs) by factors of 13, and 3.5 respectively.

##### Monitoring Well MW-3

In general, concentration trends also appear to be stabilizing in MW-3. GRO and BTEX concentrations for June 94 and May 95 samples were slightly lower than

### Monitoring Well MW-3

In general, concentration trends also appear to be stabilizing in MW-3. GRO and BTEX concentrations for June 94 and May 95 samples were slightly lower than concentrations identified in October 93. As in MW-2, concentrations are still within the same order of magnitude. Fifteen additional constituents were identified in the June 94 sampling. Benzene, ethylbenzene, 1,2-dibromoethane, and 1,2-Dichloroethane, were identified with concentrations above their HRLs by factors of 200, 1.24, 975, and 5 respectively. Naphthalene concentration is at the HRL of 300 ppb.

### **References**

- Table 2. MW-1 Summary of Detected Constituents
- Table 3. MW-2 Summary of Detected Constituents
- Table 4a. MW-3 Summary of Detected Constituents (11/90 to 7/92)
- Table 4b. MW-3 Summary of Detected Constituents (1/93 to 5/95)
- Table 5. MW-1 Water Quality
- Table 6. MW-2 Water Quality
- Table 7. MW-3 Water Quality
- Figure 4. MW-1 Water Quality vs. Time (page 1 of 1)
- Figure 5. MW-2 Water Quality vs. Time (page 1 of 4)
- Figure 6. MW-2 Water Quality vs. Time (page 2 of 4)
- Figure 7. MW-2 Water Quality vs. Time (page 3 of 4)
- Figure 8. MW-2 Water Quality vs. Time (page 4 of 4)
- Figure 9. MW-3 Water Quality vs. Time (page 1 of 4)
- Figure 10. MW-3 Water Quality vs. Time (page 2 of 4)
- Figure 11. MW-3 Water Quality vs. Time (page 3 of 4)
- Figure 12. MW-3 Water Quality vs. Time (page 4 of 4)

### **V. DISCUSSION**

Groundwater elevations decreased nearly four to five feet from the July 93, elevations.

GRO, DRO, and BTEX concentrations in the groundwater appear to have stabilized. The highest concentrations are still identified in MW-3, with GRO at 19,000 ppb. Four constituents were identified in the groundwater samples with concentrations above their respective HRLs: benzene, ethylbenzene, 1,2-dibromoethane, and 1,2-dichloroethane.

1,2-Dibromoethane (or "ethylene dibromide", an anti-knock gasoline component) exceeds its HRL by a factor of 975. This compound was detected in MW-3 at a concentration of 3.9 ppb, and has an HRL of 0.004 ppb. 1,2-Dibromoethane was not detected in MW-1 and MW-2 during the June 12, 1994 sampling event when it was analyzed with a 0.2 ppb detection limit. It was previously analyzed during the November 8, 1990

sampling event. It was not detected in MW-1 and MW-2 above the detection limit of 4.0 ppb, or in MW-3 above the detection limit of 40 ppb.

#### VI. CONCLUSIONS

- GRO, DRO, and BTEX concentrations in the groundwater appear to have stabilized.
- Concentrations remain the highest in MW-3, with GRO concentrations at 19,000 ppb.
- Five constituents have concentrations at or above their respective HRLs.

<u>Constituent</u>	<u>Ratio (conc/HRL)</u>
Benzene	200
Ethylbenzene	1.24
1,2-Dibromoethane	975
1,2-Dichloroethane	5
Naphthalene	1

#### VII. RECOMMENDATIONS

Based on the groundwater sampling results, particularly those of 1,2-Dibromoethane, we recommend an additional round of sampling to verify concentration trends. We recommend that groundwater elevations be monitored and groundwater samples collected and analyzed for GRO and volatile organic compounds (VOCs) using method 465D once again in the spring of 1996. If concentration trends appear stable or diminishing, file closure may be requested in the next annual report.

#### VIII. CONSULTANT PREPARING THIS REPORT

Company Name: Applied Engineering, Inc.  
 Street/Box: 2905 Oak Lea Terrace  
 City, Zip: Wayzata, MN 55391  
 Telephone: 612-939-9095  
 Contact: Thomas A. Greene

This report represents opinion based on accepted analytical, industry, and MPCA standards. However, no warranty is expressed or implied.

Signature: Thomas A. Greene Date 10-11-95  
 Thomas A. Greene, P.E.

