OIL & HAZARDOUS MATERIAL
SITE EVALUATION
FLINT-EXCHANGE SITE
ROCHESTER, NEW YORK

by

H&A of New York
Rochester, New York

for

Rochester City School District
Rochester, New York

File No. 70082-40

August 1989

EXECUTIVE SUMMARY

This investigation is a preliminary evaluation of the potential for oil and hazardous material to exist on the subject property, and potential site construction considerations (foundation types and disposal of site materials) so as to assist RCSD in evaluating the potential liability associated with ownership, financing and development of a school on the property. The site consists of an area generally bounded by the Genesee River, Violetta St., Exchange St., Fenwick St., Plymouth Ave., and Flint St. in Rochester, New York. The investigation consisted of a review of readily available information in public files; interviews with individuals familiar with the site use and history; limited subsurface exploration on the site consisting of 28 soil vapor sampling locations and 3 test borings; limited analyses of site soils; and visual observation of readily apparent surface and environmental conditions. Based on a review of this information, H&A has the following conclusions and recommendations:

- The Vacuum Oil Company was located on most of the site from 1866 to 1936. Vacuum Oil performed distillation of unrefined oil to produce petroleum products and derivatives. Available site historical information indicates the site was also used for the storage (in above ground tanks) and disposal of these products. Since 1936 the site has been used for warehouse, manufacturing and tool and die operations. Several underground storage tanks are reported to exist on the site; the locations and/or condition of the tanks could not be determined from available records.

- Twenty-eight soil vapor samples were analyzed and three test boring explorations completed on the site. Each of the borings was located within the former Genesee Valley Canal. The borings were terminated at the apparent top of bedrock, approximately 11-13 feet below the ground surface. Fill materials encountered in the borings generally consisted of sand, cinders, brick and concrete.

- Laboratory analyses for volatiles, semi-volatiles, priority pollutant metals, petroleum hydrocarbons and hazardous waste characteristics were conducted on site soils. A fill sample which had a petroleum odor was analyzed for volatile organics and petroleum hydrocarbons. No petroleum hydrocarbon compounds or volatile organic compounds were detected above the laboratory detection limits (0.0003 parts per million or less). A composite soil sample from site borings was analyzed for semi-volatile organic compounds. Ten compounds were possibly present at the detection limit (0.00033 ppm) but could not be quantified. The compounds detected are common by-products of fossil fuel combustion and, where criteria have been established, sample concentrations fall below published USEPA Health Based Criteria for residues in soil. A composite of surficial soils was submitted for analysis for priority pollutant metals because of the higher likelihood of human contact with shallow soils. Each metal concentration detected in the sample fell below the reported average for metal compounds naturally present in soils. Analysis for hazardous waste characteristics (EP Toxicity, Reactivity, Corrosivity, Ignitability) was also performed on a shallow soil sample. The sample was not hazardous based on these characteristics.

- Loose fill was encountered in all three site borings up to a depth of 11± ft. below ground surface and approximately 1 to 2± ft. above the apparent top of bedrock. Depending on the building configuration considered for the site, recommended foundation types appropriate for this site may include drilled-in piers with slab-on-grade floors or spread footings. These may require partial or total removal of site fill. Relatively high groundwater conditions were also encountered which should be considered if a basement is contemplated.

- Removal of site fill may require one or more types of special handling. Cinder fill from the Genesee Valley Canal area is classified as a solid waste and would likely require disposal at a sanitary landfill. If site soils are found to contain petroleum products or derivatives (from Vacuum Oil operations) they may require disposal as a hazardous waste (if reactive, ignitable, corrosive, EP toxic, or containing a listed organic substance), or a special waste (if found to contain a petroleum product but not exhibit hazardous characteristics). Hazardous waste would have to be disposed at a NYSDEC permitted hazardous waste treatment storage and disposal facility; petroleum stained soils could be landfilled at a NYSDEC permitted sanitary landfill.

- The walkover and subsurface investigations were limited to the city owned, vacant portion of the site from the end of Flint and Violetta Streets to the Genesee River. The remainder of the site is privately owned warehouse, industrial and manufacturing properties where many of the Vacuum Oil Company tanks and buildings formerly were located. Neither a walkover nor subsurface investigations were performed on the portion of the site where the highest potential for oil or hazardous materials appears to be present. Vacuum Oil operations and subsequent permitted underground storage tanks are or were on the portions of the site H&A personnel were unable to view. A thorough walkover and additional subsurface investigations (test borings and soil vapor sample locations) should be conducted on the remainder of the site with particular emphasis on the portion of the site considered for the school building location.

In summary, based on the scope of work performed, and our conclusions and recommendations described above, the property evaluated appears to be capable of undergoing re-development provided that prior to development evaluation of and accommodations for the fill material and soils potentially containing petroleum derivatives are made. Of the compounds detected on site (volatile organics, semi-volatile organics and metals), none appear to be present in concentrations above USEPA Health Based Criteria or levels naturally expected to occur in soil at the limited locations sampled. However, the potential for hazardous materials to be present in areas not explored during this investigation appears to be high based on past and present site land use.

QUADRANGLE LOCATION

N

USGS QUADRANGLES
ROCHESTER, EAST AND
ROCHESTER, WEST

H & A of New York
Consulting Geotechnical Engineers, Geologists and Hydrogeologists

MADISON/FLINT-EXCHANGE SITES
ROCHESTER, NEW YORK

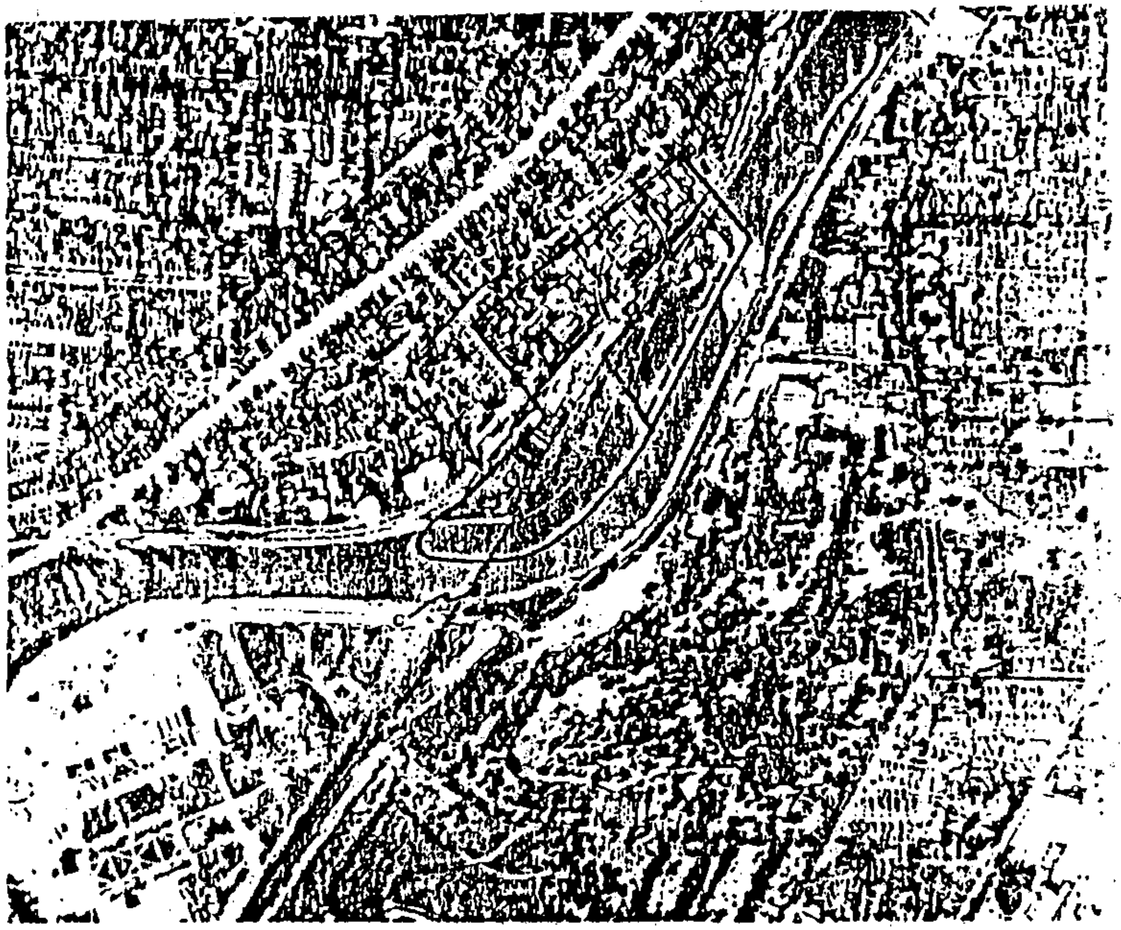
PROJECT LOCUS

SCALE: 1IN=2000FT

JULY 1989

FIGURE 1

FILE NO. 70082-40



LEGEND:

A — VACUUM OIL COMPANY (NOTE STORAGE TANKS AND APPARENT ELEVATED PIPELINE/BARREL CONVEYOR)

B GENESEE RIVER

C RAILROAD BRIDGE

D -- APPROXIMATE SITE BOUNDARY

NOTES:

1. AIR PHOTO SUPPLIED BY MONROE COUNTY ENVIRONMENTAL MANAGEMENT COUNCIL, ROCHESTER, NEW YORK.
2. AIR PHOTO TAKEN IN 1930.
3. ALL SITE BOUNDARIES AND SITE FEATURE LOCATIONS APPROXIMATE.
4. SEE ACCOMPANYING REPORT FOR ADDITIONAL INFORMATION.

N

0 500 1000

SCALE IN FEET

H&A of New York

FLINT-EXCHANGE SITE
ROCHESTER, NEW YORK

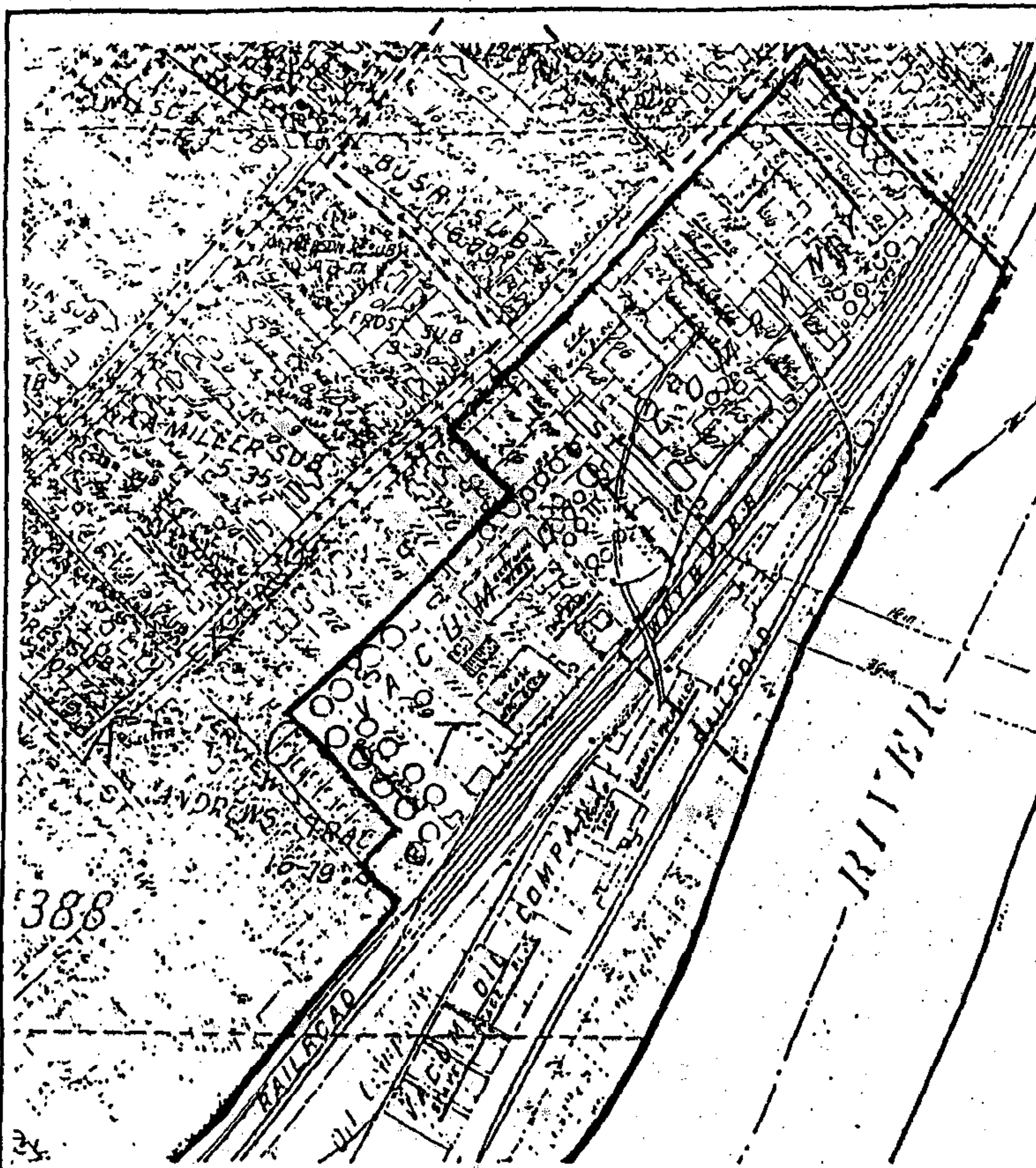
1930 SITE AERIAL PHOTOGRA

SCALE AS SHOWN

JULY 19

FIGURE

FILE NO. 70082-40



LEGEND:

——— APPROXIMATE BOUNDARY OF VACUUM OIL COMPANY

— — — APPROXIMATE BOUNDARY OF PROPOSED SITE

○ ABOVE GROUND STORAGE TANKS

NOTES:

1. BASE PLAN FROM G.M. HOPKINS 1926 PLAT BOOK.
2. ALL SITE LOCATIONS APPROXIMATE.
3. SEE ACCOMPANYING TEXT FOR ADDITIONAL INFORMATION.

0 50 100 200

SCALE IN FEET

H&A of New York

FLINT-EXCHANGE SITE
ROCHESTER, NEW YORK

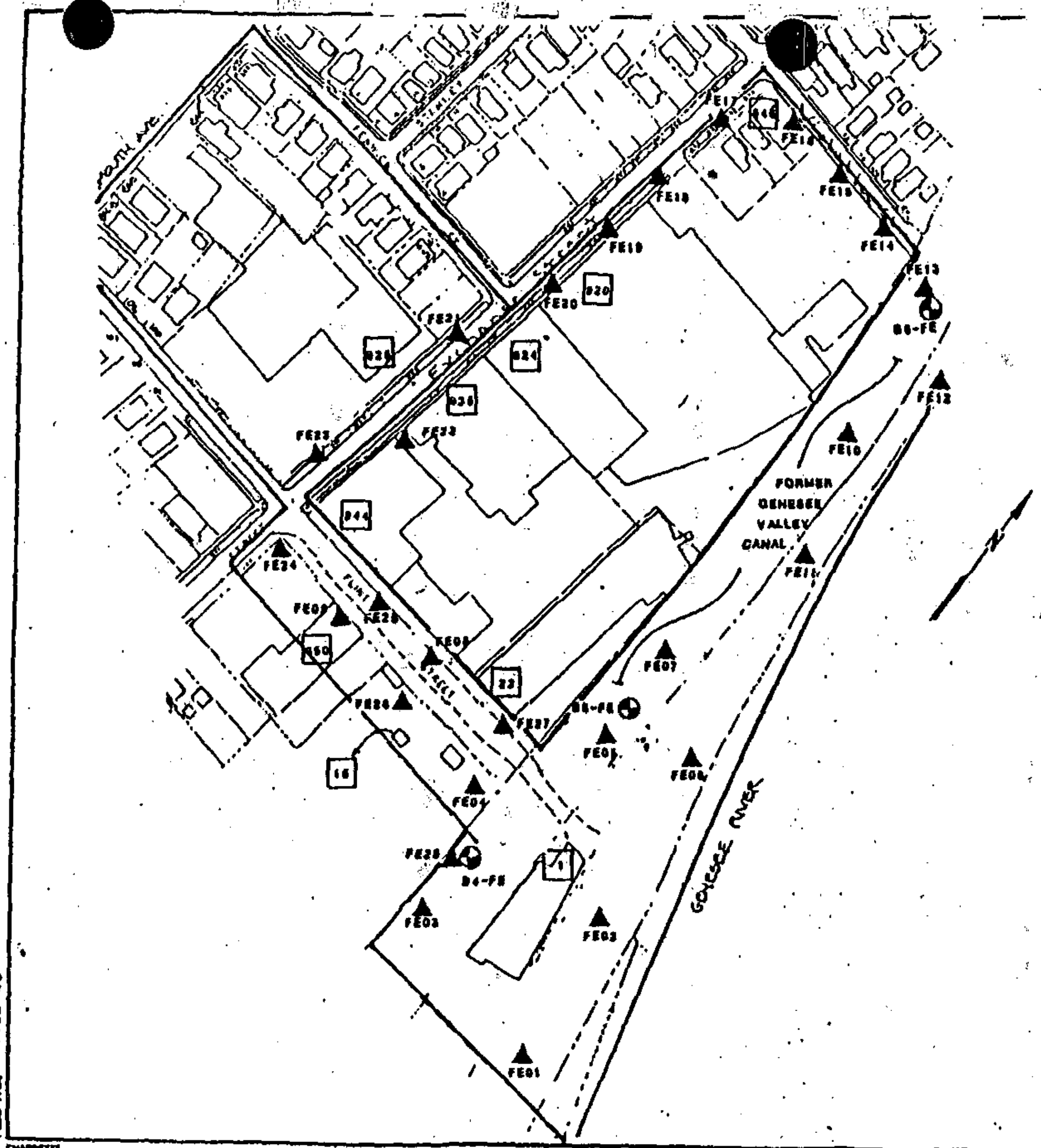
1926 SITE PLAN-
VACUUM OIL COMPANY

SCALE AS SHOWN — JULY

FIGURE

FILE NO. 70082-40

CHARRETTE



LEGEND:

APPROXIMATE SITE BOUNDARY

820 SITE ADDRESS

FE09 LOCATION AND NUMBER OF SOIL VAPOR SAMPLE POINT

B6-FE APPROXIMATE LOCATION AND NUMBER OF TEST BORING EXPLORATION

EXISTING STRUCTURE

NOTES:

1. BASE PLAN FROM 1986 PROVIDED BY CITY OF ROCHESTER, DEPARTMENT OF PLANNING.
2. ALL SITE LOCATIONS APPROXIMATE.
3. SOIL VAPOR SAMPLING PERFORMED BY H&A OF NEW YORK PERSONNEL BETWEEN 24 MAY AND 12 JUNE 1989 USING A PHOTOVAC 10S50 PORTABLE GAS CHROMATOGRAPH. SEE TABLE II FOR RESULTS.
4. TEST BORINGS PERFORMED BY ROCHESTER DRILLING CO., INC. ON 1 AND 6 JUNE 1989. SEE FIGURE 4 FOR BORING INFORMATION SUMMARY.
5. SITE AND ADJACENT PROPERTIES ARE LISTED BY ADDRESS ON TABLE I.
6. SEE ACCOMPANYING TEXT FOR ADDITIONAL INFORMATION.

H&A of New York

FLINT-EXCHANGE SITE
ROCHESTER, NEW YORK

SITE PLAN

SCALE AS SHOWN

JULY 1

FIGUR

FILE NO. 70052-40

TABLE I

SITE USAGE

FLINT-EXCHANGE SITE

ROCHESTER, NEW YORK

ADDRESS	YEAR	NAME	USAGE (POSSIBLE/DOCUMENTED O&HM USAGE)
932-948 EXCHANGE	1945-1947?	GENESEE BREWING	INDUSTRIAL ALCOHOL (BULK STORAGE OF 10,000 GAL. ALCOHOL FOR DISTILLING USE, FIRE MARSHAL)
" "	1950	RG&E WAREHOUSE	
		BACUM CORP.	WAREHOUSE
		CHAMBERLAIN CO.	WEATHER STRIPPING
		GENESEE TILE	WAREHOUSE
		STROMBERG/CARLSON	
		ROCHESTER CONVEYOR	
		MACHINE MFG.	MANUFACTURING
		ROCHESTER DISTILLING	PETROLEUM DISTILLING (POSSIBLE PETROLEUM PRODUCT STORAGE)
" "	1960	WEATHER MASTER	WEATHER STRIPPING
		ONTARIO LIQUOR	DISTRIBUTOR
		ALLISON CORP.	FURNITURE WHOLESALE
" "	1969-1983	KOLKO PAPER	(2000 GAL. GAS, FIRE MARSHAL)
" "	1970	KOLKO PAPER	
		ROCH. MUNICIPAL	WAREHOUSE
		ALLISON CORP.	FURNITURE WHOLESALE
" "	1978	KOLKO PAPER	1000 GAL. GAS REMOVED, (FIRE MARSHAL) FURNITURE WAREHOUSE
		ALLISON CORP.	
" "	1983	KOLKO PAPER	
		VACANT	
" "	1985	KOLKO PAPER	(2000 GAL. GAS REMOVED, FIRE MARSHAL)
" "	1989	H.P. NEUN	
		KOLKO PAPER	
		ALLISON CORP.	FURNITURE WAREHOUSE
950 EXCHANGE	1950	LUCAS SCREW	SCREW PRODUCTS (POSSIBLE OILS AND METAL CLEANING SOLVENTS)
" "	1960-1970	ONTARIO MACH.	TOOL & DIE (POSSIBLE OILS AND METAL CLEANING SOLVENTS)
" "	1978-1989	XL TOOL & DIE	(POSSIBLE OILS AND METAL CLEANING SOLVENTS)

TABLE I
SITE USAGE
FLINT-EXCHANGE SITE
ROCHESTER, NEW YORK

ADDRESS	YEAR	NAME	USAGE (POSSIBLE/DOCUMENTED OSHM USAGE)
846 EXCHANGE	1960-1989	ROCHESTER SANITARY PRODUCTS	DISINFECTANT SALES/DISTRIBUTION
920 EXCHANGE	1960-1970	SEARS	SERVICE CENTER
" "	1971	BEVACO FOOD	FREEZER/WAREHOUSE (1000 GAL., 2000 GAL AND 3000 GAL. GAS TANKS, FIRE MARSHAL)
" "	1978	EGAN FOOD	FREEZER/WAREHOUSE
" "	1979	NORTH ATLANTIC FISHERIES	(2000 GAL. GAS TANK REMOVED, FIRE MARSHAL)
" "	1983	BEVACO FOOD	FREEZER/WAREHOUSE
" "	1986	EGAN FOOD NORTH ATLANTIC FISHERIES	(3000 GAL. GAS TANK, FIRE MARSHAL) (2 FUEL OIL TANKS FILLED WITH CONCRETE, FIRE MARSHAL)
" "	1989	NORTH ATLANTIC FISHERIES BUDGET BALANCER FOOD CLUB	FREEZER/WAREHOUSE (GAS PUMP OBSERVED)
924 EXCHANGE	1950-1970	SEARS	WHOLESALE, REPAIRS (POSSIBLE OILS AND SOLVENTS)
" "	1977	EGAN FOOD	(3000 GAL. GAS TANK, FIRE MARSHAL)
" "	1978	SPECIALIZED	WAREHOUSE
" "	1983	VACANT	

TABLE I
SITE USAGE
FLINT-EXCHANGE SITE
ROCHESTER, NEW YORK

ADDRESS	YEAR	NAME	USAGE (POSSIBLE/DOCUMENTED O&HM USAGE)
925 EXCHANGE	1960	TALLMAN TOOL AND MACHINE	MANUFACTURER (POSSIBLE SOLVENTS AND OILS)
" "	1970	WOODHILL PRODUCTS	
" "	1978	PRECISION PRODUCTS	
" "	1983	NATIONWIDE PRECISION PRODUCTS	
" "	1989	CANFIELD & TACK	
926 EXCHANGE	1936	VACUUM OIL ROCHESTER DISTILLING	PETROLEUM DISTILLATE PRODUCTS
" "	1950	GENERAL SOLVENTS	(POSSIBLE SOLVENT STORAGE)

FILE NO 70082-40

TABLE I
SITE USAGE
FLINT-EXCHANGE SITE
ROCHESTER, NEW YORK

ADDRESS	YEAR	NAME	USAGE (POSSIBLE/DOCUMENTED O&HM USAGE)
22 FLINT STREET	1950	SCHWARTZ	ELECTRICAL EQUIPMENT (POSSIBLE METAL CLEANING SOLVENTS OR PCBS)
" "	1960	MILLS TALBOT	ELECTRICAL EQUIPMENT (POSSIBLE METAL CLEANING SOLVENTS OR PCBS)
" "	1960-1967	?	(1000 GAL. GAS TANK, FIRE MARSHAL)
" "	1970	EAT CORP.	WAREHOUSE
" "	1974	?	(MAINTAIN 1000 GAL. GAS TANK, FIRE MARSHAL)
" "	1978	SPECIALIZED	WAREHOUSE
" "	1983	NIBLACK	FOOD WAREHOUSE
" "	1983	NIBLACK	BULK FOODS
		TADCO	
		CORN HILL EX.	
		PRINTER'S WRHSE	WAREHOUSE (POSSIBLE INKS, SOLVENTS)
		UPSTATE TRADING	

TABLE I
SITE USAGE
FLINT-EXCHANGE SITE
ROCHESTER, NEW YORK

ADDRESS	YEAR	NAME	USAGE (POSSIBLE/DOCUMENTED O&HM USAGE)
AREA BOUND BY GENESEE RIVER, VIOLETTA, EXCHANGE AND FLINT STREETS	1866-1936	VACUUM OIL CO.	PETROLEUM DISTILLING PLANT (PRODUCTS INCLUDED NAPTHA, KEROSENE AND OILS; NEWS ACCOUNTS REFER TO DISPOSAL OF PROCESS WASTES BY DUMPING INTO THE GENESEE VALLEY CANAL, GENESEE RIVER, AND BY LAND BURIAL
1 FLINT STREET	1950	VACUUM OIL CO.	VACANT BARREL BUILDING
" "	1960	DANNEMILLER	COFFEE WAREHOUSE
" "	1970	FASCO	WAREHOUSE
" "	1978	VACANT	VACANT WAREHOUSE
" "	1983	KNEPPAR METAL	METAL BUYERS
" "	1989	KNEPPAR	LICENSED HAZARDOUS WASTE TRANSPORTER
15 FLINT STREET	1950	ROCHESTER SCRAP BAILING CO.	METAL DEALERS
" "	1960	"	" "
" "	1946-1961?	"	METAL DEALERS (1000 GAL. GAS TANK, FIRE MARSHAL)
" "	1970	VACANT	VACANT
" "	1978-1989	FLINT AUTO WRECKERS	AUTO JUNKYARD (POSSIBLE PETROLEUM PRODUCT STORAGE)

TABLE II

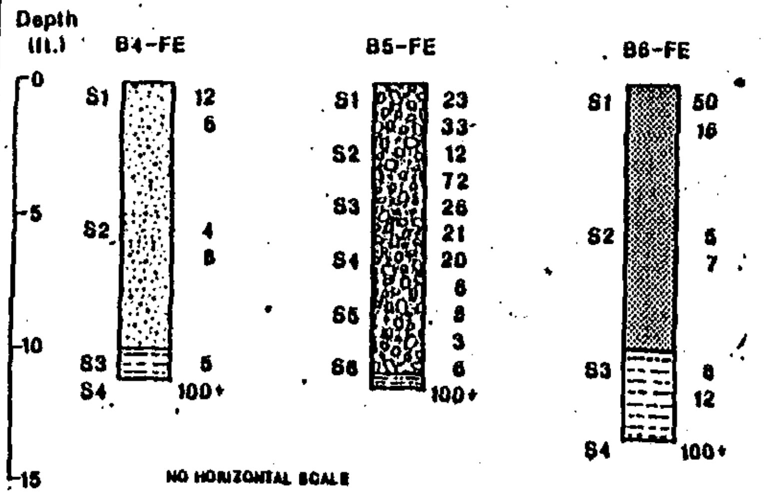
SOIL VAPOR SURVEY RESULTS

FLINT-EXCHANGE SITE

ROCHESTER CITY SCHOOL DISTRICT

Sample Date	Depth (ft.)	HEX	BNZ	TOL	EBZ	M-XYL	O-XYL	Unknowns**	Total Detected
Probe Blank 6-7-89	--	--	--	--	--	--	--	--	--
FE01	3.25	--	--	--	--	--	--	0.077	0.077
FE02	3.25	--	--	--	--	--	--	0.159*	0.159
FE02D	3.25	--	--	--	--	--	--	0.145*	0.145
FE03	3.25	--	--	--	--	--	.049	0.625	0.674
FE03D	3.25	--	--	--	--	--	.062	0.861	0.923
FE04	3.25	--	--	--	--	--	--	TR	0.012
FE05	3.25	--	--	--	--	--	--	TR	0.019
FE06	3.25	--	--	--	--	--	--	0.040	0.040
FE07	3.25	--	--	--	--	--	--	0.033	0.033
FE08	3.25	--	--	--	--	--	--	TR	0.027
FE09	3.25	--	--	--	--	--	--	0.030	0.030
Probe Blank 6-8-89	--	--	--	--	--	--	--	0.040	0.040
Probe Blank	--	--	--	--	--	--	--	TR	0.015
FE10	3.25	--	--	--	--	--	--	0.060*	0.060
FE11	3.25	--	--	TR	--	--	--	0.179*	0.193
FE11D	3.25	--	--	TR	--	--	--	0.190*	0.204
FE12	3.25	--	--	--	--	--	--	0.057*	0.057
Carrier Gas 6-12-89	--	--	--	--	--	--	--	--	--
Probe Blank	--	--	--	--	--	--	--	--	--
FE13	3.25	--	--	--	--	--	--	0.143*	0.143
FE14	3.25	--	--	--	--	--	--	TR	0.014
FE15	3.25	--	--	--	--	--	--	0.036	0.036
FE16	3.25	--	--	--	--	--	--	0.034	0.034
FE17	3.25	--	--	--	--	--	--	TR	0.018
FE17D	3.25	--	--	--	--	--	--	TR	0.019
FE18	3.25	--	--	--	--	--	--	TR	0.020
FE19	3.25	--	--	--	--	--	--	0.042	0.042
FE20	3.25	--	--	--	--	--	--	0.054	0.054
Probe Blank 6-13-89	--	--	--	--	--	--	--	TR	0.012
FE21	3.25	--	--	--	--	--	--	TR	0.012
FE22	3.25	--	--	--	--	--	--	--	--
FE23	3.25	--	--	--	--	--	--	--	--
FE24	3.25	--	--	--	--	--	--	--	--
FE25	3.25	--	--	--	--	--	--	0.034	0.034
FE26	3.25	--	--	--	--	--	--	0.051	0.051
FE27	3.25	--	--	--	--	--	--	TR	0.015
FE28	3.25	--	--	--	--	--	--	TR	0.022

Notes:
1. All concentrations listed in parts per million (ppm).
2. Compound Abbreviations:
   HEX = hexane TOL = toluene M-XYL = m-xylene
   BNZ = benzene EBZ = ethyl benzene O-XYL = o-xylene
3. ** Unknown volatile compounds quantified as sum of unidentified peak areas compared to the signal response of toluene.
4. * Possible presence of methane.
5. TR Trace (concentration between 0.01 and 0.03 ppm).
   -- Not detected (concentrations less than 0.01 ppm).
6. D Duplicate Sample.
7. See Figure 2, Site and Subsurface Exploration Plan, for sample locations.
8. Soil vapor sampling performed by H&A of New York personnel between 7 and 13 June 1989 using a Photovac 10S50 Portable Gas Chromatograph.
9. See accompanying text for additional information.



NOTES:

1. SUBSURFACE CONDITIONS DEPICTED IN THE BORING REPRESENTATIONS ABOVE:

   - SANDY FILL
   - FLUVIAL SILT
   - CINDER, SAND & GRAVEL FILL
   - SILT, SAND & GRAVEL FILL

2. EACH TWO FOOT SPLIT-SPOON SAMPLE IS INDICATED BY THE LETTER "S" FOLLOWED BY THE SAMPLE NUMBER, SHOWN TO THE LEFT OF EACH BORING REPRESENTATION ABOVE.

3. THE NUMBERS TO THE RIGHT OF EACH BORING REPRESENTATION ARE THE STANDARD PENETRATION RESISTANCE, THE NUMBER OF BLOWS NEEDED TO ADVANCE THE STANDARD SPLIT SPOON SAMPLER 1.0 FT. INTO UNDISTURBED SOIL WITH A 140-LB. WEIGHT FALLING FREELY FOR 30 INCHES.

4. SEE ACCOMPANYING REPORT FOR ADDITIONAL INFORMATION AND TEST BORING REPORTS.

SAMPLE NAME	SAMPLE COMPOSITION	ANALYSES CONDUCTED	ANALYTICAL RESULTS (COMPARISON VALUES)			
FEMET	B4-FE, S1 B2-M, S1 B3-M, S1	Priority Pollutant Metals	Arsenic Cadmium Chromium Copper	0.0095 (5.0) 0.0007 (0.06) 0.011 (0.4) 0.029 (20.0)	Lead Mercury Nickel Zinc	0.3 (10.0) 0.00024 (0.03) 0.011 (2.0) 0.11 (50.0)
B4-S3	B4-FE, S3	Volatile Organic Compounds	Methylene Chloride Toluene	≤0.0003 (93.0) ≤0.0007 (20.0)		
B4-S3	B4-FE, S3	Petroleum Hydrocarbons	None detected			
FEABN	B4-FE, S1 B4-FE, S2 B5-FE, S2 B6-FE, S2	Semi-Volatile Organic Compounds	Acenaphthene Anthracene Benzo(A)anthracene Benzo(A)pyrene Benzo(B)fluoranthene Chrysene Fluoranthene Fluorene Phenanthrene Pyrene	≤0.00033 ≤0.00033 ≤0.00033 (0.224) ≤0.00033 (0.0609) ≤0.00033 ≤0.00033 ≤0.00033 ≤0.00033 ≤0.00033 ≤0.00033		
FEOAN	B4-FE, S1 B4-FE, S2 B5-FE, S2 B6-FE, S2	Hazardous Waste Characteristics	Extractable Barium Extractable Cadmium Extractable Lead	0.16 (100.0) 0.011 (1.0) 0.16 (5.0)		

Notes:

1. All concentrations above in parts per million (ppm). Note, most concentrations in lab report, Appendix B, are in parts per billion (ppb).
2. NA Comparison value not available.
3. See References at end of report text for comparison criteria sources.

H&A of New York

FLINT-EXCHANGE SITE
ROCHESTER, NEW YORK

SUMMARY OF SUBSURFACE COND[ITIONS]
AND LABORATORY ANALYTICAL RES[ULTS]

SCALE AS SHOWN

JULY 1

TA[BLE]

FILE NO. 70082-40

APPENDIX A

Test Boring Reports

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	TEST BORING REPORT	BORING NO. 84-FE

PROJECT:	FLINT-EXCHANGE SITE	FILE NO.	70082-40
CLIENT:	ROCHESTER CITY SCHOOL DISTRICT	SHEET NO.	1 OF 1
CONTRACTOR:	ROCHESTER DRILLING CO., INC.	LOCATION:	See Plan

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	AUGER	SS	---
INSIDE DIAMETER (IN)	4-1/4	1-3/8	---
HAMMER WEIGHT (LB)	---	140	---
HAMMER FALL (IN)	---	30	---

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE: CME 75, Truck-Mounted
BIT TYPE: ---
DRILL MUD: ---
OTHER: Advanced augers to 11.1 ft.

ELEVATION: ---
DATUM: ---
START: 8 June 1989
FINISH: 8 June 1989
DRILLER: T. Smith
H&A REP: W. Lanik

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
0		7 5 3 3	S1 4"/24"	0.0 - 2.0		Loose light brown coarse to fine SAND, little fine gravel with asphalt fragments. -FILL-
5		2 2 3 5	S2 8"/24"	5.0 - 7.0		Loose dark brown to black coarse to medium SAND, trace fine gravel, with brick fragments, wet. Slight petroleum odor.
10		2 3 100/0.1	S3 13"/13"	10.0 - 11.1	10.0	Loose dark gray fine sandy SILT, little gravel, trace clay. Slight petroleum odor. -FLUVIAL-
					11.1	Top of rock at 11.1 ft.
		100/0.1	S4 1"/1"	11.1 - 11.2		Very dense dark gray DOLOMITE FRAGMENTS, little silt. -SEVERELY WEATHERED BEDROCK-
15						
20						
25						

Notes:

1. Completed borehole backfilled with borehole cuttings.

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	BOTTOM OF HOLE	WATER
6/8/89	1600	0.5	11.0	11.2	4.6

SAMPLE IDENTIFICATION

O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon

SUMMARY

OVERBURDEN (LIN FT): 11.2 ft.
ROCK CORED (LIN FT): ---
SAMPLES: 4S
BORING NO. 84-FE

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	TEST BORING REPORT	BORING NO. B5-FE

PROJECT:	FLINT-EXCHANGE SITE	FILE NO.	70082-40
CLIENT:	ROCHESTER CITY SCHOOL DISTRICT	SHEET NO.	1 OF 1
CONTRACTOR:	ROCHESTER DRILLING CO., INC.	LOCATION:	See Plan

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	AUGER	SS	---
INSIDE DIAMETER (IN)	4-1/4	1-3/8	---
HAMMER WEIGHT (LB)	---	140	---
HAMMER FALL (IN)	---	30	---

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE: CME 75, Truck-Mounted
BIT TYPE: ---
DRILL MUD: ---
OTHER: Advanced augers to 11.4 ft.

ELEVATION: ---
DATUM: ---
START: 9 June 1989
FINISH: 9 June 1989
DRILLER: T. Smith
H&A REP: W. Lanik

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
		7 16 23 10	S1 7"/24"	0.0 2.0		Dense light brown gravelly coarse to fine SAND, trace roots. -FILL-
		6 6 42 30	S2 15"/24"	2.0 4.0		Dense black CINDER PARTICLES and red BRICK FRAGMENTS.
5		12 14 11 10	S3 13"/24"	4.0 6.0		Medium dense dark brown to black CINDER PARTICLES. -FILL-
		10 10 4 2	S4 6"/24"	6.0 8.0		Medium dense dark brown coarse sandy coarse to fine GRAVEL, wet.
		4 4 1 2	S5 6"/24"	8.0 10.0		Loose dark brown coarse to fine GRAVEL, trace coarse sand. -FILL-
10		4 2 100/0.4	S6 12"/17"	10.0 11.4	11.0 11.4	Same. Dark gray fine sandy SILT. -FLUVIAL-
						Top of Rock at 11.4 ft.
15						Note: 1. Completed borehole backfilled with borehole cuttings.
20						
25						

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	BOTTOM OF HOLE	WATER
6/9/89	0900	0.5	8.0	11.4	7.7

SAMPLE IDENTIFICATION

O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon

SUMMARY

OVERBURDEN (LIN FT): 11.4 ft.
ROCK CORED (LIN FT): ---
SAMPLES: 6S
BORING NO. B5-FE

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	TEST BORING REPORT	BORING NO. 86-FE

PROJECT:	FLINT-EXCHANGE SITE	FILE NO.	70082-40
CLIENT:	ROCHESTER CITY SCHOOL DISTRICT	SHEET NO.	1 OF 1
CONTRACTOR:	ROCHESTER DRILLING CO., INC.	LOCATION:	See Plan

ITEM	CASING	DRIVE SAMPLER	CORE BARREL	DRILLING EQUIPMENT & PROCEDURES		
					ELEVATION:	---
				RIG TYPE: CME 75, Truck-Mounted	DATUM:	---
TYPE	AUGER	SS	---	BIT TYPE: ---	START:	9 June 1989
INSIDE DIAMETER (IN)	4-1/4	1-3/8	---	DRILL MUD: ---	FINISH:	9 June 1989
HAMMER WEIGHT (LB)	---	140	---	OTHER: Advanced augers to 13.0 ft.	DRILLER:	T. Smith
HAMMER FALL (IN)	---	30	---		H&A REP:	W. Lanik

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
		23 27 10 6	S1 8"/24"	0.0 2.0		Dense gray to black coarse to fine gravelly coarse to medium SAND, with concrete fragments. -FILL-
5		2 3 3 4	S2 10"/24"	5.0 7.0		Loose brown fine sandy SILT, trace gravel, trace coarse sand. -FILL-
10		3 5 6 6	S3 14"/24"	10.0 12.0	10.0	Medium dense gray fine sandy SILT, trace clay, wet. -FLUVIAL-
		100/0.2	S4 2"/2"	13.0 13.2	13.0	Top of Rock at 13.0 ft. Very dense dark gray silty DOLOMITE FRAGMENTS.
15						Notes: 1. Completed borehole backfilled with borehole cuttings.
20						
25						

WATER LEVEL DATA						SAMPLE IDENTIFICATION	SUMMARY	
DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	BOTTOM OF HOLE	WATER	O Open End Rod T Thin Wall Tube U Undisturbed Sample S Split Spoon	OVERBURDEN (LIN FT):	13.2
6/9/89	1100	1.0	12.5	13.2	9.2		ROCK CORED (LIN FT):	---
							SAMPLES:	4S
							BORING NO.	86-FE

TABLE I
SITE USAGE
FLINT-EXCHANGE SITE
ROCHESTER, NEW YORK

ADDRESS	YEAR	NAME	USAGE (POSSIBLE/DOCUMENTED O&HM USAGE)
22 FLINT STREET	1950	SCHWARTZ	ELECTRICAL EQUIPMENT (POSSIBLE METAL CLEANING SOLVENTS OR PCBS)
" "	1960	MILLS TALBOT	ELECTRICAL EQUIPMENT (POSSIBLE METAL CLEANING SOLVENTS OR PCBS)
" "	1960-1967	?	(1000 GAL. GAS TANK, FIRE MARSHAL)
" "	1970	EAT CORP.	WAREHOUSE
" "	1974	?	(MAINTAIN 1000 GAL. GAS TANK, FIRE MARSHAL)
" "	1978	SPECIALIZED	WAREHOUSE
" "	1983	NIBLACK	FOOD WAREHOUSE
" "	1983	NIBLACK TADCO CORN HILL EX. PRINTER'S WRHSE UPSTATE TRADING	BULK FOODS WAREHOUSE (POSSIBLE INKS, SOLVENTS)

FILE NO 70082-40

TABLE II
SOIL VAPOR SURVEY RESULTS
FLINT-EXCHANGE SITE
ROCHESTER CITY SCHOOL DISTRICT

Sample Date	Depth (ft.)	HEX	BNZ	TOL	EBZ	M-XYL	O-XYL	Unknowns**	Total Detected
Probe Blank 6-7-89	--	--	--	--	--	--	--	--	--
FE01	3.25	--	--	--	--	--	--	0.077	0.077
FE02	3.25	--	--	--	--	--	--	0.159*	0.159
FE02D	3.25	--	--	--	--	--	--	0.145*	0.145
FE03	3.25	--	--	--	--	--	.049	0.625	0.674
FE03D	3.25	--	--	--	--	--	.062	0.861	0.923
FE04	3.25	--	--	--	--	--	--	TR	0.012
FE05	3.25	--	--	--	--	--	--	TR	0.019
FE06	3.25	--	--	--	--	--	--	0.040	0.040
FE07	3.25	--	--	--	--	--	--	0.033	0.033
FE08	3.25	--	--	--	--	--	--	TR	0.027
FE09	3.25	--	--	--	--	--	--	0.030	0.030
Probe Blank 6-8-89	--	--	--	--	--	--	--	0.040	0.040
Probe Blank	--	--	--	--	--	--	--	TR	0.015
FE10	3.25	--	--	--	--	--	--	0.060*	0.060
FE11	3.25	--	--	TR	--	--	--	0.179*	0.193
FE11D	3.25	--	--	TR	--	--	--	0.190*	0.204
FE12	3.25	--	--	--	--	--	--	0.057*	0.057
Carrier Gas 6-12-89	--	--	--	--	--	--	--	--	--
Probe Blank	--	--	--	--	--	--	--	--	--
FE13	3.25	--	--	--	--	--	--	0.143*	0.143
FE14	3.25	--	--	--	--	--	--	TR	0.014
FE15	3.25	--	--	--	--	--	--	0.036	0.036
FE16	3.25	--	--	--	--	--	--	0.034	0.034
FE17	3.25	--	--	--	--	--	--	TR	0.018
FE17D	3.25	--	--	--	--	--	--	TR	0.019
FE18	3.25	--	--	--	--	--	--	TR	0.020
FE19	3.25	--	--	--	--	--	--	0.042	0.042
FE20	3.25	--	--	--	--	--	--	0.054	0.054
Probe Blank 6-13-89	--	--	--	--	--	--	--	TR	0.012
FE21	3.25	--	--	--	--	--	--	TR	0.012
FE22	3.25	--	--	--	--	--	--	--	--
FE23	3.25	--	--	--	--	--	--	--	--
FE24	3.25	--	--	--	--	--	--	--	--
FE25	3.25	--	--	--	--	--	--	0.034	0.034
FE26	3.25	--	--	--	--	--	--	0.051	0.051
FE27	3.25	--	--	--	--	--	--	TR	0.015
FE28	3.25	--	--	--	--	--	--	TR	0.022

Notes:
1. All concentrations listed in parts per million (ppm).
2. Compound Abbreviations:
   HEX = hexane   TOL = toluene   M-XYL = m-xylene
   BNZ = benzene   EBZ = ethyl benzene   O-XYL = o-xylene
3. ** Unknown volatile compounds quantified as sum of unidentified peak areas compared to the signal response of toluene.
4. * Possible presence of methane.
5. TR Trace (concentration between 0.01 and 0.03 ppm).
   -- Not detected (concentrations less than 0.01 ppm).
6. D Duplicate Sample.
7. See Figure 2, Site and Subsurface Exploration Plan, for sample locations.
8. Soil vapor sampling performed by H&A of New York personnel between 7 and 13 June 1989 using a Photovac 10S50 Portable Gas Chromatograph.
9. See accompanying text for additional information.

