RAPID OIL CHANGE

Initial Site Investigation Final Report

Delta No. 10-87-251

Prepared by:

Delta Environmental Consultants, Inc.
1801 Highway 8, Suite 123
St. Paul, Minnesota 55112
(612) 636-2427

April 11, 1988

RAPID OIL CHANGE

Initial Site Investigation Final Report
Delta No. 10-87-251

1.0 INTRODUCTION

1.1 Purpose of Work Performed

Delta Environmental Consultants, Inc. (Delta) submits this initial report of soil/water remedial investigation of 16 Rapid Oil Change sites located in Minnesota. The purpose of this work was to identify Rapid Oil Change sites that may have petroleum hydrocarbon contamination of soil or ground water.

1.2 Authorization

This work was authorized through the Ashland Oil, Inc. Letter Agreement with Delta for the term beginning September 8, 1987. Specific instructions concerning this work were received from Mr. Raymond E. Roberson of the Ashland Petroleum Company, Facilities Engineering Department in Ashland, Kentucky. Work at individual sites was coordinated through local Rapid Oil Change management.

1.3 Summary of Work Performed

Delta drilled soil borings at 16 Rapid Oil Change sites in Minnesota during the period of October 5 through November 12, 1987 and collected additional data at five sites on February 16 and 17, 1988. One of the borings was completed as a water monitoring well; the remaining borings were plugged with cement grout and abandoned. Soil and/or water samples were taken from borings at selected sites to verify photoionization meter readings obtained while screening soil samples for volatile organic compounds (VOC's). Table 1 lists each site investigated, each boring by number, highest photoionization meter reading obtained from screening samples from that boring, and the results of the chemical analyses of soil or water samples taken at the sites. Laboratory analysis reports and tables showing screening results of all samples taken at a site are included in Appendix A under a tab for the site address. Procedures used in screening soil samples with a photoionization meter are described in Section 3.3, Soil Vapor Screening. Some modification in the scope of site activities resulted from additional direction from Ashland Oil, Inc. during this investigation.

TABLE 1
Summary of Soil Screening and Chemical Analysis

Site Address	Boring No.	Highest hNu Reading (ppm)	Chemical Analysis Sample	B	T	X	THC
1925 Lexington Ave. Roseville, MN	1	0	--	--	--	--	--
	2	160	W	.0027	.028	.071	NA
	2 (MW-1)	NA	W	0.009	ND	ND	0.03
	3	200	--	--	--	--	--
	4	300+	--	--	--	--	--
	4A10	100	12'S	0.18	1.2	4.6	34
	4A15	400	17'S	35	94	980	1100
	4A15 (D)	400	17'S	0.14	1.3	3.0	36
3701 Silver Lake Rd St. Anthony Vlg, MN	1	220	--	--	--	--	--
	1A10	50	12'S	ND	ND	ND	ND
	1A20	300	24'S	0.29	2.9	13	90
	2	500+	--	--	--	--	--
	2A20	200	22'S	1.4	4.3	10	98
	3	20	--	--	--	--	--
	4	0	--	--	--	--	--
5701 University Ave. Fridley, MN	1	0	--	--	--	--	--
	2	300	--	--	--	--	--
	2A9	50	11'S	0.12	0.29	5.0	48
	2A25	0	25'S	ND	ND	ND	ND
	3	0	--	--	--	--	--
	4	0	--	--	--	--	--
5602 Lakeland Ave. N Crystal, MN	1	300	--	--	--	--	--
	2	1	--	--	--	--	--
	3	300	W	3.1	19	13	140
	3A4	70	6'S	ND	8.1	110	770
	3A9	300	11'S	ND	11	73	230
	3A9 (D)	300	11'S	ND	0.14	2.7	18
	4	300+	--	--	--	--	--
	4A9	200	11'S	ND	12	200	1500
8950 Highway 55 Golden Valley, MN	1	<1	--	--	--	--	--
	2	200+	W	.004	ND	.001	.030
	3	0	--	--	--	--	--
	4	0	--	--	--	--	--
2633 W. Broadway N. Minneapolis, MN	1	250	S	ND	ND	16	14
	2	25	S	ND	ND	ND	ND
	3	20	W	.003	.001	.005	.040
2425 University Ave. Minneapolis, MN	1	0	--	--	--	--	--
	2	15	--	--	--	--	--
	3	0	--	--	--	--	--
	4	0	W	ND	ND	ND	ND

TABLE 1 (continued)