**Table 1. Groundwater Elevations**

DATE	MW-1	MW-2	MW-3
05/10/91	79.29	78.54	79.20
06/08/91	80.84	80.66	80.92
07/03/91	80.21	79.59	81.09
08/01/91	78.98	77.92	81.18
09/03/91	78.37	77.28	82.07
10/01/91	81.04	80.39	84.03
11/11/91	78.94	77.87	81.46
12/06/91	80.36	79.61	83.39
01/16/92	79.40	78.39	81.31
02/06/92	78.86	77.78	80.94
03/02/92	79.75	79.08	81.09
04/01/92	80.20	79.22	83.11
04/30/92	80.53	79.67	83.69
06/01/92	78.99	77.85	83.52
07/01/92	79.49	78.57	83.22
07/31/92	78.78	77.65	82.59
08/31/92	78.47	77.34	81.06
09/29/92	78.68	77.47	81.17
11/01/92	78.80	77.68	80.92
12/01/92	79.33	78.26	81.29
01/04/93	78.58	77.38	80.54
02/03/93	78.13	77.00	79.88
03/04/93	77.95	76.85	79.31
04/02/93	80.22	79.89	80.23
05/01/93	79.92	79.01	80.71
06/02/93	80.58	79.57	83.25
07/02/93	83.51	83.11	85.34
08/02/93	81.94	80.89	86.33
09/01/93	80.81	79.66	85.51
10/01/93	80.42	79.17	84.95
11/01/93	79.58	78.25	84.12
05/06/95	79.56	78.65	80.35
Top of casing	104.5	99.04	98.73
Top of screen	77.25	76.68	80.7
Bottom of screen	67.25	66.68	70.7



**Table 2. MW-1 Summary of Detected Constituents**

Constituent (ppb)	1/93	6/94	HRL	Ratio
Xylene	3.6	ND	10,000	0
Lead	ND	100	no HRL	0
Dichlorodifluoromethane	-	0.7 A	1000	0
Sum of Ratios				0

Notes: A = Observed in lab blank at a concentration of 0.8 ug/L.  
HRL = Health Risk Limit, Minnesota Department of Health, 12/94.

ND = Not detected

"-" = Not analyzed

Ratio =  $\frac{\text{Concentration}}{\text{HRL}}$

**Table 3. MW-2 Summary of Detected Constituents**

Constituent (ppb)	7/91	12/91	4/92	7/92	1/93	4/93	10/93	6/94	5/95	HRL	Ratio
TPH/GRO	ND	ND	530	1100	ND	2600	650	810	770	no HRL	-
DRO	-	-	-	-	-	-	110	310	-	no HRL	-
Benzene	58	41	93	240	3.8	90	93	170	130	10	13
Toluene	ND	ND	ND	14	ND	18	5.2	5.3	9.9	1,000	0.01
Ethylbenzene	ND	ND	ND	ND	ND	16	5.8	7.0	6.1	700	0.01
Xylene	ND	9	32	31	1.2	78	56	67	99	10,000	0.01
MTBE	-	86	ND	ND	ND	ND	ND	ND	-	no HRL	-
Lead	-	-	-	ND	ND	ND	-	100	-	no HRL	-
sec-Butylbenzene	-	-	-	-	-	-	-	0.5	-	no HRL	-
Dichlorodifluoro-methane	-	-	-	-	-	-	-	0.5 A	-	1,000	0
1,2-Dichloroethane	-	-	-	-	21	15	10	14	-	4	3.5
1,2-Dichloropropane	-	-	-	-	-	-	-	0.2	-	5	0.04
Ethyl ether	-	-	-	-	ND	130	-	ND	-	1,000	0
Isopropylbenzene	-	-	-	-	-	-	-	5.0	-	no HRL	-
Methyl ethyl ketone	-	-	-	-	-	-	-	79	-	4,000	0.02
Naphthalene	-	-	-	-	-	-	-	8.6	-	300	0.03
n-Propylbenzene	-	-	-	-	-	-	-	2.3	-	no HRL	-
Tetrahydrofuran	-	-	-	-	ND	130	-	240	-	no HRL	-
1,2,4-Trimethylbenzene	-	-	-	-	-	-	-	18	-	no HRL	-
1,3,5-Trimethylbenzene	-	-	-	-	-	-	-	8.2	-	no HRL	-
Sum of Ratios											16.62

Notes: A = Observed in lab blank at a concentration of 0.8 ug/L.