APPENDIX A

Test Boring Reports

H&A OF NEW YORK, ROCHESTER, NEW YORK Consulting Geotechnical Engineers, Geologists and Hydrogeologists	TEST BORING REPORT	BORING NO. 85-FE

PROJECT: FLINT-EXCHANGE SITE
CLIENT: ROCHESTER CITY SCHOOL DISTRICT
CONTRACTOR: ROCHESTER DRILLING CO., INC.

FILE NO. 70082-40
SHEET NO. 1 OF 1
LOCATION: See Plan

ITEM	CASING	DRIVE SAMPLER	CORE BARREL
TYPE	AUGER	SS	---
INSIDE DIAMETER (IN)	4-1/4	1-3/8	---
HAMMER WEIGHT (LB)	---	140	---
HAMMER FALL (IN)	---	30	---

DRILLING EQUIPMENT & PROCEDURES

RIG TYPE: CME 75, Truck-Mounted
BIT TYPE: ---
DRILL MUD: ---
OTHER: Advanced augers to 11.4 ft.

ELEVATION: ---
DATUM: ---
START: 9 June 1989
FINISH: 9 June 1989
DRILLER: T. Smith
H&A REP: W. Lanik

DEPTH (FT)	CASING BLOWS PER FT	SAMPLER BLOWS PER 6 IN	SAMPLE NUMBER & RECOVERY	SAMPLE DEPTH (FT)	STRATA CHANGE (FT)	VISUAL CLASSIFICATION AND REMARKS
		7 16 23 10	S1 7"/24"	0.0 2.0		Dense light brown gravelly coarse to fine SAND, trace roots. -FILL-
		6 6 42 30	S2 15"/24"	2.0 4.0		Dense black CINDER PARTICLES and red BRICK FRAGMENTS.
5		12 14 11 10	S3 13"/24"	4.0 6.0		Medium dense dark brown to black CINDER PARTICLES. -FILL-
		10 10 4 2	S4 6"/24"	6.0 8.0		Medium dense dark brown coarse sandy coarse to fine GRAVEL, wet.
		4 4 1 2	S5 6"/24"	8.0 10.0		Loose dark brown coarse to fine GRAVEL, trace coarse sand. -FILL-
10		4 2 100/0.4	S6 12"/17"	10.0 11.4	11.0 11.4	Same. Dark gray fine sandy SILT. -FLUVIAL-
						Top of Rock at 11.4 ft.
						Note:
15						1. Completed borehole backfilled with borehole cuttings.
20						
25						

WATER LEVEL DATA

DATE	TIME	ELAPSED TIME (HR)	DEPTH (FT) TO: BOTTOM OF CASING	BOTTOM OF HOLE	WATER
6/9/89	0900	0.5	8.0	11.4	7.7

SAMPLE IDENTIFICATION

O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon

SUMMARY

OVERBURDEN (LIN FT): 11.4 ft.
ROCK CORED (LIN FT): ---
SAMPLES: 6S
BORING NO. 85-FE

APPENDIX E

1999 SOIL GAS SURVEY REPORT

EMFLUX® Report No. EM1138

EMFLUX® Passive, Non-Invasive Soil-Gas Survey

FORMER VACUUM OIL FACILITY
ROCHESTER, NY

Prepared for

International Technology Corporation
2200 Cottontail Lane
Somerset, NJ 08873-1248

by

BEACON Environmental Services, Inc.
2000 Grafton Shop Road
Forest Hill, MD 21050

November 19, 1999

Applying Results from Soil-Gas Surveys

The utility of soil-gas surveys is directly proportional to their accuracy in reflecting and representing changes in the subsurface concentrations of source compounds. An EMFLUX® soil-gas survey measures the mass collected from the vapor-phase of the source. The vapor-phase is merely a fractional trace of the source, so, as a matter of convenience, the units used in reporting detection values from EMFLUX® surveys are smaller than those employed for source-compound concentrations.

The critical fact is that, whatever the relative concentrations of source and associated soil gas, best results are realized when the ratio of soil-gas measurements to actual subsurface concentrations remains as close to constant as the real world permits. It is the reliability and consistency of this ratio, not the particular units of mass (*e.g.*, nanograms) that determine usefulness. Thus, BEACON emphasizes the necessity of conducting – at minimum – follow-on intrusive sampling at one or two points which show relatively high EMFLUX® values to obtain corresponding concentrations of soil and ground-water contaminants. These correspondent values furnish the basis for approximating the required ratio. Once that ratio is established, it can be used in conjunction with EMFLUX® measurements (regardless of the units adopted) to estimate subsurface contaminant concentrations across the survey field. It is important to keep in mind, however, that specific conditions at individual sample points, including soil porosity and permeability, depth to contamination, and perched ground water, can have significant impact on soil-gas measurements at those locations.

When EMFLUX® Surveys are handled in this way, the data provide information which can yield substantial savings in drilling costs and in time. They furnish, among other things, a checklist of compounds expected at each survey location and help to determine how and where drilling budgets can most effectively be spent.

Former Vacuum Oil Facility
Rochester, NY

This EMFLUX® Soil-Gas Survey Report has been prepared for International Technology Corporation (IT) by Beacon Environmental Services, Inc. (BEACON) in accordance with the terms of Purchase Order No.127282, dated October 14, 1999. IT performed this project under contract to New York State Department of Environmental Conservation (NYSDEC). BEACON's principal contact at IT for this project has been Mr. Prabal Amin.

1. Objectives

Soil-gas samples were collected to determine the presence, identity, and relative strength of targeted contaminants in soil and/or ground water at the Former Vacuum Oil Facility. Survey results will be used to determine the distribution of contaminants and to guide further site investigation.

2. Target Compounds

This survey targeted the 25 compounds listed in **Attachment 1**, which supplies the resulting laboratory data in nanograms (ng) of specific compound per cartridge.

3. Survey Description

- No. of Field Sample Points: 53
- No. of Trip Blanks: 2
- Total No. of EMFLUX® Cartridges: 55

4. Field Work

NYSDEC was provided an EMFLUX® Field Kit with the equipment needed to conduct a 53-point EMFLUX® Soil-Gas Survey. Collectors were deployed on October 20, 1999 and retrieved November 4, 1999. **Attachment 2** describes the field procedures used. Individual deployment and retrieval times will be found in the Field Deployment Report (**Attachment 3**).

5. Analysis and Reporting Dates

- BEACON's laboratory received 55 sample cartridges for analysis on November 5, 1999.
- BEACON's laboratory analyzed the samples for the specified compounds, using thermal desorption and a capillary-column gas chromatograph (GC) with a photoionization detector

(PID), a flame ionization detector (FID), and a dry electrolytic conductivity detector (DELCD) in accordance with EPA Method 8015B/8021 (Modified), as described in **Attachment 4.**

- Analysis was completed on November 11, 1999, and following a laboratory review, results were provided to IT that same day.

6. Report Notes and Quality Assurance/Quality Control Factors

- **Attachment 1** provides survey results in nanograms per cartridge by sample-point number and compound name. The quantitation levels represent values above which quantitative laboratory results can be achieved within specified limits of precision and with a high degree of confidence. The quantitation level of each compound, therefore, provides a reliable basis for comparison of the relative strength of individual detections of that compound.

- **Data Compatibility.** It is important to note that when sample locations are covered with or near the edge of an artificial surface (*e.g.*, asphalt or concrete), sample measurements are often distorted (increased) significantly. Such distortion can be attributed to the fact that gas rising from sources beneath impermeable caps tends to reach equilibrium in relatively short periods of time and that, once equilibrium is reached, the soil-gas concentration measured at any point in a vertical line between source and cap is theoretically the same. Thus, a reading taken immediately below or near an impermeable surface is much higher than it would be in the absence of such a cap.

- The **Chain-of-Custody** form, which was shipped with the samples for this survey, is supplied as **Attachment 5.**

- **Laboratory QA/QC procedures** consist of control blanks and verifications, as well as system calibration, as specified for EPA Method 8015B/8021. Laboratory personnel conducted internal control blanks and internal control verification analyses daily to ensure that the system was contaminant free and properly calibrated. The system was calibrated using external-standard procedures to at least three different concentrations for each compound targeted.

- **QA/QC Contaminant Corrections.** Following EPA guidelines, EMFLUX® laboratory data is not corrected for method blank and trip blank contamination values; all contamination detected on QA/QC samples is reported in **Attachment 1.** Subsequent handling of QA/QC sample contamination depends upon the circumstances and origin of the sample; any corrective conventions noted below have proved highly useful in deriving accurate and reproducible interpretations of survey data in prior EMFLUX® Surveys. *No other methods thus far tested have produced comparable levels of quality.*

Laboratory method blanks are run each day with project samples to identify contamination present in the laboratory. If contamination is detected on a method blank, detections of identical compounds on samples analyzed the same day are considered to be suspect and are flagged in the laboratory report. The laboratory method blanks analyzed in connection with the present samples revealed no contamination.

Trip blanks are EMFLUX® cartridges prepared, transported, and analyzed with other samples but intentionally not exposed. The trip blanks (labeled Trip-1 and Trip-2 in **Attachment 1**) recorded none of the targeted compounds, indicating that the survey site itself is the source of detected contamination.

- As additional QA/QC, NYSDEC deployed a duplicate field sample for sample **C2** designated **C2D**. Because duplicates cannot be identically located with their base field samples and because it is possible for even small geophysical differences between sample locations to affect soil-gas-emission quantities, comparisons between duplicates and base samples should be made on a qualitative basis, as quantitative results may be subject to random distortions. In general, a duplicate correspondence should be defined as a difference of 50% or less between contaminant data for base and duplicate samples. Also, for the purpose of calculating correspondences, all non-detections should be assigned as a baseline value the quantitation level for the specific contaminant. Based on these assumptions, a 100% correlation was found between the duplicate sample and its base sample.

- **Survey findings** are relative exclusively to this project and should not routinely be compared with results of other EMFLUX® Surveys. *To establish a relationship between reported soil-gas measurements and actual subsurface contaminant concentrations, which will indicate those detections representing significant subsurface contamination, BEACON recommends the guidelines on the inside front cover of this report.*

- The following **Attachments** are included:

  - -1- Laboratory Report
  - -2- EMFLUX® Field Procedures
  - -3- Field Deployment Report
  - -4- Laboratory Procedures
  - -5- Chain-of-Custody Form

Attachment 1

Laboratory Report

Attachment 1

Laboratory Report
Results in Nanograms (ng)
Analysis Completed: November 11, 1999

EMFLUX Project No. EM1138

In this analysis 55 EMFLUX samples were analyzed under the requirements of EPA Method 8021/8015B using an SRI 8610 Gas Chromatograph equipped with a thermal desorber, a photoionization detector, a flame ionization detector and a dry electrolytic conductivity detector.

SAMPLE NO.	A1	A2	A3	B2	B3	B4	C1	C2
COMPOUNDS								
1,1-Dichloroethene	U	U	U	U	U	U	U	U
Methylene Chloride	U	U	U	U	U	U	U	U
trans-1,2-Dichloroethene	U	U	U	U	U	U	U	U
1,1-Dichloroethane	U	U	U	U	U	U	U	U
cis-1,2-Dichloroethene	U	U	U	U	U	U	U	U
Chloroform	U	U	U	U	U	U	U	U
1,2-Dichloroethane	U	U	U	U	U	U	U	U
1,1,1-Trichloroethane	U	U	U	U	U	U	87	U
Carbon Tetrachloride	U	U	U	U	U	U	U	U
Trichloroethene	U	U	U	U	U	U	U	U
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U
Tetrachloroethene	U	U	U	U	U	U	U	U
Chlorobenzene	U	U	U	U	U	U	U	U
Ethylene Dibromide	U	U	U	U	U	U	U	U
Bromoform	U	U	U	U	U	U	U	U
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U
MTBE	U	U	U	U	U	U	U	U
Benzene	U	U	U	U	U	U	U	U
Toluene	U	U	U	U	34	U	U	U
Ethylbenzene	U	U	U	26	240	U	U	U
Xylenes (total)	U	40	1,100	74	250	U	U	U
1,3,5-Trimethylbenzene	U	U	170	U	180	180	U	U
1,2,4-Trimethylbenzene	U	U	120	60	93	U	U	U
Naphthalene	U	U	U	40	25	U	U	U
TPH Volatiles	U	U	3,600	1,400	14,000	2,500	U	280

Reported Quantitation Level = 25 nanograms for individual compounds
Reported Quantitation Level = 250 nanograms for TPH Volatiles
U = Below Reported Quantitation Level

Attachment 1
(continued)
Laboratory Report
Results in Nanograms (ng)
Analysis Completed: November 11, 1999

SAMPLE NO.	C2D	C3	C4	D2	D3	D4	D5	D6
COMPOUNDS								
1,1-Dichloroethene	U	27	U	U	U	U	U	U
Methylene Chloride	U	U	U	U	U	U	U	U
trans-1,2-Dichloroethene	U	U	U	U	U	U	U	U
1,1-Dichloroethane	U	62	U	U	U	U	U	U
cis-1,2-Dichloroethene	U	U	U	U	U	U	U	U
Chloroform	U	U	U	U	U	U	U	U
1,2-Dichloroethane	U	U	U	U	U	U	U	U
1,1,1-Trichloroethane	U	980	U	U	140	U	U	29
Carbon Tetrachloride	U	U	U	U	U	U	U	U
Trichloroethene	U	27	U	U	U	U	U	U
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U
Tetrachloroethene	U	U	U	U	54	U	U	U
Chlorobenzene	U	U	U	U	U	U	U	U
Ethylene Dibromide	U	U	U	U	U	U	U	U
Bromoform	U	U	U	U	U	U	U	U
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U
MTBE	U	U	U	U	U	U	U	U
Benzene	U	U	U	U	U	U	U	U
Toluene	U	35	U	U	U	U	U	U
Ethylbenzene	U	U	U	U	U	U	U	U
Xylenes (total)	U	49	140	U	U	U	U	U
1,3,5-Trimethylbenzene	U	28	U	U	U	U	U	U
1,2,4-Trimethylbenzene	U	U	U	U	U	U	U	U
Naphthalene	U	26	U	U	U	U	U	U
TPH Volatiles	U	1,100	580	U	U	U	U	U

Reported Quantitation Level = 25 nanograms for individual compounds
Reported Quantitation Level = 250 nanograms for TPH Volatiles
U = Below Reported Quantitation Level

Attachment 1
(continued)
Laboratory Report
Results in Nanograms (ng)
Analysis Completed: November 11, 1999

SAMPLE NO.	D7	E1	E2	E3	E4	E5	E6	F2
COMPOUNDS								
1,1-Dichloroethene	U	U	U	U	U	U	U	U
Methylene Chloride	U	U	U	U	U	U	U	U
trans-1,2-Dichloroethene	U	U	U	U	U	U	U	U
1,1-Dichloroethane	U	U	U	U	U	U	U	U
cis-1,2-Dichloroethene	U	U	U	U	U	U	U	U
Chloroform	U	U	U	U	U	U	U	U
1,2-Dichloroethane	U	U	U	U	U	U	U	U
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U
Carbon Tetrachloride	U	U	U	U	U	U	U	U
Trichloroethene	U	U	U	U	U	U	U	U
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U
Tetrachloroethene	U	U	U	U	U	U	U	U
Chlorobenzene	U	U	U	U	U	U	U	U
Ethylene Dibromide	U	U	U	U	U	U	U	U
Bromoform	U	U	U	U	U	U	U	U
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U
MTBE	U	U	U	U	U	U	U	U
Benzene	U	U	U	U	U	U	U	U
Toluene	U	U	U	U	U	U	U	U
Ethylbenzene	U	U	U	U	U	U	U	U
Xylenes (total)	U	U	U	U	51	U	U	U
1,3,5-Trimethylbenzene	U	U	U	U	U	U	U	U
1,2,4-Trimethylbenzene	U	U	U	U	U	U	U	U
Naphthalene	U	U	U	U	U	U	U	U
TPH Volatiles	U	260	260	U	390	U	U	U

Reported Quantitation Level = 25 nanograms for individual compounds
Reported Quantitation Level = 250 nanograms for TPH Volatiles
U = Below Reported Quantitation Level

Attachment 1
(continued)
Laboratory Report
Results in Nanograms (ng)
Analysis Completed: November 11, 1999

SAMPLE NO.	F3	F4	F5	F6	G2	G3	G4	G5
COMPOUNDS								
1,1-Dichloroethene	U	U	U	U	U	U	U	U
Methylene Chloride	U	U	U	U	U	U	U	U
trans-1,2-Dichloroethene	U	U	U	U	U	U	U	U
1,1-Dichloroethane	U	U	U	U	U	U	U	U
cis-1,2-Dichloroethene	U	U	U	U	U	U	U	U
Chloroform	U	U	U	U	U	U	U	U
1,2-Dichloroethane	U	U	U	U	U	U	U	U
1,1,1-Trichloroethane	U	U	42	U	U	U	U	U
Carbon Tetrachloride	U	U	U	U	U	U	U	U
Trichloroethene	U	U	U	U	U	U	U	U
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U
Tetrachloroethene	U	U	U	U	U	U	U	U
Chlorobenzene	U	U	U	U	U	U	U	U
Ethylene Dibromide	U	U	U	U	U	U	U	U
Bromoform	U	U	U	U	U	U	U	U
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U
MTBE	U	U	U	U	U	U	U	U
Benzene	U	U	U	U	U	U	U	U
Toluene	U	U	46	U	U	U	U	U
Ethylbenzene	U	U	U	U	U	U	U	U
Xylenes (total)	39	U	3,100	U	U	U	U	U
1,3,5-Trimethylbenzene	U	U	860	U	U	U	U	U
1,2,4-Trimethylbenzene	U	U	2,100	U	38	79	U	U
Naphthalene	27	U	U	U	U	U	U	U
TPH Volatiles	U	U	53,000	1,100	U	2,500	330	430

Reported Quantitation Level = 25 nanograms for individual compounds
Reported Quantitation Level = 250 nanograms for TPH Volatiles
U = Below Reported Quantitation Level

Attachment 1
(continued)
Laboratory Report
Results in Nanograms (ng)
Analysis Completed: November 11, 1999

SAMPLE NO.	G6	H2	H3	H4	H5	H6	H7	H8
COMPOUNDS								
1,1-Dichloroethene	U	U	U	U	U	U	U	U
Methylene Chloride	U	U	U	U	U	U	U	U
trans-1,2-Dichloroethene	U	U	U	U	U	U	U	U
1,1-Dichloroethane	U	U	U	U	U	U	U	U
cis-1,2-Dichloroethene	U	U	U	U	U	U	U	U
Chloroform	U	U	U	U	U	U	U	U
1,2-Dichloroethane	U	U	U	U	U	U	U	U
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U
Carbon Tetrachloride	U	U	U	U	U	U	U	U
Trichloroethene	U	U	U	U	U	U	U	U
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U
Tetrachloroethene	U	U	U	U	U	U	U	U
Chlorobenzene	U	U	U	U	U	U	U	U
Ethylene Dibromide	U	U	U	U	U	U	U	U
Bromoform	U	U	U	U	U	U	U	U
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U
MTBE	U	U	U	U	U	U	U	U
Benzene	U	U	U	U	U	U	U	U
Toluene	U	U	U	U	U	U	U	U
Ethylbenzene	U	U	U	U	U	U	U	U
Xylenes (total)	U	U	U	U	U	U	U	U
1,3,5-Trimethylbenzene	U	U	U	U	U	U	U	U
1,2,4-Trimethylbenzene	U	U	U	U	U	U	U	U
Naphthalene	86	U	U	42	U	U	U	U
TPH Volatiles	1,000	U	U	490	U	U	U	U

Reported Quantitation Level = 25 nanograms for individual compounds
Reported Quantitation Level = 250 nanograms for TPH Volatiles
U = Below Reported Quantitation Level

Attachment 1
(continued)
Laboratory Report
Results in Nanograms (ng)
Analysis Completed: November 11, 1999

SAMPLE NO.	I4	I5	I6	I7	J5	J6	J7	J8
COMPOUNDS								
1,1-Dichloroethene	U	U	U	U	U	U	U	U
Methylene Chloride	U	U	U	U	U	U	U	U
trans-1,2-Dichloroethene	U	U	U	U	U	U	U	U
1,1-Dichloroethane	U	U	U	U	U	U	U	U
cis-1,2-Dichloroethene	U	U	U	U	U	U	U	U
Chloroform	U	U	U	U	U	U	U	U
1,2-Dichloroethane	U	U	U	U	U	U	U	U
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U
Carbon Tetrachloride	U	U	U	U	U	U	U	U
Trichloroethene	U	U	U	U	U	U	U	U
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U
Tetrachloroethene	U	U	U	U	U	U	U	U
Chlorobenzene	U	U	U	U	U	U	U	U
Ethylene Dibromide	U	U	U	U	U	U	U	U
Bromoform	U	U	U	U	U	U	U	U
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U
MTBE	U	U	U	U	U	U	U	U
Benzene	U	U	U	U	U	U	U	U
Toluene	U	U	U	U	U	U	U	U
Ethylbenzene	U	U	U	U	U	U	U	U
Xylenes (total)	U	U	U	U	U	U	U	U
1,3,5-Trimethylbenzene	U	U	U	U	U	U	U	U
1,2,4-Trimethylbenzene	U	U	U	U	U	U	U	U
Naphthalene	U	U	U	U	U	U	U	U
TPH Volatiles	U	U	U	U	U	U	U	900

Reported Quantitation Level = 25 nanograms for individual compounds
Reported Quantitation Level = 250 nanograms for TPH Volatiles
U = Below Reported Quantitation Level

Attachment 1
(continued)
Laboratory Report
Results in Nanograms (ng)
Analysis Completed: November 11, 1999

SAMPLE NO.	K6	K7	K8	L6	L7	Trip-1	Trip-2
COMPOUNDS							
1,1-Dichloroethene	U	U	U	U	U	U	U
Methylene Chloride	U	U	U	U	U	U	U
trans-1,2-Dichloroethene	U	U	U	U	U	U	U
1,1-Dichloroethane	U	U	U	U	U	U	U
cis-1,2-Dichloroethene	U	U	U	U	U	U	U
Chloroform	U	U	U	U	U	U	U
1,2-Dichloroethane	U	U	U	U	U	U	U
1,1,1-Trichloroethane	U	U	U	U	U	U	U
Carbon Tetrachloride	U	U	U	U	U	U	U
Trichloroethene	U	U	U	U	U	U	U
1,1,2-Trichloroethane	U	U	U	U	U	U	U
Tetrachloroethene	U	U	U	U	U	U	U
Chlorobenzene	U	U	U	U	U	U	U
Ethylene Dibromide	U	U	U	U	U	U	U
Bromoform	U	U	U	U	U	U	U
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U
MTBE	U	U	U	U	U	U	U
Benzene	U	U	U	U	U	U	U
Toluene	U	66	U	U	U	U	U
Ethylbenzene	U	U	U	U	U	U	U
Xylenes (total)	U	U	U	36	U	U	U
1,3,5-Trimethylbenzene	U	U	U	U	U	U	U
1,2,4-Trimethylbenzene	U	U	U	U	U	U	U
Naphthalene	U	U	U	U	U	U	U
TPH Volatiles	U	U	U	400	U	U	U

Reported Quantitation Level = 25 nanograms for individual compounds
Reported *Quantitation* Level = 250 nanograms for TPH Volatiles
U = Below Reported Quantitation Level

Attachment 2

FIELD PROCEDURES FOR EMFLUX® SOIL-GAS SURVEYS

The following field procedures are routinely used during EMFLUX® Soil-Gas Surveys. Modifications can be and are incorporated from time to time in response to individual project requirements. In all instances, BEACON adheres to EPA-approved Quality Assurance and Quality Control practices.

A. Field personnel carry EMFLUX® system components and support equipment to the site and deploy the EMFLUX® Collectors in a prearranged survey pattern. Although EMFLUX® Collectors require only one person for emplacement and retrieval, the specific number of field personnel required depends upon the scope and schedule of the project. Each Collector emplacement generally takes less than two minutes.

B. At each survey point, a field technician clears vegetation as needed and, using a slide hammer with a ½" diameter rod, creates a hole three-feet deep. The technician then uses a hammer and a ¾" diameter pointed metal stake to widen the top four inches of the hole. [Note: For locations covered with asphalt, concrete, or gravel surfacing, the field technician drills a 1"- to 1½"-diameter hole through the surfacing to the soils beneath. If necessary, the Collector can be sleeved with a ¾" i.d. metal sleeve.] The solid cap on a Sampler Vial, which contains an adsorbent cartridge, is removed and replaced with a Sampling Cap (a one-hole cap with a screen meshing insert). The stake is removed from the hole in the ground and the Sampler is inserted, with the Sampling Cap end facing down, in the top four inches of the hole. The date and time of emplacement and other relevant information are recorded on the Field Deployment Form.

C. One or more trip blanks are included as part of the quality-control procedures.

D. Once all EMFLUX® Collectors have been deployed, field personnel schedule Collector recovery (typically 72 hours after emplacement) and depart, taking all no-longer-needed equipment and materials with them).

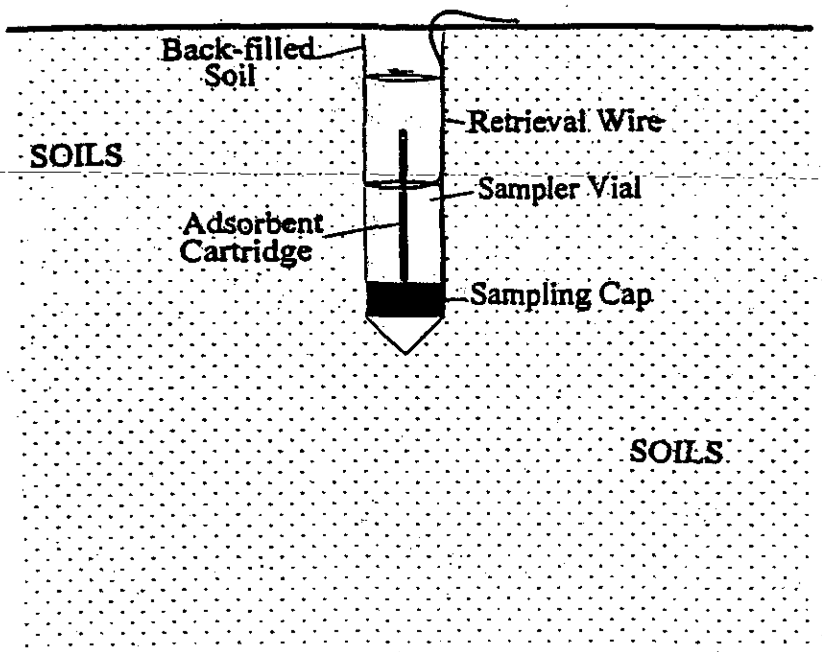
E. Field personnel retrieve the Collectors at the end of the exposure period. At each location, a field technician withdraws the Collector from its hole and wipes the outside of the vial clean using gauze cloth; following removal of the Sampling Cap, the threads of the vial are also cleaned. A solid plastic cap is screwed onto the vial and the sample location number is written on the label. The technician then records sample-point location, date, time, etc. on the Field Deployment Form.

F. Sampling holes are refilled with soil, sand, or other suitable material. If Collectors have been installed through asphalt or concrete, the hole is filled to grade and patched with similar material.

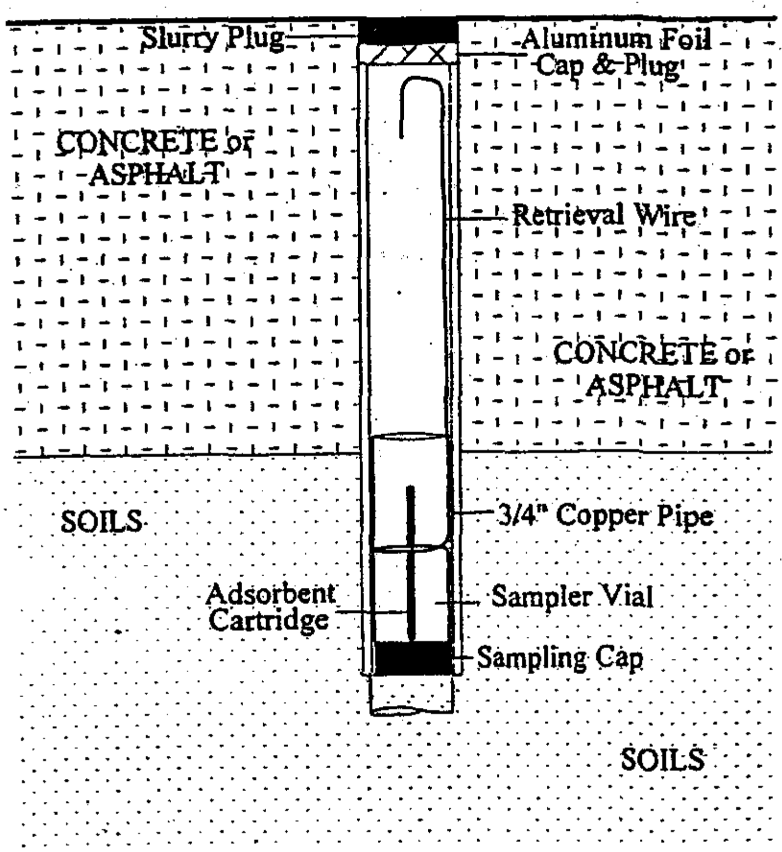
G. Following retrieval, field personnel ship the EMFLUX® Field Kits to BEACON's laboratory or an analytical laboratory under contract to BEACON.

EMFLUX® COLLECTOR

DEPLOYMENT THROUGH SOILS



DEPLOYMENT THROUGH AN ASPHALT/CONCRETE CAP



Attachment 3

Field Deployment Report

BEACON ENVIRONMENTAL SERVICES, INC.
FIELD DEPLOYMENT REPORT

PROJECT #: 1138	CLIENT: IT Corp.	SITE: Vacuum Oil

INDIVIDUAL SAMPLE INFORMATION

EMPLACEMENT DATE: 10/20/99. RETRIEVAL DATE: 11/4/99

SAMPLE NUMBER	TIME Emplaced	TIME Retrieved	FIELD NOTES (e.g., asphalt/concrete covering, description of sample location, cartridge/vial condition)
A2	0945	0945	on slope west of walkway (within 10')
A3	0950	0947	10' behind Pk Lot (SW corner)
B2	1005	0953	next to walkway
B3	1010	0955	
B4	1015	0957	50' from junkyard (E)
C3	1020	1005	
C4	1025	1006	
D2	1035	1010	East of walkway 5'
D3	1040	1012	
D4	1045	1014	on old RR bed
D5	1050	1017	Tank
D6	1100	1019	Tank
E2	1115	1032	
E3	1120	1030	Rubble Area
E4	1125	1028	RR Bed
E[illegible]	1135	1026	Slope

SAMPLE NUMBER	TIME		FIELD NOTES (e.g., asphalt/concrete covering, description of sample location, cartridge/vial condition)
	Emplaced	Retrieved	
E6	1140	1015	Tank
D7	1150	1022	Farthest West Tank
F2	1300	1045	
F3	1305	1059	
F4	1310	1102	
F5	1315	1104	
G2	1325	1122	
G3	1340	1119	
G4	1345	1117	
G5	1350	1115	
G6	1355	1111	
H2	1405	1125	
H3	1410	1130	
H4	1545	1132	
H5	1420	1133	
H6	1425	1135	
H7	1435	1136	
H8	1430	1137	
I4	1435	1147	

SAMPLE NUMBER	TIME		FIELD NOTES (*e.g.*, asphalt/concrete covering, description of sample location, cartridge/vial condition)
	Emplaced	Retrieved	
I5	1550	1145	
I6	1440	1143	
I7	1445	1142	
J6	1450	1150	
J5	1455	1152	
J7	1500	1153	
J8	1505	1155	
K6	1520	1204	
K7	1525	1202	
K8	1530	1200	
L6	1535		
L7	1540	1205	
A1	1550	0940	LAWN AREA NEXT TO RIVER (WITHIN 10')
C1	1555	1000	" " " "
E1	1600	1036	LAWN AREA " " "
C2	1605	1001	
C20	1610	1002	
F6	1615	1108	SWALE

SAMPLE NUMBER	TIME		FIELD NOTES (*e.g.*, asphalt/concrete covering, description of sample location, cartridge/vial condition)
	Emplaced	Retrieved	
Trip-1	—	—	Do not open!
Trip-2	—	—	

Attachment 4

LABORATORY PROCEDURES FOR EMFLUX® ADSORBENT CARTRIDGES

Following are laboratory procedures used with the EMFLUX® Soil-Gas System, a screening technology for expedited site investigation. After exposure, EMFLUX® cartridges are analyzed using U.S. EPA Method 8015B/8021 as described in the Solid Waste Manual (SW-846) for screening purposes. This method, which is modified to accommodate thermal desorption screening of the adsorbent cartridges, uses a capillary column gas chromatograph (GC) with a photo ionization detector (PID) in series with a flame ionization detector (FID) and a dry electrolytic conductivity detector (DELCD). This procedure is summarized below:

A. EMFLUX® cartridges are placed in the thermal desorbtion chamber, where they are purged with carrier gas then desorbed into the capillary column. The capillary column separates the sample into single component analytes. Analytes in the carrier gas are detected by a PID, then by an FID and finally by a DELCD.

B. The laboratory uses a 105-m, 0.53-mm-i.d., 3 µm-film-thickness Rtx-502.2 capillary column for separation during analysis.

C. The PID, FID and DELCD are set to high gain.

D. Lab personnel conduct internal control blank and internal control verification analyses every 24 hours to ensure that the system is contaminant free and properly calibrated. The system is calibrated using the external standard calibration procedure to at least three different concentration levels for each compound targeted, with the lowest concentration level at or near the method detection limit.

E. The instrumentation used for these analyses is an SRI 8610 Gas Chromatograph, equipped with a thermal desorber and connected to a PID in series with an FID and a DELCD.

Attachment 5

Chain-of-Custody Form

BEACON ENVIRONMENTAL SERVICES, INC.
CHAIN-OF-CUSTODY FORM

PROJECT NUMBER: 1138		PROJECT NAME: Vacuum Oil	
LOCATION: Rochester, NY		CLIENT: IT Corp.	
TARGET COMPOUNDS: 8021/8015B			

SAMPLE NUMBER	LAB ID No. (for lab use only)	REMARKS Condition of sample or vial	Date	Time	Init.
A2			10/20/99	0945	
A3			"	0950	
B2			"	1005	
B3			"	1010	
B4			"	1015	
C3			"	1020	
C4			"	1025	
D2			"	1035	
D3			"	1040	
D4			"	1045	
D5			"	1050	
D6			"	1100	
E2			"	1115	
E3			"	1120	
E4			"	1125	
E5			"	1135	
E6			"	1140	
E7			"	1150	
F2			"	1300	
F3			"	1305	
F4			"	1310	
F5			"	1315	
G2			"	1325	
G3			"	1340	
G4			"	1345	
G5			"	1350	
G6			"	1355	
H2			"	1405	
H3			"	1410	
H4			"	1545	
H5			"	1420	
H6			"	1425	

RELINQUISHED BY Signature	Printed Name	DATE	TIME	RECEIVED BY Signature	Printed Name
SCT	Steve Thornley	10.14.99	1700	Fedex	→
Fedex	→	10.15.99	1200	[illegible]	Frank Sowers
[illegible]	Frank Sowers	11.4.99	1500	UPS	→
UPS	→	11.5.99	1100	[illegible]	H. O'Neill

ENVIRONMENTAL SERVICES, INC.

CHAIN-OF-CUSTODY FORM

PROJECT NUMBER: 1138	PROJECT NAME: Vacuum Oil
LOCATION: Rochester, NY	CLIENT: IT Corp.
TARGET COMPOUNDS: 8021/8015B	

SAMPLE NUMBER	LAB ID No. (for lab use only)	REMARKS: Condition of sample or vial	Date	Time	Init.
F7			10/20/99	1435	
F8			"	1430	
I4			"	143[illegible]	
I5			"	1550	
I6			"	1440	
I7			"	1445	
J6			"	1450	
J5			"	1455	
J7			"	1500	
J8			"	1505	
K6			"	1520	
K7			"	1525	
K8			"	1530	
L6			"	1535	
L7			"	1540	
A1			"	1550	
C1			"	1555	
E1			"	1600	
C2			"	1605	
C2D			"	1610	
F6			"	1615	
			"		

RELINQUISHED BY: Signature	RELINQUISHED BY: Printed Name	DATE	TIME	RECEIVED BY: Signature	RECEIVED BY: Printed Name
ST	Steve Thornley	10.14.99	1700	Fedex	→
Fedex	→	10.15.99	1200	[signature]	Frank Sowers
Frank Sowers	Frank Sowers	11.4.99	1500	UPS	→
UPS	→	11/5/99	1100	[signature]	K. O'Neill

Appendix L

NYSDEC Site Investigation Report

SITE INVESTIGATION REPORT
Former Vacuum Oil Company
Site #828089P
City of Rochester, Monroe County

March 2001

Prepared for:
New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233
Erin M. Crotty, *Acting Commissioner*

Division of Environmental Remediation
Michael J. O'Toole, Jr. P.E., *Director*

By:
Frank Sowers, P.E.
Environmental Engineer 1
New York State Department of Environmental Conservation
Division of Environmental Remediation
Region 8
6274 East Avon-Lima Road

SITE INVESTIGATION REPORT
Former Vacuum Oil Company
Site #828089P
Rochester, Monroe County

Prepared for:

Division of Environmental Remediation
New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233

Prepared by:

Frank Sowers, P.E.
Environmental Engineer 1
New York State Department of Environmental Conservation
Division of Environmental Remediation
Region 8
6274 East Avon-Lima Road
Avon, NY 14414

March 2001

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APPENDICES

1.0 EXECUTIVE SUMMARY

The site for this 1999-2000 investigation consisted of a 24-acre portion of the former Vacuum Oil Company facility located on the western bank of the Genesee River (see Figure 1 and Figure 2) in the City of Rochester, New York, Monroe County.