Site Address	Boring No.	Highest hNu Reading (ppm)	Chemical Analysis Sample	B	T	X	THC
2955 Portland Ave.	1	2	S	ND	ND	ND	ND
Minneapolis, MN	2		--	--	--	--	--
	3	0	--	--	--	--	--
4530 France Ave.	1	0	--	--	--	--	--
Edina, MN	2	0	--	--	--	--	--
	3	0	--	--	--	--	--
5800 Lyndale Ave.	1	500	S	ND	43	340	2200
Minneapolis, MN	2	5	--	--	--	--	--
	3	700	S	6.2	150	150	1200
	4	2	--				
8600 Lyndale Ave.	1	40	S	ND	ND	ND	ND
Bloomington, MN	2	20	--	--	--	--	--
	3	<2	--	--	--	--	--
	4	0	--	--	--	--	--
699 Snelling Ave.	1	3*	--	--	--	--	--
St. Paul, MN	2	10*	--	--	--	--	--
	3	2*	--	--	--	--	--
	4	<1*	--	--	--	--	--
619 St. Anthony St.	1	350	--	--	--	--	--
St. Paul, MN	1A3	60	4'S	ND	0.55	17	71
	1A9	1	10'S	ND	ND	ND	ND
	2	4	--	--	--	--	--
	3	12	--	--	--	--	--
	4	500	--	--	--	--	--
1383 Arcade St.	1	500	6'S	2.6	110	230	1200
St. Paul, MN	2	--	9'S	3.4	53	89	1400
	3	4	--	--	--	--	--
	4	12	--	--	--	--	--
		500	6'S	ND	37	110	840
			10's	4.7	88	170	2800
1126 S. Robert St.	1	500	5's	ND	ND	ND	ND
W. St. Paul, MN	2	500	15's	7.6	140	220	920
		500	500	4.2	69	270	1200
1950 Hastings	1	0	--	--	--	--	--
Newport, MN	2	0	--	--	--	--	--
	3	0	--	--	--	--	--

* = TIP Photoionization Meter Readings
D - Duplicate
4'S = Soil sample taken at approximately four feet.

Chemical Name	Chemical Symbol	Soil Samples	Water Samples
Benzene	B	mg/kg	mg/l
Toluene	T	mg/kg	mg/l
Xylene	X	mg/kg	mg/l

2.0 BACKGROUND INFORMATION

Each of the Rapid Oil Change sites investigated appeared to be former gasoline stations. Areas at each site presenting the highest potential as sources for soil/ground water pollution, such as former pump islands and underground storage tank areas, were visible at most sites. Former pump island and tank locations were concealed by driveway resurfacing at some sites. Maps showing the location of each site and a diagram of each Rapid Oil Change facility investigated are included in Appendix A tabbed with the address of the site.

3.0 METHODS AND PROCEDURES

3.1 Soil Sampling

Soil sampling was done in accordance with ASTM:D 1586-84. Using this procedure, a 2 inch O.D. split spoon sampler is driven into the soil by a 140 pound weight falling 30 inches. After an initial set of 6 inches, the number of blows required to drive the sampler an additional 12 inches is known as the penetration resistance, or the N value. The N value is an index of the relative density of cohesionless soils and the consistency of cohesive soils. Soil samples taken for chemical analysis were collected in 40 ml vials from the split spoon sampler.

3.2 Soil Classification

As the samples were obtained in the field, they were visually and manually classified by the crew chief in accordance with ASTM:D 2488-84. Representative portions of the samples were then returned to the laboratory for further examination and for verification of the field classification. Logs of the borings indicating the depth and identification of the various strata, the N value, water level information and pertinent information regarding the method of maintaining and advancing the drill hole are included with drilling logs from each site. Charts illustrating the soil classification procedure, the descriptive terminology and symbols used on the boring logs are contained in Appendix B.

3.3 Soil Vapor Screening

Soil samples were screened in two phases using either an hNu or TIP brand photoionization meter. The first soil screening phases occurred immediately after the split spoon soil sampling tube was removed

from the boring and opened. The VOC concentration reading in parts per million (ppm) recorded is the highest reading observed over the length of sample which was generally one to one and one-half feet long.

Representative portions of each soil sample were placed in glass jars with metal lids for soil classification and measuring head space VOC concentration. Head space screening is the second phase of soil sample screening. A photoionization meter is used to measure the VOC concentration in the air confined in the sample bottle after sufficient time has passed, generally more than one-half hour, for VOC's in the soil sample to come to equilibrium in the air confined in the sample jar. Head space air is sampled by carefully opening the sample jar lid and quickly inserting the photoionization meter intake tube into the jar. The highest reading observed after inserting the photoionization meter intake tube into the jar is recorded as the head space reading. The head space VOC measurement is used to support and reconfirm measurements of the sample taken earlier at the split spoon soil sampler.

The photoionization meter uses a small pump to continuously draw air through the instrument detector. As air passes through the detector, it is exposed to ultraviolet light which ionizes many volatile organic compounds including those typically associated with gasoline contamination such as benzene, toluene, and xylene. The ions created by the ultraviolet light are electrically charged. This electrical charge is measured and represents the concentration of VOC's in the air. The instruments used during this investigation gave concentration measurement readings in ppm.

3.4 Ground Water Sampling

Ground water samples were obtained directly from the boreholes, through the hollow stem auger, using a laboratory cleaned stainless steel bailer. The samples were collected in 40 ml purge and trap vials.

3.5 Chemical Analyses

All soil and water samples were analyzed by PACE Laboratories, an EPA approved analytical laboratory. Water samples from 1925 Lexington Avenue in Roseville, Minnesota were analyzed using EPA Method 601/602 which provides concentration information on a wide spectrum of contaminants. The remaining samples were analyzed for benzene, toluene, xylene, and total hydrocarbons or product identification to identify the contaminant as either gasoline or fuel oil.

4.0 REMARKS

The findings 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.

Gary A. Lewis

Date: 4/14/88

Gary A. Lewis, P.E.
Chemical Engineer/
Project Manager

Reviewed by:

Date: _____

Robert M. Karls, M.S.
Midwest Region Manager