HRL = Health Risk Limit, Minnesota Department of Health, 12/94.

ND = Not detected

"-" = Not analyzed

Ratio =  $\frac{\text{Concentration}}{\text{HRL}}$

**Table 4a. MW-3 Summary of Detected Constituents  
From 11/90 to 7/92**

Constituent(ug/L)	11/90	12/90	7/91	12/91	4/92	7/92
TPH/GRO	13,000	920	3,500	33,000	22,000	22,000
DRO	-	-	-	-	-	-
Benzene	1,500	300	660	7,500	5,900	5,800
Toluene	100	18	93	4,100	2,600	3,600
Ethylbenzene	ND	ND	ND	860	660	870
Xylene	86	15	85	3,100	2,900	4,500
MTBE	-	-	-	5,600	1,200	210
Lead	-	-	-	-	-	ND
1,2-Dichloroethane	690	-	-	-	-	-
Ethyl ether	630	-	-	-	-	-
Tetrahydrofuran	700	-	-	-	-	-

**Table 4b. MW-3 Summary of Detected Constituents  
From 1/93 to 5/95**

Constituent (ppb)	1/93	4/93	10/93	6/94	6/94 dup	5/95	HRL	Ratio
TPH/GRO	12,000	14,000	29,000	20,000	18,000	19,000	no HRL	-
DRO	-	-	8,000	5,800	-	-	no HRL	-
Benzene	4,600	4,000	4,100	1,800	1,600	2,000	10	200
Toluene	350	280	4,700	2,000	1,900	990	1000	.99
Ethylbenzene	ND	250	920	1,000	840	870	700	1.24
Xylene	960	1,000	6,100	5,900	5,200	4,500	10,000	0.45
MTBE	ND	ND	ND	ND	ND	-	no HRL	-
Lead	100	ND	-	100	-	-	no HRL	-
n-Butylbenzene	-	-	-	130	-	-	no HRL	-
sec-Butylbenzene	-	-	-	12	-	-	no HRL	-
1,2-Dibromoethane	-	-	-	3.9	-	-	0.004	975
Dichlorodifluoro-methane	-	-	-	0.7	-	-	1000	0
1,2-Dichloroethane	230	200	150	20	-	-	4	5
1,2-Dichloropropane	-	-	-	0.4	-	-	5	0.08
Ethyl ether	1,400	1,500	-	ND	-	-	1,000	0
Isopropylbenzene	-	-	-	58	-	-	no HRL	-
Methyl ethyl ketone	-	-	-	960	-	-	4,000	0.24
Methyl isobutyl ketone	-	-	-	20	-	-	300	0.07
Naphthalene	-	-	-	300	-	-	300	1
n-Propylbenzene	-	-	-	120	-	-	no HRL	-
Tetrahydrofuran	ND	1,400	-	3,100	-	-	no HRL	-
1,2,4-Trimethylbenzene	-	-	-	1,400	-	-	no HRL	-
1,3,5-Trimethylbenzene	-	-	-	600	-	-	no HRL	-
Sum of Ratios								1184

HRL = Health Risk Limit, Minnesota Department of Health, 12/94.

ND = Not detected

"-" = Not analyzed

Ratio =  $\frac{\text{Concentration}}{\text{HRL}}$

**Table 4a. MW-3 Summary of Detected Constituents  
From 11/90 to 7/92**

Constituent(ug/L)	11/90	12/90	7/91	12/91	4/92	7/92
TPH/GRO	13,000	920	3,500	33,000	22,000	22,000
DRO	-	-	-	-	-	-
Benzene	1,500	300	660	7,500	5,900	5,800
Toluene	100	18	93	4,100	2,600	3,600
Ethylbenzene	ND	ND	ND	860	660	870
Xylene	86	15	85	3,100	2,900	4,500
MTBE	-	-	-	5,600	1,200	210
Lead	-	-	-	-	-	ND
1,2-Dichloroethane	690	-	-	-	-	-
Ethyl ether	630	-	-	-	-	-
Tetrahydrofuran	700	-	-	-	-	-