The Vacuum Oil Company (the predecessor of Mobil Oil) operated an oil refinery at this location from c.1866 to c.1935. The Vacuum Oil facility consisted of several process and storage buildings, a railyard, tank farms, and pipelines. The processing operations reportedly entailed distilling crude petroleum under pressure to produce a variety of petroleum products. Reports from 1887 indicated that there were 135 tanks and six boilers at the works, and that the facility refined over 4 million gallons of crude oil per year. Many of the Vacuum Oil refinery structures were reportedly demolished in place. Remnants of the Vacuum Oil facility were observed at the site during the 1999-2000 site investigation. These remnants included concrete tank foundations, fire hydrants and building foundations.

The site is currently under multiple ownership and most of the properties are either vacant or under utilized. The site is located in a commercial, residential, and recreational area south of downtown Rochester. Commercial businesses are primarily located northwest and southwest of the site. A residential area is adjacent to the site to the west, and there is a bike path through the site. There are no known private or public wells nearby.

In September 1992, the NYSDEC removed approximately 400-500 tons of petroleum sludge located in the former railyard area at the southeastern portion of the Vacuum Oil facility near what is currently the Genesee River bike trail (Figure 3). The sludge was tested and was found to be non-hazardous.

In 1999-2000, the NYSDEC conducted an investigation of a 24-acre portion of the former Vacuum Oil facility. The investigation consisted of a point passive soil gas survey, surface soil samples, subsurface soil samples, and groundwater samples from three monitoring wells. Sample locations are provided on Figure 4. The results of the NYSDEC investigation indicated widespread petroleum-related contamination (SVOCs and BTEX) in the surface soil, subsurface soil, and groundwater at the site. The most significant petroleum contamination was detected in the northern section of the site in the vicinity of MW-1 and MW-2. To a lesser extent, chlorinated VOCs, metals, and pesticides were also detected above NYS standards at the site.

The results of the 1999-2000 investigation indicated that site contamination was not the result of disposal of a consequential amount of hazardous waste. NYSDEC will not include the site in the New York State Listing of Inactive Hazardous Waste Disposal Sites at this time.

2.0 PURPOSE

The site for this investigation consisted of approximately 24 acres located on the western bank of the Genesee River south of Flint Street in the City of Rochester, New York, Monroe County (Figures 1 and 2). The purpose of this site investigation was to obtain initial information regarding environmental contamination at the site. Specific objectives for this investigation, as stated in the document entitled "Former Vacuum Oil Preliminary Site Investigation Project Work Plan January 22, 1999" (work plan) were to:

- further define the nature and extent of contamination at the site; and
- determine if this site should be listed in the NYS Listing of Inactive Hazardous Waste Disposal Sites. If listed, determine the appropriate classification.

2.1 EXTENT OF CONTAMINATION

In September 1992, the NYSDEC removed approximately 400 to 500 tons of petroleum sludge located in the former railyard area at the southeastern portion of the property near what is currently the Genesee River bike trail. The sludge was discovered during construction of the bike trail. The approximate location of the sludge pits are shown on Figure 3. The 1999-2000 investigation was designed to provide additional information concerning the nature and extent of contamination in the overburden on the Vacuum Oil property.

2.2 THE NYS LISTING OF INACTIVE HAZARDOUS WASTE DISPOSAL SITES

The New York State Department of Environmental Conservation (NYSDEC) is charged by ECL Section 27-1305 with maintaining a list of inactive hazardous waste disposal sites in a statewide Registry and updating it on an annual basis. The Division of Environmental Remediation (DER) is responsible for listing all sites in the Registry where it believes there is confirmed disposal of a consequential amount of waste which conforms with the characteristics of a hazardous waste (as defined in 6 NYCRR Part 371.3) or listed hazardous wastes (as defined in 6 NYCRR Part 371.4). The results of site investigations will be evaluated to help determine if the disposal of a consequential amount of hazardous waste has occurred.

3.0 SCOPE OF WORK

A work plan specifying the scope of work for this investigation was prepared by the NYSDEC Region 8 and reviewed by personnel from the NYSDEC in Albany, the New York State Department of Health (NYSDOH), the Monroe County Health Department (MCHD), and the City of Rochester Division of Environmental Quality. Included in the work plan were the data collection procedures identified to fulfill the objectives of the investigation. These data collection activities included the following tasks:

- a passive soil gas survey;
- surface and subsurface soil sampling and analysis;
- monitoring well installation and groundwater sampling and analysis; and
- site survey and map preparation.

Details of the specific procedures used in performing each task are presented in the following sections.

3.1 PASSIVE SOIL GAS SURVEY

A passive soil gas survey was conducted across the site in an effort to identify potential sources of contamination. The survey consisted of 53 EMFLUX modules plus two trip blank modules. The modules were deployed on October 20, 1999 and retrieved November 4, 1999. Fifty of the modules were placed in a roughly 120'x120' grid across the site. Two modules (E-6 and H-8) were placed in potentially contaminated areas based on field observations and one module (C-2D) was collocated with module C-2. Figure 4 shows the location of each soil gas module.

At each survey point, the soil gas module was placed into a hole approximately 4" deep and 3/4" in diameter. The holes were created using a pointed metal stake provided by the vendor. After retrieval, the modules were sent to a laboratory for analyses. The modules were analyzed for 25 specific compounds including some volatile organic compounds (VOCs), some semi-volatile organic compounds (SVOCs), and total petroleum hydrocarbons (TPH).

3.2 SUBSURFACE SOIL SAMPLING AND ANALYSIS

The subsurface soil sampling program used during this project was designed to aid in the collection of subsurface information relative to the overburden materials at the site. The subsurface soil sampling program consisted of two phases:

- test pit excavations; and
- soil borings.

3.2.1 Test Pit Excavations

The primary goals of the test pit program were to:

- characterize the overburden materials with respect to textural classifications;
- collect soil samples for analysis;
- determine if there is a water bearing zone in the overburden; and
- characterize and describe the bedrock surface.

Ten test pit excavations were completed at the site on December 6, 1999. Prior to mobilization, an Underground Facility Protection Organization (UFPO) underground utility stakeout was performed to document the position of public utilities. The test pits were primarily located in areas of elevated soil gas concentrations. The test pits were completed using a track mounted Komatsu PC35R excavator. Test pit locations are shown on Figure 4.

For each excavation, a geologist described and logged the subsurface soils with respect to their geologic character features and properties. Bedrock was not encountered in any of the test pits; therefore the bedrock surface was not characterized. The excavated pits were also photographed. Test pit logs and photographs are provided in Appendix A.

Excavated soil was screened for VOCs using a hand held photoionization detector (PID) instrument. The PID measurements included in the test pit logs were collected from just above the soil in the excavator bucket. PID measurements were also obtained in the breathing zone.

A concrete slab was encountered at about one foot below the ground surface at several locations in the vicinity of test pits TP-2 and TP-3. The excavator was not capable of penetrating the slab. When a slab was encountered, the excavation was backfilled and a new test pit was attempted several yards away. The full extent of the concrete slab was not determined, but it can be estimated by reviewing building locations from aerial photograph or site maps of the Vacuum Oil facility (See Appendix B).

The work plan specified that two soil samples from each test pit would be collected for analysis. A total of 8 soil samples were actually collected from the 10 test pits. Two samples were collected from test pit TP-1. No samples were collected from test pits TP-6, TP-7 and TP-9 as there were no indications that these soils were contaminated (i.e. no visual signs of staining, no detectable odors, and no detections on the PID). One sample was collected from each of the remaining test pits (TP-2, TP-3, TP-4, TP-5, TP-8, and TP-10) either because the subsurface materials were homogeneous or there were no indications of contamination (i.e. no visual signs of staining, no detectable odors, and no detections on the PID).

The work plan specified that each soil sample from the test pits would be analyzed for volatile organics, semi-volatile organics, and metals, and that one sample from each test pit would be analyzed for cyanide, pesticides, and polychlorinated biphenyls (PCBs). This protocol was followed for the test pits where samples were collected. Additionally, the Toxicity Characteristic Leachate Procedure (TCLP) analysis was performed on both soil samples from test pit TP-1 as these soils were stained black, PID readings up to 200 ppm were measured just above the soil, and there was a strong petroleum odor. A sample collection and analytical matrix is provided in Table 1. Samples were placed into glass jars, labeled, and placed into a cooler chilled with ice or ice packs. The samples were shipped for analysis via UPS to RECRA LabNet, Lionville, Pennsylvania. Chain of Custody forms are provided in Appendix C.

3.2.2 Soil Borings

Three soil borings, which were all later completed as groundwater monitoring wells, were advanced at the site from February 7-9, 2000. Prior to mobilization, an Underground Facility Protection Organization (UFPO) underground utility stakeout was performed to document the position of public utilities. Soil boring locations were selected based on:

- test pit soil sample results;
- locations of site features such as tank foundations and concrete slabs; and
- results of the UFPO stakeout.

The soil boring locations are shown on Figure 4. Boring MW-1 was located in the vicinity of test pit TP-1, boring MW-2 was located in the vicinity of test pit TP-2, and boring MW-3 was located in the vicinity of test pit TP-10 at the base of a former tank farm.

The work plan specified that additional soil classification and sampling were optional activities during the monitoring well installation task. It was determined that these activities were necessary based on the following:

- the test pits did not extend to bedrock, so split spoon sampling was necessary to characterize soil conditions below the base of the test pits;
- one of the borings, MW-2, was located where a concrete slab was encountered during test pitting, so split spoon sampling was necessary to characterize soil conditions below the concrete slab; and
- the analytical results of the test pit soil samples indicated the presence of petroleum compounds, so additional soil samples were required for Total Petroleum Hydrocarbon (TPH) analysis.

A track-mounted CME 850 drill rig was used to advance the soil borings. Continuous split-spoon samples were collected to refusal (presumed top of bedrock) at each of the soil boring locations. Depth to refusal varied from 6 to 16.5 feet below the ground surface. All down-hole tools and equipment used during the advance of the borings were steam cleaned prior to their introduction into a boring. Split spoons were cleaned with an Alconox solution after each sample was collected.

A qualified geologist described and logged the extracted subsurface soil materials with respect to their geologic character, features, and properties. The extracted subsurface soil materials were also screened visually for signs of obvious contamination. Additionally, soil from each spoon was screened for the presence of volatile organic vapors using a PID monitoring instrument. Information on sample characterization was later used to prepare boring logs which are presented in Appendix A.

Two soil samples were collected for analysis from each of the borings, except MW-3. No soil samples were collected from boring MW-3 since there were no indications of contamination (i.e. no visual signs of staining, no detectable odors, and no detections on the PID). A duplicate soil sample was also collected at boring MW-1. All of the soil samples were analyzed for TPH. In addition to TPH, soils from boring MW-2 were analyzed for VOCs, SVOCs, and metals, and soils from boring MW-1 were analyzed for metals. A sample collection/analytical matrix for this investigation is provided in Table 1. Samples were placed into glass jars, labeled, and placed into a cooler chilled with ice or ice packs. The samples were shipped for analysis via UPS to RECRA LabNet, Lionville, Pennsylvania. Chain of Custody forms are provided in Appendix C.

3.3 SURFACE SOIL SAMPLING AND ANALYSIS

As specified in the work plan, five surface soil samples were collected at the site. Each sample was analyzed for:

- TAL metals;
- Cyanide;
- TCL VOCs;
- TCL SVOCs; and
- TCL pesticides and PCBs.

All of the surface soil samples obtained during this investigation were collected on December 7, 1999. Surface soil sample locations were selected based on the soil gas survey results, visual indications of contamination, and a desire to collect data from across the entire site. Surface soil sample SS-4 was collected from a wet, low-lying area at the site. The surface soil sample locations are shown on Figure 4.

Surface soil samples obtained from the site were collected from the first two inches of soil after sod, surface debris, or gravel cover were removed. A new disposable plastic scoop was used to collect each sample. A sample collection/analytical matrix for this investigation is provided in Table 1. Samples were placed into glass jars, labeled, and placed into a cooler chilled with ice or ice packs. The samples were shipped for analysis via UPS to RECRA LabNet, Lionville, Pennsylvania. Chain of Custody forms are provided in Appendix C.

3.4 MONITORING WELL INSTALLATION AND GROUNDWATER SAMPLING AND ANALYSIS

The groundwater sampling program implemented during this project was designed to aid in the collection of subsurface information relative to the overburden materials at the site. More specifically, the program was designed to further define the extent of contamination at the site and evaluate suspected source areas. The groundwater sampling program consisted of completing the three soil borings as monitoring wells and collecting groundwater samples for analyses.

3.4.1 Groundwater Monitoring Well Installation

All three of the soil borings advanced on February 7, 8 and 9, 2000 were completed as 2-inch diameter overburden monitoring wells. The purpose of these wells was to allow long-term monitoring of overburden groundwater conditions at the site. The monitoring wells were located to investigate groundwater conditions in areas where soil contamination was identified, and allow development of groundwater flow contours. Monitoring well locations are shown on Figure 4.

The borings were advanced to the top of bedrock using 4.25-inch I.D. hollow stem augers. The monitoring wells consisted of 2-inch diameter schedule 40 PVC casing. The well screens consisted of 0.010-inch slotted PVC and varied in length from 4 feet at MW-3 to 10 feet at MW-1 and MW-2. Construction logs for each monitoring well are provided in Appendix A.

The wells were developed on February 9, 10, and 11, 2000 using new dedicated polyethylene bailers. Several days were needed to develop the wells because they would become dry after several well volumes of water were removed and recovery was slow. Well development logs, including field parameter measurements, are provided in Appendix A.

3.4.2 Groundwater Monitoring Well Sampling

The three groundwater monitoring wells were sampled on February 23, 2000. Prior to sampling, approximately 3 well volumes of groundwater were purged from each well using dedicated polyethylene bailers.

After being purged, each well was allowed to recover for approximately one hour before samples were collected. The three wells were sampled for VOCs, SVOCs, metals, and TPH using dedicated polyethylene bailers. There was not enough water in the wells to collect all of the samples at one time. The VOC, SVOC, and TPH samples were collected in the morning, then the wells were allowed to recover for several hours and the metals samples were collected in the afternoon. Water samples were also collected from each well during sampling to measure pH, specific conductivity, temperature, and turbidity. Field parameter measurements are provided in Appendix C. A sample collection/analytical matrix for this investigation is provided in Table 1.

Samples were placed into the appropriate container, labeled, and placed into a cooler chilled with ice or ice packs. The samples were shipped for analysis via UPS to RECRA LabNet, Lionville, Pennsylvania. Chain of Custody forms are provided in Appendix C.

3.5 SITE SURVEY AND MAP PREPARATION

A survey was performed at the site in two phases. First a surveyor was on-site in March 2000 to make such measurements as were necessary to create a plot plan of the site showing the locations of the property boundaries, buildings, the bike path, monitoring wells, and test pits. The surveyor also established well elevations at the top of the PVC riser for each of the three wells plus a location along the concrete wall at the edge of the Genesee River.

The second phase of the survey was completed on April 12 and 13, 2000. NYSDEC personnel used a Corvallis Microtechnology Inc. March II hand-held Global Positioning System (GPS) unit to record the location of soil gas sample points which were marked in the field by flagging. The raw GPS data collected in the field were corrected using PC-GPS version 3.6D. The corrected data were provided to the surveyor for inclusion on the plot plan. The survey data are provided in Table 2.

After plotting the soil gas points, one sample (I-7) appeared to be incorrect. NYSDEC personnel re-visited the site and manually measured the location of soil gas point I-7 using a tape measure. The correct location of I-7 was determined to be approximately 100 ft. south-southwest from the location measured by the GPS. The plot plan (Figure 4) was corrected to better reflect the actual location of I-7.

The location of the surface soil sample points on the plot plan (Figure 4) are based on field observations of the distance of the surface soil sample location to the nearest soil gas sample location.

3.6 GROUNDWATER ELEVATION MEASUREMENTS

Groundwater elevations at the site were measured twice during this investigation. The first measurements, obtained on February 23, 2000, included only the three overburden monitoring wells. The second measurements, obtained on May 4, 2000, included the three overburden monitoring wells and the elevation of the Genesee River. The water level measurements are provided in Table 3. Groundwater contours for May 4, 2000 are provided in Figure 5.

4.0 SITE ASSESSMENT

4.1 SITE HISTORY

The former Vacuum Oil Company occupied approximately 40 acres on the western bank of the Genesee River (see Figure 1 and Figure 6) in the City of Rochester, New York, Monroe County. The Vacuum Oil Company (the predecessor of Mobil Oil) operated an oil refinery at this location from c.1866 to c.1935.

The "site" for the 1999-2000 investigation was an approximately 24-acre portion of the former Vacuum Oil facility consisting of seven parcels of land (Figure 2). After 1935, the parcels were sold separately and used for a variety of commercial purposes. Owners included a university, a scrap bailing company, and government agencies. The site is currently under multiple ownership and most of the properties are either vacant or under utilized. The site is located in a commercial, residential, and recreational area south of downtown Rochester. Commercial businesses are primarily located northwest and southwest of the site. A residential area is adjacent to the site to the west, and there is a bike path through the site. There are no known private or public wells nearby.

The Vacuum Oil facility consisted of several process and storage buildings, a railyard, tank farms, and pipelines. The processing operations reportedly entailed distilling crude petroleum under pressure to produce a variety of materials including: lubricating oils, vacuum oil blacking for harnesses, naptha, refined petroleum and high test kerosene oils, neutral oils, also sperm whale, elephant, lard, neats foot, straits, bank, laborador, salad, signal, and other oils. Reports from 1887 indicated that there were 135 tanks and six boilers at the works, and that the facility refined over 4 million gallons of crude oil per year.

In 1989, a portion of the former Vacuum Oil facility (bounded by Flint St., Exchange St., Violetta St., and the Genesee River) was investigated as a potential site for a new elementary school by the City of Rochester, but environmental conditions at the site made it unfavorable for development. A summary of the 1989 investigation is provided in Appendix D.

In September 1992, the NYSDEC removed approximately 400-500 tons of petroleum sludge located in the former railyard area at the southeastern portion of the Vacuum Oil facility near what is currently the Genesee River bike trail. The sludge was tested and was found to be non-hazardous. The location of the sludge pits are shown on Figure 3.

Many of the Vacuum Oil refinery structures were reportedly demolished in place. For example, tank foundations in the former tank farm area are evident in the 1960s aerial photographs. Additionally, remnants of the Vacuum Oil facility were observed at the site during the 1999-2000 site investigation. These remnants included concrete tank foundations, fire hydrants and building foundations.

4.2 SITE TOPOGRAPHY

The former Vacuum Oil site is located on the western bank of the Genesee River. A concrete retaining wall separates the river from the ground. On May 4, 2000, the top of the retaining wall was measured to be 6.5 ft. above the river. West of the river, the terrain appeared to slope gently downward before a steep rise to the residential area on Cottage Street and Riverview Place. The lowest spot on the site appeared to be in the vicinity of soil gas sample point H-8 and surface soil sample point SS-4 (See Figure 4). This area was consistently moist and often contained standing water. The portion of the bike path between soil gas sample points A-2 and H-3 was elevated with what appeared to be fill material. This portion of the bike path was formerly part of the Erie Railroad system. The building foundations observed at the site were generally located west of the bike bath. The tank foundations were roughly located in the area bounded by soil gas sample points D-5, D-7 and E-5.

With the exception of the bike path, most of the surface was overgrown with trees, bushes, wild grapevines, and weeds. Poison ivy was also prevalent at the site both as vines on trees and as patches of plants less than about 2 ft. tall. Dense swarms of insects, especially mosquitoes, were encountered at the site during the spring.

4.3 SITE GEOLOGY

Based on the test pits and soil borings, the site consisted of 6 to 16.5 feet of overburden on top of bedrock. The overburden generally consisted of three layers:

- topsoil;
- fill material; and
- native soil.

The topsoil layer was typically 3 to 6 inches thick. Fill material was encountered up to 6 ft. below the ground surface. The fill consisted of a variety of materials including:

- bricks;
- slag;
- sand;
- shingles;
- a material that resembled ground coal;
- gravel; and
- wood.

The native soil consisted of a mixture of silt, sand, and clay. The bedrock at the site is mapped as the Lockport Dolomite.

The depth to groundwater at the site ranged from 3 to 7.5 feet below ground. Groundwater elevations at the site were measured twice during this investigation. The first measurements, obtained on February 23, 2000, included only the three overburden monitoring wells. The second measurements, obtained on May 4, 2000, included the three overburden monitoring wells and the elevation of the Genesee River. The water level measurements are provided in Table 3. The results indicated that the groundwater at the site flows to the west and away from the Genesee River. Figure 5 presents groundwater elevation contours for the overburden based on the May 4, 2000 measurements. Groundwater elevation contours developed using the February 23, 2000 measurements were similar to the May 4, 2000 contours and are not included in this report.

4.4 CONTAMINANT ASSESSMENT

The following sections provide the analytical data generated during the 1999-2000 investigation. The information is organized according to sample media (soil gas, surface soil, subsurface soil, and groundwater) and compounds of concern. Analytical data were compared to environmental New York State Standards, Criteria, and Guidance (SCGs) values. Groundwater SCGs for this site were based on the groundwater quality standards contained in 6 NYCRR Part 703 and the NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1. NYSDEC Technical Assistance Guidance Memorandum (TAGM) 4046 was used to evaluate surface and subsurface soils. TCLP analytical results were compared to the toxicity characteristic regulatory levels contained in 6 NYCRR 371.3(e).

Sample point locations are shown on Figure 4. The analytical data for the 1999 soil gas survey are provided in Appendix E. The analytical data for surface soil, subsurface soil, and groundwater samples collected by the NYSDEC as part of the 1999-2000 investigation are provided in Appendix C. Statistical summaries of the analytical results are provided in Tables 4 through 6. All detected values for field samples, field duplicates, and trip blanks are presented in Tables 7 through 25 in data summary forms.

4.4.1 Passive Soil Gas Survey

A passive soil gas survey was performed at the site to identify potential areas of contamination and to help focus later phases of the investigation. A 53 point passive soil gas survey was conducted across the site between October 20, 1999 and November 4, 1999. Figure 4 shows the location of each soil gas module. Upon retrieval, each module was analyzed for 25 specific compounds including some volatile organic compounds (VOCs), some semi-volatile organic compounds (SVOCs), and total petroleum hydrocarbons (TPH) The complete list of compounds is provided in Appendix E.

The following limitations should be considered when reviewing the results of the soil gas survey:

- The soil gas sample points were placed approximately 120 feet apart. This spacing was considered acceptable for identifying large areas of contamination at this site, but this spacing may miss smaller contaminated areas and is not appropriate for defining the extent of contamination.
- Some of the soil gas results may be biased low. Buried building slabs were encountered during test pitting and these slabs may have restricted contaminated soil gas located below the slab from migrating to the soil gas modules located above the slab.

Appendix E contains the data report from the vendor who supplied and analyzed the soil gas modules. Petroleum-related compounds and chlorinated compounds were the primary contaminants detected during the survey.

4.4.1.1 Petroleum-Related Compounds

The soil gas survey detected petroleum-related compounds in two categories: total petroleum hydrocarbons (TPH) and individual petroleum related compounds (benzene, toluene, ethyl benzene, xylene, trimethylbenzenes, and napthalene). The soil gas data in Appendix E indicate a strong correlation between elevated TPH results and elevated results for the individual petroleum-related compounds.

Figure 7 shows soil gas concentration contours for TPH at the site. Five distinct plumes are identified on Figure 7. The plumes are identified as follows (with maximum concentrations in parentheses) based on the soil gas point in the apparent center of the plume:

- the B-3 plume (14,000 nanograms);
- the F-5 plume (58,000 nanograms);
- the J-8 plume (900 nanograms);
- the L-6 plume (400 nanograms); and
- the E-1/E-2 plume (260 nanograms).

Of the five plumes, the B-3 and F-5 plumes were of the greatest significance in terms of lateral extent and maximum concentration. The B-3 and F-5 plumes were determined to have the greatest potential for contamination and were the focus of subsequent sampling activities for petroleum compounds.

4.4.1.2 Total Chlorinated Volatiles

Figure 8 shows soil gas concentration contours for total chlorinated compounds at the site. Chlorinated compounds were detected in the following five soil gas samples:

- C-3 at 1096 nanograms;.
- D-3 at 194 nanograms;
- C-1 at 87 nanograms;
- F-5 at 42 nanograms; and
- D-6 at 29 nanograms.

C-3 was the focus of subsequent sampling activities for chlorinated compounds since the concentration of chlorinated compounds at C-3 was an order-of-magnitude greater than the other four locations.

4.4.2 Surface Soil

A total of five surface soil samples were collected from five different locations across the site and analyzed for the parameters shown in Table 1. Metals, VOCs, SVOCs and pesticides were detected in some of the surface soil samples at levels above SCGs. Compounds detected at levels above SCGs in at least one surface soil sample, and the concentration range for each compound, are identified in the following sections.

The VOC and SVOC analyses also detected the presence of a number of additional compounds that are not on the standard Target Compound List (TCL). The laboratory only calibrates the analytical instruments to identify and quantify the TCL compounds. Compounds that are not on the TCL, but are detected during analysis, are called Tentatively Identified Compounds (TICs) and the identity and concentration of these compounds are estimated. As indicated in Tables 7,8, and 9, total TIC concentrations in the surface soil samples ranged from not detected to 20 ppb for VOCs and 15,800 to 114,000 ppb for SVOCs. Concentration estimates for individual TICs are provided with the analytical data in Appendix C.

Surface soil sample point locations are shown on Figure 4. Surface soil sample locations are denoted by "SS-" in the tables and figures. Figure 9 presents a summary of surface soil results exceeding SCGs and total TICs.

The results of the 1999-2000 investigation, including comparisons to SCGs, are summarized in the following tables:

- Table 4 provides a statistical summary of the surface soil results;
- Table 7 summarizes the SVOC results sorted by sample location;
- Table 8 summarizes the SVOC results sorted by compound;
- Table 9 summarizes the VOC results;
- Table 10 summarizes the inorganic compound results sorted by sample location;
- Table 11 summarizes the inorganic compound results sorted by compound; and
- Table 12 summarizes the pesticide and PCB results.

The analytical data from RECRA Environmental Inc. are provided in Appendix C.

<u>4.4.2.1 Surface Soil - Semi-Volatile Organic Compounds</u>

A total of 20 different SVOCs, plus TICs, were detected in the five surface soil samples analyzed for TCL SVOCs. Eight of the compounds were detected at concentrations above TAGM 4046 recommended soil cleanup values. SVOCs detected at levels above SCGs in at least one surface soil sample, and the concentration range for each compound, are identified below:

- benzo(a)anthracene (330 - 28,000 ppb);
- benzo(a)pyrene (440 - 23,000 ppb);
- benzo(b)fluoranthene (470 - 20,000 ppb);
- benzo(k)fluoranthene (420 - 22,000 ppb);

- chrysene (480 - 30,000 ppb);
- dibenzo(a,h)anthracene (85 - 5,700 ppb);
- fluoranthene (700 - 63,000 ppb); and
- indeno(1,2,3-c,d)pyrene (310 - 14,000 ppb).

The remaining 12 SVOCs were detected at levels below TAGM 4046 recommended soil cleanup values. As indicated on Figure 9, surface soils containing SVOCs exceeding SCGs were located across the site; however, the TCL SVOC concentrations at SS-2 were typically a factor of 10 higher than the other four sample points. Surface soil sample SS-2 also contained the highest concentration of TICs (114,000 ppb). Surface soil sample SS-4, which had the lowest concentration of TCL SVOCs based on Figure 9, contained second highest TIC concentration (96,800 ppb).

4.4.2.2 Surface Soil - Volatile Organic Compounds

The following VOCs were detected in the surface soils at the site:

- acetone;
- methylene chloride; and
- TICs.

Acetone was detected in surface soil sample SS-3. Methylene chloride was detected in each of the five surface soil samples at concentrations between 24 ppb and 150 ppb. The methylene chloride concentration in sample SS-3 (150 ppb) exceeded the TAGM 4046 recommended soil cleanup value for methylene chloride of 100 ppb. As discussed in another section of this report, the methylene chloride surface soil sample results may be biased high due to laboratory contamination.

4.4.2.3 Surface Soil - Inorganic Compounds

A total of 22 different inorganic compounds were detected in the five surface soil samples analyzed for TAL metals. Eight of the compounds were detected at concentrations above TAGM 4046 recommended soil cleanup values. Inorganic compounds detected at levels above SCGs in at least one surface soil sample, and the concentration range for each compound, are identified below:

- arsenic (4.3 - 60.7 ppm);
- calcium (11,900 - 167,000);
- copper (17.9 - 75.8 ppm);
- lead (119 - 972 ppm);
- magnesium (2,490 - 30,600 ppm);
- mercury (0.12 - 2.1 ppm);
- selenium (not detected - 7.40 ppm); and
- zinc (103 - 772 ppm).

The remaining 14 inorganic compounds were detected at levels below TAGM 4046 recommended soil cleanup values. As indicated on Figure 9, surface soils containing inorganic compounds exceeding SCGs were located across the site. Additionally, the inorganic compound concentrations were fairly consistent in the five samples.

4.4.2.4 Surface Soil - Pesticides and PCBs

A total of six pesticides were detected in the five surface soil samples at the site. Two of the pesticides were detected at concentrations above TAGM 4046 recommended soil cleanup values. Pesticides detected at levels above SCGs in at least one surface soil sample, and the concentration range for each compound, are identified below:

- dieldrin (not detected - 74 ppb); and
- heptachlor epoxide (not detected - 30 ppb).

No PCBs were detected in the five surface soil samples at the site.

The remaining four pesticides were detected at levels below TAGM 4046 recommended soil cleanup values. As indicated on Figure 9, SS-1 was the only surface soil sample location where pesticides exceeded SCGs.

4.4.3 Subsurface Soil

A total of twelve subsurface soil samples were collected from ten test pit excavations and three overburden monitoring wells completed at the site. The samples were analyzed for the parameters shown in Table 1. Several metals, VOCs, and SVOCs were detected in subsurface soil samples at levels above SCGs. Compounds detected at levels above SCGs in at least one subsurface soil sample, and the concentration range for each compound, are identified in the following sections.

The VOC and SVOC analyses also detected the presence of a number of additional compounds that are not on the standard TCL. The laboratory only calibrates the analytical instruments to identify and quantify the TCL compounds. Compounds that are not on the TCL, but are detected during analysis, are called TICs and the identity and concentration of these compounds are estimated. As indicated in Tables 13, 14, 16, and 17, total TIC concentrations in the subsurface soil samples ranged from not detected to 133,000 ppb for VOCs and 1,450 to 2,240,000 ppb for SVOCs. Concentration estimates for individual TICs are provided with the analytical data in Appendix C.

Sample point locations are shown on Figure 4. Subsurface soil sample locations from a test pit are denoted by "TP-" in the tables and figures. Subsurface soil sample locations from a soil boring that was later converted into a monitoring well are denoted by "MW-" in the tables and figures. Figure 10 presents a summary of subsurface soil results exceeding SCGs, total TICs, and TPH.

The results of the 1999-2000 investigation, including comparisons to SCGs, are summarized in the following tables:

- Table 5 provides a statistical summary of the results;
- Table 13 summarizes the SVOC results sorted by soil boring interval;
- Table 14 summarizes the SVOC results sorted by compound;
- Table 15 summarizes the TPH results;
- Table 16 summarizes the VOC results sorted by soil boring interval;

- Table 17 summarizes the VOC results sorted by compound;
- Table 18 summarizes the inorganic compound results sorted by soil boring interval;
- Table 19 summarizes the inorganic compound results sorted by compound;
- Table 20 summarizes the pesticide and PCB results; and
- Table 21 summarizes the TCLP results.

The analytical data from RECRA Environmental Inc. are provided in Appendix C.

4.4.3.1 Subsurface Soil - Semi-Volatile Organic Compounds

A total of 21 different SVOCs, plus TICs, were detected in the nine subsurface soil samples analyzed for TCL SVOCs. Seventeen of the compounds were detected at concentrations above TAGM 4046 recommended soil cleanup values. SVOCs detected at levels above SCGs in at least one surface soil sample, and the concentration range for each compound, are identified below:

- acenaphthene (not detected - 170,000 ppb);
- anthracene (not detected - 510,000 ppb);
- benzo(a)anthracene (not detected - 760,000 ppb);
- benzo(a)pyrene (not detected - 530,000 ppb);
- benzo(b)fluoranthene (not detected - 480,000 ppb);
- benzo(g,h,i)perylene (not detected - 280,000 ppb);
- benzo(k)fluoranthene (not detected - 470,000 ppb);
- chrysene (not detected - 710,000 ppb);
- dibenzo(a,h)anthracene (not detected - 100,000 ppb);
- dibenzofuran ((not detected - 220,000 ppb);
- fluoranthene (not detected - 1,500,000 ppb);
- fluorene (not detected - 360,000 ppb);
- indeno(1,2,3-c,d)pyrene (not detected - 280,000 ppb);
- 2-methylnaphthalene (not detected - 110,000 ppb);
- naphthalene (not detected - 320,000 ppb);
- phenanthrene (29 - 1,600,000 ppb); and
- pyrene (not detected - 960,000 ppb).

The SVOC compounds most frequently detected above SCGs were:

- benzo(a)anthracene (5 of 9 samples exceeded SCG);
- benzo(a)pyrene (5 of 9 samples exceeded SCG);
- chrysene (5 of 9 samples exceeded SCG); and
- dibenzo(a,h)anthracene (5 of 9 samples exceeded SCG).

As indicated on Table 5, maximum concentrations for all 17 SVOCs detected at levels above SCGs were obtained from test pit TP-2 approximately 5 ft. below ground surface. Subsurface soils from test pit TP-2 also contained the highest concentration of SVOC TICs (2,240,000 ppb 5 ft. below ground surface). The second highest concentration of SVOC TICs was detected in test pit TP-1 (814,000 ppb 7 to 8 ft. below ground surface). TP-1 and TP-2 are located on the northern portion of the site (see Figure 10).

4.4.3.2 Subsurface Soil - Total Petroleum Hydrocarbons

Four subsurface soil samples were collected and analyzed for TPH during the installation of the groundwater monitoring wells. Two of the samples were collected from boring MW-1 (located adjacent to test pit TP-1), and two of the samples were collected from boring MW-2 (located adjacent to test pit TP-2). As shown on Table 15, TPH results ranged from 22.3 ppm at the 10 to 12 ft. interval of TP-2 to 1140 ppm at the 8 to 10 ft. interval of TP-1. There are no SCGs for TPH.

4.4.3.3 Subsurface Soil - Volatile Organic Compounds

A total of nine different VOCs, plus TICs, were detected in the nine subsurface soil samples analyzed for TCL VOCs. Two of the compounds were detected at concentrations above TAGM 4046 recommended soil cleanup values. VOCs detected at levels above SCGs in at least one subsurface soil sample, and the concentration range for each compound, are identified below:

- methylene chloride (24 - 750 ppb);and
- xylene (total) (not detected - 6,300 ppb)

Overall two analytical results (One result for each compound identified above) exceeded subsurface soil SCGs for VOCs. Four additional analytical results for acetone (2 results) and methylene chloride (2 results) were detected at levels above SCGs, but these results were considered invalid due to laboratory contamination.

The xylene analytical result exceeding the subsurface soil SCG was collected from test pit TP-1. The methylene chloride result exceeding the subsurface soil SCG was collected from boring MW-2. TP-1 and MW-2 are located on the northern portion of the site (see Figure 10).

Subsurface soils from test pit TP-1 also contained the highest concentration of VOC TICs (133,000 ppb 7 to 8 ft. below ground surface and 109,000 ppb 3 to 5 ft. below ground surface). None of the other subsurface soil samples had a VOC TIC concentration above 300 ppb.

4.4.3.4 Subsurface Soil - Inorganic Compounds

A total of 23 different inorganic compounds were detected in the 10 subsurface soil samples analyzed for TAL metals. Ten of the compounds were detected at concentrations above TAGM 4046 recommended soil cleanup values. Inorganic compounds detected at levels above SCGs in at least one subsurface soil sample, and the concentration range for each compound, are identified below:

- arsenic (4.7 - 113 ppm);
- barium (28.5 - 828 ppm);
- beryllium (0.15 - 2.20 ppm);
- calcium (1280 - 85,100 ppm);

- chromium (9.40 - 59.3 ppm);
- copper (8.10 - 143 ppm);
- magnesium (396 - 35800 ppm);
- nickel (14 to 35.6 ppm);
- mercury (not detected - 4 ppm); and
- zinc (54.7 - 663 ppm).

The remaining 13 inorganic compounds were detected at levels below TAGM 4046 recommended soil cleanup values. As indicated on Figure 10, subsurface soils containing inorganic compounds exceeding SCGs were located across the site. Maximum concentrations for five of the nine inorganic compounds detected at levels above SCGs were obtained from test pit TP-2 approximately 5-ft. below ground surface.

4.4.3.5 Subsurface Soil - Pesticides and PCBs

Eight subsurface soil samples were collected and analyzed for pesticides and PCBs. PCBs were not detected in any of the subsurface soil samples. The pesticide Aldrin was detected at low levels (2.6 ppb) in one subsurface soil sample. No other pesticides were detected in the subsurface soil. The analytical results for pesticides and PCBs are summarized in Table 20.

4.4.3.6 Subsurface Soil -Toxicity Characteristic Leachate Procedure (TCLP)

Two subsurface soil samples from TP-1 were analyzed for TCLP parameters. No compounds were detected above regulatory levels in the two samples analyzed for TCLP compounds. The TCLP analytical results are provided in Table 21.

4.4.4 Groundwater Quality

A total of three groundwater samples were collected from the three overburden monitoring wells completed at the site and analyzed for the parameters shown in Table 1. Several metals, VOCs, and SVOCs were detected in groundwater samples at levels above SCGs. Compounds detected at levels above SCGs in at least one groundwater sample, and the concentration range for each compound, are identified in the following sections.

The VOC and SVOC analyses also detected the presence of a number of additional compounds that are not on the standard TCL. The laboratory only calibrates the analytical instruments to identify and quantify the TCL compounds. Compounds that are not on the TCL, but are detected during analysis, are called TICs and the identity and concentration of these compounds are estimated. As indicated in Tables 22 and 24, total TIC concentrations in the groundwater samples ranged from not detected to 650 ppb for VOCs and 67 to 1,250 ppb for SVOCs. Concentration estimates for individual TICs are provided with the analytical data in Appendix C.

Groundwater sample locations are shown on Figure 4. Groundwater locations are identified as MW-1, MW-2, and MW-3 in the tables and figures. Figure 11 presents a summary of groundwater results exceeding SCGs.

People in the area are not using area groundwater for a source of drinking water. Residents and businesses in the area are served by a public water supply provided by the City of Rochester Water Bureau and there are no known private or public wells nearby.

The results of the 1999-2000 investigations are summarized in the following tables:

- Table 6 provides a statistical summary of the results;
- Table 22 summarizes the SVOC results sorted by compound;
- Table 23 summarizes the TPH results;
- Table 24 summarizes the VOC results sorted by compound;
- Table 25 summarizes the inorganic compound results sorted by sample location; and
- Table 26 summarizes the inorganic compound results sorted by compound.

The analytical data from RECRA Environmental Inc. are provided in Appendix C.

4.4.4.1 Groundwater - Semi-Volatile Organic Compounds

A total of eight different SVOCs, plus TICs, were detected in the three groundwater samples analyzed for TCL SVOCs. As indicated on Figure 11, the compound phenol was detected at a concentration above the TOGS 1.1.1groundwater standard in one sample (MW-1). The phenol concentration in the groundwater samples ranged from not detected to 7 ppb. The remaining seven SVOCs were detected at levels below TOGS 1.1.1 groundwater standards and guidance values.

SVOC TICs were detected in each of the three groundwater samples. The highest concentration of SVOC TICs was detected at well MW-1 (1,250 ppb), followed by well MW-2 (125 ppb) and well MW-3 (67 ppb).

4.4.4.2 Groundwater - Total Petroleum Hydrocarbons

One groundwater sample from each of the three wells was collected and analyzed for TPH. As shown on Figure 11, TPH was detected in the groundwater at one well, MW-1, at a concentration of 3.7 ppm. TPH was not detected at wells MW-2 or MW-3. There are no SCGs for TPH.

4.4.4.3 Groundwater - Volatile Organic Compounds

A total of seven different VOCs, plus TICs, were detected in the three groundwater samples analyzed for TCL VOCs. Five of the compounds were detected at concentrations above TOGS 1.1.1 groundwater standards and guidance values. VOCs detected at levels above SCGs in at least one groundwater sample, and the concentration range for each compound, are identified below:

- benzene (not detected - 95 ppb);
- 1,1,1-dichloroethane (not detected - 13 ppb);
- ethyl benzene (not detected - 49 ppb);
- 1,1,2-trichloroethane (not detected - 2 ppb); and
- xylene (total) (not detected - 190 ppb).

Methylene chloride was also detected at levels above SCGs in the samples collected at the site, but the methylene chloride results were considered invalid due to laboratory contamination.

Table 6 also indicates that well MW-1 contained the highest groundwater concentration of each detected VOC except 1,1-dichloroethane. VOC TICs were detected in one of the three groundwater samples. VOC TICs were detected at well MW-1 at a concentration of 650 ppb (Figure 11).

4.4.4.4 Groundwater - Inorganic Compounds

A total of 19 different inorganic compounds were detected in the three groundwater samples analyzed for TAL metals. Five of the compounds were detected at concentrations above TOGS 1.1.1 groundwater standards and guidance values. Inorganic compounds detected at levels above SCGs in at least groundwater sample, and the concentration range for each compound, are identified below:

- iron (9360 - 21,700 ppb);
- lead (11.1 - 62.4 ppb);
- magnesium (49600 - 76,200 ppb);
- manganese (181 - 1,730 ppb);
- sodium (10800 - 152,000 ppb);

The remaining 14 inorganic compounds were detected at levels below TOGS 1.1.1 groundwater standards and guidance values. As indicated on Figure 11, inorganic compounds exceeding groundwater SCGs were detected in each of the three wells.

4.4.5 Quality Assurance/Quality Control (QA/QC) Sample Results

The QA/QC program implemented for this project included both field and analytical components. Field components included use of acceptable sample collection methods, use of clean equipment to minimize the potential for cross contamination, and trip blank samples. Analytical components included instrument calibration, laboratory blanks, and MS/MSD samples. Overall, the quantitative results of the QA/QC program indicated the data collected by the NYSDEC at Vacuum Oil were of acceptable quality for the objectives of the investigation except for methylene chloride. As discussed below, laboratory contamination of methylene chloride resulted in the sample results for methylene chloride to be invalidated or considered biased high.