**Table 4b. MW-3 Summary of Detected Constituents  
From 1/93 to 5/95**

Constituent (ppb)	1/93	4/93	10/93	6/94	6/94 dup	5/95	HRL	Ratio
TPH/GRO	12,000	14,000	29,000	20,000	18,000	19,000	no HRL	-
DRO	-	-	8,000	5,800	-	-	no HRL	-
Benzene	4,600	4,000	4,100	1,800	1,600	2,000	10	200
Toluene	350	280	4,700	2,000	1,900	990	1000	.99
Ethylbenzene	ND	250	920	1,000	840	870	700	1.24
Xylene	960	1,000	6,100	5,900	5,200	4,500	10,000	0.45
MTBE	ND	ND	ND	ND	ND	-	no HRL	-
Lead	100	ND	-	100	-	-	no HRL	-
n-Butylbenzene	-	-	-	130	-	-	no HRL	-
sec-Butylbenzene	-	-	-	12	-	-	no HRL	-
1,2-Dibromoethane	-	-	-	3.9	-	-	0.004	975
Dichlorodifluoro-methane	-	-	-	0.7	-	-	1000	0
1,2-Dichloroethane	230	200	150	20	-	-	4	5
1,2-Dichloropropane	-	-	-	0.4	-	-	5	0.08
Ethyl ether	1,400	1,500	-	ND	-	-	1,000	0
Isopropylbenzene	-	-	-	58	-	-	no HRL	-
Methyl ethyl ketone	-	-	-	960	-	-	4,000	0.24
Methyl isobutyl ketone	-	-	-	20	-	-	300	0.07
Naphthalene	-	-	-	300	-	-	300	1
n-Propylbenzene	-	-	-	120	-	-	no HRL	-
Tetrahydrofuran	ND	1,400	-	3,100	-	-	no HRL	-
1,2,4-Trimethylbenzene	-	-	-	1,400	-	-	no HRL	-
1,3,5-Trimethylbenzene	-	-	-	600	-	-	no HRL	-
Sum of Ratios								1184

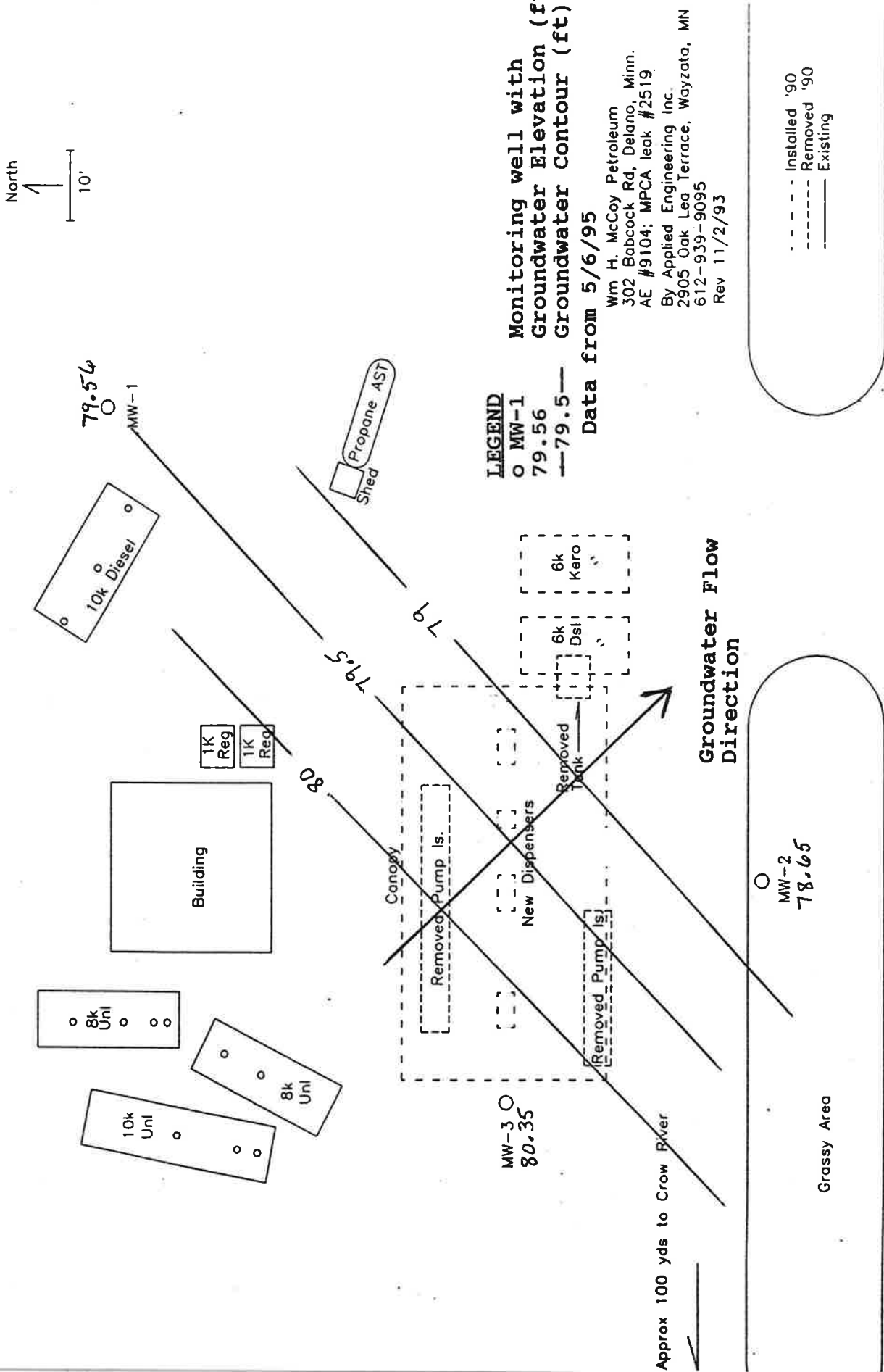
HRL = Health Risk Limit, Minnesota Department of Health, 12/94.

ND = Not detected

"- " = Not analyzed

Ratio =  $\frac{\text{Concentration}}{\text{HRL}}$

Figure 2. Groundwater Contour Map



**Monitoring well with  
Groundwater Elevation (ft)  
Groundwater Contour (ft)**

**LEGEND**  
 ○ MW-1  
 79.56  
 ---79.5---  
**Data from 5/6/95**

Wm H. McCoy Petroleum  
 302 Babcock Rd, Delano, Minn.  
 AE #9104; MPCA leak #2519  
 By Applied Engineering Inc.  
 2905 Oak Lea Terrace, Wayzata, MN  
 612-939-9095  
 Rev 11/2/93

--- Installed '90  
 - - - - - Removed '90  
 \_\_\_\_\_ Existing

State Highway 12

This drawing is not a survey and not intended for purposes other than this environmental investigation



# SERCO Laboratories

CC: KATHY

Lee

7-5-94

1931 West County Road C2, St. Paul, Minnesota 55113 Phone (612) 636-7173 FAX (612) 636-7178

LABORATORY ANALYSIS REPORT NO: 45199  
07/01/94

PAGE 1 of 4

Applied Engineering  
2905 Oak Lea Terrace  
Wayzata, MN 55391

DATE COLLECTED: 06/12/94  
DATE RECEIVED: 06/13/94  
COLLECTED BY : CLIENT  
DELIVERED BY : CLIENT  
SAMPLE TYPE : WATER

Attn: Thomas Greene

CLIENT'S ID: AE9104 McCoy's Delano

SERCO SAMPLE NO:	87384	87394	87404	87414
SAMPLE DESCRIPTION:	L406121 MW-1	L406122 MW-2	L406123 MW-3	L406123D MW-3

### ANALYSIS:

Gasoline Range Organics, C6-C10, ug/L	<100	810	20000	18000
Analytical Method for MOD GRO	MOD GRO	MOD GRO	MOD GRO	MOD GRO
Date of Analysis for MOD GRO	06/17/94	06/24/94	06/18/94	06/17/94
Diesel Range Organics, C10-C28, ug/L	<100	310	5800	-
Analytical Method for MOD DRO	MOD DRO	MOD DRO	MOD DRO	-
Date of Extraction for MOD DRO	06/15/94	06/15/94	06/15/94	-
Date of Analysis for MOD DRO	06/20/94	06/20/94	06/20/94	-
✓Acetone, ug/L	<100	<100	<100	-
✓Allyl chloride, ug/L	<0.2	<0.2	<0.2	-
✓Benzene, ug/L	<1.0	170	1800	1600
○Bromobenzene, ug/L	<0.2	<0.2	<0.2	-
✓Bromochloromethane, ug/L	<0.4	<0.4	<0.4	-
✓Bromodichloromethane, ug/L	<0.2	<0.2	<0.2	-
✓Bromoform, ug/L	<0.5	<0.5	<0.5	-
✓Bromomethane, ug/L (Methyl bromide)	<1.0	<1.0	<1.0	-
n-Butylbenzene, ug/L	<0.3	<0.3	130	-
sec-Butylbenzene, ug/L	<0.4	0.5	12	-
tert-Butylbenzene, ug/L	<0.5	<0.5	<0.5	-
✓Carbon tetrachloride, ug/L	<0.2	<0.2	<0.2	-
✓Chlorobenzene, ug/L	<1.0	<1.0	<1.0	-
✓Chloroethane, ug/L (Ethyl chloride)	<0.4	<0.4	<0.4	-
✓Chloroform, ug/L	<0.5	<0.5	<0.5	-
✓Chloromethane, ug/L (Methyl chloride)	<0.6	<0.6	<0.6	-
2-Chlorotoluene, ug/L (o-Chlorotoluene)	<0.2	<0.2	<0.2	-
4-Chlorotoluene, ug/L (p-Chlorotoluene)	<0.2	<0.2	<0.2	-