Trip blanks consisted of vials filled in the RECRA Labnet laboratory with uncontaminated water. These vials accompanied sample collection personnel in the field and were treated identically to other water samples but were never opened. One (1) trip blank sample was collected by NYSDEC during this investigation for VOC analysis. The trip blank results provided in Table 24 indicate the presence of methylene chloride at a concentration of 9 ppb. The concentration of methylene chloride in the associated groundwater samples (B70622, B70623, and B70624) and method blank samples was 8 ppb. These results indicate that the methylene chloride detected in samples B70622, B70623, and B70624 was the result of laboratory contamination.

MS/MSD results, method blank results and additional QA/QC data are provided along with the analytical results in Appendix C. The results of the analytical QA/QC program are summarized below:

SVOCs

- The samples were extracted and analyzed within required holding times.
- Non-target compounds were detected in the samples.
- Due to a suspected GPC malfunction, a reserve pre-GPC aliquot was analyzed and reported in association with sample B70617.
- Samples B70601 and B70602 required a 20-fold dilution due to high levels of non-target compounds.
- All samples B70603 to B70615 (except B70605 and B70612) required 2 to 1000-fold dilutions due to high levels of both target and non-target compounds.
- Sample B70623 required a 5-fold dilution due to high levels of non-target compounds.
- Three of 32 surrogate recoveries were outside EPA QC limits for samples B70601 and B70602. However, EPA CLP surrogate recovery criteria were met (i.e. no more than one outlier per fraction (acid and base neutral) and no recoveries less than 10%).
- Two of 104 obtainable surrogate recoveries were outside EPA QC limits for samples B70603 to B70615. However, EPA CLP surrogate recovery criteria were met (i.e. no more than one outlier per fraction (acid and base neutral) and no recoveries less than 10%).
- All surrogate recoveries were within EPA QC limits for samples B70617, B70622, B70623, and B70624.
- Five of 11 blank spike recoveries were outside EPA QC limits for samples B70601 and B70602. The out of limit recoveries were slightly high; however, there was no impact on the data.
- Five of 11 blank spike recoveries were outside EPA QC limits for samples B70603 to B70615.
- Two of 11 blank spike recoveries were outside EPA QC limits for sample B70617.
- Two of 11 blank spike recoveries were outside EPA QC limits for samples B70622 to B70624.
- Two of 22 matrix spike recoveries were outside EPA QC limits for samples B70603 to B70615. The spike concentration of Pyrene proved to be too low for the sample matrix (Pyrene was present in the sample).
- Five of 22 matrix spike recoveries were outside EPA QC limits for samples B70622 to B70624.
- Some method blanks contained the common laboratory contaminants Di-n-butylphthalate and bis(2-ethylhexyl)phthalate at levels less than the CRQL.
- All internal standard area and retention time criteria were met.

TPH

- For samples B70616 to B70620, the matrix spike recovery for total petroleum hydrocarbons was below the 75 to 125% control limits.
- For samples B70616 to B70620, the replicate analysis for percent solids was within the 20% RPD control limit, however replicate analysis for TPH was outside the control limit.
- The poor recovery and reproducibility for TPH for samples B70616 to B70620 may be

attributed to low spike level and sample inhomogeneity.

VOCs

- The required holding time for analysis was met.
- Non-target compounds were detected in the samples.
- Samples B70601, B70602, and B70617 required medium level analysis due to high levels of both target and non-target compounds.
- Four of 18 surrogate recoveries were outside EPA QC limits for samples B70601 and B70602. The analysis of the method blank fulfills the reanalysis requirement of sample 99LVN492-MB1 BS. The surrogate recovery criteria were not met for samples B70601 and B70602 due to the TIC interferences; however, samples were not reanalyzed because no significant target compounds were detected in the samples.
- Two of 60 surrogate recoveries were outside EPA QC limits for samples B70603 to B70615. Sample B70610 was reanalyzed due to internal standard, surrogate recoveries being out of range and the contamination of methylene chloride. The initial analysis also had surrogate, internal standard out of criteria and higher concentration of methylene chloride contamination. Further analysis was not performed due to exceeded holding time.
- All surrogate recoveries were within EPA QC limits for samples B70617, B70622, B70623, and B70624.
- The soil method blank samples associated with samples B70603 to B70615 contained the common laboratory contaminants methylene chloride, acetone, and 2-butanone at concentrations not exceeding 23 ppb, 10 ppb, and 2 ppb, respectively. **The analytical results for these compounds, especially methylene chloride, for samples B70603 to B70615 may be biased high due to laboratory contamination as indicated by the method blank results.**
- The soil method blank, 99LVN490-MB1, contained the common laboratory contaminants methylene chloride, acetone, and 2-butanone at concentrations of 2000 ppb, 420 ppb, and 130 ppb, respectively. Method blank sample 99LVN490-MB1 is associated with samples B70601 and B70602. The analytical results for methylene chloride, acetone, and 2-butanone for samples B70601 and B70602 were similar to or less than the associated method blank results indicating that the methylene chloride detected in the samples was the result of laboratory contamination and not site soil contamination. **Based on this information, the analytical results for methylene chloride, acetone, and 2-butanone for samples B70601 and B70602 were considered invalid.**
- The soil method blank, 00LVH052-MB1, contained the common laboratory contaminants methylene chloride and acetone at concentrations of 530 ppb and 380 ppb, respectively. Method blank sample 00LVH052-MB1 is associated with sample B70617. Acetone was not detected in sample B70617. Methylene chloride was detected in sample B70617 at a concentration of 750 ppb. **The concentration of methylene chloride in sample B70617 may be biased high due to laboratory contamination as indicated by the method blank results.**
- The water method blank samples associated with samples B70622 to B70624 contained the common laboratory contaminants methylene chloride and acetone at concentrations of 8 ppb each. The analytical results for methylene chloride for samples B70622 to B70624 were the same as the associated method blank results indicating that the methylene chloride detected

in the samples was the result of laboratory contamination and not groundwater contamination. **Based on this information, the analytical results for methylene chloride for samples B70622 to B70624 were considered invalid.**

- All matrix spike recoveries were within EPA QC limits.
- One blank spike recovery was outside EPA-QC limits.
- All internal standard area and retention time criteria were met.

Inorganic Compounds

- All analyses were performed within the required hold times.
- All initial and continuing calibration verifications (ICV/CCVs) were within control limits.
- All initial and continuing calibration blanks (ICB/CCBs) were within control limits.
- All preparation/method blanks were within method criteria.
- All ICP interference check samples (ICSA and ICSAB) were within control limits with the exception of the ending ICSAB for selenium at 126.6% in TA1215A associated with samples B70601 and B70602. All of the samples were surrounded by CCVs which were within the control limits. The concentration of the interfering analytes was lower in the samples as compared to the ICSAB solution. Therefore, it is unlikely that the samples are significantly impacted.
- All laboratory control samples (LCS) were within the 80 to 120% control limits.
- All serial dilution percent differences were within method control limits.
- The TCLP extract from sample B70601 was selected for the matrix spike for this analytical batch. All TCLP matrix spike recoveries were greater than 50% as per method criteria.
- The matrix spike recovery for 1 analyte for samples B70617 to B70620, was outside the 75 to 125% control limits.
- The matrix spike recoveries for 2 analytes for samples B70603 to B70615 were outside the 75 to 125% control limits.
- The matrix spike recoveries for 2 analytes for samples B70622 to B70624 were outside the 75 to 125% control limits.
- The duplicate analysis for 1 analyte for samples B70617 to B70620 was outside the method criteria.

Pesticide/PCB

- Linearity and breakdown criteria were met for each of the analytical columns.
- Retention time criteria were met for all compounds on both analytical columns.
- Resolution of all pesticides in the Resolution Check Standard were within EPA QC limits.
- The RPDs of the pesticides in the Individual Mixes analyzed for calibration verification were within 25% for both analytical columns.
- The RPDs of the pesticides in the Performance Evaluation Mixes analyzed for calibration verification were within 25% for both analytical columns.
- All obtainable surrogate recoveries were within the advisory EPA QC limits.
- All blank spike recoveries were within EPA QC limits.
- Matrix spike recoveries for samples for samples B70603 to B70615 were unobtainable due to the dilution required for analysis.
- Recoveries of pesticides for the Florisil Cartridge Check were within EPA QC limits.
- Recoveries of pesticides for the GPC Calibration Check were within EPA QC limits.

SVOCs - TCLP

- All required holding times for extraction and analysis were met.
- All surrogate recoveries were within EPA QC limits.
- All blank spike recoveries were within EPA QC limits.
- Internal standard area criteria were not met for the method blank spike 99LE1549-MB1 BS. The analysis of associated blank spike duplicate 99LE1549-MB1 BSD fulfills the reanalysis requirement.

VOC - TCLP

- The required holding time for analysis was met.
- The samples were analyzed at five-fold dilution due to the leachate matrix.
- All surrogate recoveries were within EPA QC limits.
- Internal standard area and retention time criteria were met.

Pesticide - TCLP

- All required holding times for extraction and analysis were met.
- All method blanks were below the reporting limits for all target compounds.
- All surrogate recoveries were within acceptance criteria.
- All blank spike recoveries were within acceptance criteria.
- All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

Herbicide - TCLP

- All required holding times for extraction and analysis were met.
- All method blanks were below the reporting limits for all target compounds.
- One of six surrogate recoveries were outside acceptance criteria.
- All blank spike recoveries were within acceptance criteria.
- All initial calibrations were within acceptance criteria.
- All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

4.5 CONCLUSIONS

Significant findings of this investigation relative to project objectives are provided below.

4.5.1 Extent of Contamination

The 1999-2000 investigation was designed to provide additional information concerning the nature and extent of contamination in the overburden on a portion of the property formerly occupied by the Vacuum Oil Company. The 1999-2000 investigation was not designed to completely define the nature and extent of contamination at the site. Rather the scope of work was designed to provide some information about all areas of the site, identify some heavily contaminated areas, and, if possible, determine if a consequential amount of hazardous waste was disposed of on the site.

Elevated levels of SVOCs, VOCs, inorganic compounds, and pesticides were detected throughout the site. The extent of contamination for specific compounds is discussed below. No PCBs were detected at the site during the 1999-2000 investigation.

4.5.1.1 Semi-Volatile Organic Compounds and Total Petroleum Hydrocarbons

The TPH soil gas results indicated that there were two large areas with the potential for significant petroleum related contamination at the site. The first area was centered around soil gas sample point B-3 and the second area was centered around soil gas sample point F-5 (see Figure 7). All of the test pits, except TP-10, were located within these two TPH plumes. The test pit and soil boring sampling results indicated that the soils in the B-3 plume area contained more SVOC compounds at higher concentrations than the soils in the F-5 plume. For example, Figure 10 indicates that a total of 17 different SVOCs were detected at concentrations above SCGs in the subsurface soils at TP-2 (in the B3 plume area) and all of those compounds were detected at concentrations between 100,000 ppb and 1,600,000 ppb. By comparison, 7 different SVOCs were detected at concentrations above SCGs in the subsurface soils at TP-8 (in the F-5 plume area) and none of those compounds were detected at concentrations above 10,000 ppb.

SVOCs were detected above SCGs in surface and subsurface soil samples collected throughout the B-3 plume area. The most heavily SVOC contaminated soils were encountered in the vicinity of soil gas location C-3. The C-3 area included surface soil location SS-2, test pit TP-2 and well MW-2 (see Figures 7, 9, and 10). SVOCs exceeding SCGs were also detected in the B-3 plume in surface soil sample SS-1 and test pit TP-3 indicating that the SVOC contamination may be widespread.

Test pit TP-1 and well MW-1 were located immediately adjacent to soil gas point B-3 (Figure 7). No SVOCs were detected above SCGs in the subsurface soil samples collected from TP-1 or MW-1, but soils from MW-1 contained the highest TPH concentration (1,140 ppm) and soils from TP-1 contained the second highest concentration of SVOC TICs (814,000 ppb; Figure 10). The nature of the contamination in the soils at TP-1 and MW-1 also appeared to be different from TP-2, MW-2, and TP-3. The PID field screening results, provided in Appendix A, did not indicate the presence of contamination in the soils at TP-2 or TP-3. The PID did indicate the presence of some contamination in the 6 to 12 ft. interval of MW-2. At TP-1 and MW-1, the contamination was more volatile in nature as the PID results indicated contamination was present from 4 ft. until refusal at 16.5 ft and the soils had a strong petroleum odor.

The groundwater results (see Figure 11), indicate that the SVOC contamination at the site has primarily impacted site soils as phenol was the only SVOC detected in the groundwater at concentrations above SCGs. Phenol was detected at a concentration of 7 ppb at well MW-1, the NYS groundwater standard for phenol is 1 ppb. Phenol was not detected in the groundwater at wells MW-2 or MW-3.

Figure 11 also indicates that the groundwater at MW-1 was more contaminated with SVOCs and TPH than MW-2. This is based on the following:

- Phenol at MW-1 was the only SVOC detected in the groundwater at concentrations above

SCGs;

- The groundwater at MW-1 contained a higher concentration of SVOC TICS (1,250 ppb) than MW-2 (125 ppb); and
- The groundwater at MW-1 contained a higher concentration of TPH (3.7 ppm) than MW-2 (not detected).

These groundwater results do not correlate well with the soil results which indicated that the soils in the vicinity of MW-2 were more contaminated with SVOCs than the soils in the vicinity of MW-1.

4.5.1.2 Volatile Organic Compounds

The VOC soil gas results detected the presence of petroleum-related VOCs (BTEX, trimethylbenzenes, and naphthalene) and chlorinated VOCs (1,1,1-trichloroethane, trichloroethene, and tetrachloroethene). The soil gas data, presented in Appendix E, indicated a correlation between the petroleum VOC soil gas results and the TPH soil gas results. Subsequent sampling of the surface soil, subsurface soil and groundwater indicated that petroleum-related VOC contamination was present in the subsurface soil and groundwater in the vicinity of MW-1 and TP-1 (see Figures 10 and 11). In the subsurface soil from TP-1, xylene was detected at a concentration of 6,300 ppb at MW-1. The TAGM 4046 recommended soil cleanup objective for xylene is 1,200 ppb. Subsurface soil samples from TP-1 also contained the highest level of VOC TICs (133,000 ppb). The next highest level of VOC TICs in the subsurface soil was 237 ppb from TP-3. In the groundwater, the petroleum-related compounds benzene, ethyl benzene, and xylene were detected above NYS groundwater standards at well MW-1 which is adjacent to test pit TP-1 (see Figure 11). Petroleum-related VOCs were not detected in wells MW-2 or MW-3.

Chlorinated VOCs were detected less frequently in the soil vapor than the petroleum VOCs and there was not a strong correlation between the chlorinated VOC soil gas results and the soil gas results for other compounds. Total chlorinated VOC concentrations detected in the soil gas are shown on Figure 8. Figure 8 indicated that the area around soil gas points C-3 and D-3 was a potential source of chlorinated compound contamination, but additional sampling at the site did not identify the presence of a consequential chlorinated VOC source area. This conclusion was based on the following:

- Except for methylene chloride, no chlorinated VOCs were detected in the surface soil samples (Table 9).
- In the subsurface, chlorinated VOCs (excluding methylene chloride) were detected in one sample (TP-3) at a total concentration of about 42 ppb. Trichloroethene was the individual chlorinated VOC detected at the highest concentration, 28 ppb, which was much lower than the TAGM 4046 recommended soil cleanup objective of 700 ppb (see Tables 16 and 17).
- In the groundwater, chlorinated compounds (excluding methylene chloride) were detected at concentrations above NYS groundwater standards at wells MW-1 and MW-2 (Figure 11). 1,1-Dichloroethane was detected at the highest concentration, 13 ppb, which is only slightly higher than the NYS groundwater standard of 5 ppb.
- As discussed in Section 4.4.5, laboratory contamination resulted in invalid and biased high

analytical data for methylene chloride.

4.5.1.3 Inorganic Compounds

A total of 14 different inorganic compounds that were detected at concentrations above SCGs in either the surface soil, subsurface soil, or groundwater during the 1999-2000 investigation. The following two compounds were identified as compounds of concern for additional review:

- arsenic; and
- mercury.

These compounds were identified based on the number and magnitude of SCG exceedances (see Tables 4, 5 and 6) and the potential hazards of the compound in the environment.

Arsenic: Elevated levels of arsenic were detected throughout the site, particularly in the surface soil and subsurface soil. In the surface soil, elevated levels of arsenic (greater than the Eastern USA background concentration of 12 ppm) were detected in two of the five surface soil samples: SS-2 (60.7 ppm) and SS-5 (13.5 ppm). As shown on Figure 9, SS-2 was located in the northern portion of the site. SS-5 was located in the southern portion of the site in the vicinity of former "sludge pits" that were excavated in 1992 (Figure 3). The sludge pit soils reportedly contained arsenic at concentrations up to 930 ppm.

In the subsurface soils, elevated levels of arsenic (greater than the Eastern USA background concentration of 12 ppm) were detected in three of the nine test pits and borings sampled for metals at concentrations ranging from 16.1 ppm to 113 ppm (see Figure 10). The highest concentration of arsenic detected in the subsurface soil was 113 ppm at test pit TP-8. Elevated levels of arsenic were also detected in TP-5 (37.7 ppm) and TP-2 (16.1 ppm). Test pit TP-2 was located in the vicinity of surface soil sample location SS-2 where elevated levels of arsenic were also detected. Test pit TP-8 was located in the western portion of the site and TP-5 was located in the southeastern portion of the site. There were no other sample locations in the immediate vicinity of either TP-8 or TP-5. Figure 9 and Figure 10 indicate that there may be a correlation between elevated arsenic concentrations and elevated SVOC concentrations in the soil.

Site specific background samples were not collected as part of the 1999-2000 investigation, but samples collected at other sites in the City of Rochester indicated that the Eastern USA background concentration of 12 ppm identified in TAGM 4046 is an appropriate upper limit to use as a background level for arsenic. Based on these data, the elevated levels of arsenic detected at the site are likely the result of past site activities.

Arsenic was detected in each of the three groundwater samples, but the results were all less than the NYS groundwater standard of 25 ppb (Tables 25 and 26). The highest concentration of arsenic detected in the groundwater was 17 ppb at well MW-2. Well MW-2 was located adjacent to surface soil sample point SS-2 and test pit TP-2 where elevated levels of arsenic were detected.

Mercury: Elevated levels of mercury were detected throughout the site in the surface and subsurface soils. In the surface soil, elevated levels of mercury (greater than the TAGM 4046 recommended cleanup value of 0.1 ppm) were detected in each of the five surface soil samples. The highest mercury concentration was 2.1 ppm at SS-4 located in the southwest portion of the site (see Figure 9).

In the subsurface soil, elevated levels of mercury (greater than the TAGM 4046 recommended cleanup value of 0.1 ppm) were detected in three of the nine test pits and borings sampled for metals at concentrations ranging from 0.12 ppm to 4 ppm (see Figure 10). The highest concentration of mercury detected in the subsurface soil was 4 ppm at test pit TP-1. Elevated levels of arsenic were also detected in TP-3 (0.12 ppm), TP-2 (1 ppm), and TP-10 (1.5 ppm). TP-1, TP-2, TP-3, and TP-10 are located in the northern portion of the site.

Site specific background samples were not collected as part of the 1999-2000 investigation, but samples collected at other sites in the City of Rochester indicated that approximately 1 ppm is an appropriate upper limit to use as a background level for mercury. Based on these data, two surface soil samples (SS-4 and SS-5) and three subsurface soil samples (TP-1, TP-2, and TP-10) contained levels of mercury that are likely the result of past site activities.

Mercury was not detected in the groundwater at concentrations above NYS groundwater standards.

4.5.1.4 Pesticides

The 1999-2000 investigation indicated the potential for limited pesticide contamination. Elevated levels of the pesticides dieldrin and heptachlor epoxide were detected in surface soil sample SS-1 (Figure 9). Dieldrin was detected at a concentration of 74 ppb and heptachlor epoxide was detected at a concentration of 30 ppb. The TAGM 4046 recommended cleanup objectives for dieldrin and heptachlor epoxide are 44 ppb and 20 ppb, respectively.

4.5.2 The NYS Listing of Inactive Hazardous Waste Disposal Sites

As discussed below, the results of the 1999-2000 investigation indicated that site contamination resulted from the disposal of petroleum-related compounds at the site. Some hazardous waste may have also been disposed of at the site, but the 1999-2000 investigation results did not identify a consequential amount of hazardous waste. Based on the results of the investigation NYSDEC will not include the Vacuum Oil site in the NYS Listing of Inactive Hazardous Waste Disposal Sites. This conclusion is based on the following:

- The primary contaminants at the site are petroleum related SVOCs and VOCs. This is consistent with the site's former use as an oil refinery.
- Site contamination could not be identified as a characteristic hazardous waste as defined in 6 NYCRR 371.3. Waste soils and water generated during the 1999-2000 investigation were tested and were not ignitable, corrosive, reactive, or toxic. TCLP analytical results for subsurface soil samples from TP-1 (see Table 21), were below regulatory levels. During the 1992 soil removal at the site, arsenic was detected in the sludge pit soils at concentrations up to 930 ppm, but TCLP results for the sludge pit soils were below regulatory levels. The

highest arsenic concentration detected in the soil during the 1999-2000 investigation was 113 ppm.

- The petroleum contamination at the site could not be identified as a listed hazardous waste as defined in 6 NYCRR 371.4. The following hazardous waste codes apply to specific wastes from petroleum refineries: F037, F038, and K048 to K052. Since the NYSDEC has no knowledge as to what operations at Vacuum Oil caused the petroleum contamination, it is not appropriate to classify the site using the listed hazardous waste codes.
- The chlorinated compounds detected at the site may have been caused by the disposal of listed hazardous waste (either waste code F001 or F002), but the sampling results indicated that the amount of hazardous waste disposed was not consequential.

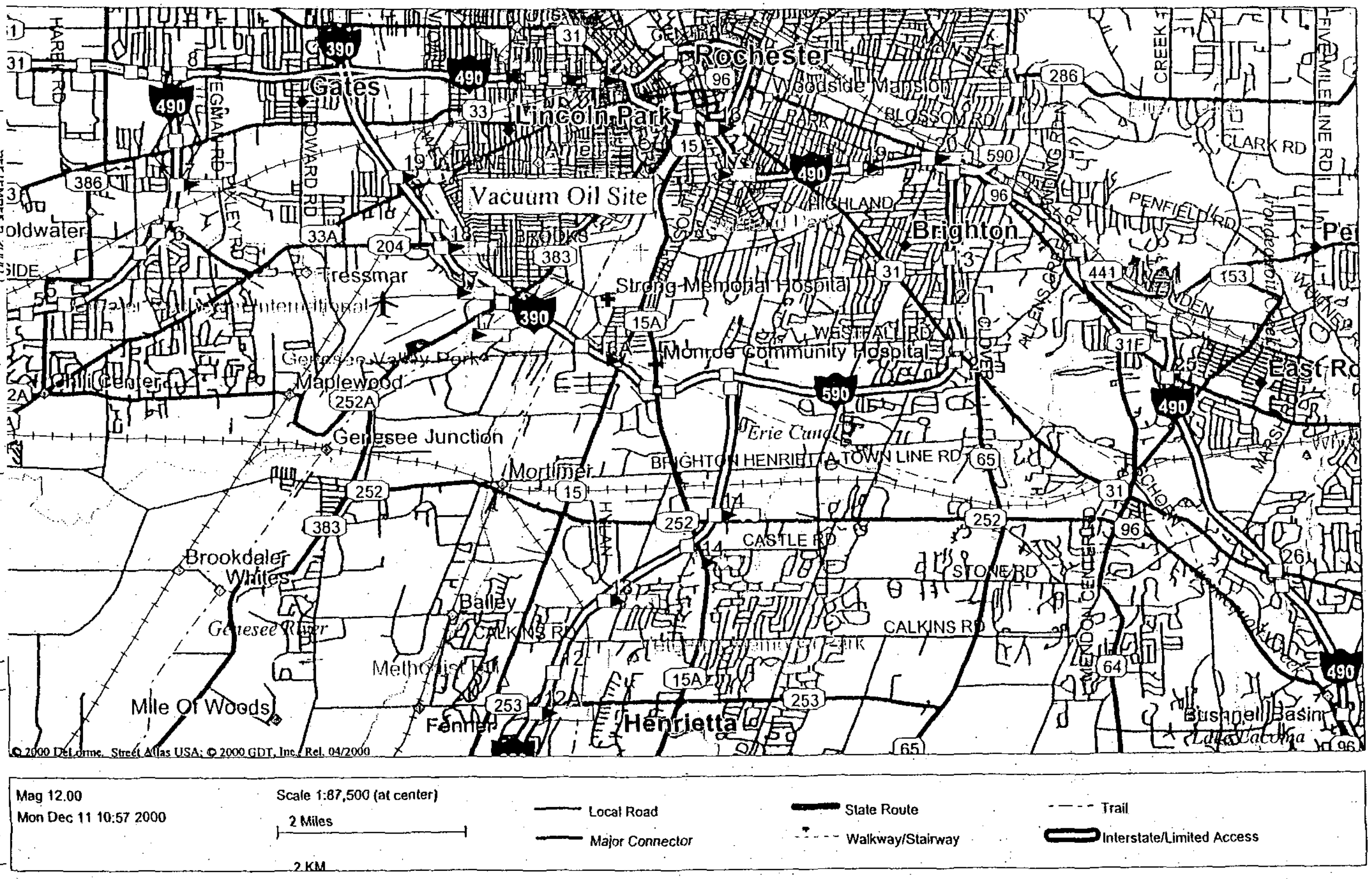
5.0 RECOMMENDATIONS

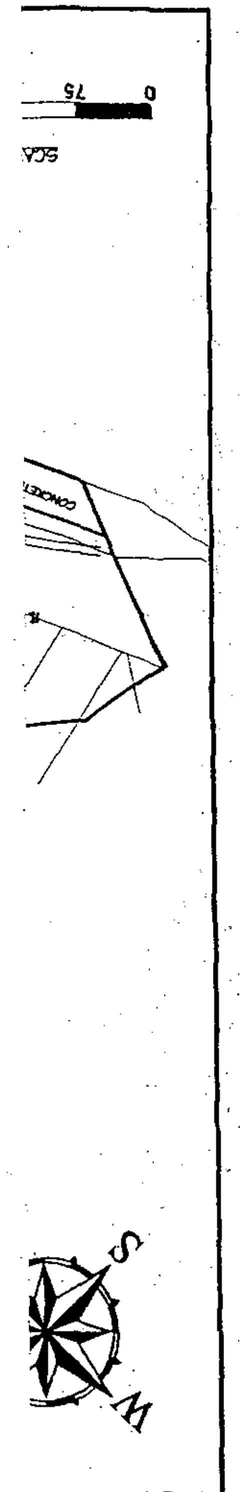
In 1999-2000, the NYSDEC conducted a site investigation of a portion of the former Vacuum Oil Company facility in Rochester, New York. Soil gas, surface soil, subsurface soil, and groundwater samples were collected at the site and analyzed for TCL SVOCs, TPH, TCL VOCs, TAL metals, cyanide, pesticides, PCBs, and TCLP.

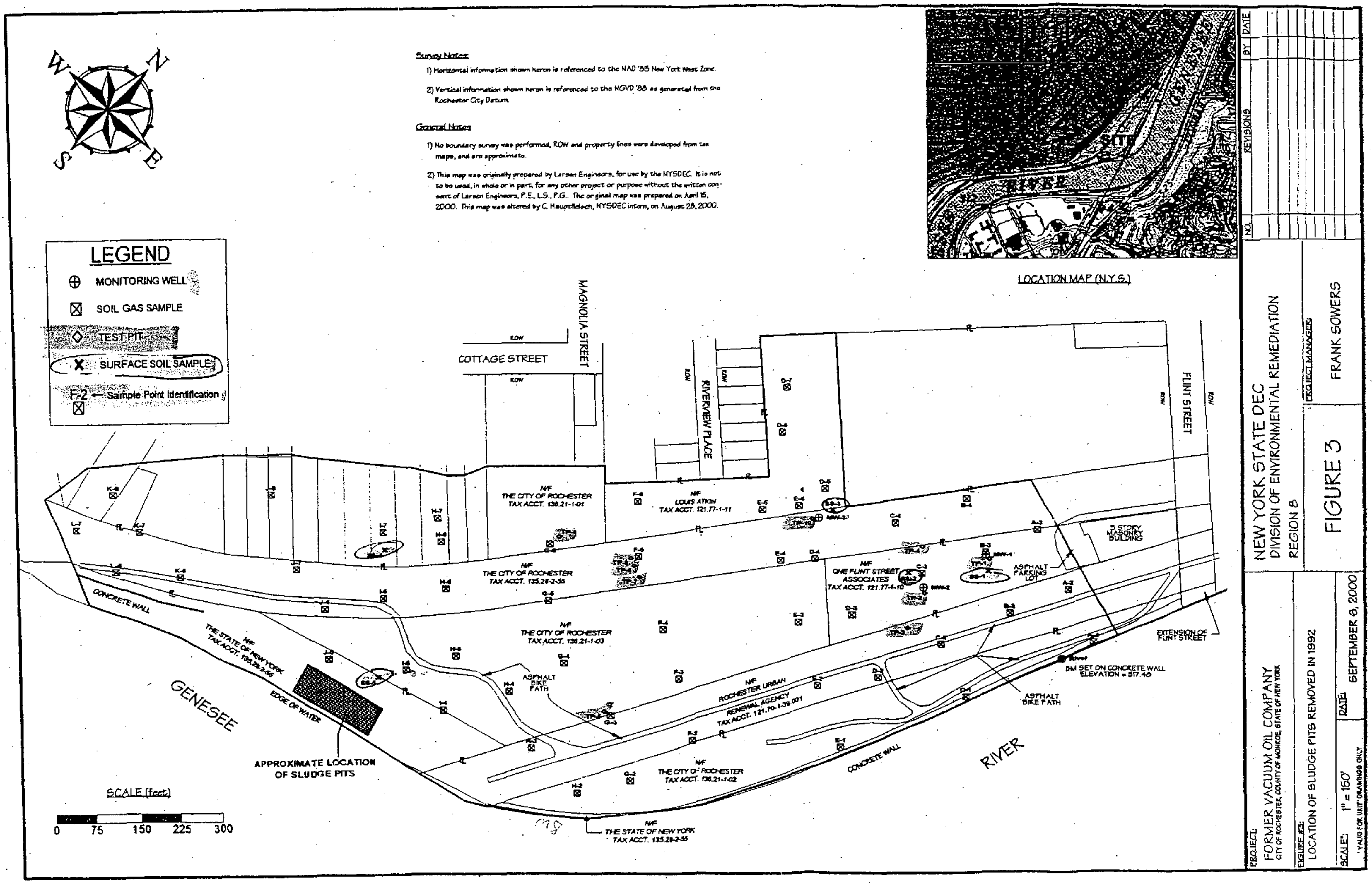
The results of the NYSDEC investigation indicated widespread petroleum contamination in the surface soil, subsurface soil, and groundwater at the site. To a lesser extent, chlorinated VOCs, metals, and pesticides were also detected above NYS standards at the site

The results of the 1999-2000 investigation indicated that site contamination was not the result of disposal of a consequential amount of hazardous waste. NYSDEC will not include the site in the New York State Listing of Inactive Hazardous Waste Disposal Sites at this time.

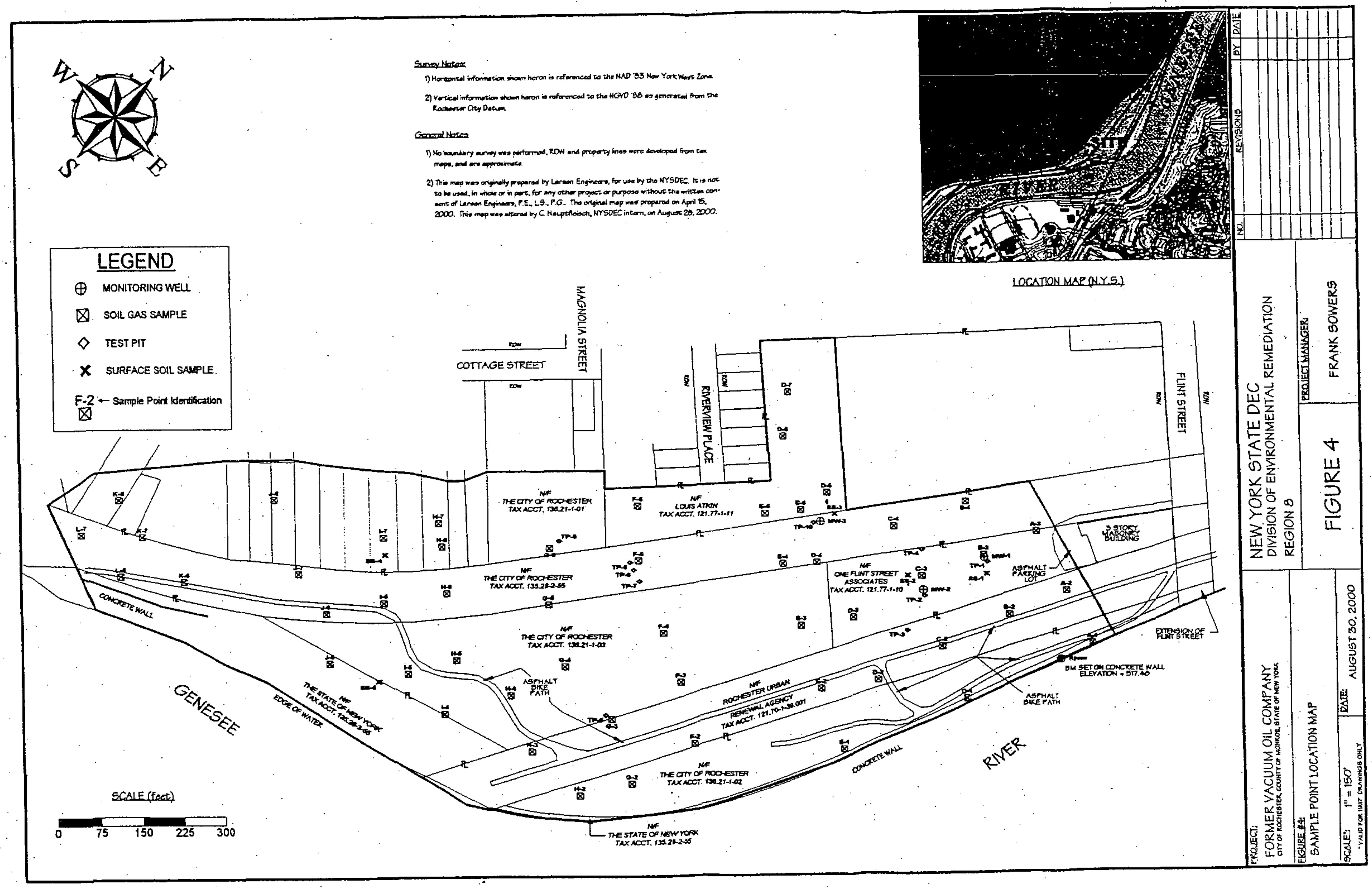
Figure 1. Rochester, New York Location of Former Vacuum Oil Facility







Survey Notes:
1) Horizontal information shown heron is referenced to the NAD '83 New York West Zone.
2) Vertical information shown heron is referenced to the NGVD '88 as generated from the Rochester City Datum.
General Notes:
1) No boundary survey was performed, ROW and property lines were developed from tax maps, and are approximate.
2) This map was originally prepared by Larsen Engineers, for use by the NYSDEC. It is not to be used, in whole or in part, for any other project or purpose without the written consent of Larsen Engineers, P.E., L.S., P.G.. The original map was prepared on April 15, 2000. This map was altered by C. Hauptfleisch, NYSDEC intern, on August 28, 2000.
LEGEND
MONITORING WELL
SOIL GAS SAMPLE
TEST PIT
SURFACE SOIL SAMPLE
F-2 — Sample Point Identification
LOCATION MAP (N.Y.S.)
SITE
RIVER
COTTAGE STREET
MAGNOLIA STREET
RIVERVIEW PLACE
FLINT STREET
N/F THE CITY OF ROCHESTER TAX ACCT. 136.21-1-01
N/F LOUIS ATKIN TAX ACCT. 121.77-1-11
N/F THE CITY OF ROCHESTER TAX ACCT. 135.28-2-55
N/F ONE FLINT STREET ASSOCIATES TAX ACCT. 121.77-1-10
N/F THE CITY OF ROCHESTER TAX ACCT. 136.21-1-03
N/F ROCHESTER URBAN RENEWAL AGENCY TAX ACCT. 121.70-1-39.001
N/F THE CITY OF ROCHESTER TAX ACCT. 136.21-1-02
N/F THE STATE OF NEW YORK TAX ACCT. 135.28-2-55
3 STORY MASONRY BUILDING
ASPHALT PARKING LOT
ASPHALT BIKE PATH
EXTENSION OF FLINT STREET
BM SET ON CONCRETE WALL ELEVATION = 517.40
CONCRETE WALL
EDGE OF WATER
GENESEE
RIVER
APPROXIMATE LOCATION OF SLUDGE PITS
SCALE (feet)
0 75 150 225 300
NO. REVISIONS BY DATE
NEW YORK STATE DEC
DIVISION OF ENVIRONMENTAL REMEDIATION
REGION 8
PROJECT MANAGER:
FRANK SOWERS
FIGURE 3
PROJECT:
FORMER VACUUM OIL COMPANY
CITY OF ROCHESTER, COUNTY OF MONROE, STATE OF NEW YORK
FIGURE #3:
LOCATION OF SLUDGE PITS REMOVED IN 1992
SCALE: 1" = 150'
DATE: SEPTEMBER 6, 2000



W N S E
Survey Notes:
1) Horizontal information shown heron is referenced to the NAD '83 New York West Zone.
2) Vertical information shown heron is referenced to the NGVD '88 as generated from the Rochester City Datum.
General Notes:
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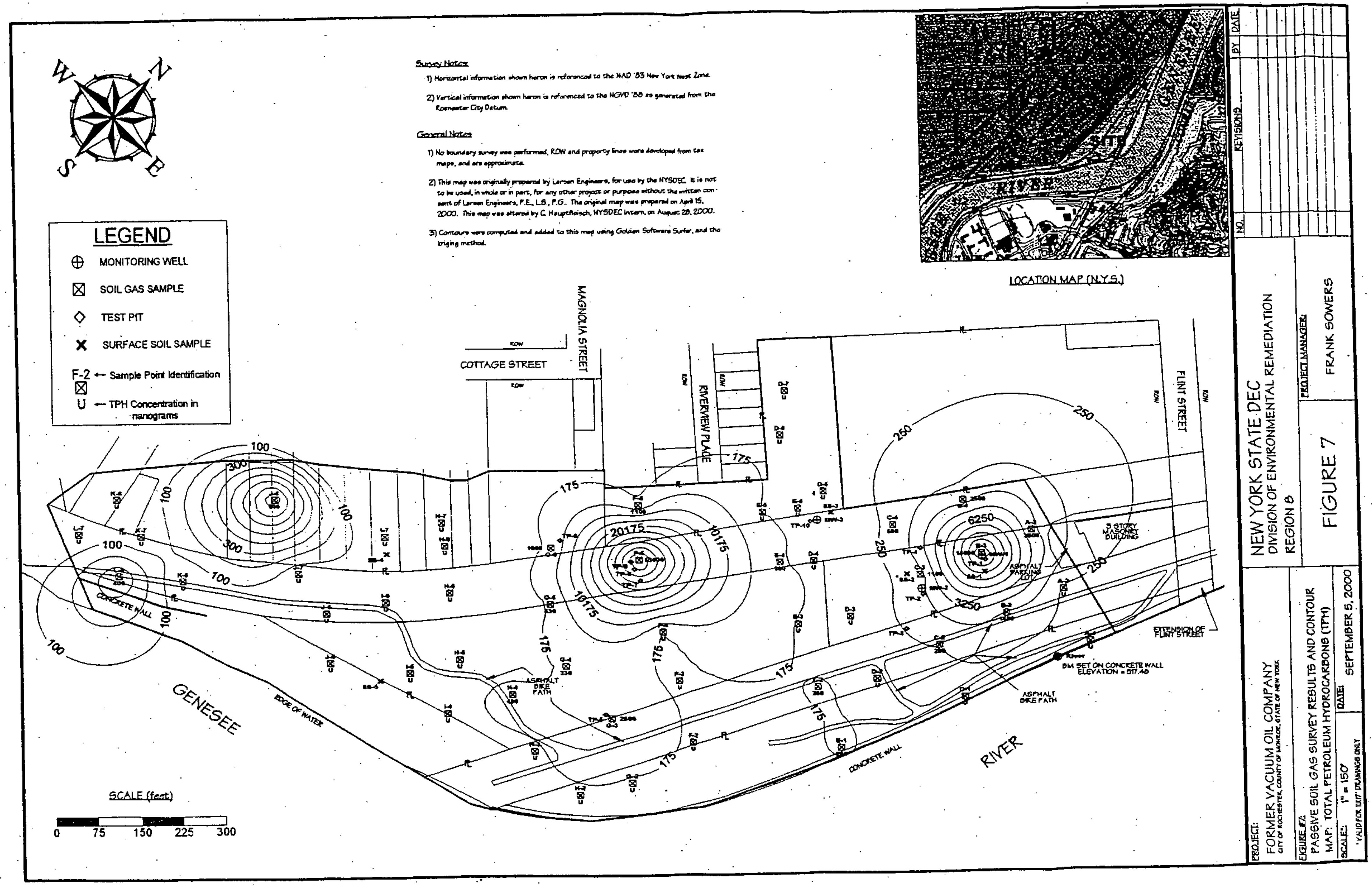
2) This map was originally prepared by Larsen Engineers, for use by the NYSDEC. It is not to be used, in whole or in part, for any other project or purpose without the written consent of Larsen Engineers, P.E., L.S., P.G.. The original map was prepared on April 15, 2000. This map was altered by C. Hauptfleisch, NYSDEC intern, on August 28, 2000.
LOCATION MAP (N.Y.S.)
LEGEND
MONITORING WELL
SOIL GAS SAMPLE
TEST PIT
SURFACE SOIL SAMPLE
F-2 ← Sample Point Identification
COTTAGE STREET
MAGNOLIA STREET
RIVERVIEW PLACE
FLINT STREET
N/F THE CITY OF ROCHESTER TAX ACCT. 136.21-1-01
N/F LOUIS ATKIN TAX ACCT. 121.77-1-11
N/F THE CITY OF ROCHESTER TAX ACCT. 135.29-2-55
N/F ONE FLINT STREET ASSOCIATES TAX ACCT. 121.77-1-10
ASPHALT PARKING LOT
3 STORY MASONRY BUILDING
N/F THE CITY OF ROCHESTER TAX ACCT. 136.21-1-03
N/F ROCHESTER URBAN RENEWAL AGENCY TAX ACCT. 121.70-1-38.001
ASPHALT BIKE PATH
EXTENSION OF FLINT STREET
BM SET ON CONCRETE WALL ELEVATION = 517.46
N/F THE STATE OF NEW YORK TAX ACCT. 135.29-2-55
N/F THE CITY OF ROCHESTER TAX ACCT. 136.21-1-02
CONCRETE WALL
EDGE OF WATER
GENESEE
RIVER
SCALE (feet)
0 75 150 225 300
NO. REVISIONS BY DATE
NEW YORK STATE DEC
DIVISION OF ENVIRONMENTAL REMEDIATION
REGION 8
PROJECT MANAGER:
FRANK SOWERS
FIGURE 4
PROJECT:
FORMER VACUUM OIL COMPANY
CITY OF ROCHESTER, COUNTY OF MONROE, STATE OF NEW YORK
FIGURE #4:
SAMPLE POINT LOCATION MAP
SCALE: 1" = 150'
DATE: AUGUST 30, 2000