< means "not detected at this level". 1 mg = 1000 ug.





# SERCO Laboratories

1931 West County Road C2. St. Paul, Minnesota 55113 Phone (612) 636-7173 FAX (612) 636-7178

LABORATORY ANALYSIS REPORT NO: 45199  
07/01/94

PAGE 2 of 4

SERCO SAMPLE NO:	87384	87394	87404	87414
SAMPLE DESCRIPTION:	L406121 MW-1	L406122 MW-2	L406123 MW-3	L406123D MW-3

### ANALYSIS:

√Dibromochloromethane, ug/L (Chlorodibromomethane)	<0.4	<0.4	<0.4	-
1,2-Dibromo-3-chloropropane, ug/L	<1.2	<1.2	<1.2	-
√1,2-Dibromoethane, ug/L (Ethylene dibromide)	<0.2	<0.2	3.9	-
√1,2-Dichlorobenzene, ug/L (o-Dichlorobenzene)	<1.0	<1.0	<1.0	-
√1,3-Dichlorobenzene, ug/L (m-Dichlorobenzene)	<1.0	<1.0	<1.0	-
√1,4-Dichlorobenzene, ug/L (p-Dichlorobenzene)	<1.0	<1.0	<1.0	-
√Dichlorodifluoromethane, ug/L (Freon 12)	0.7 B	0.5 B	0.7	-
√1,1-Dichloroethane, ug/L	<0.1	<0.1	<0.1	-
√1,2-Dichloroethane, ug/L (Ethylene dichloride)	<0.2	14	20	-
√1,1-Dichloroethene, ug/L	<0.2	<0.2	<0.2	-
√cis-1,2-Dichloroethene, ug/L	<0.1	<0.1	<0.1	-
√trans-1,2-Dichloroethene, ug/L	<0.1	<0.1	<0.1	-
√Dichlorofluoromethane, ug/L (Freon 21)	<1.2	<1.2	<1.2	-
√1,2-Dichloropropane, ug/L	<0.1	0.2	0.4	-
√1,3-Dichloropropane, ug/L	<0.2	<0.2	<0.2	-
2,2-Dichloropropane, ug/L	<0.2	<0.2	<0.2	-
√1,1-Dichloropropene, ug/L	<0.2	<0.2	<0.2	-
√cis-1,3-Dichloropropene, ug/L	<1.5	<1.5	<1.5	-
√trans-1,3-Dichloropropene, ug/L	<0.9	<0.9	<0.9	-
√Ethylbenzene, ug/L	<1.0	7.0	1000	840
√Ethyl ether, ug/L	<10	<10	<10	-
Hexachlorobutadiene, ug/L	<0.3	<0.3	<0.3	-
√Isopropylbenzene, ug/L, (Cumene)	<1.0	5.0	58	-
4-Isopropyltoluene, ug/L (p-Isopropyltoluene)	<0.5	<0.5	<0.5	-
√Methyl ethyl ketone, ug/L (2-Butanone)	<5.0	79	960	-

< means "not detected at this level". 1 mg = 1000 ug.







# SERCO Laboratories

1931 West County Road C2. St. Paul. Minnesota 55113 Phone (612) 636-7173 FAX (612) 636-7178

LABORATORY ANALYSIS REPORT NO: 45199  
07/01/94

PAGE 3 of 4

SERCO SAMPLE NO:	87384	87394	87404	87414
SAMPLE DESCRIPTION:	L406121 MW-1	L406122 MW-2	L406123 MW-3	L406123D MW-3

ANALYSIS:

✓ Methyl isobutyl ketone, ug/L (4-Methyl-2-pentanone)	<5.0	<5.0	20	-
✓ Methyl tertiary butyl ether, ug/L	<10	<10	<10	<500 A
✓ Methylene chloride, ug/L (Dichloromethane)	<5.0	<5.0	<5.0	-
Naphthalene, ug/L	<1.0	8.6	300	-
n-Propylbenzene, ug/L	<0.4	2.3	120	-
Styrene, ug/L	<1.0	<1.0	<1.0	-
✓ 1,1,1,2-Tetrachloroethane, ug/L	<0.1	<0.1	<0.1	-
✓ 1,1,2,2-Tetrachloroethane, ug/L	<0.2	<0.2	<0.2	-
✓ Tetrachloroethene, ug/L	<1.5	<1.5	<1.5	-
✓ Tetrahydrofuran, ug/L	<5.0	240	3100	-
✓ Toluene, ug/L	<1.0	5.3	2000	1900
1,2,3-Trichlorobenzene, ug/L	<0.2	<0.2	<0.2	-
1,2,4-Trichlorobenzene, ug/L	<0.2	<0.2	<0.2	-
✓ 1,1,1-Trichloroethane, ug/L	<5.0	<5.0	<5.0	-
✓ 1,1,2-Trichloroethane, ug/L	<0.1	<0.1	<0.1	-
✓ Trichloroethene, ug/L	<0.4	<0.4	<0.4	-
✓ Trichlorofluoromethane, ug/L (Freon 11)	<0.7	<0.7	<0.7	-
✓ 1,2,3-Trichloropropane, ug/L	<0.2	<0.2	<0.2	-
✓ 1,1,2-Trichlorotrifluoroethane, ug/L (Freon 113)	<5.0	<5.0	<5.0	-
1,2,4-Trimethylbenzene, ug/L	<1.0	18	1400	-
1,3,5-Trimethylbenzene, ug/L (Mesitylene)	<1.0	8.2	600	-
✓ Vinyl chloride, ug/L	<1.0	<1.0	<1.0	-
✓ Total Xylene, ug/L	<1.0	67	5900	5200
✓ Dibromomethane, ug/L	<0.2	<0.2	<0.2	-
✓ Lead, filtered, mg/L as Pb	0.1	0.1	0.10	-
Analytical Method for BETX/MTBE	-	-	-	8020
Date of analysis for BETX/MTBE	-	-	-	06/23/94

< means "not detected at this level". 1 mg = 1000 ug.





# SERCO Laboratories

1931 West County Road C2. St. Paul. Minnesota 55113 Phone (612) 636-7173 FAX (612) 636-7178

LABORATORY ANALYSIS REPORT NO: 45199  
07/01/94

PAGE 4 of 4

SERCO SAMPLE NO: 87424

SAMPLE DESCRIPTION: L406123B  
Field  
Blank

ANALYSIS:

Benzene, ug/L	<1.0
Ethylbenzene, ug/L	<1.0
Methyl tertiary butyl ether, ug/L	<10
Toluene, ug/L	1.2
Total Xylene, ug/L	<1.0
Analytical Method for BETX/MTBE	8020
Date of analysis for BETX/MTBE	06/17/94
Gasoline Range Organics, C6-C10, ug/L	<100
Analytical Method for MOD GRO	MOD GRO
Date of Analysis for MOD GRO	06/17/94

Samples were received on ice.

A: Increased detection limits due to sample matrix.

B: This compound was observed in the laboratory blank at a concentration of 0.8 ug/L.

The analytical results in this report pertain only to the items tested. All analyses were performed using EPA or state approved methodologies. Samples that may be of an environmentally hazardous nature may be returned to you. Other samples will be stored for 30 days from the date of this report, then disposed of by SERCO Laboratories. Please contact me if other arrangements are needed. This report may not be reproduced, except in its entirety, without prior written approval from SERCO Laboratories.

Report submitted by,

Diane J. Anderson  
Project Manager

< means "not detected at this level". 1 mg = 1000 ug.