N
E
S
W
Survey Notes
1) Horizontal information shown heron is referenced to the NAD '83 New York West Zone.
2) Vertical information shown heron is referenced to the NGVD '88 as generated from the Rochester City Datum.
General Notes
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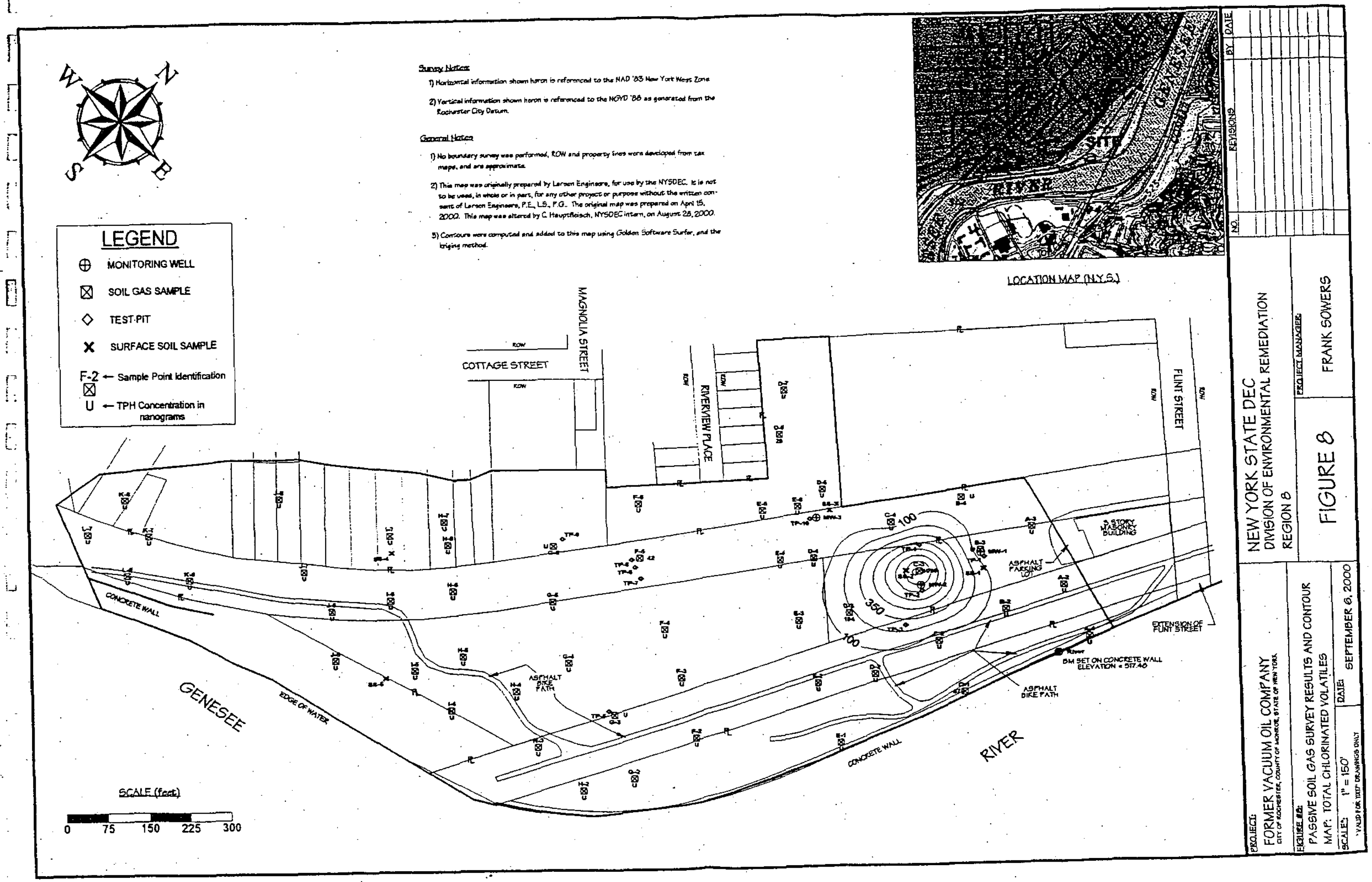
3) Contours were computed and added to this map using Golden Software Surfer, and the kriging method.
LOCATION MAP (N.Y.S.)
LEGEND
MONITORING WELL
SOIL GAS SAMPLE
TEST PIT
SURFACE SOIL SAMPLE
F-2 ← Sample Point Identification
U ← TPH Concentration in nanograms
COTTAGE STREET
MAGNOLIA STREET
RIVERVIEW PLACE
FLINT STREET
EXTENSION OF FLINT STREET
3 STORY MASONRY BUILDING
ASPHALT PARKING LOT
ASPHALT BIKE PATH
BM SET ON CONCRETE WALL ELEVATION = 517.40
CONCRETE WALL
EDGE OF WATER
GENESEE
RIVER
100
300
175
20175
10175
250
6250
3250
SCALE (feet)
0
75
150
225
300
PROJECT:
FORMER VACUUM OIL COMPANY
CITY OF ROCHESTER, COUNTY OF MONROE, STATE OF NEW YORK
FIGURE #7:
PASSIVE SOIL GAS SURVEY RESULTS AND CONTOUR MAP: TOTAL PETROLEUM HYDROCARBONS (TPH)
SCALE: 1" = 150'
*VALID FOR 11x17 DRAWINGS ONLY
DATE: SEPTEMBER 5, 2000
NEW YORK STATE DEC
DIVISION OF ENVIRONMENTAL REMEDIATION
REGION 8
FIGURE 7
PROJECT MANAGER:
FRANK SOWERS
NO.
REVISIONS
BY
DATE


W N E S
Survey Notes
1) Horizontal information shown heron is referenced to the NAD '83 New York West Zone
2) Vertical information shown heron is referenced to the NGVD '88 as generated from the Rochester City Datum.
General Notes
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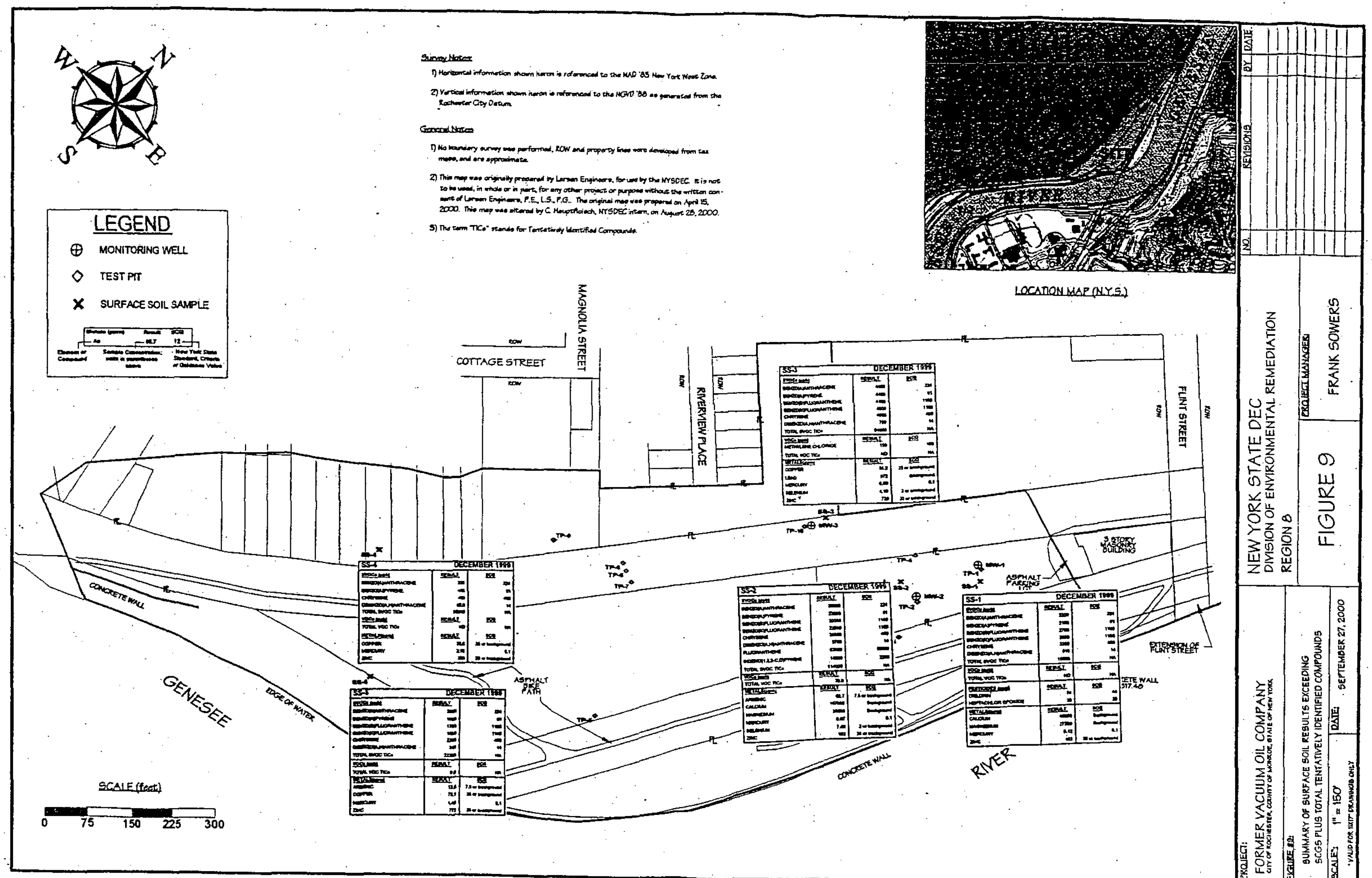
5) Contours were computed and added to this map using Golden Software Surfer, and the kriging method.
LEGEND
MONITORING WELL
SOIL GAS SAMPLE
TEST PIT
SURFACE SOIL SAMPLE
F-2 ← Sample Point Identification
U ← TPH Concentration in nanograms
LOCATION MAP (N.Y.S.)
COTTAGE STREET
MAGNOLIA STREET
RIVERVIEW PLACE
FLINT STREET
ROW
3 STORY MASONRY BUILDING
ASPHALT PARKING LOT
ASPHALT BIKE PATH
EXTENSION OF FLINT STREET
BM SET ON CONCRETE WALL ELEVATION = 517.40
CONCRETE WALL
EDGE OF WATER
GENESEE
RIVER
100
350
SCALE (feet)
0 75 150 225 300
NEW YORK STATE DEC
DIVISION OF ENVIRONMENTAL REMEDIATION
REGION 8
PROJECT MANAGER:
FRANK SOWERS
FIGURE 8
NO. REVISIONS BY DATE
PROJECT:
FORMER VACUUM OIL COMPANY
CITY OF ROCHESTER, COUNTY OF MONROE, STATE OF NEW YORK
FIGURE #8:
PASSIVE SOIL GAS SURVEY RESULTS AND CONTOUR MAP: TOTAL CHLORINATED VOLATILES
SCALE: 1" = 150'
DATE: SEPTEMBER 6, 2000
VALID FOR 11X17 DRAWINGS ONLY



W
N
S
E
LEGEND
MONITORING WELL
TEST PIT
SURFACE SOIL SAMPLE
Survey Notes
1) Horizontal information shown heron is referenced to the NAD '83 New York West Zone.
2) Vertical information shown heron is referenced to the NGVD '88 as generated from the Rochester City Datum.
General Notes
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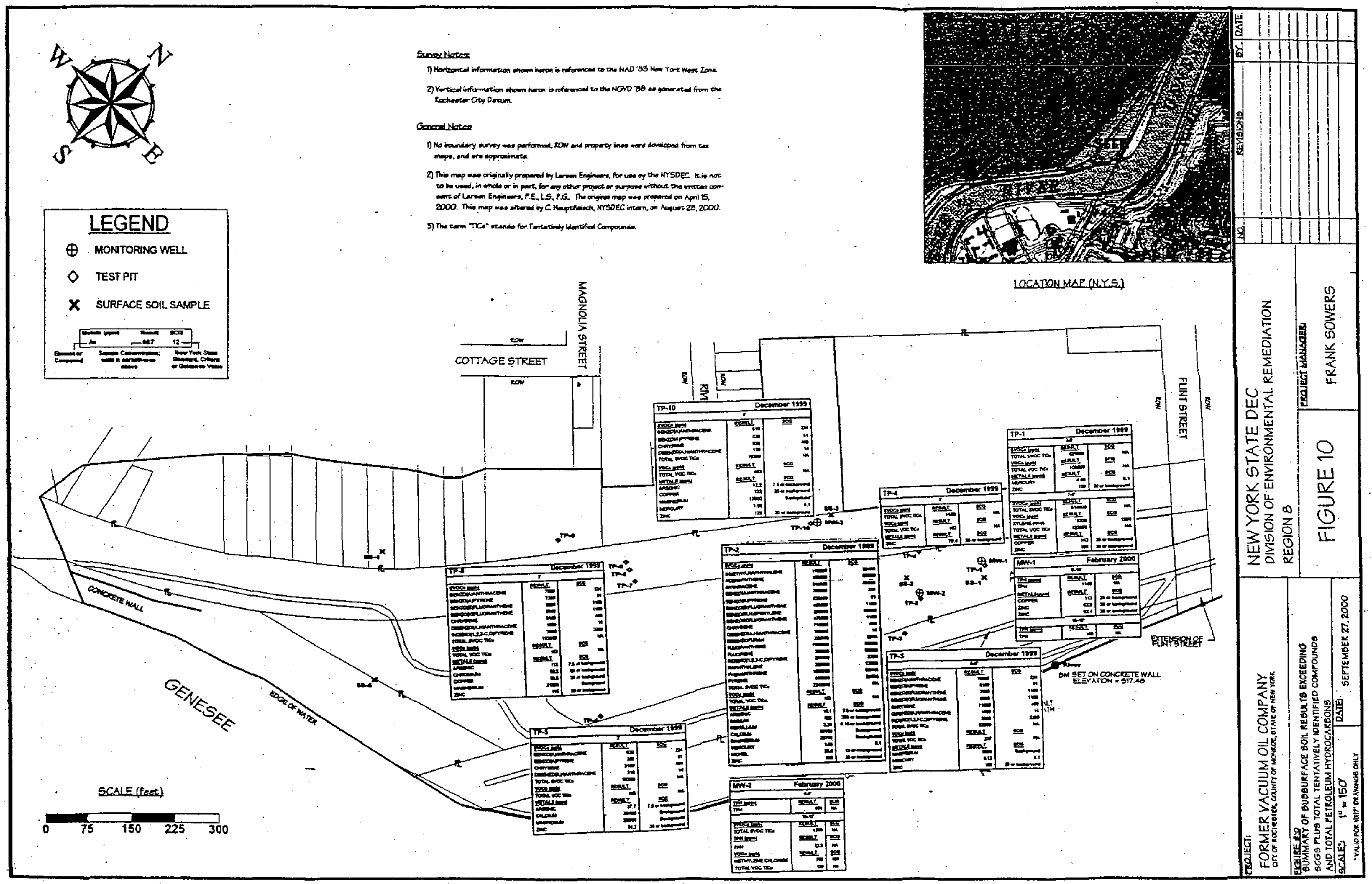
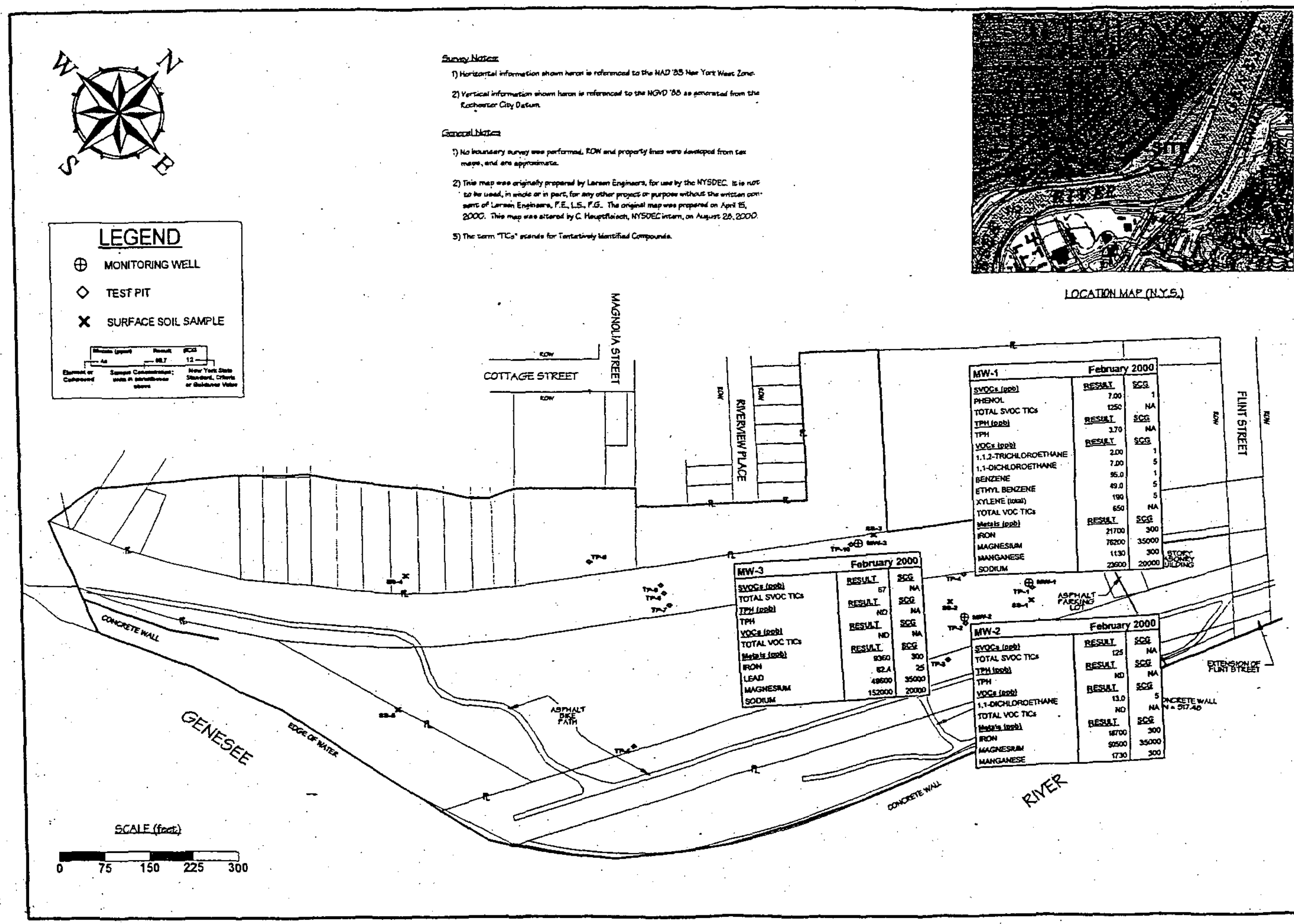
2) This map was originally prepared by Larsen Engineers, for use by the NYSDEC. It is not to be used, in whole or in part, for any other project or purpose without the written consent of Larsen Engineers, P.E., L.S., P.G.. The original map was prepared on April 15, 2000. This map was altered by C. Hauptfleisch, NYSDEC intern, on August 28, 2000.
3) The term "TICs" stands for Tentatively Identified Compounds.
LOCATION MAP (N.Y.S.)
COTTAGE STREET
MAGNOLIA STREET
RIVERVIEW PLACE
FLINT STREET
SS-3 DECEMBER 1999
SS-4 DECEMBER 1999
SS-2 DECEMBER 1999
SS-1 DECEMBER 1999
SS-5 DECEMBER 1999
3 STORY MASONRY BUILDING
ASPHALT PARKING
ASPHALT BIKE PATH
CONCRETE WALL
GENESEE
EDGE OF WATER
RIVER
EXTENSION OF FLINT STREET
SCALE (feet)
0 75 150 225 300
NEW YORK STATE DEC
DIVISION OF ENVIRONMENTAL REMEDIATION
REGION 8
FIGURE 9
PROJECT MANAGER:
FRANK SOWERS
NO.
REVISIONS
BY
DATE
PROJECT:
FORMER VACUUM OIL COMPANY
CITY OF ROCHESTER, COUNTY OF MONROE, STATE OF NEW YORK
FIGURE #9:
SUMMARY OF SURFACE SOIL RESULTS EXCEEDING SCGS PLUS TOTAL TENTATIVELY IDENTIFIED COMPOUNDS
DATE: SEPTEMBER 27, 2000
SCALE: 1" = 150'



Survey Notes:
1) Horizontal information shown hereon is referenced to the NAD '83 New York West Zone.
2) Vertical information shown hereon is referenced to the NGVD '88 as generated from the Rochester City Datum.
General Notes:
1) No boundary survey was performed, ROW and property lines were developed from tax maps, and are approximate.
2) This map was originally prepared by Larsen Engineers, for use by the NYSDEC. It is not to be used, in whole or in part, for any other project or purpose without the written consent of Larsen Engineers, P.E., L.S., P.G. The original map was prepared on April 15, 2000. This map was altered by C. Hauptfleisch, NYSDEC intern, on August 28, 2000.
3) The term "TICs" stands for Tentatively Identified Compounds.
LEGEND
MONITORING WELL
TEST PIT
SURFACE SOIL SAMPLE
LOCATION MAP (N.Y.S.)
COTTAGE STREET
MAGNOLIA STREET
FLINT STREET
CONCRETE WALL
GENESEE
EDGE OF WATER
EXTENSION OF FLINT STREET
BM SET ON CONCRETE WALL ELEVATION = 517.46
TP-10 December 1999
TP-1 December 1999
TP-4 December 1999
TP-2 December 1999
TP-8 December 1999
MW-1 February 2000
TP-3 December 1999
TP-5 December 1999
MW-2 February 2000
SCALE (feet)
0 75 150 225 300
NEW YORK STATE DEC
DIVISION OF ENVIRONMENTAL REMEDIATION
REGION 8
PROJECT MANAGER:
FRANK SOWERS
FIGURE 10
PROJECT:
FORMER VACUUM OIL COMPANY
CITY OF ROCHESTER, COUNTY OF MONROE, STATE OF NEW YORK
FIGURE #10
SUMMARY OF SUBSURFACE SOIL RESULTS EXCEEDING SCGS PLUS TOTAL TENTATIVELY IDENTIFIED COMPOUNDS AND TOTAL PETROLEUM HYDROCARBONS
SCALE: 1" = 150'
DATE: SEPTEMBER 27, 2000
NO. REVISIONS BY DATE



MW-1	February 2000	
SVOCs (ppb)	RESULT	SCG
PHENOL	7.00	1
TOTAL SVOC TICs	1250	NA
TPH (ppb)	RESULT	SCG
TPH	3.70	NA
VOCs (ppb)	RESULT	SCG
1,1,2-TRICHLOROETHANE	2.00	1
1,1-DICHLOROETHANE	7.00	5
BENZENE	95.0	1
ETHYL BENZENE	49.0	5
XYLENE (total)	190	5
TOTAL VOC TICs	650	NA
Metals (ppb)	RESULT	SCG
IRON	21700	300
MAGNESIUM	76200	35000
MANGANESE	1130	300
SODIUM	23600	20000

MW-3	February 2000	
SVOCs (ppb)	RESULT	SCG
TOTAL SVOC TICs	57	NA
TPH (ppb)	RESULT	SCG
TPH	ND	NA
VOCs (ppb)	RESULT	SCG
TOTAL VOC TICs	ND	NA
Metals (ppb)	RESULT	SCG
IRON	9360	300
LEAD	82.4	25
MAGNESIUM	48600	35000
SODIUM	152000	20000

MW-2	February 2000	
SVOCs (ppb)	RESULT	SCG
TOTAL SVOC TICs	125	NA
TPH (ppb)	RESULT	SCG
TPH	ND	NA
VOCs (ppb)	RESULT	SCG
1,1-DICHLOROETHANE	13.0	5
TOTAL VOC TICs	ND	NA
Metals (ppb)	RESULT	SCG
IRON	18700	300
MAGNESIUM	90500	35000
MANGANESE	1730	300

NEW YORK STATE DEC
DIVISION OF ENVIRONMENTAL REMEDIATION
REGION 8

PROJECT MANAGER: FRANK SOWERS

FIGURE 11

PROJECT: FORMER VACUUM OIL COMPANY
CITY OF ROCHESTER, COUNTY OF MONROE, STATE OF NEW YORK

FIGURE #11: SUMMARY OF GROUNDWATER RESULTS EXCEEDING SCGS PLUS TOTAL TENTATIVELY IDENTIFIED COMPOUNDS AND TOTAL PETROLEUM HYDROCARBONS

SCALE: 1" = 150'
DATE: SEPTEMBER 27, 2000
*VALID FOR 11X17 DRAWINGS ONLY

NO.	REVISIONS	BY	DATE

TABLES

Table 1. Sample Collection/Analytical Matrix
Former Vacuum Oil Company - 1999-2000 Site Investigation

Sample Location	Matrix	Sample Collection Date	Analytical Parameter						
			VOCs (ASP Method 95-1)	SVOCs (ASP Method 95-2)	Pesticides/ PCBs (ASP Method 95-3)	Total Metals	Cyanide	TPH	TCLP
SS-1	Surface Soil	12/07/99	x	x	x	x	x		
SS-2	Surface Soil	12/07/99	x	x	x	x	x		
SS-3	Surface Soil	12/07/99	x	x	x	x	x		
SS-4	Surface Soil	12/07/99	x	x	x	x	x		
SS-5	Surface Soil	12/07/99	x	x	x	x	x		
TP-1 (3-5')	Soil	12/06/99	x	x	x	x	x		x
TP-1 (7-8')	Soil	12/06/99	x	x	x	x	x		x
TP-2 (5')	Soil	12/06/99	x	x	x	x	x		
TP-3 (8-9')	Soil	12/06/99	x	x	x	x	x		
TP-4 (4')	Soil	12/06/99	x	x	x	x	x		
TP-5 (3')	Soil	12/06/99	x	x	x	x	x		
TP-8 (3')	Soil	12/06/99	x (+MS/MSD)	x (+MS/MSD)	x (+MS/MSD)	x (+MS/MSD)	x (+MS/MSD)		
TP-10 (4')	Soil	12/06/99	x	x	x	x	x		
MW-2 (6-8')	Soil	2/08/00				x		x	
MW-2 (10-12')	Soil	2/08/00	x	x				x	
MW-1 (8-10')	Soil	2/08/00				xo		xo	
MW-1 (16-18')	Soil	2/08/00						x	
MW-1	Water	2/23/00	x	x		x		x	
MW-2	Water	2/23/00	x (+MS/MSD)	x (+MS/MSD)		x (+MS/MSD)		x (+MS/MSD)	
MW-3	Water	2/23/00	x	x		x		x	

Notes
X - Field sample.
O - Field duplicate sample.
VOC - Volatile Organic Compound
SVOC- Semi-Volatile Organic Compound

TPH - Total Petroleum Hydrocarbon
TCLP- Toxicity Characteristic Leachate Procedure
MS/MSD- Matrix Spike/Matrix Spike Duplicate

Table 2. Site Survey Data
Former Vacuum Oil Company
1999-2000 Site Investigation

SAMPLE	NORTH	EAST	ELEVATION (ft.)	DESCRIPTION
MW-1	1144237.05	1405147.46	515.67	TOP OF CONC. PAD
			518.02	CASE
			517.81	PVC RISER
MW-2	1144117.41	1405111.91	513.20	TOP OF CONC. PAD
			514.98	CASE
			514.88	PVC RISER
MW-3	1144095.65	1404885.62	510.12	TOP OF CONC. PAD
			512.42	CASE
			511.95	PVC RISER
GENESEE RIVER	NOT AVAILABLE	NOT AVAILABLE	517.48	TOP OF WALL
TP-1	1144237.1	1405147.5	515.7	TEST PIT
TP-2	1144117.4	1405111.9	512.9	TEST PIT
TP-3	1144040.4	1405143.9	511.8	TEST PIT
TP-4	1144175.2	1405056.0	511.2	TEST PIT
TP-5	1143561.6	1404863.0	514.0	TEST PIT
TP-6	1143804.2	1404707.7	510.1	TEST PIT
TP-7	1143794.9	1404729.8	510.5	TEST PIT
TP-8	1143811.8	1404693.1	509.6	TEST PIT
TP-9	1143760.8	1404576.0	513.6	TEST PIT
TP-10	1144084.9	1404878.3	509.3	TEST PIT
A-1	1144237.5	1405399.3	N/A	SOIL GAS SAMPLE
A-2	1144283.6	1405297.6	N/A	SOIL GAS SAMPLE
A-3	1144333.5	1405177.5	N/A	SOIL GAS SAMPLE
B-2	1144182.0	1405254.8	N/A	SOIL GAS SAMPLE
B-3	1144239.2	1405143.2	N/A	SOIL GAS SAMPLE
B-4	1144297.3	1405050.2	N/A	SOIL GAS SAMPLE
C-1	1144011.1	1405309.4	N/A	SOIL GAS SAMPLE
C-2	1144059.3	1405200.9	N/A	SOIL GAS SAMPLE
C-3	1144133.5	1405089.7	N/A	SOIL GAS SAMPLE
C-4	1144175.7	1404987.9	N/A	SOIL GAS SAMPLE
D-2	1143936.1	1405172.6	N/A	SOIL GAS SAMPLE
D-3	1143994.6	1405054.6	N/A	SOIL GAS SAMPLE
D-4	1144030.7	1404936.4	N/A	SOIL GAS SAMPLE
D-5	1144145.0	1404854.8	N/A	SOIL GAS SAMPLE
D-6	1144176.4	1404725.8	N/A	SOIL GAS SAMPLE
D-7	1144245.3	1404671.8	N/A	SOIL GAS SAMPLE
E-1	1143793.6	1405214.4	N/A	SOIL GAS SAMPLE
E-2	1143852.7	1405103.1	N/A	SOIL GAS SAMPLE
E-3	1143920.7	1404997.2	N/A	SOIL GAS SAMPLE
E-4	1143989.3	1404893.0	N/A	SOIL GAS SAMPLE
E-5	1144042.8	1404804.2	N/A	SOIL GAS SAMPLE
E-6	1144090.5	1404844.9	N/A	SOIL GAS SAMPLE
F-2	1143625.2	1405012.5	N/A	SOIL GAS SAMPLE
F-3	1143697.9	1404913.4	N/A	SOIL GAS SAMPLE
F-4	1143747.4	1404827.8	N/A	SOIL GAS SAMPLE
F-5	1143825.9	1404702.6	N/A	SOIL GAS SAMPLE
F-6	1143905.2	1404630.9	N/A	SOIL GAS SAMPLE
G-2	1143494.3	1404983.2	N/A	SOIL GAS SAMPLE

Table 2. Site Survey Data
Former Vacuum Oil Company
1999-2000 Site Investigation

SAMPLE	NORTH	EAST	ELEVATION (ft.)	DESCRIPTION
G-3	1143562.9	1404875.1	N/A	SOIL GAS SAMPLE
G-4	1143585.9	1404747.3	N/A	SOIL GAS SAMPLE
G-5	1143656.5	1404647.2	N/A	SOIL GAS SAMPLE
G-6	1143738.6	1404571.5	N/A	SOIL GAS SAMPLE
H-2	1143418.6	1404933.8	N/A	SOIL GAS SAMPLE
H-3	1143426.2	1404816.9	N/A	SOIL GAS SAMPLE
H-4	1143481.0	1404715.9	N/A	SOIL GAS SAMPLE
H-5	1143467.2	1404599.2	N/A	SOIL GAS SAMPLE
H-6	1143552.2	1404499.6	N/A	SOIL GAS SAMPLE
H-7	1143644.0	1404395.8	N/A	SOIL GAS SAMPLE
H-8	1143613.6	1404432.7	N/A	SOIL GAS SAMPLE
I-4	1143377.8	1404653.6	N/A	SOIL GAS SAMPLE
I-5	1143389.5	1404550.7	N/A	SOIL GAS SAMPLE
I-6	1143465.2	1404430.5	N/A	SOIL GAS SAMPLE
I-7	1143617.9	1404372.6	N/A	SOIL GAS SAMPLE
J-5	1143315.2	1404440.2	N/A	SOIL GAS SAMPLE
J-6	1143381.8	1404369.5	N/A	SOIL GAS SAMPLE
J-7	1143406.0	1404281.2	N/A	SOIL GAS SAMPLE
J-8	1143487.3	1404150.6	N/A	SOIL GAS SAMPLE
K-6	1143258.3	1404139.3	N/A	SOIL GAS SAMPLE
K-7	1143274.1	1404027.2	N/A	SOIL GAS SAMPLE
K-8	1143302.3	1403946.8	N/A	SOIL GAS SAMPLE
L-6	1143193.9	1404051.6	N/A	SOIL GAS SAMPLE
L-7	1143206.4	1403946.9	N/A	SOIL GAS SAMPLE

1. Vertical information is referenced to the NGVD '88 as generated from the Rochester City Datum.
2. Horizontal information is referenced to the NAD'83 New York West Zone.

Table 3. Groundwater Elevation Data
Former Vacuum Oil Company
1999-2000 Site Investigation

Location Id.	Date	Reference Elevation (ft. AMSL)	Depth to Water (ft.)	Water Elevation (ft. AMSL)
MW-1	02/23/2000	517.81	9.78	508.03
MW-2	02/23/2000	514.88	6.70	508.18
MW-3	02/23/2000	511.95	4.65	507.30
MW-1	05/04/2000	517.81	7.50	510.31
MW-2	05/04/2000	514.88	3.90	510.98
MW-3	05/04/2000	511.95	3.62	508.33
Genesee River	05/04/2000	517.48	6.51	510.97

AMSL - Above Mean Sea Level

Table 4. Surface Soil Statistical Summary of Detected Compounds
Former Vacuum Oil Company - 1999-2000 Site Investigation

Compound	Analysis	Number of Samples	Number of Valid Detections	SCG (TAGM 4046)	Eastern USA Background (ppm)	Number of Valid Detections > SCG	Maximum	Location of Maximum
Aluminum	TAL Metals	5	5	Background	33,000	0	11,900 ppm	SS-4
Antimony	TAL Metals	5	2	Background	Not Available	0	3.7 ppm	SS-5
Arsenic	TAL Metals	5	5	7.5 ppm or background	3 - 12	2	60.7 ppm	SS-2
Barium	TAL Metals	5	5	300 ppm or background	15 - 600	0	366 ppm	SS-2
Beryllium	TAL Metals	5	4	0.16 ppm or background	0 - 1.75	0	0.63 ppm	SS-2
Cadmium	TAL Metals	5	5	10 ppm or background	0.1 - 1	0	3.5 ppm	SS-3
Calcium	TAL Metals	5	5	Background	130 - 35,000	2	167,000 ppm	SS-2
Chromium	TAL Metals	5	5	50 ppm or background	1.5 - 40	0	24 ppm	SS-4
Cobalt	TAL Metals	5	5	30 ppm or background	2.5 - 60	0	8.4 ppm	SS-4
Copper	TAL Metals	5	5	25 ppm or background	1 - 50	3	75.8 ppm	SS-4
Iron	TAL Metals	5	5	2000 ppm or background	2,000 - 550,000	0	22,800 ppm	SS-4
Lead	TAL Metals	5	5	Background	200 - 500	1	972 ppm	SS-3
Magnesium	TAL Metals	5	5	Background	100 - 5,000	2	30,600 ppm	SS-2
Manganese	TAL Metals	5	5	Background	50 - 5,000	0	1,500 ppm	SS-2

Table 4. Surface Soil Statistieal Summary of Detected Compounds (Continued)
Former Vacuum Oil Company - 1998-1999 Site Investigation

Compound	Analysis	Number of Samples	Number of Valid Detections	SCG (TAGM 4046)	Eastern USA Background (ppm)	Number of Valid Detections > SCG	Maximum	Location of Maximum
Mercury	TAL Metals	5	5	0.1 ppm	0.001 - 0.2	5	2.1 ppm	SS-4
Nickel	TAL Metals	5	5	13 ppm or background	0.5 - 25	0	24.2 ppm	SS-4
Potassium	TAL Metals	5	5	Background	8,500 - 43,000	0	2,240 ppm	SS-2
Selenium	TAL Metals	5	4	2 ppm or background	0.1 - 3.9	2	7.4 ppm	SS-2
Silver	TAL Metals	5	4	Background	Not Available	0	1.2 ppm	SS-3
Sodium	TAL Metals	5	5	Background	6,000 - 8,000	0	497 ppm	SS-2
Vanadium	TAL Metals	5	5	150 ppm or background	1 - 300	0	28.6 ppm	SS-2
Zinc	TAL Metals	5	5	20 ppm or background	9 - 50	5	772 ppm	SS-5
4,4-DDE	ASP 95-3	5	1	2,100 ppb	Not Applicable	0	19 ppb	SS-5
4,4'-DDT (P,P'-DDT	ASP 95-3	5	1	2,100 ppb	Not Applicable	0	21 ppb	SS-5
Alpha Chlordane	ASP 95-3	5	1	540 ppb	Not Applicable	0	210 ppb	SS-1
Gamma Chlordane	ASP 95-3	5	1	540 ppb	Not Applicable	0	170 ppb	SS-1
Dieldrin	ASP 95-3	5	2	44 ppb	Not Applicable	1	74 ppb	SS-1
Heptachlor Epoxide	ASP 95-3	5	1	20 ppb	Not Applicable	1	30 ppb	SS-1
2-Methylnaphthalene	ASP 95-2	5	2	36,400 ppb	Not Applicable	0	140 ppb	SS-5
Acenaphthene	ASP 95-2	5	4	50,000 ppb	Not Applicable	0	3,700 ppb	SS-2

Table 4. Surface Soil Statistical Summary of Detected Compounds (Continued)
Former Vacuum Oil Company - 1998-1999 Site Investigation

Compound	Analysis	Number of Samples	Number of Valid Detections	SCG (TAGM 4046)	Eastern USA Background (ppm)	Number of Valid Detections > SCG	Maximum	Location of Maximum
Acenaphthylene	ASP 95-2	5	1	41,000 ppb	Not Applicable	0	190 ppb	SS-3
Anthracene	ASP 95-2	5	4	50,000 ppb	Not Applicable	0	12,000 ppb	SS-2
Benzo(a)anthracene	ASP 95-2	5	5	224 ppb	Not Applicable	5	28,000 ppb	SS-2
Benzo(a)pyrene	ASP 95-2	5	5	61 ppb	Not Applicable	5	23,000 ppb	SS-2
Benzo(b)fluoranthene	ASP 95-2	5	5	1,100 ppb	Not Applicable	4	20,000 ppb	SS-2
Benzo(k)fluoranthene	ASP 95-2	5	5	1,100 ppb	Not Applicable	4	22,000 ppb	SS-2
Benzo(g,h,i)perylene	ASP 95-2	5	5	50,000 ppb	Not Applicable	0	15,000 ppb	SS-2
Bis(2-ethylhexyl)phthalate	ASP 95-2	5	2	50,000 ppb	Not Applicable	0	230 ppb	SS-3
Carbazole	ASP 95-2	5	4	Not Available	Not Applicable	0	4,000 ppb	SS-2
Chrysene	ASP 95-2	5	5	400 ppb	Not Applicable	5	30,000 ppb	SS-2
Dibenzo(a,h)anthracene	ASP 95-2	5	5	14 ppb	Not Applicable	5	5,700 ppb	SS-2
Dibenzofuran	ASP 95-2	5	5	6,200 ppb	Not Applicable	0	2,300 ppb	SS-2
Fluoranthene	ASP 95-2	5	5	50,000 ppb	Not Applicable	1	63,000 ppb	SS-2
Fluorene	ASP 95-2	5	4	50,000 ppb	Not Applicable	0	3,900 ppb	SS-2
Indeno(1,2,3-c,d)pyrene	ASP 95-2	5	5	3,200 ppb	Not Applicable	1	14,000 ppb	SS-2
Naphthalene	ASP 95-2	5	3	13,000 ppb	Not Applicable	0	2,400 ppb	SS-2
Phenanthrene	ASP 95-2	5	5	50,000 ppb	Not Applicable	0	46,000 ppb	SS-2
Pyrene	ASP 95-2	5	5	50,000 ppb	Not Applicable	0	47,000 ppb	SS-2
Acetone	ASP 95-1	5	1	200 ppb	Not Applicable	0	30 ppb	SS-3
Methylene Chloride	ASP 95-1	5	5	100 ppb	Not Applicable	1	150 ppb	SS-3