To Laboratory:

### LAB SAMPLE CHAIN OF CUSTODY

Serco Laboratories or other:  
1931 W. Co Rd C-2  
St. Paul, MN 55113

Applied Engineering Proj # AE 9104

Sampler Signature Lifeng Guo

Site Name McLoy's

Print Name Beneath Sig: Lifeng Guo

Site Address Delano, MN

From:  
Applied Engineering, Inc.  
2905 Oak Lea Terrace  
Wayzata, MN 55391-2533  
Fax/Tel 612-939-9095

#### REQUESTED ANALYSES:

#	Sample Code	1994 mo/day	Time	Soil or Water	Location (all samples grab unless noted)	Depth	Type Soil	HNU Level	Pres- ervative (b)	No. Jars	REQUESTED ANALYSES:								
											TPH as Gas	TPH as FO	GRO (c)	DRO (c)	MTBE & BTEX	465 D	Lead (a)	Metals & PCBs (a)	Other
1	L406121	6/12	14:40	Water	MW-1				H	6			X	X		X	X		
2	L406122	"	15:50	"	MW-2				H	6			X	X		X	X		
3	L406123	"	17:00	"	MW-3				H	6			X	X		X	X		
4	L406123D	"	17:05	"	MW-3				H	4			X		X				
5	L406123B	"	16:50	"	Field Blank				H	4			X		X				
6																			
7																			
8																			
9																			
10																			
11																			
12																			
13																			
14																			
15																			
16																			
17																			
18																			
19																			
20																			

Comments:

AA: Need to be filtered in Lab

Trip blank also received NPD 6/13/94  
ON ICE

Pb bottle received for L406123D, but analysis  
was not requested.

a Metals to be analysed include Arsenic, Barium, Cadmium, Chromium, Mercury, Selenium, and Silver. Also analyze for PCB's

b Type Preservative: M = Methanol; S = Sodium Bisulfate Crystals H = HCl

c Analyze sample constituents per Wisconsin DNR GRO and DRO Methods, to include GRO, DRO, BTEX, and MTBE

Relinquished by:

6-13-94 9:30 AM

Received by

1. Sig, Date, & Time [Signature]  
Print Name Beneath Sig: \_\_\_\_\_

Sig, Company: D. Demulling 6/13/94 - 9:30am SERCO  
Print Name Beneath Sig: D. Demulling

2. Sig, Date & Time \_\_\_\_\_  
Print Name Beneath Sig: \_\_\_\_\_

Sig, Company: \_\_\_\_\_  
Print Name Beneath Sig: \_\_\_\_\_

3. Sig, Date, Time \_\_\_\_\_  
Print Name Beneath Sig: \_\_\_\_\_

Sig, Company: \_\_\_\_\_  
Print Name Beneath Sig: \_\_\_\_\_



CC *athy* 5-21-15

# REPORT OF LABORATORY ANALYSIS

Applied Engineering  
2905 Oak Lea Terrace  
Wayzata, MN 55391-2533

May 17, 1995  
PACE Project Number: 950509512

Attn: Mr. Thomas A. Greene

Client Reference: McCoy Petroleum, Delano / AE9104

PACE Sample Number:		10 0126713	10 0126721	10 0126730	
Date Collected:		05/06/95	05/06/95	05/06/95	
Time Collected:		13:00	13:40	14:20	
Date Received:		05/09/95	05/09/95	05/09/95	
Client Sample ID:		L505061	L505062	L505063	
Parameter	Units	MDI	MW-1	MW-2	MW-3

## ORGANIC ANALYSIS

### VOLATILE PETROLEUM RELATED COMPOUNDS

Date Analyzed			14MAY95	E 13MAY95	I 13MAY95	I
Benzene	ug/L	1.0	ND	130	-	-
Benzene	ug/L	10	-	-	2000	-
Toluene	ug/L	1.0	ND	9.9	-	-
Toluene	ug/L	10	-	-	990	-
Ethylbenzene	ug/L	1.0	ND	6.1	-	-
Ethylbenzene	ug/L	10	-	-	870	-
Xylenes	ug/L	2.0	ND	99	-	-
Xylenes	ug/L	20	-	-	4500	-
Gasoline Range Organic Compounds	ug/L	50	ND	770	-	-
Gasoline Range Organic Compounds	ug/L	500	-	-	19000	HB
Fluorobenzene (Surrogate)	%		105	136 H1	117	

These data have been reviewed and are approved for release.

William H. Scruton  
Project Manager