Table 5. Subsurface Soil Statistical Summary of Detected Compounds
Former Vacuum Oil Company - 1999-2000 Site Investigation

Compound	Analysis	Number of Samples	Number of Valid Detections	SCG (TAGM 4046)	Eastern USA Background (ppm)	Number of Valid Detections > SCG	Maximum	Location of Maximum
Aluminum	TAL Metals	10	10	Background	33,000	0	22,200 ppm	TP-5; 3'
Antimony	TAL Metals	10	1	Background	Not Available	0	5.7 ppm	MW-1; 8-10'
Arsenic	TAL Metals	10	10	7.5 ppm or background	3 - 12	3	113 ppm	TP-8; 3'
Barium	TAL Metals	10	10	300 ppm or background	15 - 600	1	828 ppm	TP-2; 5'
Beryllium	TAL Metals	10	10	0.16 ppm or background	0 - 1.75	1	2.2 ppm	TP-2; 5'
Cadmium	TAL Metals	10	8	10 ppm or background	0.1 - 1	0	2.4 ppm	TP-2; 5'
Calcium	TAL Metals	10	10	Background	130 - 35,000	2	85,100 ppm	TP-2; 5'
Chromium	TAL Metals	10	10	50 ppm or background	1.5 - 40	1	59.3 ppm	TP-8; 3'
Cobalt	TAL Metals	10	10	30 ppm or background	2.5 - 60	0	11.5 ppm	TP-4; 5'
Copper	TAL Metals	10	10	25 ppm or background	1 - 50	4	143 ppm	TP-1; 7-8'
Iron	TAL Metals	10	10	2000 ppm or background	2,000 - 550,000	0	65,500 ppm	TP-8; 3'
Lead	TAL Metals	10	10	Background	200 - 500	0	473 ppm	TP-10; 4'

Table 5. Subsurface Soil Statistical Summary of Detected Compounds (Continued)
Former Vacuum Oil Company - 1999-2000 Site Investigation

Compound	Analysis	Number of Samples	Number of Valid Detections	SCG (TAGM 4046)	Eastern USA Background (ppm)	Number of Valid Detections > SCG	Maximum	Location of Maximum
Magnesium	TAL Metals	10	10	Background	100 - 5000	5	35,800 ppm	TP-2; 5'
Manganese	TAL Metals	10	10	Background	50 - 5,000	0	3,480 ppm	TP-2; 5'
Mercury	TAL Metals	10	7	0.1 ppm	0.001 - 0.2	4	4.0 ppm	TP-1; 3-5'
Nickel	TAL Metals	10	10	13 ppm or background	0.5 - 25	1	35.6 ppm	TP-2; 5'
Potassium	TAL Metals	10	10	Background	8,500 - 43,000	0	3,400 ppm	TP-5; 3'
Selenium	TAL Metals	10	9	2 ppm or background	0.1 - 3.9	0	3.5 ppm	TP-10; 4'
Silver	TAL Metals	10	1	Background	Not Available	0	0.24 ppm	TP-2; 5'
Sodium	TAL Metals	10	10	Background	6,000 - 8,000	0	824 ppm	TP-5; 3'
Vanadium	TAL Metals	10	10	150 ppm or background	1 - 300	0	13.9 ppm	MW-2; 6-8'
Zinc	TAL Metals	10	10	20 ppm or background	9 - 50	9	663 ppm	TP-2; 5'
Cyanide	Cyanide	8	1	Site Specific	Not Available	0	1.1 ppm	TP-3; 8-9'
Aldrin	ASP 95-3	8	1	41 ppb	Not Applicable	0	2.6 ppb	TP-1; 7-8'
Acetone	ASP 95-1	9	3	200 ppb	Not Applicable	0	100 ppb	TP-10; 4'
2-Butanone	ASP 95-1	9	2	300 ppb	Not Applicable	0	240 ppb	TP-1; 7-8'
Carbon Disulfide	ASP 95-1	9	1	2700 ppb	Not Applicable	0	2 ppb	TP-3; 8-9'
1,1-Dichloroethane	ASP 95-1	9	1	200 ppb	Not Applicable	0	8 ppb	TP-3; 8-9'

Table 5. Subsurface Soil Statistical Summary of Detected Compounds (Continued)
Former Vacuum Oil Company - 1999-2000 Site Investigation

Compound	Analysis	Number of Samples	Number of Valid Detections	SCG (TAGM 4046)	Eastern USA Background (ppm)	Number of Valid Detections > SCG	Maximum	Location of Maximum
1,2-Dichloroethene (total)	ASP 95-1	9	1	Not Available	Not Applicable	0	6 ppb	TP-3; 8-9'
Methylene Chloride	ASP 95-1	9	7	100 ppb	Not Applicable	1	750 ppb	MW-2; 10-12'
Toluene	ASP 95-1	9	1	1,500 ppb	Not Applicable	0	3 ppb	TP-3; 8-9'
Trichloroethene	ASP 95-1	9	1	700 ppb	Not Applicable	0	28 ppb	TP-3; 8-9'
(m+p) Xylene	ASP 95-1	9	1	1,200 ppb	Not Applicable	1	6,300 ppb	TP-1; 7-8'
Total Petroleum Hydrocarbon	TPH	4	4	Not Available	Not Applicable	0	1,140 ppm	MW-1; 8-10'
Acenaphthene	ASP 95-2	9	3	50,000 ppb	Not Applicable	1	17,0000 ppb	TP-2; 5'
Acenaphthylene	ASP 95-2	9	3	41,000 ppb	Not Applicable	0	540 ppb	TP-8; 3'
Anthracene	ASP 95-2	9	4	50,000 ppb	Not Applicable	0	510,000 ppb	TP-2; 5'
Benzo(a)Anthracene	ASP 95-2	9	6	224 ppb	Not Applicable	5	760,000 ppb	TP-2; 5'
Benzo(a)Pyrene	ASP 95-2	9	6	61 ppb	Not Applicable	5	530,000 ppb	TP-2; 5'
Benzo(b)Fluoranthene	ASP 95-2	9	6	1,100 ppb	Not Applicable	3	480,000 ppb	TP-2; 5'
Benzo(k)Fluoranthene	ASP 95-2	9	6	1,100 ppb	Not Applicable	3	470,000 ppb	TP-2; 5'
Benzo(g,h,i)Perylene	ASP 95-2	9	6	50,000 ppb	Not Applicable	1	280,000 ppb	TP-2; 5'
Bis(2-Ethylhexyl)Phthalate	ASP 95-2	9	1	50,000 ppb	Not Applicable	0	440 ppb	TP-10; 4'
Carbazole	ASP 95-2	9	4	Not Available	Not Applicable	0	170,000 ppb	TP-2; 5'
Chrysene	ASP 95-2	9	7	400 ppb	Not Applicable	5	710,000 ppb	TP-2; 5'

Table 5. Subsurface Soil Statistical Summary of Detected Compounds (Continued)
Former Vacuum Oil Company - 1999-2000 Site Investigation

Compound	Analysis	Number of Samples	Number of Valid Detections	SCG (TAGM 4046)	Eastern USA Background (ppm)	Number of Valid Detections > SCG	Maximum	Location of Maximum
Dibenzo(a,h)anthracene	ASP 95-2	9	5	14 ppb	Not Applicable	5	100,000 ppb	TP-2; 5'
Dibenzofuran	ASP 95-2	9	4	6,200 ppb	Not Applicable	1	220,000 ppb	TP-2; 5'
Di-n-octylphthalate	ASP 95-2	9	1	50,000 ppb	Not Applicable	0	130 ppb	TP-5; 3'
Fluoranthene	ASP 95-2	9	6	50,000 ppb	Not Applicable	1	1,500,000 ppb	TP-2; 5'
Fluorene	ASP 95-2	9	3	50,000 ppb	Not Applicable	1	360,000 ppb	TP-2; 5'
2-Methylnaphthalene	ASP 95-2	9	5	36,400 ppb	Not Applicable	1	110,000 ppb	TP-2; 5'
Indeno(1,2,3-c,d)pyrene	ASP 95-2	9	6	3200 ppb	Not Applicable	3	280,000 ppb	TP-2; 5'
Napthalene	ASP 95-2	9	3	13,000 ppb	Not Applicable	1	320,000 ppb	TP-2; 5'
Phenanthrene	ASP 95-2	9	9	50,000 ppb	Not Applicable	1	1,600,000 ppb	TP-2; 5'
Pyrene	ASP 95-2	9	7	50,000 ppb	Not Applicable	1	960,000 ppb	TP-2; 5'
Barium	TCLP	2	2	10,0000 ppb*	Not Applicable	0	910 ppb	TP-1; 3-5'
Lead	TCLP	2	2	5,000 ppb*	Not Applicable	0	62 ppb	TP-1; 7-8'
Mercury	TCLP	2	1	200 ppb*	Not Applicable	0	0.18 ppb	TP-1; 7-8'
Benzene	TCLP	2	1	500 ppb*	Not Applicable	0	97 ppb	TP-1; 7-8'
2-Butanone	TCLP	2	1	200,000 ppb*	Not Applicable	0	11 ppb	TP-1; 7-8'

*SCGs for TCLP analyses are from 6 NYCRR 371.3(e).

Table 6. Groundwater Statistical Summary of Detected Compounds
Former Vacuum Oil Company - 1999-2000 Site Investigation

Compound	Analysis	Number of Samples	Number of Valid Detections	SCG (TOGS 1.1.1)	Number of Valid Detections > SCG	Maximum	Location of Maximum
Aluminum	TAL Metals	3	3	Not Applicable	0	7,380 ppb	MW-1
Arsenic	TAL Metals	3	3	25 ppb	0	17 ppb	MW-2
Barium	TAL Metals	3	3	1000 ppb	0	246 ppb	MW-2
Beryllium	TAL Metals	3	3	3 ppb	0	0.68 ppb	MW-1
Cadmium	TAL Metals	3	2	5 ppb	0	0.87	MW-2
Calcium	TAL Metals	3	3	Not Applicable	0	212,000 ppb	MW-1
Chromium	TAL Metals	3	3	50 ppb	0	10 ppb	MW-1
Cobalt	TAL Metals	3	3	Not Applicable	0	6.3 ppb	MW-1
Copper	TAL Metals	3	3	200 ppb	0	30 ppb	MW-3
Iron	TAL Metals	3	3	300 ppb	3	21,700 ppb	MW-1
Lead	TAL Metals	3	3	25 ppb	1	62.4 ppb	MW-3
Magnesium	TAL Metals	3	3	35,000 ppb	3	76,200 ppb	MW-1
Manganese	TAL Metals	3	3	300 ppb	2	1,730 ppb	MW-2
Mercury	TAL Metals	3	1	0.7 ppb	0	0.23 ppb	MW-3
Nickel	TAL Metals	3	3	100 ppb	0	19.4 ppb	MW-1
Potassium	TAL Metals	3	3	Not Applicable	0	10,700 ppb	MW-3
Sodium	TAL Metals	3	3	20,000 ppb	2	152,000 ppb	MW-3
Vanadium	TAL Metals	3	3	Not Applicable	0	12 ppb	MW-1

Table 6. Groundwater Statistical Summary of Detected Compounds (Continued)
FormerVacuum Oil Company - 1999-2000 Site Investigation

Compound	Analysis	Number of Samples	Number of Valid Detections	SCG (TOGS 1.1.1)	Number of Valid Detections > SCG	Maximum	Location of Maximum
Zinc	TAL Metals	3	3	2,000 ppb	0	274 ppb	MW-3
Acetone	ASP 95-1	3	2	50 ppb	0	28 ppb	MW-1
Benzene	ASP 95-1	3	1	1 ppb	1	95 ppb	MW-1
1,1-Dichloroethane	ASP 95-1	3	2	5 ppb	2	13 ppb	MW-2
Ethyl Benzene	ASP 95-1	3	1	5 ppb	1	49 ppb	MW-1
1,1,2-Trichloroethane	ASP 95-1	3	1	1 ppb	1	2 ppb	MW-1
Methylene Chloride	ASP 95-1	3	0	5 ppb	0	NA	NA
Toluene	ASP 95-1	3	1	5 ppb	0	4 ppb	MW-1
Xylene	ASP 95-1	3	1	5 ppb	1	190 ppb	MW-1
Total Petroleum Hydrocarbon	TPH	3	1	Not Available	0	3.7 ppm	MW-1
Acenaphthene	ASP 95-2	3	1	20 ppb	0	0.6 ppb	MW-2
Carbazole	ASP 95-2	3	1	Not Available	0	0.9 ppb	MW-2
Dibenzofuran	ASP 95-2	3	1	Not Available	0	0.6 ppb	MW-2
Di-n-octylphthalate	ASP 95-2	3	1	50 ppb	0	0.8 ppb	MW-2
Fluorene	ASP 95-2	3	1	50 ppb	0	0.8 ppb	MW-2
4-Methylphenol	ASP 95-2	3	1	1 ppb	0	0.8 ppb	MW-2
Naphthalenee	ASP 95-2	3	1	10 ppb	0	1 ppb	MW-2
Phenol	ASP 95-2	3	1	1 ppb	1	7 ppb	MW-1

Table 7. Summary of Surface Soil Sample Results
Semi-Volatile Organic Compounds Sorted by Location
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Depth (ft)	Sample Date	Sample Number	Compound	Concentration	Units	Standard/ Guidance	Units
SS-4	SURFACE	12/07/99	B70612	DIBENZO(A,H)ANTHRACENE	85.0	ppb	14	ppb
SS-4	SURFACE	12/07/99	B70612	FLUORANTHENE	700	ppb	50000	ppb
SS-4	SURFACE	12/07/99	B70612	INDENO(1,2,3-C,D)PYRENE	310	ppb	3200	ppb
SS-4	SURFACE	12/07/99	B70612	PHENANTHRENE	270	ppb	50000	ppb
SS-4	SURFACE	12/07/99	B70612	PYRENE	570	ppb	50000	ppb
SS-4	SURFACE	12/07/99	B70612	TOTAL SVOC TICs	96800	ppb	NA	ppb
SS-5	SURFACE	12/07/99	B70615	2-METHYLNAPHTHALENE	140	ppb	36400	ppb
SS-5	SURFACE	12/07/99	B70615	ACENAPHTHENE	310	ppb	50000	ppb
SS-5	SURFACE	12/07/99	B70615	ANTHRACENE	740	ppb	50000	ppm
SS-5	SURFACE	12/07/99	B70615	BENZO(A)ANTHRACENE	2000	ppb	224	ppb
SS-5	SURFACE	12/07/99	B70615	BENZO(A)PYRENE	1900	ppb	61	ppb
SS-5	SURFACE	12/07/99	B70615	BENZO(B)FLUORANTHENE	1700	ppb	1100	ppb
SS-5	SURFACE	12/07/99	B70615	BENZO(G,H,I)PERYLENE	1200	ppb	50000	ppb
SS-5	SURFACE	12/07/99	B70615	BENZO(K)FLUORANTHENE	1600	ppb	1100	ppb
SS-5	SURFACE	12/07/99	B70615	CARBAZOLE	400	ppb	NA	ppb
SS-5	SURFACE	12/07/99	B70615	CHRYSENE	2300	ppb	400	ppb
SS-5	SURFACE	12/07/99	B70615	DIBENZO(A,H)ANTHRACENE	340	ppb	14	ppb
SS-5	SURFACE	12/07/99	B70615	DIBENZOFURAN	210	ppb	6200	ppb
SS-5	SURFACE	12/07/99	B70615	FLUORANTHENE	4800	ppb	50000	ppb
SS-5	SURFACE	12/07/99	B70615	FLUORENE	320	ppb	50000	ppb
SS-5	SURFACE	12/07/99	B70615	INDENO(1,2,3-C,D)PYRENE	1100	ppb	3200	ppb
SS-5	SURFACE	12/07/99	B70615	NAPHTHALENE	150	ppb	13000	ppb
SS-5	SURFACE	12/07/99	B70615	PHENANTHRENE	4100	ppb	50000	ppb
SS-5	SURFACE	12/07/99	B70615	PYRENE	3700	ppb	50000	ppb
SS-5	SURFACE	12/07/99	B70615	TOTAL SVOC TICs	22300	ppb	NA	ppb

NA- Not Applicable

Table 8. Summary of Surface Soil Sample Results
Semi-Volatile Organic Compounds Sorted by Compound
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Depth (ft)	Sample Date	Sample Number	Compound	Concentration	Units	Standard/ Guidance	Units
SS-5	SURFACE	12/07/99	B70615	2-METHYLNAPHTHALENE	140	ppb	36400	ppb
SS-1	SURFACE	12/07/99	B70611	2-METHYLNAPHTHALENE	98.0	ppb	36400	ppb
SS-2	SURFACE	12/07/99	B70613	ACENAPHTHENE	3700	ppb	50000	ppb
SS-1	SURFACE	12/07/99	B70611	ACENAPHTHENE	780	ppb	50000	ppb
SS-5	SURFACE	12/07/99	B70615	ACENAPHTHENE	310	ppb	50000	ppb
SS-3	SURFACE	12/07/99	B70614	ACENAPHTHENE	180	ppb	50000	ppb
SS-3	SURFACE	12/07/99	B70614	ACENAPHTHYLENE	190	ppb	41000	ppb
SS-2	SURFACE	12/07/99	B70613	ANTHRACENE	12000	ppb	50000	ppm
SS-1	SURFACE	12/07/99	B70611	ANTHRACENE	1600	ppb	50000	ppm
SS-3	SURFACE	12/07/99	B70614	ANTHRACENE	920	ppb	50000	ppm
SS-5	SURFACE	12/07/99	B70615	ANTHRACENE	740	ppb	50000	ppm
SS-2	SURFACE	12/07/99	B70613	BENZO(A)ANTHRACENE	28000	ppb	224	ppb
SS-3	SURFACE	12/07/99	B70614	BENZO(A)ANTHRACENE	4400	ppb	224	ppb
SS-1	SURFACE	12/07/99	B70611	BENZO(A)ANTHRACENE	3200	ppb	224	ppb
SS-5	SURFACE	12/07/99	B70615	BENZO(A)ANTHRACENE	2000	ppb	224	ppb
SS-4	SURFACE	12/07/99	B70612	BENZO(A)ANTHRACENE	330	ppb	224	ppb
SS-2	SURFACE	12/07/99	B70613	BENZO(A)PYRENE	23000	ppb	61	ppb
SS-3	SURFACE	12/07/99	B70614	BENZO(A)PYRENE	4400	ppb	61	ppb
SS-1	SURFACE	12/07/99	B70611	BENZO(A)PYRENE	3100	ppb	61	ppb
SS-5	SURFACE	12/07/99	B70615	BENZO(A)PYRENE	1900	ppb	61	ppb
SS-4	SURFACE	12/07/99	B70612	BENZO(A)PYRENE	440	ppb	61	ppb
SS-2	SURFACE	12/07/99	B70613	BENZO(B)FLUORANTHENE	20000	ppb	1100	ppb
SS-3	SURFACE	12/07/99	B70614	BENZO(B)FLUORANTHENE	4100	ppb	1100	ppb
SS-1	SURFACE	12/07/99	B70611	BENZO(B)FLUORANTHENE	2700	ppb	1100	ppb
SS-5	SURFACE	12/07/99	B70615	BENZO(B)FLUORANTHENE	1700	ppb	1100	ppb
SS-4	SURFACE	12/07/99	B70612	BENZO(B)FLUORANTHENE	470	ppb	1100	ppb
SS-2	SURFACE	12/07/99	B70613	BENZO(G,H,I)PERYLENE	15000	ppb	50000	ppb
SS-3	SURFACE	12/07/99	B70614	BENZO(G,H,I)PERYLENE	2600	ppb	50000	ppb
SS-1	SURFACE	12/07/99	B70611	BENZO(G,H,I)PERYLENE	1900	ppb	50000	ppb
SS-5	SURFACE	12/07/99	B70615	BENZO(G,H,I)PERYLENE	1200	ppb	50000	ppb
SS-4	SURFACE	12/07/99	B70612	BENZO(G,H,I)PERYLENE	350	ppb	50000	ppb
SS-2	SURFACE	12/07/99	B70613	BENZO(K)FLUORANTHENE	22000	ppb	1100	ppb
SS-3	SURFACE	12/07/99	B70614	BENZO(K)FLUORANTHENE	4000	ppb	1100	ppb
SS-1	SURFACE	12/07/99	B70611	BENZO(K)FLUORANTHENE	2600	ppb	1100	ppb
SS-5	SURFACE	12/07/99	B70615	BENZO(K)FLUORANTHENE	1600	ppb	1100	ppb
SS-4	SURFACE	12/07/99	B70612	BENZO(K)FLUORANTHENE	420	ppb	1100	ppb
SS-3	SURFACE	12/07/99	B70614	BIS(2-ETHYLHEXYL)PHTHALATE	230	ppb	50000	ppb
SS-4	SURFACE	12/07/99	B70612	BIS(2-ETHYLHEXYL)PHTHALATE	160	ppb	50000	ppb
SS-2	SURFACE	12/07/99	B70613	CARBAZOLE	4000	ppb	NA	ppb
SS-1	SURFACE	12/07/99	B70611	CARBAZOLE	850	ppb	NA	ppb
SS-3	SURFACE	12/07/99	B70614	CARBAZOLE	580	ppb	NA	ppb
SS-5	SURFACE	12/07/99	B70615	CARBAZOLE	400	ppb	NA	ppb
SS-2	SURFACE	12/07/99	B70613	CHRYSENE	30000	ppb	400	ppb
SS-3	SURFACE	12/07/99	B70614	CHRYSENE	4900	ppb	400	ppb
SS-1	SURFACE	12/07/99	B70611	CHRYSENE	3300	ppb	400	ppb
SS-5	SURFACE	12/07/99	B70615	CHRYSENE	2300	ppb	400	ppb
SS-4	SURFACE	12/07/99	B70612	CHRYSENE	480	ppb	400	ppb
SS-2	SURFACE	12/07/99	B70613	DIBENZO(A,H)ANTHRACENE	5700	ppb	14	ppb
SS-3	SURFACE	12/07/99	B70614	DIBENZO(A,H)ANTHRACENE	750	ppb	14	ppb
SS-1	SURFACE	12/07/99	B70611	DIBENZO(A,H)ANTHRACENE	510	ppb	14	ppb
SS-5	SURFACE	12/07/99	B70615	DIBENZO(A,H)ANTHRACENE	340	ppb	14	ppb
SS-4	SURFACE	12/07/99	B70612	DIBENZO(A,H)ANTHRACENE	85.0	ppb	14	ppb
SS-2	SURFACE	12/07/99	B70613	DIBENZOFURAN	2300	ppb	6200	ppb
SS-1	SURFACE	12/07/99	B70611	DIBENZOFURAN	420	ppb	6200	ppb
SS-5	SURFACE	12/07/99	B70615	DIBENZOFURAN	210	ppb	6200	ppb
SS-2	SURFACE	12/07/99	B70613	FLUORANTHENE	63000	ppb	50000	ppb
SS-1	SURFACE	12/07/99	B70611	FLUORANTHENE	9700	ppb	50000	ppb
SS-3	SURFACE	12/07/99	B70614	FLUORANTHENE	8100	ppb	50000	ppb
SS-5	SURFACE	12/07/99	B70615	FLUORANTHENE	4800	ppb	50000	ppb
SS-4	SURFACE	12/07/99	B70612	FLUORANTHENE	700	ppb	50000	ppb

Table 8. Summary of Surface Soil Sample Results
Semi-Volatile Organic Compounds Sorted by Compound
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Depth (ft)	Sample Date	Sample Number	Compound	Concentration	Units	Standard/ Guidance	Units
SS-2	SURFACE	12/07/99	B70613	FLUORENE	3900	ppb	50000	ppb
SS-1	SURFACE	12/07/99	B70611	FLUORENE	730	ppb	50000	ppb
SS-5	SURFACE	12/07/99	B70615	FLUORENE	320	ppb	50000	ppb
SS-3	SURFACE	12/07/99	B70614	FLUORENE	240	ppb	50000	ppb
SS-2	SURFACE	12/07/99	B70613	INDENO(1,2,3-C,D)PYRENE	14000	ppb	3200	ppb
SS-3	SURFACE	12/07/99	B70614	INDENO(1,2,3-C,D)PYRENE	2500	ppb	3200	ppb
SS-1	SURFACE	12/07/99	B70611	INDENO(1,2,3-C,D)PYRENE	1700	ppb	3200	ppb
SS-5	SURFACE	12/07/99	B70615	INDENO(1,2,3-C,D)PYRENE	1100	ppb	3200	ppb
SS-4	SURFACE	12/07/99	B70612	INDENO(1,2,3-C,D)PYRENE	310	ppb	3200	ppb
SS-2	SURFACE	12/07/99	B70613	NAPHTHALENE	2400	ppb	13000	ppb
SS-1	SURFACE	12/07/99	B70611	NAPHTHALENE	260	ppb	13000	ppb
SS-5	SURFACE	12/07/99	B70615	NAPHTHALENE	150	ppb	13000	ppb
SS-2	SURFACE	12/07/99	B70613	PHENANTHRENE	46000	ppb	50000	ppb
SS-1	SURFACE	12/07/99	B70611	PHENANTHRENE	7300	ppb	50000	ppb
SS-5	SURFACE	12/07/99	B70615	PHENANTHRENE	4100	ppb	50000	ppb
SS-3	SURFACE	12/07/99	B70614	PHENANTHRENE	3300	ppb	50000	ppb
SS-4	SURFACE	12/07/99	B70612	PHENANTHRENE	270	ppb	50000	ppb
SS-2	SURFACE	12/07/99	B70613	PYRENE	47000	ppb	50000	ppb
SS-1	SURFACE	12/07/99	B70611	PYRENE	7200	ppb	50000	ppb
SS-3	SURFACE	12/07/99	B70614	PYRENE	7100	ppb	50000	ppb
SS-5	SURFACE	12/07/99	B70615	PYRENE	3700	ppb	50000	ppb
SS-4	SURFACE	12/07/99	B70612	PYRENE	570	ppb	50000	ppb
SS-2	SURFACE	12/07/99	B70613	TOTAL SVOC TICs	114000	ppb	NA	ppb
SS-4	SURFACE	12/07/99	B70612	TOTAL SVOC TICs	96800	ppb	NA	ppb
SS-3	SURFACE	12/07/99	B70614	TOTAL SVOC TICs	94800	ppb	NA	ppb
SS-5	SURFACE	12/07/99	B70615	TOTAL SVOC TICs	22300	ppb	NA	ppb
SS-1	SURFACE	12/07/99	B70611	TOTAL SVOC TICs	15800	ppb	NA	ppb

NA- Not Applicable

Table 9. Summary of Surface Soil Sample Results
Volatile Organic Compounds
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Depth (ft)	Sample Date	Sample Number	Compound	Concentration	Units	Standard/ Guidance	Units	Comments
SS-3	SURFACE	12/07/99	B70614	ACETONE	30.0	ppb	200	ppb	
SS-3	SURFACE	12/07/99	B70614	METHYLENE CHLORIDE	150	ppb	100	ppb	Result biased high due to laboratory contamination.
SS-5	SURFACE	12/07/99	B70615	METHYLENE CHLORIDE	82.0	ppb	100	ppb	Result biased high due to laboratory contamination.
SS-4	SURFACE	12/07/99	B70612	METHYLENE CHLORIDE	63.0	ppb	100	ppb	Result biased high due to laboratory contamination.
SS-2	SURFACE	12/07/99	B70613	METHYLENE CHLORIDE	40.0	ppb	100	ppb	Result biased high due to laboratory contamination.
SS-1	SURFACE	12/07/99	B70611	METHYLENE CHLORIDE	24.0	ppb	100	ppb	Result biased high due to laboratory contamination.
SS-2	SURFACE	12/07/99	B70613	TOTAL VOC TICs	20.0	ppb	NA	ppb	
SS-5	SURFACE	12/07/99	B70615	TOTAL VOC TICs	9.0	ppb	NA	ppb	
SS-1	SURFACE	12/07/99	B70611	TOTAL VOC TICs	ND	ppb	NA	ppb	
SS-3	SURFACE	12/07/99	B70614	TOTAL VOC TICs	ND	ppb	NA	ppb	
SS-4	SURFACE	12/07/99	B70612	TOTAL VOC TICs	ND	ppb	NA	ppb	

ND- Not Detected
NA- Not Applicable

Table 10. Summary of Surface Soil Sample Results
Inorganic Compounds Sorted by Location
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Depth (ft)	Sample Date	Sample Number	Compound	Concentration	Units	Standard/Guidance	Units
SS-1	SURFACE	12/07/99	B70611	ALUMINUM	6770	ppm	Background	ppm
SS-1	SURFACE	12/07/99	B70611	ARSENIC	4.60	ppm	7.5 or background	ppm
SS-1	SURFACE	12/07/99	B70611	BARIUM	51.0	ppm	300 or background	ppm
SS-1	SURFACE	12/07/99	B70611	BERYLLIUM	0.34	ppm	0.16 or background	ppm
SS-1	SURFACE	12/07/99	B70611	CADMIUM	0.34	ppm	10 or background	ppm
SS-1	SURFACE	12/07/99	B70611	CALCIUM	46500	ppm	Background	ppm
SS-1	SURFACE	12/07/99	B70611	CHROMIUM	10.1	ppm	50 or background	ppm
SS-1	SURFACE	12/07/99	B70611	COBALT	4.70	ppm	30 or background	ppm
SS-1	SURFACE	12/07/99	B70611	COPPER	17.9	ppm	25 or background	ppm
SS-1	SURFACE	12/07/99	B70611	IRON	14900	ppm	2000 or background	ppm
SS-1	SURFACE	12/07/99	B70611	LEAD	152	ppm	Background	ppm
SS-1	SURFACE	12/07/99	B70611	MAGNESIUM	27200	ppm	Background	ppm
SS-1	SURFACE	12/07/99	B70611	MANGANESE	440	ppm	Background	ppm
SS-1	SURFACE	12/07/99	B70611	MERCURY	0.12	ppm	0.1	ppm
SS-1	SURFACE	12/07/99	B70611	NICKEL	10.1	ppm	13 or background	ppm
SS-1	SURFACE	12/07/99	B70611	POTASSIUM	1000	ppm	Background	ppm
SS-1	SURFACE	12/07/99	B70611	SODIUM	118	ppm	Background	ppm
SS-1	SURFACE	12/07/99	B70611	VANADIUM	16.6	ppm	150 or background	ppm
SS-1	SURFACE	12/07/99	B70611	ZINC	103	ppm	20 or background	ppm
SS-2	SURFACE	12/07/99	B70613	ALUMINUM	7000	ppm	Background	ppm
SS-2	SURFACE	12/07/99	B70613	ANTIMONY	1.20	ppm	Background	ppm
SS-2	SURFACE	12/07/99	B70613	ARSENIC	60.7	ppm	7.5 or background	ppm
SS-2	SURFACE	12/07/99	B70613	BARIUM	366	ppm	300 or background	ppm
SS-2	SURFACE	12/07/99	B70613	BERYLLIUM	0.63	ppm	0.16 or background	ppm
SS-2	SURFACE	12/07/99	B70613	CADMIUM	2.30	ppm	10 or background	ppm
SS-2	SURFACE	12/07/99	B70613	CALCIUM	167000	ppm	Background	ppm
SS-2	SURFACE	12/07/99	B70613	CHROMIUM	14.1	ppm	50 or background	ppm
SS-2	SURFACE	12/07/99	B70613	COBALT	4.90	ppm	30 or background	ppm
SS-2	SURFACE	12/07/99	B70613	COPPER	44.1	ppm	25 or background	ppm
SS-2	SURFACE	12/07/99	B70613	IRON	17400	ppm	2000 or background	ppm
SS-2	SURFACE	12/07/99	B70613	LEAD	119	ppm	Background	ppm
SS-2	SURFACE	12/07/99	B70613	MAGNESIUM	30600	ppm	Background	ppm
SS-2	SURFACE	12/07/99	B70613	MANGANESE	1500	ppm	Background	ppm
SS-2	SURFACE	12/07/99	B70613	MERCURY	0.67	ppm	0.1	ppm
SS-2	SURFACE	12/07/99	B70613	NICKEL	23.6	ppm	13 or background	ppm
SS-2	SURFACE	12/07/99	B70613	POTASSIUM	2240	ppm	Background	ppm
SS-2	SURFACE	12/07/99	B70613	SELENIUM	7.40	ppm	2 or background	ppm
SS-2	SURFACE	12/07/99	B70613	SILVER	0.36	ppm	Background	ppm
SS-2	SURFACE	12/07/99	B70613	SODIUM	497	ppm	Background	ppm
SS-2	SURFACE	12/07/99	B70613	VANADIUM	28.6	ppm	150 or background	ppm
SS-2	SURFACE	12/07/99	B70613	ZINC	183	ppm	20 or background	ppm
SS-3	SURFACE	12/07/99	B70614	ALUMINUM	2970	ppm	Background	ppm
SS-3	SURFACE	12/07/99	B70614	ARSENIC	4.30	ppm	7.5 or background	ppm
SS-3	SURFACE	12/07/99	B70614	BARIUM	358	ppm	300 or background	ppm
SS-3	SURFACE	12/07/99	B70614	CADMIUM	3.50	ppm	10 or background	ppm
SS-3	SURFACE	12/07/99	B70614	CALCIUM	22600	ppm	Background	ppm
SS-3	SURFACE	12/07/99	B70614	CHROMIUM	10.4	ppm	50 or background	ppm
SS-3	SURFACE	12/07/99	B70614	COBALT	3.10	ppm	30 or background	ppm
SS-3	SURFACE	12/07/99	B70614	COPPER	54.2	ppm	25 or background	ppm
SS-3	SURFACE	12/07/99	B70614	IRON	21200	ppm	2000 or background	ppm
SS-3	SURFACE	12/07/99	B70614	LEAD	972	ppm	Background	ppm
SS-3	SURFACE	12/07/99	B70614	MAGNESIUM	2490	ppm	Background	ppm
SS-3	SURFACE	12/07/99	B70614	MANGANESE	189	ppm	Background	ppm
SS-3	SURFACE	12/07/99	B70614	MERCURY	0.50	ppm	0.1	ppm
SS-3	SURFACE	12/07/99	B70614	NICKEL	11.4	ppm	13 or background	ppm
SS-3	SURFACE	12/07/99	B70614	POTASSIUM	1300	ppm	Background	ppm
SS-3	SURFACE	12/07/99	B70614	SELENIUM	4.10	ppm	2 or background	ppm
SS-3	SURFACE	12/07/99	B70614	SILVER	1.20	ppm	Background	ppm

Table 10. Summary of Surface Soil Sample Results
Inorganic Compounds Sorted by Location
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Depth (ft)	Sample Date	Sample Number	Compound	Concentration	Units	Standard/Guidance	Units
SS-3	SURFACE	12/07/99	B70614	SODIUM	186	ppm	Background	ppm
SS-3	SURFACE	12/07/99	B70614	VANADIUM	12.9	ppm	150 or background	ppm
SS-3	SURFACE	12/07/99	B70614	ZINC	739	ppm	20 or background	ppm
SS-4	SURFACE	12/07/99	B70612	ALUMINUM	11900	ppm	Background	ppm
SS-4	SURFACE	12/07/99	B70612	ARSENIC	8.70	ppm	7.5 or background	ppm
SS-4	SURFACE	12/07/99	B70612	BARIUM	138	ppm	300 or background	ppm
SS-4	SURFACE	12/07/99	B70612	BERYLLIUM	0.58	ppm	0.16 or background	ppm
SS-4	SURFACE	12/07/99	B70612	CADMIUM	1.80	ppm	10 or background	ppm
SS-4	SURFACE	12/07/99	B70612	CALCIUM	11900	ppm	Background	ppm
SS-4	SURFACE	12/07/99	B70612	CHROMIUM	24.0	ppm	50 or background	ppm
SS-4	SURFACE	12/07/99	B70612	COBALT	8.40	ppm	30 or background	ppm
SS-4	SURFACE	12/07/99	B70612	COPPER	75.8	ppm	25 or background	ppm
SS-4	SURFACE	12/07/99	B70612	IRON	22800	ppm	2000 or background	ppm
SS-4	SURFACE	12/07/99	B70612	LEAD	164	ppm	Background	ppm
SS-4	SURFACE	12/07/99	B70612	MAGNESIUM	4510	ppm	Background	ppm
SS-4	SURFACE	12/07/99	B70612	MANGANESE	352	ppm	Background	ppm
SS-4	SURFACE	12/07/99	B70612	MERCURY	2.10	ppm	0.1	ppm
SS-4	SURFACE	12/07/99	B70612	NICKEL	24.2	ppm	13 or background	ppm
SS-4	SURFACE	12/07/99	B70612	POTASSIUM	1790	ppm	Background	ppm
SS-4	SURFACE	12/07/99	B70612	SELENIUM	3.10	ppm	2 or background	ppm
SS-4	SURFACE	12/07/99	B70612	SILVER	1.20	ppm	Background	ppm
SS-4	SURFACE	12/07/99	B70612	SODIUM	458	ppm	Background	ppm
SS-4	SURFACE	12/07/99	B70612	VANADIUM	24.8	ppm	150 or background	ppm
SS-4	SURFACE	12/07/99	B70612	ZINC	309	ppm	20 or background	ppm
SS-5	SURFACE	12/07/99	B70615	ALUMINUM	4400	ppm	Background	ppm
SS-5	SURFACE	12/07/99	B70615	ANTIMONY	3.70	ppm	Background	ppm
SS-5	SURFACE	12/07/99	B70615	ARSENIC	13.5	ppm	7.5 or background	ppm
SS-5	SURFACE	12/07/99	B70615	BARIUM	224	ppm	300 or background	ppm
SS-5	SURFACE	12/07/99	B70615	BERYLLIUM	0.39	ppm	0.16 or background	ppm
SS-5	SURFACE	12/07/99	B70615	CADMIUM	3.40	ppm	10 or background	ppm
SS-5	SURFACE	12/07/99	B70615	CALCIUM	19600	ppm	Background	ppm
SS-5	SURFACE	12/07/99	B70615	CHROMIUM	13.1	ppm	50 or background	ppm
SS-5	SURFACE	12/07/99	B70615	COBALT	5.90	ppm	30 or background	ppm
SS-5	SURFACE	12/07/99	B70615	COPPER	73.1	ppm	25 or background	ppm
SS-5	SURFACE	12/07/99	B70615	IRON	18700	ppm	2000 or background	ppm
SS-5	SURFACE	12/07/99	B70615	LEAD	261	ppm	Background	ppm
SS-5	SURFACE	12/07/99	B70615	MAGNESIUM	4870	ppm	Background	ppm
SS-5	SURFACE	12/07/99	B70615	MANGANESE	250	ppm	Background	ppm
SS-5	SURFACE	12/07/99	B70615	MERCURY	1.40	ppm	0.1	ppm
SS-5	SURFACE	12/07/99	B70615	NICKEL	17.3	ppm	13 or background	ppm
SS-5	SURFACE	12/07/99	B70615	POTASSIUM	853	ppm	Background	ppm
SS-5	SURFACE	12/07/99	B70615	SELENIUM	2.90	ppm	2 or background	ppm
SS-5	SURFACE	12/07/99	B70615	SILVER	0.66	ppm	Background	ppm
SS-5	SURFACE	12/07/99	B70615	SODIUM	180	ppm	Background	ppm
SS-5	SURFACE	12/07/99	B70615	VANADIUM	17.8	ppm	150 or background	ppm
SS-5	SURFACE	12/07/99	B70615	ZINC	772	ppm	20 or background	ppm

Table 11. Summary of Surface Soil Sample Results
Inorganic Compounds Sorted by Compound
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Depth (ft)	Sample Date	Sample Number	Compound	Concentration	Units	Standard/Guidance	Units
SS-4	SURFACE	12/07/99	B70612	ALUMINUM	11900	ppm	Background	ppm
SS-2	SURFACE	12/07/99	B70613	ALUMINUM	7000	ppm	Background	ppm
SS-1	SURFACE	12/07/99	B70611	ALUMINUM	6770	ppm	Background	ppm
SS-5	SURFACE	12/07/99	B70615	ALUMINUM	4400	ppm	Background	ppm
SS-3	SURFACE	12/07/99	B70614	ALUMINUM	2970	ppm	Background	ppm
SS-5	SURFACE	12/07/99	B70615	ANTIMONY	3.70	ppm	Background	ppm
SS-2	SURFACE	12/07/99	B70613	ANTIMONY	1.20	ppm	Background	ppm
SS-2	SURFACE	12/07/99	B70613	ARSENIC	60.7	ppm	7.5 or background	ppm
SS-5	SURFACE	12/07/99	B70615	ARSENIC	13.5	ppm	7.5 or background	ppm
SS-4	SURFACE	12/07/99	B70612	ARSENIC	8.70	ppm	7.5 or background	ppm
SS-1	SURFACE	12/07/99	B70611	ARSENIC	4.60	ppm	7.5 or background	ppm
SS-3	SURFACE	12/07/99	B70614	ARSENIC	4.30	ppm	7.5 or background	ppm
SS-2	SURFACE	12/07/99	B70613	BARIUM	366	ppm	300 or background	ppm
SS-3	SURFACE	12/07/99	B70614	BARIUM	358	ppm	300 or background	ppm
SS-5	SURFACE	12/07/99	B70615	BARIUM	224	ppm	300 or background	ppm
SS-4	SURFACE	12/07/99	B70612	BARIUM	138	ppm	300 or background	ppm
SS-1	SURFACE	12/07/99	B70611	BARIUM	51.0	ppm	300 or background	ppm
SS-2	SURFACE	12/07/99	B70613	BERYLLIUM	0.63	ppm	0.16 or background	ppm
SS-4	SURFACE	12/07/99	B70612	BERYLLIUM	0.58	ppm	0.16 or background	ppm
SS-5	SURFACE	12/07/99	B70615	BERYLLIUM	0.39	ppm	0.16 or background	ppm
SS-1	SURFACE	12/07/99	B70611	BERYLLIUM	0.34	ppm	0.16 or background	ppm
SS-3	SURFACE	12/07/99	B70614	CADMIUM	3.50	ppm	10 or background	ppm
SS-5	SURFACE	12/07/99	B70615	CADMIUM	3.40	ppm	10 or background	ppm
SS-2	SURFACE	12/07/99	B70613	CADMIUM	2.30	ppm	10 or background	ppm
SS-4	SURFACE	12/07/99	B70612	CADMIUM	1.80	ppm	10 or background	ppm
SS-1	SURFACE	12/07/99	B70611	CADMIUM	0.34	ppm	10 or background	ppm
SS-2	SURFACE	12/07/99	B70613	CALCIUM	167000	ppm	Background	ppm
SS-1	SURFACE	12/07/99	B70611	CALCIUM	46500	ppm	Background	ppm
SS-3	SURFACE	12/07/99	B70614	CALCIUM	22600	ppm	Background	ppm
SS-5	SURFACE	12/07/99	B70615	CALCIUM	19600	ppm	Background	ppm
SS-4	SURFACE	12/07/99	B70612	CALCIUM	11900	ppm	Background	ppm
SS-4	SURFACE	12/07/99	B70612	CHROMIUM	24.0	ppm	50 or background	ppm
SS-2	SURFACE	12/07/99	B70613	CHROMIUM	14.1	ppm	50 or background	ppm
SS-5	SURFACE	12/07/99	B70615	CHROMIUM	13.1	ppm	50 or background	ppm
SS-3	SURFACE	12/07/99	B70614	CHROMIUM	10.4	ppm	50 or background	ppm
SS-1	SURFACE	12/07/99	B70611	CHROMIUM	10.1	ppm	50 or background	ppm
SS-4	SURFACE	12/07/99	B70612	COBALT	8.40	ppm	30 or background	ppm
SS-5	SURFACE	12/07/99	B70615	COBALT	5.90	ppm	30 or background	ppm
SS-2	SURFACE	12/07/99	B70613	COBALT	4.90	ppm	30 or background	ppm
SS-1	SURFACE	12/07/99	B70611	COBALT	4.70	ppm	30 or background	ppm
SS-3	SURFACE	12/07/99	B70614	COBALT	3.10	ppm	30 or background	ppm
SS-4	SURFACE	12/07/99	B70612	COPPER	75.8	ppm	25 or background	ppm
SS-5	SURFACE	12/07/99	B70615	COPPER	73.1	ppm	25 or background	ppm
SS-3	SURFACE	12/07/99	B70614	COPPER	54.2	ppm	25 or background	ppm
SS-2	SURFACE	12/07/99	B70613	COPPER	44.1	ppm	25 or background	ppm
SS-1	SURFACE	12/07/99	B70611	COPPER	17.9	ppm	25 or background	ppm
SS-4	SURFACE	12/07/99	B70612	IRON	22800	ppm	2000 or background	ppm
SS-3	SURFACE	12/07/99	B70614	IRON	21200	ppm	2000 or background	ppm
SS-5	SURFACE	12/07/99	B70615	IRON	18700	ppm	2000 or background	ppm
SS-2	SURFACE	12/07/99	B70613	IRON	17400	ppm	2000 or background	ppm
SS-1	SURFACE	12/07/99	B70611	IRON	14900	ppm	2000 or background	ppm
SS-3	SURFACE	12/07/99	B70614	LEAD	972	ppm	Background	ppm
SS-5	SURFACE	12/07/99	B70615	LEAD	261	ppm	Background	ppm
SS-4	SURFACE	12/07/99	B70612	LEAD	164	ppm	Background	ppm
SS-1	SURFACE	12/07/99	B70611	LEAD	152	ppm	Background	ppm
SS-2	SURFACE	12/07/99	B70613	LEAD	119	ppm	Background	ppm

Table 11. Summary of Surface Soil Sample Results
Inorganic Compounds Sorted by Compound
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Depth (ft)	Sample Date	Sample Number	Compound	Concentration	Units	Standard/Guidance	Units
SS-2	SURFACE	12/07/99	B70613	MAGNESIUM	30600	ppm	Background	ppm
SS-1	SURFACE	12/07/99	B70611	MAGNESIUM	27200	ppm	Background	ppm
SS-5	SURFACE	12/07/99	B70615	MAGNESIUM	4870	ppm	Background	ppm
SS-4	SURFACE	12/07/99	B70612	MAGNESIUM	4510	ppm	Background	ppm
SS-3	SURFACE	12/07/99	B70614	MAGNESIUM	2490	ppm	Background	ppm
SS-2	SURFACE	12/07/99	B70613	MANGANESE	1500	ppm	Background	ppm
SS-1	SURFACE	12/07/99	B70611	MANGANESE	440	ppm	Background	ppm
SS-4	SURFACE	12/07/99	B70612	MANGANESE	352	ppm	Background	ppm
SS-5	SURFACE	12/07/99	B70615	MANGANESE	250	ppm	Background	ppm
SS-3	SURFACE	12/07/99	B70614	MANGANESE	189	ppm	Background	ppm
SS-4	SURFACE	12/07/99	B70612	MERCURY	2.10	ppm	0.1	ppm
SS-5	SURFACE	12/07/99	B70615	MERCURY	1.40	ppm	0.1	ppm
SS-2	SURFACE	12/07/99	B70613	MERCURY	0.67	ppm	0.1	ppm
SS-3	SURFACE	12/07/99	B70614	MERCURY	0.50	ppm	0.1	ppm
SS-1	SURFACE	12/07/99	B70611	MERCURY	0.12	ppm	0.1	ppm
SS-4	SURFACE	12/07/99	B70612	NICKEL	24.2	ppm	13 or background	ppm
SS-2	SURFACE	12/07/99	B70613	NICKEL	23.6	ppm	13 or background	ppm
SS-5	SURFACE	12/07/99	B70615	NICKEL	17.3	ppm	13 or background	ppm
SS-3	SURFACE	12/07/99	B70614	NICKEL	11.4	ppm	13 or background	ppm
SS-1	SURFACE	12/07/99	B70611	NICKEL	10.1	ppm	13 or background	ppm
SS-2	SURFACE	12/07/99	B70613	POTASSIUM	2240	ppm	Background	ppm
SS-4	SURFACE	12/07/99	B70612	POTASSIUM	1790	ppm	Background	ppm
SS-3	SURFACE	12/07/99	B70614	POTASSIUM	1300	ppm	Background	ppm
SS-1	SURFACE	12/07/99	B70611	POTASSIUM	1000	ppm	Background	ppm
SS-5	SURFACE	12/07/99	B70615	POTASSIUM	853	ppm	Background	ppm
SS-2	SURFACE	12/07/99	B70613	SELENIUM	7.40	ppm	2 or background	ppm
SS-3	SURFACE	12/07/99	B70614	SELENIUM	4.10	ppm	2 or background	ppm
SS-4	SURFACE	12/07/99	B70612	SELENIUM	3.10	ppm	2 or background	ppm
SS-5	SURFACE	12/07/99	B70615	SELENIUM	2.90	ppm	2 or background	ppm
SS-3	SURFACE	12/07/99	B70614	SILVER	1.20	ppm	Background	ppm
SS-4	SURFACE	12/07/99	B70612	SILVER	1.20	ppm	Background	ppm
SS-5	SURFACE	12/07/99	B70615	SILVER	0.66	ppm	Background	ppm
SS-2	SURFACE	12/07/99	B70613	SILVER	0.36	ppm	Background	ppm
SS-2	SURFACE	12/07/99	B70613	SODIUM	497	ppm	Background	ppm
SS-4	SURFACE	12/07/99	B70612	SODIUM	458	ppm	Background	ppm
SS-3	SURFACE	12/07/99	B70614	SODIUM	186	ppm	Background	ppm
SS-5	SURFACE	12/07/99	B70615	SODIUM	180	ppm	Background	ppm
SS-1	SURFACE	12/07/99	B70611	SODIUM	118	ppm	Background	ppm
SS-2	SURFACE	12/07/99	B70613	VANADIUM	28.6	ppm	150 or background	ppm
SS-4	SURFACE	12/07/99	B70612	VANADIUM	24.8	ppm	150 or background	ppm
SS-5	SURFACE	12/07/99	B70615	VANADIUM	17.8	ppm	150 or background	ppm
SS-1	SURFACE	12/07/99	B70611	VANADIUM	16.6	ppm	150 or background	ppm
SS-3	SURFACE	12/07/99	B70614	VANADIUM	12.9	ppm	150 or background	ppm
SS-5	SURFACE	12/07/99	B70615	ZINC	772	ppm	20 or background	ppm
SS-3	SURFACE	12/07/99	B70614	ZINC	739	ppm	20 or background	ppm
SS-4	SURFACE	12/07/99	B70612	ZINC	309	ppm	20 or background	ppm
SS-2	SURFACE	12/07/99	B70613	ZINC	183	ppm	20 or background	ppm
SS-1	SURFACE	12/07/99	B70611	ZINC	103	ppm	20 or background	ppm

Table 12. Summary of Surface Soil Sample Results
Pesticides and PCBs
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Depth (ft)	Sample Date	Sample Number	Compound	Concentration	Units	Standard/Guidance	Units
SS-5	SURFACE	12/07/99	B70615	4,4'-DDE	19.0	ppb	2100	ppb
SS-5	SURFACE	12/07/99	B70615	4,4'-DDT (P,P'-DDT)	21.0	ppb	2100	ppb
SS-1	SURFACE	12/07/99	B70611	ALPHA CHLORDANE	210	ppb	540 (Chlordane)	ppb
SS-1	SURFACE	12/07/99	B70611	DIELDRIN	74.0	ppb	44	ppb
SS-3	SURFACE	12/07/99	B70614	DIELDRIN	15.0	ppb	44	ppb
SS-1	SURFACE	12/07/99	B70611	GAMMA CHLORDANE	170	ppb	540	ppb
SS-1	SURFACE	12/07/99	B70611	HEPTACHLOR EPOXIDE	30.0	ppb	20	ppb
SS-2	SURFACE	12/07/99	B70613	ALL PESTICIDES/PCBs	ND	ppb	NA	ppb
SS-4	SURFACE	12/07/99	B70612	ALL PESTICIDES/PCBs	ND	ppb	NA	ppb

ND- Not Detected
NA- Not Applicable

Table 13. Summary of Subsurface Soil Sample Results
Semi-Volatile Organic Compounds Sorted by Depth
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Depth (ft)	Sample Date	Sample Number	Compound	Concentration	Units	Standard/ Guidance	Units
MW-2	10-12	02/08/00	B70617	PHENANTHRENE	29.0	ppb	50000	ppb
MW-2	10-12	02/08/00	B70617	TOTAL SVOC TICs	1360	ppb	NA	ppb
TP-1	3-5	12/06/99	B70601	2-METHYLNAPHTHALENE	1500	ppb	36400	ppb
TP-1	3-5	12/06/99	B70601	CHRYSENE	390	ppb	400	ppb
TP-1	3-5	12/06/99	B70601	FLUORANTHENE	500	ppb	50000	ppb
TP-1	3-5	12/06/99	B70601	PHENANTHRENE	1300	ppb	50000	ppb
TP-1	3-5	12/06/99	B70601	PYRENE	670	ppb	50000	ppb
TP-1	3-5	12/06/99	B70601	TOTAL SVOC TICs	625000	ppb	NA	ppb
TP-1	7-8	12/06/99	B70602	2-METHYLNAPHTHALENE	6400	ppb	36400	ppb
TP-1	7-8	12/06/99	B70602	PHENANTHRENE	1500	ppb	50000	ppb
TP-1	7-8	12/06/99	B70602	TOTAL SVOC TICs	814000	ppb	NA	ppb
TP-10	4	12/06/99	B70610	2-METHYLNAPHTHALENE	140	ppb	36400	ppb
TP-10	4	12/06/99	B70610	ACENAPHTHYLENE	71.0	ppb	41000	ppb
TP-10	4	12/06/99	B70610	ANTHRACENE	97.0	ppb	50000	ppb
TP-10	4	12/06/99	B70610	BENZO(A)ANTHRACENE	510	ppb	224	ppb
TP-10	4	12/06/99	B70610	BENZO(A)PYRENE	520	ppb	61	ppb
TP-10	4	12/06/99	B70610	BENZO(B)FLUORANTHENE	690	ppb	1100	ppb
TP-10	4	12/06/99	B70610	BENZO(G,H,I)PERYLENE	460	ppb	50000	ppb
TP-10	4	12/06/99	B70610	BENZO(K)FLUORANTHENE	560	ppb	1100	ppb
TP-10	4	12/06/99	B70610	BIS(2-ETHYLHEXYL)PHTHALATE	440	ppb	50000	ppb
TP-10	4	12/06/99	B70610	CARBAZOLE	55.0	ppb	NA	ppb
TP-10	4	12/06/99	B70610	CHRYSENE	920	ppb	400	ppb
TP-10	4	12/06/99	B70610	DIBENZO(A,H)ANTHRACENE	130	ppb	14	ppb
TP-10	4	12/06/99	B70610	DIBENZOFURAN	86.0	ppb	6200	ppb
TP-10	4	12/06/99	B70610	FLUORANTHENE	870	ppb	50000	ppb
TP-10	4	12/06/99	B70610	INDENO(1,2,3-C,D)PYRENE	380	ppb	3200	ppb
TP-10	4	12/06/99	B70610	NAPHTHALENE	86.0	ppb	13000	ppb
TP-10	4	12/06/99	B70610	PHENANTHRENE	580	ppb	50000	ppb
TP-10	4	12/06/99	B70610	PYRENE	720	ppb	50000	ppb
TP-10	4	12/06/99	B70610	TOTAL SVOC TICs	18300	ppb	NA	ppb
TP-2	5	12/06/99	B70603	2-METHYLNAPHTHALENE	110000	ppb	36400	ppb
TP-2	5	12/06/99	B70603	ACENAPHTHENE	170000	ppb	50000	ppb
TP-2	5	12/06/99	B70603	ANTHRACENE	510000	ppb	50000	ppb
TP-2	5	12/06/99	B70603	BENZO(A)ANTHRACENE	760000	ppb	224	ppb
TP-2	5	12/06/99	B70603	BENZO(A)PYRENE	530000	ppb	61	ppb
TP-2	5	12/06/99	B70603	BENZO(B)FLUORANTHENE	480000	ppb	1100	ppb
TP-2	5	12/06/99	B70603	BENZO(G,H,I)PERYLENE	280000	ppb	50000	ppb
TP-2	5	12/06/99	B70603	BENZO(K)FLUORANTHENE	470000	ppb	1100	ppb
TP-2	5	12/06/99	B70603	CARBAZOLE	170000	ppb	NA	ppb
TP-2	5	12/06/99	B70603	CHRYSENE	710000	ppb	400	ppb
TP-2	5	12/06/99	B70603	DIBENZO(A,H)ANTHRACENE	100000	ppb	14	ppb
TP-2	5	12/06/99	B70603	DIBENZOFURAN	220000	ppb	6200	ppb
TP-2	5	12/06/99	B70603	FLUORANTHENE	1500000	ppb	50000	ppb
TP-2	5	12/06/99	B70603	FLUORENE	360000	ppb	50000	ppb
TP-2	5	12/06/99	B70603	INDENO(1,2,3-C,D)PYRENE	280000	ppb	3200	ppb
TP-2	5	12/06/99	B70603	NAPHTHALENE	320000	ppb	13000	ppb
TP-2	5	12/06/99	B70603	PHENANTHRENE	1600000	ppb	50000	ppb
TP-2	5	12/06/99	B70603	PYRENE	960000	ppb	50000	ppb
TP-2	5	12/06/99	B70603	TOTAL SVOC TICs	2240000	ppb	NA	ppb
TP-3	8-9	12/06/99	B70604	2-METHYLNAPHTHALENE	670	ppb	36400	ppb
TP-3	8-9	12/06/99	B70604	ACENAPHTHENE	1700	ppb	50000	ppb
TP-3	8-9	12/06/99	B70604	ACENAPHTHYLENE	310	ppb	41000	ppb
TP-3	8-9	12/06/99	B70604	ANTHRACENE	4700	ppb	50000	ppb
TP-3	8-9	12/06/99	B70604	BENZO(A)ANTHRACENE	10000	ppb	224	ppb
TP-3	8-9	12/06/99	B70604	BENZO(A)PYRENE	8100	ppb	61	ppb
TP-3	8-9	12/06/99	B70604	BENZO(B)FLUORANTHENE	7000	ppb	1100	ppb
TP-3	8-9	12/06/99	B70604	BENZO(G,H,I)PERYLENE	4200	ppb	50000	ppb
TP-3	8-9	12/06/99	B70604	BENZO(K)FLUORANTHENE	6900	ppb	1100	ppb
TP-3	8-9	12/06/99	B70604	CARBAZOLE	2500	ppb	NA	ppb
TP-3	8-9	12/06/99	B70604	CHRYSENE	11000	ppb	400	ppb
TP-3	8-9	12/06/99	B70604	DIBENZO(A,H)ANTHRACENE	1400	ppb	14	ppb

Table 13. Summary of Subsurface Soil Sample Results
Semi-Volatile Organic Compounds Sorted by Depth
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Depth (ft)	Sample Date	Sample Number	Compound	Concentration	Units	Standard/ Guidance	Units
TP-3	8-9	12/06/99	B70604	DIBENZOFURAN	1500	ppb	6200	ppb
TP-3	8-9	12/06/99	B70604	FLUORANTHENE	24000	ppb	50000	ppb
TP-3	8-9	12/06/99	B70604	FLUORENE	2400	ppb	50000	ppb
TP-3	8-9	12/06/99	B70604	INDENO(1,2,3-C,D)PYRENE	3900	ppb	3200	ppb
TP-3	8-9	12/06/99	B70604	NAPHTHALENE	2300	ppb	13000	ppb
TP-3	8-9	12/06/99	B70604	PHENANTHRENE	25000	ppb	50000	ppb
TP-3	8-9	12/06/99	B70604	PYRENE	20000	ppb	50000	ppb
TP-3	8-9	12/06/99	B70604	TOTAL SVOC TICs	63000	ppb	NA	ppb
TP-4	5	12/06/99	B70605	BENZO(A)ANTHRACENE	65.0	ppb	224	ppb
TP-4	5	12/06/99	B70605	BENZO(A)PYRENE	54.0	ppb	61	ppb
TP-4	5	12/06/99	B70605	BENZO(B)FLUORANTHENE	55.0	ppb	1100	ppb
TP-4	5	12/06/99	B70605	BENZO(G,H,I)PERYLENE	43.0	ppb	50000	ppb
TP-4	5	12/06/99	B70605	BENZO(K)FLUORANTHENE	59.0	ppb	1100	ppb
TP-4	5	12/06/99	B70605	CHRYSENE	72.0	ppb	400	ppb
TP-4	5	12/06/99	B70605	FLUORANTHENE	130	ppb	50000	ppb
TP-4	5	12/06/99	B70605	INDENO(1,2,3-C,D)PYRENE	35.0	ppb	3200	ppb
TP-4	5	12/06/99	B70605	PHENANTHRENE	99.0	ppb	50000	ppb
TP-4	5	12/06/99	B70605	PYRENE	110	ppb	50000	ppb
TP-4	5	12/06/99	B70605	TOTAL SVOC TICs	1450	ppb	NA	ppb
TP-5	3	12/06/99	B70606	BENZO(A)ANTHRACENE	630	ppb	224	ppb
TP-5	3	12/06/99	B70606	BENZO(A)PYRENE	260	ppb	61	ppb
TP-5	3	12/06/99	B70606	BENZO(B)FLUORANTHENE	460	ppb	1100	ppb
TP-5	3	12/06/99	B70606	BENZO(G,H,I)PERYLENE	300	ppb	50000	ppb
TP-5	3	12/06/99	B70606	BENZO(K)FLUORANTHENE	220	ppb	1100	ppb
TP-5	3	12/06/99	B70606	CHRYSENE	3100	ppb	400	ppb
TP-5	3	12/06/99	B70606	DIBENZO(A,H)ANTHRACENE	310	ppb	14	ppb
TP-5	3	12/06/99	B70606	DI-N-OCTYLPHTHALATE	130	ppb	50000	ppb
TP-5	3	12/06/99	B70606	INDENO(1,2,3-C,D)PYRENE	190	ppb	3200	ppb
TP-5	3	12/06/99	B70606	PHENANTHRENE	1400	ppb	50000	ppb
TP-5	3	12/06/99	B70606	PYRENE	120	ppb	50000	ppb
TP-5	3	12/06/99	B70606	TOTAL SVOC TICs	56200	ppb	NA	ppb
TP-8	3	12/06/99	B70607	ACENAPHTHENE	270	ppb	50000	ppb
TP-8	3	12/06/99	B70607	ACENAPHTHYLENE	540	ppb	41000	ppb
TP-8	3	12/06/99	B70607	ANTHRACENE	2000	ppb	50000	ppb
TP-8	3	12/06/99	B70607	BENZO(A)ANTHRACENE	7900	ppb	224	ppb
TP-8	3	12/06/99	B70607	BENZO(A)PYRENE	7200	ppb	61	ppb
TP-8	3	12/06/99	B70607	BENZO(B)FLUORANTHENE	5800	ppb	1100	ppb
TP-8	3	12/06/99	B70607	BENZO(G,H,I)PERYLENE	4500	ppb	50000	ppb
TP-8	3	12/06/99	B70607	BENZO(K)FLUORANTHENE	5800	ppb	1100	ppb
TP-8	3	12/06/99	B70607	CARBAZOLE	650	ppb	NA	ppb
TP-8	3	12/06/99	B70607	CHRYSENE	9100	ppb	400	ppb
TP-8	3	12/06/99	B70607	DIBENZO(A,H)ANTHRACENE	1600	ppb	14	ppb
TP-8	3	12/06/99	B70607	DIBENZOFURAN	380	ppb	6200	ppb
TP-8	3	12/06/99	B70607	FLUORANTHENE	20000	ppb	50000	ppb
TP-8	3	12/06/99	B70607	FLUORENE	450	ppb	50000	ppb
TP-8	3	12/06/99	B70607	INDENO(1,2,3-C,D)PYRENE	3900	ppb	3200	ppb
TP-8	3	12/06/99	B70607	PHENANTHRENE	12000	ppb	50000	ppb
TP-8	3	12/06/99	B70607	PYRENE	19000	ppb	50000	ppb
TP-8	3	12/06/99	B70607	TOTAL SVOC TICs	153000	ppb	NA	ppb

NA- Not Applicable

Table 14. Summary of Subsurface Soil Sample Results
Semi-Volatile Organic Compounds Sorted by Compound
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Depth (ft)	Sample Date	Sample Number	Compound	Concentration	Units	Standard/ Guidance
TP-2	5	12/06/99	B70603	2-METHYLNAPHTHALENE	110000	ppb	36400
TP-1	7-8	12/06/99	B70602	2-METHYLNAPHTHALENE	6400	ppb	36400
TP-1	3-5	12/06/99	B70601	2-METHYLNAPHTHALENE	1500	ppb	36400
TP-3	8-9	12/06/99	B70604	2-METHYLNAPHTHALENE	670	ppb	36400
TP-10	4	12/06/99	B70610	2-METHYLNAPHTHALENE	140	ppb	36400
TP-2	5	12/06/99	B70603	ACENAPHTHENE	170000	ppb	50000
TP-3	8-9	12/06/99	B70604	ACENAPHTHENE	1700	ppb	50000
TP-8	3	12/06/99	B70607	ACENAPHTHENE	270	ppb	50000
TP-8	3	12/06/99	B70607	ACENAPHTHYLENE	540	ppb	41000
TP-3	8-9	12/06/99	B70604	ACENAPHTHYLENE	310	ppb	41000
TP-10	4	12/06/99	B70610	ACENAPHTHYLENE	71.0	ppb	41000
TP-2	5	12/06/99	B70603	ANTHRACENE	510000	ppb	50000
TP-3	8-9	12/06/99	B70604	ANTHRACENE	4700	ppb	50000
TP-8	3	12/06/99	B70607	ANTHRACENE	2000	ppb	50000
TP-10	4	12/06/99	B70610	ANTHRACENE	97.0	ppb	50000
TP-2	5	12/06/99	B70603	BENZO(A)ANTHRACENE	760000	ppb	224
TP-3	8-9	12/06/99	B70604	BENZO(A)ANTHRACENE	10000	ppb	224
TP-8	3	12/06/99	B70607	BENZO(A)ANTHRACENE	7900	ppb	224
TP-5	3	12/06/99	B70606	BENZO(A)ANTHRACENE	630	ppb	224
TP-10	4	12/06/99	B70610	BENZO(A)ANTHRACENE	510	ppb	224
TP-4	5	12/06/99	B70605	BENZO(A)ANTHRACENE	65.0	ppb	224
TP-2	5	12/06/99	B70603	BENZO(A)PYRENE	530000	ppb	61
TP-3	8-9	12/06/99	B70604	BENZO(A)PYRENE	8100	ppb	61
TP-8	3	12/06/99	B70607	BENZO(A)PYRENE	7200	ppb	61
TP-10	4	12/06/99	B70610	BENZO(A)PYRENE	520	ppb	61
TP-5	3	12/06/99	B70606	BENZO(A)PYRENE	260	ppb	61
TP-4	5	12/06/99	B70605	BENZO(A)PYRENE	54.0	ppb	61
TP-2	5	12/06/99	B70603	BENZO(B)FLUORANTHENE	480000	ppb	1100
TP-3	8-9	12/06/99	B70604	BENZO(B)FLUORANTHENE	7000	ppb	1100
TP-8	3	12/06/99	B70607	BENZO(B)FLUORANTHENE	5800	ppb	1100
TP-10	4	12/06/99	B70610	BENZO(B)FLUORANTHENE	690	ppb	1100
TP-5	3	12/06/99	B70606	BENZO(B)FLUORANTHENE	460	ppb	1100
TP-4	5	12/06/99	B70605	BENZO(B)FLUORANTHENE	55.0	ppb	1100
TP-2	5	12/06/99	B70603	BENZO(G,H,I)PERYLENE	280000	ppb	50000
TP-8	3	12/06/99	B70607	BENZO(G,H,I)PERYLENE	4500	ppb	50000
TP-3	8-9	12/06/99	B70604	BENZO(G,H,I)PERYLENE	4200	ppb	50000
TP-10	4	12/06/99	B70610	BENZO(G,H,I)PERYLENE	460	ppb	50000
TP-5	3	12/06/99	B70606	BENZO(G,H,I)PERYLENE	300	ppb	50000
TP-4	5	12/06/99	B70605	BENZO(G,H,I)PERYLENE	43.0	ppb	50000
TP-2	5	12/06/99	B70603	BENZO(K)FLUORANTHENE	470000	ppb	1100
TP-3	8-9	12/06/99	B70604	BENZO(K)FLUORANTHENE	6900	ppb	1100
TP-8	3	12/06/99	B70607	BENZO(K)FLUORANTHENE	5800	ppb	1100
TP-10	4	12/06/99	B70610	BENZO(K)FLUORANTHENE	560	ppb	1100
TP-5	3	12/06/99	B70606	BENZO(K)FLUORANTHENE	220	ppb	1100
TP-4	5	12/06/99	B70605	BENZO(K)FLUORANTHENE	59.0	ppb	1100
TP-10	4	12/06/99	B70610	BIS(2-ETHYLHEXYL)PHTHALATE	440	ppb	50000
TP-2	5	12/06/99	B70603	CARBAZOLE	170000	ppb	NA
TP-3	8-9	12/06/99	B70604	CARBAZOLE	2500	ppb	NA
TP-8	3	12/06/99	B70607	CARBAZOLE	650	ppb	NA
TP-10	4	12/06/99	B70610	CARBAZOLE	55.0	ppb	NA
TP-2	5	12/06/99	B70603	CHRYSENE	710000	ppb	400
TP-3	8-9	12/06/99	B70604	CHRYSENE	11000	ppb	400
TP-8	3	12/06/99	B70607	CHRYSENE	9100	ppb	400
TP-5	3	12/06/99	B70606	CHRYSENE	3100	ppb	400
TP-10	4	12/06/99	B70610	CHRYSENE	920	ppb	400
TP-4	5	12/06/99	B70605	CHRYSENE	72.0	ppb	400
TP-1	3-5	12/06/99	B70601	CHRYSENE	390	ppb	400

Table 14. Summary of Subsurface Soil Sample Results
Semi-Volatile Organic Compounds Sorted by Compound
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Depth (ft)	Sample Date	Sample Number	Compound	Concentration	Units	Standard Guidance
TP-2	5	12/06/99	B70603	DIBENZO(A,H)ANTHRACENE	100000	ppb	14
TP-8	3	12/06/99	B70607	DIBENZO(A,H)ANTHRACENE	1600	ppb	14
TP-3	8-9	12/06/99	B70604	DIBENZO(A,H)ANTHRACENE	1400	ppb	14
TP-5	3	12/06/99	B70606	DIBENZO(A,H)ANTHRACENE	310	ppb	14
TP-10	4	12/06/99	B70610	DIBENZO(A,H)ANTHRACENE	130	ppb	14
TP-2	5	12/06/99	B70603	DIBENZOFURAN	220000	ppb	6200
TP-3	8-9	12/06/99	B70604	DIBENZOFURAN	1500	ppb	6200
TP-8	3	12/06/99	B70607	DIBENZOFURAN	380	ppb	6200
TP-10	4	12/06/99	B70610	DIBENZOFURAN	86.0	ppb	6200
TP-5	3	12/06/99	B70606	DI-N-OCTYLPHTHALATE	130	ppb	50000
TP-2	5	12/06/99	B70603	FLUORANTHENE	1500000	ppb	50000
TP-3	8-9	12/06/99	B70604	FLUORANTHENE	24000	ppb	50000
TP-8	3	12/06/99	B70607	FLUORANTHENE	20000	ppb	50000
TP-10	4	12/06/99	B70610	FLUORANTHENE	870	ppb	50000
TP-1	3-5	12/06/99	B70601	FLUORANTHENE	500	ppb	50000
TP-4	5	12/06/99	B70605	FLUORANTHENE	130	ppb	50000
TP-2	5	12/06/99	B70603	FLUORENE	360000	ppb	50000
TP-3	8-9	12/06/99	B70604	FLUORENE	2400	ppb	50000
TP-8	3	12/06/99	B70607	FLUORENE	450	ppb	50000
TP-2	5	12/06/99	B70603	INDENO(1,2,3-C,D)PYRENE	280000	ppb	3200
TP-3	8-9	12/06/99	B70604	INDENO(1,2,3-C,D)PYRENE	3900	ppb	3200
TP-8	3	12/06/99	B70607	INDENO(1,2,3-C,D)PYRENE	3900	ppb	3200
TP-10	4	12/06/99	B70610	INDENO(1,2,3-C,D)PYRENE	380	ppb	3200
TP-5	3	12/06/99	B70606	INDENO(1,2,3-C,D)PYRENE	190	ppb	3200
TP-4	5	12/06/99	B70605	INDENO(1,2,3-C,D)PYRENE	35.0	ppb	320[illegible]
TP-2	5	12/06/99	B70603	NAPHTHALENE	320000	ppb	130[illegible]
TP-3	8-9	12/06/99	B70604	NAPHTHALENE	2300	ppb	13000
TP-10	4	12/06/99	B70610	NAPHTHALENE	86.0	ppb	13000
TP-2	5	12/06/99	B70603	PHENANTHRENE	1600000	ppb	50000
TP-3	8-9	12/06/99	B70604	PHENANTHRENE	25000	ppb	50000
TP-8	3	12/06/99	B70607	PHENANTHRENE	12000	ppb	50000
TP-1	7-8	12/06/99	B70602	PHENANTHRENE	1500	ppb	50000
TP-5	3	12/06/99	B70606	PHENANTHRENE	1400	ppb	50000
TP-1	3-5	12/06/99	B70601	PHENANTHRENE	1300	ppb	50000
TP-10	4	12/06/99	B70610	PHENANTHRENE	580	ppb	50000
TP-4	5	12/06/99	B70605	PHENANTHRENE	99.0	ppb	50000
MW-2	10-12	02/08/00	B70617	PHENANTHRENE	29.0	ppb	50000
TP-2	5	12/06/99	B70603	PYRENE	960000	ppb	50000
TP-3	8-9	12/06/99	B70604	PYRENE	20000	ppb	50000
TP-8	3	12/06/99	B70607	PYRENE	19000	ppb	50000
TP-10	4	12/06/99	B70610	PYRENE	720	ppb	50000
TP-1	3-5	12/06/99	B70601	PYRENE	670	ppb	50000
TP-5	3	12/06/99	B70606	PYRENE	120	ppb	50000
TP-4	5	12/06/99	B70605	PYRENE	110	ppb	50000
TP-2	5	12/06/99	B70603	TOTAL SVOC TICs	2240000	ppb	NA
TP-1	7-8	12/06/99	B70602	TOTAL SVOC TICs	814000	ppb	NA
TP-1	3-5	12/06/99	B70601	TOTAL SVOC TICs	625000	ppb	NA
TP-8	3	12/06/99	B70607	TOTAL SVOC TICs	153000	ppb	NA
TP-3	8-9	12/06/99	B70604	TOTAL SVOC TICs	63000	ppb	NA
TP-5	3	12/06/99	B70606	TOTAL SVOC TICs	56200	ppb	NA
TP-10	4	12/06/99	B70610	TOTAL SVOC TICs	18300	ppb	NA
TP-4	5	12/06/99	B70605	TOTAL SVOC TICs	1450	ppb	N[illegible]
MW-2	10-12	02/08/00	B70617	TOTAL SVOC TICs	1360	ppb	[illegible]

NA- Not Applicable

Table 15. Summary of Subsurface Soil Sample Results
Total Petroleum Hydrocarbons
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Depth (ft)	Sample Date	Sample Number	Compound	Concentration	Units	Standard/ Guidance	Units
MW-1	8-10	02/08/00	B70618	TOTAL PETROLEUM HYDROCARBONS	1140	ppm	NA	ppm
MW-1	8-10	02/08/00	B70619	TOTAL PETROLEUM HYDROCARBONS	336	ppm	NA	ppm
MW-1	16-18	02/09/00	B70620	TOTAL PETROLEUM HYDROCARBONS	166	ppm	NA	ppm
MW-2	6-8	02/08/00	B70616	TOTAL PETROLEUM HYDROCARBONS	474	ppm	NA	ppm
MW-2	10-12	02/08/00	B70617	TOTAL PETROLEUM HYDROCARBONS	22.3	ppm	NA	ppm

NA- Not Applicable
Samples B70618 and B70619 are field duplicate samples

Table 16. Summary of Subsurface Soil Sample Results
Volatile Organic Compounds Sorted by Depth
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Depth (ft)	Sample Date	Sample Number	Compound	Concentration	Units	Standard/ Guidance	Units	Comments
MW-2	10-12	02/08/00	B70617	METHYLENE CHLORIDE	750	ppb	100	ppb	Result is biased high due to laboratory contamination.
MW-2	10-12	02/08/00	B70617	TOTAL VOC TICs	130	ppb	NA	ppb	
TP-1	3-5	12/06/99	B70601	ACETONE	410	ppb	200	ppb	Result is invalid due to laboratory contamination.
TP-1	3-5	12/06/99	B70601	METHYLENE CHLORIDE	1300	ppb	100	ppb	Result is invalid due to laboratory contamination.
TP-1	3-5	12/06/99	B70601	TOTAL VOC TICs	109000	ppb	NA	ppb	
TP-1	7-8	12/06/99	B70602	2-BUTANONE	240	ppb	300	ppb	
TP-1	7-8	12/06/99	B70602	ACETONE	290	ppb	200	ppb	Result is invalid due to laboratory contamination.
TP-1	7-8	12/06/99	B70602	METHYLENE CHLORIDE	1400	ppb	100	ppb	Result is invalid due to laboratory contamination.
TP-1	7-8	12/06/99	B70602	TOTAL VOC TICs	133000	ppb	NA	ppb	
TP-1	7-8	12/06/99	B70602	XYLENE (total)	6300	ppb	1200	ppb	
TP-10	4	12/06/99	B70610	2-BUTANONE	22.0	ppb	300	ppb	
TP-10	4	12/06/99	B70610	ACETONE	100	ppb	200	ppb	
TP-10	4	12/06/99	B70610	METHYLENE CHLORIDE	58.0	ppb	100	ppb	Result is biased high due to laboratory contamination.
TP-10	4	12/06/99	B70610	TOTAL VOC TICs	ND	ppb	NA	ppb	
TP-2	5	12/06/99	B70603	METHYLENE CHLORIDE	86.0	ppb	100	ppb	Result is biased high due to laboratory contamination.
TP-2	5	12/06/99	B70603	TOTAL VOC TICs	ND	ppb	NA	ppb	
TP-3	8-9	12/06/99	B70604	1,1-DICHLOROETHANE	8.00	ppb	200	ppb	
TP-3	8-9	12/06/99	B70604	ACETONE	98.0	ppb	200	ppb	
TP-3	8-9	12/06/99	B70604	CARBON DISULFIDE	2.00	ppb	2700	ppb	
TP-3	8-9	12/06/99	B70604	METHYLENE CHLORIDE	49.0	ppb	100	ppb	Result is biased high due to laboratory contamination.
TP-3	8-9	12/06/99	B70604	TOLUENE	3.00	ppb	1500	ppb	
TP-3	8-9	12/06/99	B70604	TOTAL 1,2-DICHLOROETHENE	6.00	ppb	NA	ppb	
TP-3	8-9	12/06/99	B70604	TOTAL VOC TICs	237	ppb	NA	ppb	
TP-3	8-9	12/06/99	B70604	TRICHLOROETHENE	28.0	ppb	700	ppb	
TP-4	5	12/06/99	B70605	METHYLENE CHLORIDE	24.0	ppb	100	ppb	Result is biased high due to laboratory contamination.
TP-4	5	12/06/99	B70605	TOTAL VOC TICs	ND	ppb	NA	ppb	
TP-5	3	12/06/99	B70606	METHYLENE CHLORIDE	36.0	ppb	100	ppb	Result is biased high due to laboratory contamination.
TP-5	3	12/06/99	B70606	TOTAL VOC TICs	ND	ppb	NA	ppb	
TP-8	3	12/06/99	B70607	ACETONE	28.0	ppb	200	ppb	
TP-8	3	12/06/99	B70607	METHYLENE CHLORIDE	62.0	ppb	100	ppb	Result is biased high due to laboratory contamination.
TP-8	3	12/06/99	B70607	TOTAL VOC TICs	ND	ppb	NA	ppb	

ND- Not Detected
NA- Not Applicable

Table 17. Summary of Subsurface Soil Sample Results
Volatile Organic Compounds Sorted by Compound
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Depth (ft)	Sample Date	Sample Number	Compound	Concentration	Units	Standard/ Guidance	Units	Comments
TP-3	8-9	12/06/99	B70604	1,1-DICHLOROETHANE	8.00	ppb	200	ppb	
TP-1	7-8	12/06/99	B70602	2-BUTANONE	240	ppb	300	ppb	
TP-10	4	12/06/99	B70610	2-BUTANONE	22.0	ppb	300	ppb	
TP-1	3-5	12/06/99	B70601	ACETONE	410	ppb	200	ppb	Result is invalid due to laboratory contamination.
TP-1	7-8	12/06/99	B70602	ACETONE	290	ppb	200	ppb	Result is invalid due to laboratory contamination.
TP-10	4	12/06/99	B70610	ACETONE	100	ppb	200	ppb	
TP-3	8-9	12/06/99	B70604	ACETONE	98.0	ppb	200	ppb	
TP-8	3	12/06/99	B70607	ACETONE	28.0	ppb	200	ppb	
TP-3	8-9	12/06/99	B70604	CARBON DISULFIDE	2.00	ppb	2700	ppb	
TP-1	7-8	12/06/99	B70602	METHYLENE CHLORIDE	1400	ppb	100	ppb	Result is invalid due to laboratory contamination.
TP-1	3-5	12/06/99	B70601	METHYLENE CHLORIDE	1300	ppb	100	ppb	Result is invalid due to laboratory contamination.
MW-2	10-12	02/08/00	B70617	METHYLENE CHLORIDE	750	ppb	100	ppb	Result is biased high due to laboratory contamination.
TP-2	5	12/06/99	B70603	METHYLENE CHLORIDE	86.0	ppb	100	ppb	Result is biased high due to laboratory contamination.
TP-8	3	12/06/99	B70607	METHYLENE CHLORIDE	62.0	ppb	100	ppb	Result is biased high due to laboratory contamination.
TP-10	4	12/06/99	B70610	METHYLENE CHLORIDE	58.0	ppb	100	ppb	Result is biased high due to laboratory contamination.
TP-3	8-9	12/06/99	B70604	METHYLENE CHLORIDE	49.0	ppb	100	ppb	Result is biased high due to laboratory contamination.
TP-5	3	12/06/99	B70606	METHYLENE CHLORIDE	36.0	ppb	100	ppb	Result is biased high due to laboratory contamination.
TP-4	5	12/06/99	B70605	METHYLENE CHLORIDE	24.0	ppb	100	ppb	Result is biased high due to laboratory contamination.
TP-3	8-9	12/06/99	B70604	TOLUENE	3.00	ppb	1500	ppb	
TP-3	8-9	12/06/99	B70604	TOTAL 1,2-DICHLOROETHENE	6.00	ppb	NA	ppb	
TP-3	8-9	12/06/99	B70604	TRICHLOROETHENE	28.0	ppb	700	ppb	
TP-1	7-8	12/06/99	B70602	XYLENE (total)	6300	ppb	1200	ppb	
TP-10	4	12/06/99	B70610	TOTAL VOC TICs	ND	ppb	NA	ppb	
TP-2	5	12/06/99	B70603	TOTAL VOC TICs	ND	ppb	NA	ppb	
TP-4	5	12/06/99	B70605	TOTAL VOC TICs	ND	ppb	NA	ppb	
TP-5	3	12/06/99	B70606	TOTAL VOC TICs	ND	ppb	NA	ppb	
TP-8	3	12/06/99	B70607	TOTAL VOC TICs	ND	ppb	NA	ppb	
TP-1	7-8	12/06/99	B70602	TOTAL VOC TICs	133000	ppb	NA	ppb	
TP-1	3-5	12/06/99	B70601	TOTAL VOC TICs	109000	ppb	NA	ppb	
TP-3	8-9	12/06/99	B70604	TOTAL VOC TICs	237	ppb	NA	ppb	
MW-2	10-12	02/08/00	B70617	TOTAL VOC TICs	130	ppb	NA	ppb	

ND- Not Detected
NA- Not Applicable

Table 18. Summary of Subsurface Soil Sample Results
Inorganic Compounds Sorted by Depth
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Depth (ft)	Sample Date	Sample Number	Compound	Concentration	Units	Standard/Guidance
MW-1	8-10	02/08/00	B70618	ALUMINUM	6140	ppm	Background
MW-1	8-10	02/08/00	B70619	ALUMINUM	3400	ppm	Background
MW-1	8-10	02/08/00	B70618	ARSENIC	7.20	ppm	7.5 or background
MW-1	8-10	02/08/00	B70619	ARSENIC	8.80	ppm	7.5 or background
MW-1	8-10	02/08/00	B70618	BARIUM	43.9	ppm	300 or background
MW-1	8-10	02/08/00	B70619	BARIUM	59.7	ppm	300 or background
MW-1	8-10	02/08/00	B70619	BERYLLIUM	0.15	ppm	0.16 or background
MW-1	8-10	02/08/00	B70618	BERYLLIUM	0.28	ppm	0.16 or background
MW-1	8-10	02/08/00	B70619	CADMIUM	0.65	ppm	10 or background
MW-1	8-10	02/08/00	B70618	CALCIUM	1870	ppm	Background
MW-1	8-10	02/08/00	B70619	CALCIUM	4300	ppm	Background
MW-1	8-10	02/08/00	B70618	CHROMIUM	11.5	ppm	50 or background
MW-1	8-10	02/08/00	B70619	CHROMIUM	19.9	ppm	50 or background
MW-1	8-10	02/08/00	B70618	COBALT	4.60	ppm	30 or background
MW-1	8-10	02/08/00	B70619	COBALT	10.9	ppm	30 or background
MW-1	8-10	02/08/00	B70619	COPPER	113	ppm	25 or background
MW-1	8-10	02/08/00	B70618	COPPER	17.2	ppm	25 or background
MW-1	8-10	02/08/00	B70619	IRON	3400	ppm	2000 or background
MW-1	8-10	02/08/00	B70618	IRON	15900	ppm	2000 or background
MW-1	8-10	02/08/00	B70618	LEAD	12.1	ppm	Background
MW-1	8-10	02/08/00	B70619	LEAD	21.8	ppm	Background
MW-1	8-10	02/08/00	B70619	MAGNESIUM	396	ppm	Background
MW-1	8-10	02/08/00	B70618	MAGNESIUM	2130	ppm	Background
MW-1	8-10	02/08/00	B70618	MANGANESE	85.4	ppm	Background
MW-1	8-10	02/08/00	B70619	MANGANESE	20.4	ppm	Background
MW-1	8-10	02/08/00	B70618	MERCURY	0.09	ppm	0.1
MW-1	8-10	02/08/00	B70619	NICKEL	23.2	ppm	13 or background
MW-1	8-10	02/08/00	B70618	NICKEL	14.5	ppm	13 or background
MW-1	8-10	02/08/00	B70618	POTASSIUM	473	ppm	Background
MW-1	8-10	02/08/00	B70619	POTASSIUM	1000	ppm	Background
MW-1	8-10	02/08/00	B70619	SELENIUM	2.00	ppm	2 or background
MW-1	8-10	02/08/00	B70618	SODIUM	52.3	ppm	Background
MW-1	8-10	02/08/00	B70619	SODIUM	83.6	ppm	Background
MW-1	8-10	02/08/00	B70619	VANADIUM	32.0	ppm	150 or background
MW-1	8-10	02/08/00	B70618	VANADIUM	14.3	ppm	150 or background
MW-1	8-10	02/08/00	B70619	ZINC	62.4	ppm	20 or background
MW-1	8-10	02/08/00	B70618	ZINC	62.9	ppm	20 or background
MW-2	6-8	02/08/00	B70616	ALUMINUM	8100	ppm	Background
MW-2	6-8	02/08/00	B70616	ARSENIC	4.70	ppm	7.5 or background
MW-2	6-8	02/08/00	B70616	BARIUM	47.0	ppm	300 or background
MW-2	6-8	02/08/00	B70616	BERYLLIUM	0.46	ppm	0.16 or background
MW-2	6-8	02/08/00	B70616	CALCIUM	1280	ppm	Background
MW-2	6-8	02/08/00	B70616	CHROMIUM	11.5	ppm	50 or background
MW-2	6-8	02/08/00	B70616	COBALT	7.60	ppm	30 or background
MW-2	6-8	02/08/00	B70616	COPPER	13.7	ppm	25 or background
MW-2	6-8	02/08/00	B70616	IRON	18100	ppm	2000 or background
MW-2	6-8	02/08/00	B70616	LEAD	9.60	ppm	Background
MW-2	6-8	02/08/00	B70616	MAGNESIUM	2640	ppm	Background
MW-2	6-8	02/08/00	B70616	MANGANESE	222	ppm	Background
MW-2	6-8	02/08/00	B70616	NICKEL	20.0	ppm	13 or background
MW-2	6-8	02/08/00	B70616	POTASSIUM	865	ppm	Background
MW-2	6-8	02/08/00	B70616	SELENIUM	1.50	ppm	2 or background
MW-2	6-8	02/08/00	B70616	SODIUM	97.7	ppm	Background
MW-2	6-8	02/08/00	B70616	VANADIUM	13.9	ppm	150 or background

Table 18. Summary of Subsurface Soil Sample Results
Inorganic Compounds Sorted by Depth
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Depth (ft)	Sample Date	Sample Number	Compound	Concentration	Units	Standard/Guidance
MW-2	6-8	02/08/00	B70616	ZINC	47.5	ppm	20 or background
TP-1	3-5	12/06/99	B70601	ALUMINUM	6340	ppm	Background
TP-1	3-5	12/06/99	B70601	ARSENIC	9.00	ppm	7.5 or background
TP-1	3-5	12/06/99	B70601	BARIUM	89.5	ppm	300 or background
TP-1	3-5	12/06/99	B70601	BERYLLIUM	0.54	ppm	0.16 or background
TP-1	3-5	12/06/99	B70601	CALCIUM	3150	ppm	Background
TP-1	3-5	12/06/99	B70601	CHROMIUM	9.40	ppm	50 or background
TP-1	3-5	12/06/99	B70601	COBALT	5.80	ppm	30 or background
TP-1	3-5	12/06/99	B70601	COPPER	28.0	ppm	25 or background
TP-1	3-5	12/06/99	B70601	IRON	19300	ppm	2000 or background
TP-1	3-5	12/06/99	B70601	LEAD	29.8	ppm	Background
TP-1	3-5	12/06/99	B70601	MAGNESIUM	2250	ppm	Background
TP-1	3-5	12/06/99	B70601	MANGANESE	108	ppm	Background
TP-1	3-5	12/06/99	B70601	MERCURY	4.00	ppm	*0.1*
TP-1	3-5	12/06/99	B70601	NICKEL	14.9	ppm	13 or background
TP-1	3-5	12/06/99	B70601	POTASSIUM	930	ppm	Background
TP-1	3-5	12/06/99	B70601	SELENIUM	1.30	ppm	2 or background
TP-1	3-5	12/06/99	B70601	SODIUM	75.4	ppm	Background
TP-1	3-5	12/06/99	B70601	VANADIUM	16.2	ppm	150 or background
TP-1	3-5	12/06/99	B70601	ZINC	139	ppm	20 or background
TP-1	7-8	12/06/99	B70602	ALUMINUM	9120	ppm	Background
TP-1	7-8	12/06/99	B70602	ARSENIC	10.4	ppm	7.5 or background
TP-1	7-8	12/06/99	B70602	BARIUM	29.0	ppm	300 or background
TP-1	7-8	12/06/99	B70602	BERYLLIUM	0.52	ppm	0.16 or background
TP-1	7-8	12/06/99	B70602	CADMIUM	0.56	ppm	10 or background
TP-1	7-8	12/06/99	B70602	CALCIUM	1850	ppm	Background
TP-1	7-8	12/06/99	B70602	CHROMIUM	9.80	ppm	50 or background
TP-1	7-8	12/06/99	B70602	COBALT	5.40	ppm	30 or background
TP-1	7-8	12/06/99	B70602	COPPER	143	ppm	25 or background
TP-1	7-8	12/06/99	B70602	IRON	17700	ppm	2000 or background
TP-1	7-8	12/06/99	B70602	LEAD	9.10	ppm	Background
TP-1	7-8	12/06/99	B70602	MAGNESIUM	2410	ppm	Background
TP-1	7-8	12/06/99	B70602	MANGANESE	87.3	ppm	Background
TP-1	7-8	12/06/99	B70602	NICKEL	17.3	ppm	13 or background
TP-1	7-8	12/06/99	B70602	POTASSIUM	1040	ppm	Background
TP-1	7-8	12/06/99	B70602	SELENIUM	1.60	ppm	2 or background
TP-1	7-8	12/06/99	B70602	SODIUM	67.7	ppm	Background
TP-1	7-8	12/06/99	B70602	VANADIUM	15.7	ppm	150 or background
TP-1	7-8	12/06/99	B70602	ZINC	160	ppm	20 or background
TP-10	4	12/06/99	B70610	ALUMINUM	4400	ppm	Background
TP-10	4	12/06/99	B70610	ANTIMONY	5.70	ppm	Background
TP-10	4	12/06/99	B70610	ARSENIC	12.2	ppm	7.5 or background
TP-10	4	12/06/99	B70610	BARIUM	75.0	ppm	300 or background
TP-10	4	12/06/99	B70610	BERYLLIUM	0.46	ppm	0.16 or background
TP-10	4	12/06/99	B70610	CADMIUM	0.34	ppm	10 or background
TP-10	4	12/06/99	B70610	CALCIUM	31400	ppm	Background
TP-10	4	12/06/99	B70610	CHROMIUM	9.90	ppm	50 or background
TP-10	4	12/06/99	B70610	COBALT	5.90	ppm	30 or background
TP-10	4	12/06/99	B70610	COPPER	132	ppm	25 or background
TP-10	4	12/06/99	B70610	IRON	11400	ppm	2000 or background
TP-10	4	12/06/99	B70610	LEAD	473	ppm	Background
TP-10	4	12/06/99	B70610	MAGNESIUM	17900	ppm	Background
TP-10	4	12/06/99	B70610	MANGANESE	255	ppm	Background
TP-10	4	12/06/99	B70610	MERCURY	1.50	ppm	0.1

Table 18. Summary of Subsurface Soil Sample Results
Inorganic Compounds Sorted by Depth
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Depth (ft)	Sample Date	Sample Number	Compound	Concentration	Units	Standard/Guidance
TP-10	4	12/06/99	B70610	NICKEL	14.7	ppm	13 or background
TP-10	4	12/06/99	B70610	POTASSIUM	491	ppm	Background
TP-10	4	12/06/99	B70610	SELENIUM	3.50	ppm	2 or background
TP-10	4	12/06/99	B70610	SODIUM	331	ppm	Background
TP-10	4	12/06/99	B70610	VANADIUM	20.2	ppm	150 or background
TP-10	4	12/06/99	B70610	ZINC	128	ppm	20 or background
TP-2	5	12/06/99	B70603	ALUMINUM	20100	ppm	Background
TP-2	5	12/06/99	B70603	ARSENIC	16.1	ppm	7.5 or background
TP-2	5	12/06/99	B70603	BARIUM	828	ppm	300 or background
TP-2	5	12/06/99	B70603	BERYLLIUM	2.20	ppm	0.16 or background
TP-2	5	12/06/99	B70603	CADMIUM	2.40	ppm	10 or background
TP-2	5	12/06/99	B70603	CALCIUM	85100	ppm	Background
TP-2	5	12/06/99	B70603	CHROMIUM	47.9	ppm	50 or background
TP-2	5	12/06/99	B70603	COBALT	4.10	ppm	30 or background
TP-2	5	12/06/99	B70603	COPPER	45.8	ppm	25 or background
TP-2	5	12/06/99	B70603	IRON	20200	ppm	2000 or background
TP-2	5	12/06/99	B70603	LEAD	467	ppm	Background
TP-2	5	12/06/99	B70603	MAGNESIUM	35800	ppm	Background
TP-2	5	12/06/99	B70603	MANGANESE	3480	ppm	Background
TP-2	5	12/06/99	B70603	MERCURY	1.00	ppm	0.1
TP-2	5	12/06/99	B70603	NICKEL	35.6	ppm	13 or background
TP-2	5	12/06/99	B70603	POTASSIUM	2540	ppm	Background
TP-2	5	12/06/99	B70603	SELENIUM	2.60	ppm	2 or backgroun
TP-2	5	12/06/99	B70603	SILVER	0.24	ppm	Background
TP-2	5	12/06/99	B70603	SODIUM	714	ppm	Background
TP-2	5	12/06/99	B70603	VANADIUM	23.2	ppm	150 or background
TP-2	5	12/06/99	B70603	ZINC	663	ppm	20 or background
TP-3	8-9	12/06/99	B70604	ALUMINUM	7560	ppm	Background
TP-3	8-9	12/06/99	B70604	ARSENIC	4.70	ppm	7.5 or background
TP-3	8-9	12/06/99	B70604	BARIUM	86.1	ppm	300 or background
TP-3	8-9	12/06/99	B70604	BERYLLIUM	0.42	ppm	0.16 or background
TP-3	8-9	12/06/99	B70604	CADMIUM	0.47	ppm	10 or background
TP-3	8-9	12/06/99	B70604	CALCIUM	15400	ppm	Background
TP-3	8-9	12/06/99	B70604	CHROMIUM	11.1	ppm	50 or background
TP-3	8-9	12/06/99	B70604	COBALT	5.50	ppm	30 or background
TP-3	8-9	12/06/99	B70604	COPPER	21.8	ppm	25 or background
TP-3	8-9	12/06/99	B70604	CYANIDE	1.10	ppm	Site specific
TP-3	8-9	12/06/99	B70604	IRON	16700	ppm	2000 or background
TP-3	8-9	12/06/99	B70604	LEAD	47.2	ppm	Background
TP-3	8-9	12/06/99	B70604	MAGNESIUM	5900	ppm	Background
TP-3	8-9	12/06/99	B70604	MANGANESE	346	ppm	Background
TP-3	8-9	12/06/99	B70604	MERCURY	0.12	ppm	0.1
TP-3	8-9	12/06/99	B70604	NICKEL	14.0	ppm	13 or background
TP-3	8-9	12/06/99	B70604	POTASSIUM	1020	ppm	Background
TP-3	8-9	12/06/99	B70604	SELENIUM	1.30	ppm	2 or background
TP-3	8-9	12/06/99	B70604	SODIUM	88.5	ppm	Background
TP-3	8-9	12/06/99	B70604	VANADIUM	15.5	ppm	150 or background
TP-3	8-9	12/06/99	B70604	ZINC	196	ppm	20 or backgrou
TP-4	5	12/06/99	B70605	ALUMINUM	12000	ppm	Backgrou
TP-4	5	12/06/99	B70605	ARSENIC	5.30	ppm	7.5 or background
TP-4	5	12/06/99	B70605	BARIUM	98.8	ppm	300 or background
TP-4	5	12/06/99	B70605	BERYLLIUM	0.69	ppm	0.16 or background
TP-4	5	12/06/99	B70605	CADMIUM	0.31	ppm	10 or background
TP-4	5	12/06/99	B70605	CALCIUM	3880	ppm	Background

Table 18. Summary of Subsurface Soil Sample Results
Inorganic Compounds Sorted by Depth
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Depth (ft)	Sample Date	Sample Number	Compound	Concentration	Units	Standard/Guidance
TP-4	5	12/06/99	B70605	CHROMIUM	16.3	ppm	50 or background
TP-4	5	12/06/99	B70605	COBALT	11.5	ppm	30 or background
TP-4	5	12/06/99	B70605	COPPER	13.5	ppm	25 or background
TP-4	5	12/06/99	B70605	IRON	23900	ppm	2000 or background
TP-4	5	12/06/99	B70605	LEAD	14.8	ppm	Background
TP-4	5	12/06/99	B70605	MAGNESIUM	3790	ppm	Background
TP-4	5	12/06/99	B70605	MANGANESE	780	ppm	Background
TP-4	5	12/06/99	B70605	MERCURY	0.03	ppm	0.1
TP-4	5	12/06/99	B70605	NICKEL	22.8	ppm	13 or background
TP-4	5	12/06/99	B70605	POTASSIUM	1170	ppm	Background
TP-4	5	12/06/99	B70605	SELENIUM	0.99	ppm	2 or background
TP-4	5	12/06/99	B70605	SODIUM	56.5	ppm	Background
TP-4	5	12/06/99	B70605	VANADIUM	20.1	ppm	150 or background
TP-4	5	12/06/99	B70605	ZINC	79.4	ppm	20 or background
TP-5	3	12/06/99	B70606	ALUMINUM	22200	ppm	Background
TP-5	3	12/06/99	B70606	ARSENIC	37.7	ppm	7.5 or background
TP-5	3	12/06/99	B70606	BARIUM	41.6	ppm	300 or background
TP-5	3	12/06/99	B70606	BERYLLIUM	0.81	ppm	0.16 or background
TP-5	3	12/06/99	B70606	CADMIUM	1.10	ppm	10 or background
TP-5	3	12/06/99	B70606	CALCIUM	39400	ppm	Background
TP-5	3	12/06/99	B70606	CHROMIUM	49.5	ppm	50 or background
TP-5	3	12/06/99	B70606	COBALT	2.70	ppm	30 or background
TP-5	3	12/06/99	B70606	COPPER	8.10	ppm	25 or background
TP-5	3	12/06/99	B70606	IRON	14200	ppm	2000 or background
TP-5	3	12/06/99	B70606	LEAD	25.9	ppm	Background
TP-5	3	12/06/99	B70606	MAGNESIUM	29900	ppm	Background
TP-5	3	12/06/99	B70606	MANGANESE	100	ppm	Background
TP-5	3	12/06/99	B70606	NICKEL	16.0	ppm	13 or background
TP-5	3	12/06/99	B70606	POTASSIUM	3400	ppm	Background
TP-5	3	12/06/99	B70606	SODIUM	824	ppm	Background
TP-5	3	12/06/99	B70606	VANADIUM	52.6	ppm	150 or background
TP-5	3	12/06/99	B70606	ZINC	54.7	ppm	20 or background
TP-8	3	12/06/99	B70607	ALUMINUM	21400	ppm	Background
TP-8	3	12/06/99	B70607	ARSENIC	113	ppm	7.5 or background
TP-8	3	12/06/99	B70607	BARIUM	28.5	ppm	300 or background
TP-8	3	12/06/99	B70607	BERYLLIUM	1.20	ppm	0.16 or background
TP-8	3	12/06/99	B70607	CADMIUM	1.10	ppm	10 or background
TP-8	3	12/06/99	B70607	CALCIUM	14300	ppm	Background
TP-8	3	12/06/99	B70607	CHROMIUM	59.3	ppm	50 or background
TP-8	3	12/06/99	B70607	COBALT	10.0	ppm	30 or background
TP-8	3	12/06/99	B70607	COPPER	58.5	ppm	25 or background
TP-8	3	12/06/99	B70607	IRON	65500	ppm	2000 or background
TP-8	3	12/06/99	B70607	LEAD	44.0	ppm	Background
TP-8	3	12/06/99	B70607	MAGNESIUM	21200	ppm	Background
TP-8	3	12/06/99	B70607	MANGANESE	1190	ppm	Background
TP-8	3	12/06/99	B70607	MERCURY	0.05	ppm	0.1
TP-8	3	12/06/99	B70607	NICKEL	23.7	ppm	13 or background
TP-8	3	12/06/99	B70607	POTASSIUM	2670	ppm	Background
TP-8	3	12/06/99	B70607	SELENIUM	2.70	ppm	2 or background
TP-8	3	12/06/99	B70607	SODIUM	554	ppm	Background
TP-8	3	12/06/99	B70607	VANADIUM	60.3	ppm	150 or background
TP-8	3	12/06/99	B70607	ZINC	115	ppm	20 or background

Samples B70618 and B70619 are field duplicate samples

Table 19. Summary of Subsurface Soil Sample Results
Inorganic Compounds Sorted by Compound
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Depth (ft)	Sample Date	Sample Number	Compound	Concentration	Units	Standard/Guidance	Units
TP-5	3	12/06/99	B70606	ALUMINUM	22200	ppm	Background	ppm
TP-8	3	12/06/99	B70607	ALUMINUM	21400	ppm	Background	ppm
TP-2	5	12/06/99	B70603	ALUMINUM	20100	ppm	Background	ppm
TP-4	5	12/06/99	B70605	ALUMINUM	12000	ppm	Background	ppm
TP-1	7-8	12/06/99	B70602	ALUMINUM	9120	ppm	Background	ppm
MW-2	6-8	02/08/00	B70616	ALUMINUM	8100	ppm	Background	ppm
TP-3	8-9	12/06/99	B70604	ALUMINUM	7560	ppm	Background	ppm
TP-1	3-5	12/06/99	B70601	ALUMINUM	6340	ppm	Background	ppm
MW-1	8-10	02/08/00	B70618	ALUMINUM	6140	ppm	Background	ppm
TP-10	4	12/06/99	B70610	ALUMINUM	4400	ppm	Background	ppm
MW-1	8-10	02/08/00	B70619	ALUMINUM	3400	ppm	Background	ppm
TP-10	4	12/06/99	B70610	ANTIMONY	5.70	ppm	Background	ppm
TP-8	3	12/06/99	B70607	ARSENIC	113	ppm	7.5 or background	ppm
TP-5	3	12/06/99	B70606	ARSENIC	37.7	ppm	7.5 or background	ppm
TP-2	5	12/06/99	B70603	ARSENIC	16.1	ppm	7.5 or background	ppm
TP-10	4	12/06/99	B70610	ARSENIC	12.2	ppm	7.5 or background	ppm
TP-1	7-8	12/06/99	B70602	ARSENIC	10.4	ppm	7.5 or background	ppm
TP-1	3-5	12/06/99	B70601	ARSENIC	9.00	ppm	7.5 or background	ppm
MW-1	8-10	02/08/00	B70619	ARSENIC	8.80	ppm	7.5 or background	ppm
MW-1	8-10	02/08/00	B70618	ARSENIC	7.20	ppm	7.5 or background	ppm
TP-4	5	12/06/99	B70605	ARSENIC	5.30	ppm	7.5 or background	ppm
MW-2	6-8	02/08/00	B70616	ARSENIC	4.70	ppm	7.5 or background	ppm
TP-3	8-9	12/06/99	B70604	ARSENIC	4.70	ppm	7.5 or background	ppm
TP-2	5	12/06/99	B70603	BARIUM	828	ppm	300 or background	ppm
TP-4	5	12/06/99	B70605	BARIUM	98.8	ppm	300 or background	ppm
TP-1	3-5	12/06/99	B70601	BARIUM	89.5	ppm	300 or background	ppm
TP-3	8-9	12/06/99	B70604	BARIUM	86.1	ppm	300 or background	ppm
TP-10	4	12/06/99	B70610	BARIUM	75.0	ppm	300 or background	ppm
MW-1	8-10	02/08/00	B70619	BARIUM	59.7	ppm	300 or background	ppm
MW-2	6-8	02/08/00	B70616	BARIUM	47.0	ppm	300 or background	ppm
MW-1	8-10	02/08/00	B70618	BARIUM	43.9	ppm	300 or background	ppm
TP-5	3	12/06/99	B70606	BARIUM	41.6	ppm	300 or background	ppm
TP-1	7-8	12/06/99	B70602	BARIUM	29.0	ppm	300 or background	ppm
TP-8	3	12/06/99	B70607	BARIUM	28.5	ppm	300 or background	ppm
TP-2	5	12/06/99	B70603	BERYLLIUM	2.20	ppm	0.16 or background	ppm
TP-8	3	12/06/99	B70607	BERYLLIUM	1.20	ppm	0.16 or background	ppm
TP-5	3	12/06/99	B70606	BERYLLIUM	0.81	ppm	0.16 or background	ppm
TP-4	5	12/06/99	B70605	BERYLLIUM	0.69	ppm	0.16 or background	ppm
TP-1	3-5	12/06/99	B70601	BERYLLIUM	0.54	ppm	0.16 or background	ppm
TP-1	7-8	12/06/99	B70602	BERYLLIUM	0.52	ppm	0.16 or background	ppm
MW-2	6-8	02/08/00	B70616	BERYLLIUM	0.46	ppm	0.16 or background	ppm
TP-10	4	12/06/99	B70610	BERYLLIUM	0.46	ppm	0.16 or background	ppm
TP-3	8-9	12/06/99	B70604	BERYLLIUM	0.42	ppm	0.16 or background	ppm
MW-1	8-10	02/08/00	B70618	BERYLLIUM	0.28	ppm	0.16 or background	ppm
MW-1	8-10	02/08/00	B70619	BERYLLIUM	0.15	ppm	0.16 or background	ppm
TP-2	5	12/06/99	B70603	CADMIUM	2.40	ppm	10 or background	ppm
TP-5	3	12/06/99	B70606	CADMIUM	1.10	ppm	10 or background	ppm
TP-8	3	12/06/99	B70607	CADMIUM	1.10	ppm	10 or background	ppm
MW-1	8-10	02/08/00	B70619	CADMIUM	0.65	ppm	10 or background	ppm
TP-1	7-8	12/06/99	B70602	CADMIUM	0.56	ppm	10 or background	ppm
TP-3	8-9	12/06/99	B70604	CADMIUM	0.47	ppm	10 or background	ppm
TP-10	4	12/06/99	B70610	CADMIUM	0.34	ppm	10 or background	ppm
TP-4	5	12/06/99	B70605	CADMIUM	0.31	ppm	10 or background	ppm
TP-2	5	12/06/99	B70603	CALCIUM	85100	ppm	Background	ppm
TP-5	3	12/06/99	B70606	CALCIUM	39400	ppm	Background	ppm
TP-10	4	12/06/99	B70610	CALCIUM	31400	ppm	Background	ppm
TP-3	8-9	12/06/99	B70604	CALCIUM	15400	ppm	Background	ppm

Table 19. Summary of Subsurface Soil Sample Results
Inorganic Compounds Sorted by Compound
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Depth (ft)	Sample Date	Sample Number	Compound	Concentration	Units	Standard/Guidance	Units
TP-8	3	12/06/99	B70607	CALCIUM	14300	ppm	Background	ppm
MW-1	8-10	02/08/00	B70619	CALCIUM	4300	ppm	Background	ppm
TP-4	5	12/06/99	B70605	CALCIUM	3880	ppm	Background	ppm
TP-1	3-5	12/06/99	B70601	CALCIUM	3150	ppm	Background	ppm
MW-1	8-10	02/08/00	B70618	CALCIUM	1870	ppm	Background	ppm
TP-1	7-8	12/06/99	B70602	CALCIUM	1850	ppm	Background	ppm
MW-2	6-8	02/08/00	B70616	CALCIUM	1280	ppm	Background	ppm
TP-8	3	12/06/99	B70607	CHROMIUM	59.3	ppm	50 or background	ppm
TP-5	3	12/06/99	B70606	CHROMIUM	49.5	ppm	50 or background	ppm
TP-2	5	12/06/99	B70603	CHROMIUM	47.9	ppm	50 or background	ppm
MW-1	8-10	02/08/00	B70619	CHROMIUM	19.9	ppm	50 or background	ppm
TP-4	5	12/06/99	B70605	CHROMIUM	16.3	ppm	50 or background	ppm
MW-1	8-10	02/08/00	B70618	CHROMIUM	11.5	ppm	50 or background	ppm
MW-2	6-8	02/08/00	B70616	CHROMIUM	11.5	ppm	50 or background	ppm
TP-3	8-9	12/06/99	B70604	CHROMIUM	11.1	ppm	50 or background	ppm
TP-10	4	12/06/99	B70610	CHROMIUM	9.90	ppm	50 or background	ppm
TP-1	7-8	12/06/99	B70602	CHROMIUM	9.80	ppm	50 or background	ppm
TP-1	3-5	12/06/99	B70601	CHROMIUM	9.40	ppm	50 or background	ppm
TP-4	5	12/06/99	B70605	COBALT	11.5	ppm	30 or background	ppm
MW-1	8-10	02/08/00	B70619	COBALT	10.9	ppm	30 or background	ppm
TP-8	3	12/06/99	B70607	COBALT	10.0	ppm	30 or background	ppm
MW-2	6-8	02/08/00	B70616	COBALT	7.60	ppm	30 or background	ppm
TP-10	4	12/06/99	B70610	COBALT	5.90	ppm	30 or background	ppm
TP-1	3-5	12/06/99	B70601	COBALT	5.80	ppm	30 or background	ppm
TP-3	8-9	12/06/99	B70604	COBALT	5.50	ppm	30 or background	ppm
TP-1	7-8	12/06/99	B70602	COBALT	5.40	ppm	30 or background	ppm
MW-1	8-10	02/08/00	B70618	COBALT	4.60	ppm	30 or background	ppm
TP-2	5	12/06/99	B70603	COBALT	4.10	ppm	30 or background	ppm
TP-5	3	12/06/99	B70606	COBALT	2.70	ppm	30 or background	ppm
TP-1	7-8	12/06/99	B70602	COPPER	143	ppm	25 or background	ppm
TP-10	4	12/06/99	B70610	COPPER	132	ppm	25 or background	ppm
TP-8	3	12/06/99	B70607	COPPER	58.5	ppm	25 or background	ppm
MW-1	8-10	02/08/00	B70619	COPPER	113	ppm	25 or background	ppm
TP-2	5	12/06/99	B70603	COPPER	45.8	ppm	25 or background	ppm
TP-1	3-5	12/06/99	B70601	COPPER	28.0	ppm	25 or background	ppm
TP-3	8-9	12/06/99	B70604	COPPER	21.8	ppm	25 or background	ppm
MW-1	8-10	02/08/00	B70618	COPPER	17.2	ppm	25 or background	ppm
MW-2	6-8	02/08/00	B70616	COPPER	13.7	ppm	25 or background	ppm
TP-4	5	12/06/99	B70605	COPPER	13.5	ppm	25 or background	ppm
TP-5	3	12/06/99	B70606	COPPER	8.10	ppm	25 or background	ppm
TP-3	8-9	12/06/99	B70604	CYANIDE	1.10	ppm	Site specific	ppm
TP-8	3	12/06/99	B70607	IRON	65500	ppm	2000 or background	ppm
TP-4	5	12/06/99	B70605	IRON	23900	ppm	2000 or background	ppm
TP-2	5	12/06/99	B70603	IRON	20200	ppm	2000 or background	ppm
TP-1	3-5	12/06/99	B70601	IRON	19300	ppm	2000 or background	ppm
MW-2	6-8	02/08/00	B70616	IRON	18100	ppm	2000 or background	ppm
TP-1	7-8	12/06/99	B70602	IRON	17700	ppm	2000 or background	ppm
TP-3	8-9	12/06/99	B70604	IRON	16700	ppm	2000 or background	ppm
MW-1	8-10	02/08/00	B70618	IRON	15900	ppm	2000 or background	ppm
TP-5	3	12/06/99	B70606	IRON	14200	ppm	2000 or background	ppm
TP-10	4	12/06/99	B70610	IRON	11400	ppm	2000 or background	ppm
MW-1	8-10	02/08/00	B70619	IRON	3400	ppm	2000 or background	ppm
TP-10	4	12/06/99	B70610	LEAD	473	ppm	Background	ppm
TP-2	5	12/06/99	B70603	LEAD	467	ppm	Background	ppm
TP-3	8-9	12/06/99	B70604	LEAD	47.2	ppm	Background	ppm
TP-8	3	12/06/99	B70607	LEAD	44.0	ppm	Background	ppm
TP-1	3-5	12/06/99	B70601	LEAD	29.8	ppm	Background	ppm

Table 19. Summary of Subsurface Soil Sample Results
Inorganic Compounds Sorted by Compound
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Depth (ft)	Sample Date	Sample Number	Compound	Concentration	Units	Standard/Guidance	Units
TP-5	3	12/06/99	B70606	LEAD	25.9	ppm	Background	ppm
MW-1	8-10	02/08/00	B70619	LEAD	21.8	ppm	Background	ppm
TP-4	5	12/06/99	B70605	LEAD	14.8	ppm	Background	ppm
MW-1	8-10	02/08/00	B70618	LEAD	12.1	ppm	Background	ppm
MW-2	6-8	02/08/00	B70616	LEAD	9.60	ppm	Background	ppm
TP-1	7-8	12/06/99	B70602	LEAD	9.10	ppm	Background	ppm
TP-2	5	12/06/99	B70603	MAGNESIUM	35800	ppm	Background	ppm
TP-5	3	12/06/99	B70606	MAGNESIUM	29900	ppm	Background	ppm
TP-8	3	12/06/99	B70607	MAGNESIUM	21200	ppm	Background	ppm
TP-10	4	12/06/99	B70610	MAGNESIUM	17900	ppm	Background	ppm
TP-3	8-9	12/06/99	B70604	MAGNESIUM	5900	ppm	Background	ppm
TP-4	5	12/06/99	B70605	MAGNESIUM	3790	ppm	Background	ppm
MW-2	6-8	02/08/00	B70616	MAGNESIUM	2640	ppm	Background	ppm
TP-1	7-8	12/06/99	B70602	MAGNESIUM	2410	ppm	Background	ppm
TP-1	3-5	12/06/99	B70601	MAGNESIUM	2250	ppm	Background	ppm
MW-1	8-10	02/08/00	B70618	MAGNESIUM	2130	ppm	Background	ppm
MW-1	8-10	02/08/00	B70619	MAGNESIUM	396	ppm	Background	ppm
TP-2	5	12/06/99	B70603	MANGANESE	3480	ppm	Background	ppm
TP-8	3	12/06/99	B70607	MANGANESE	1190	ppm	Background	ppm
TP-4	5	12/06/99	B70605	MANGANESE	780	ppm	Background	ppm
TP-3	8-9	12/06/99	B70604	MANGANESE	346	ppm	Background	ppm
TP-10	4	12/06/99	B70610	MANGANESE	255	ppm	Background	ppm
MW-2	6-8	02/08/00	B70616	MANGANESE	222	ppm	Background	ppm
TP-1	3-5	12/06/99	B70601	MANGANESE	108	ppm	Background	ppm
TP-5	3	12/06/99	B70606	MANGANESE	100	ppm	Background	ppm
TP-1	7-8	12/06/99	B70602	MANGANESE	87.3	ppm	Background	ppm
MW-1	8-10	02/08/00	B70618	MANGANESE	85.4	ppm	Background	ppm
MW-1	8-10	02/08/00	B70619	MANGANESE	20.4	ppm	Background	ppm
TP-1	3-5	12/06/99	B70601	MERCURY	4.00	ppm	0.1	ppm
TP-10	4	12/06/99	B70610	MERCURY	1.50	ppm	0.1	ppm
TP-2	5	12/06/99	B70603	MERCURY	1.00	ppm	0.1	ppm
TP-3	8-9	12/06/99	B70604	MERCURY	0.12	ppm	0.1	ppm
MW-1	8-10	02/08/00	B70618	MERCURY	0.09	ppm	0.1	ppm
TP-8	3	12/06/99	B70607	MERCURY	0.05	ppm	0.1	ppm
TP-4	5	12/06/99	B70605	MERCURY	0.03	ppm	0.1	ppm
TP-2	5	12/06/99	B70603	NICKEL	35.6	ppm	13 or background	ppm
TP-8	3	12/06/99	B70607	NICKEL	23.7	ppm	13 or background	ppm
MW-1	8-10	02/08/00	B70619	NICKEL	23.2	ppm	13 or background	ppm
TP-4	5	12/06/99	B70605	NICKEL	22.8	ppm	13 or background	ppm
MW-2	6-8	02/08/00	B70616	NICKEL	20.0	ppm	13 or background	ppm
TP-1	7-8	12/06/99	B70602	NICKEL	17.3	ppm	13 or background	ppm
TP-5	3	12/06/99	B70606	NICKEL	16.0	ppm	13 or background	ppm
TP-1	3-5	12/06/99	B70601	NICKEL	14.9	ppm	13 or background	ppm
TP-10	4	12/06/99	B70610	NICKEL	14.7	ppm	13 or background	ppm
MW-1	8-10	02/08/00	B70618	NICKEL	14.5	ppm	13 or background	ppm
TP-3	8-9	12/06/99	B70604	NICKEL	14.0	ppm	13 or background	ppm
TP-5	3	12/06/99	B70606	POTASSIUM	3400	ppm	Background	ppm
TP-8	3	12/06/99	B70607	POTASSIUM	2670	ppm	Background	ppm
TP-2	5	12/06/99	B70603	POTASSIUM	2540	ppm	Background	ppm
TP-4	5	12/06/99	B70605	POTASSIUM	1170	ppm	Background	ppm
TP-1	7-8	12/06/99	B70602	POTASSIUM	1040	ppm	Background	ppm
TP-3	8-9	12/06/99	B70604	POTASSIUM	1020	ppm	Background	ppm
MW-1	8-10	02/08/00	B70619	POTASSIUM	1000	ppm	Background	ppm
TP-1	3-5	12/06/99	B70601	POTASSIUM	930	ppm	Background	ppm
MW-2	6-8	02/08/00	B70616	POTASSIUM	865	ppm	Background	ppm
TP-10	4	12/06/99	B70610	POTASSIUM	491	ppm	Background	ppm
MW-1	8-10	02/08/00	B70618	POTASSIUM	473	ppm	Background	ppm

Table 19. Summary of Subsurface Soil Sample Results
Inorganic Compounds Sorted by Compound
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Depth (ft)	Sample Date	Sample Number	Compound	Concentration	Units	Standard/Guidance	Units
TP-10	4	12/06/99	B70610	SELENIUM	3.50	ppm	2 or background	ppm
TP-8	3	12/06/99	B70607	SELENIUM	2.70	ppm	2 or background	ppm
TP-2	5	12/06/99	B70603	SELENIUM	2.60	ppm	2 or background	ppm
MW-1	8-10	02/08/00	B70619	SELENIUM	2.00	ppm	2 or background	ppm
TP-1	7-8	12/06/99	B70602	SELENIUM	1.60	ppm	2 or background	ppm
MW-2	6-8	02/08/00	B70616	SELENIUM	1.50	ppm	2 or background	ppm
TP-1	3-5	12/06/99	B70601	SELENIUM	1.30	ppm	2 or background	ppm
TP-3	8-9	12/06/99	B70604	SELENIUM	1.30	ppm	2 or background	ppm
TP-4	5	12/06/99	B70605	SELENIUM	0.99	ppm	2 or background	ppm
TP-2	5	12/06/99	B70603	SILVER	0.24	ppm	Background	ppm
TP-5	3	12/06/99	B70606	SODIUM	824	ppm	Background	ppm
TP-2	5	12/06/99	B70603	SODIUM	714	ppm	Background	ppm
TP-8	3	12/06/99	B70607	SODIUM	554	ppm	Background	ppm
TP-10	4	12/06/99	B70610	SODIUM	331	ppm	Background	ppm
MW-2	6-8	02/08/00	B70616	SODIUM	97.7	ppm	Background	ppm
TP-3	8-9	12/06/99	B70604	SODIUM	88.5	ppm	Background	ppm
MW-1	8-10	02/08/00	B70619	SODIUM	83.6	ppm	Background	ppm
TP-1	3-5	12/06/99	B70601	SODIUM	75.4	ppm	Background	ppm
TP-1	7-8	12/06/99	B70602	SODIUM	67.7	ppm	Background	ppm
TP-4	5	12/06/99	B70605	SODIUM	56.5	ppm	Background	ppm
MW-1	8-10	02/08/00	B70618	SODIUM	52.3	ppm	Background	ppm
MW-2	6-8	02/08/00	B70616	VANADIUM	13.9	ppm	150 or background	ppm
TP-8	3	12/06/99	B70607	VANADIUM	60.3	ppm	150 or background	ppm
TP-5	3	12/06/99	B70606	VANADIUM	52.6	ppm	150 or background	ppm
MW-1	8-10	02/08/00	B70619	VANADIUM	32.0	ppm	150 or background	ppm
TP-2	5	12/06/99	B70603	VANADIUM	23.2	ppm	150 or background	ppm
TP-10	4	12/06/99	B70610	VANADIUM	20.2	ppm	150 or background	ppm
TP-4	5	12/06/99	B70605	VANADIUM	20.1	ppm	150 or background	ppm
TP-1	3-5	12/06/99	B70601	VANADIUM	16.2	ppm	150 or background	ppm
TP-1	7-8	12/06/99	B70602	VANADIUM	15.7	ppm	150 or background	ppm
TP-3	8-9	12/06/99	B70604	VANADIUM	15.5	ppm	150 or background	ppm
MW-1	8-10	02/08/00	B70618	VANADIUM	14.3	ppm	150 or background	ppm
TP-2	5	12/06/99	B70603	ZINC	663	ppm	20 or background	ppm
TP-3	8-9	12/06/99	B70604	ZINC	196	ppm	20 or background	ppm
TP-1	7-8	12/06/99	B70602	ZINC	160	ppm	20 or background	ppm
TP-1	3-5	12/06/99	B70601	ZINC	139	ppm	20 or background	ppm
TP-10	4	12/06/99	B70610	ZINC	128	ppm	20 or background	ppm
TP-8	3	12/06/99	B70607	ZINC	115	ppm	20 or background	ppm
TP-4	5	12/06/99	B70605	ZINC	79.4	ppm	20 or background	ppm
MW-1	8-10	02/08/00	B70618	ZINC	62.9	ppm	20 or background	ppm
MW-1	8-10	02/08/00	B70619	ZINC	62.4	ppm	20 or background	ppm
TP-5	3	12/06/99	B70606	ZINC	54.7	ppm	20 or background	ppm
MW-2	6-8	02/08/00	B70616	ZINC	47.5	ppm	20 or background	ppm

Samples B70618 and B70619 are field duplicate samples

Table 20. Summary of Subsurface Soil Sample Results
Pesticides and PCBs
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Depth (ft)	Sample Date	Sample Number	Compound	Concentration	Units	Standard/ Guidance	Units
TP-1	3-5	12/06/99	B70601	ALL PESTICIDES/PCBs	ND	ppb	NA	ppb
TP-1	7-8	12/06/99	B70602	ALDRIN	2.60	ppb	41	ppb
TP-2	5	12/06/99	B70603	ALL PESTICIDES/PCBs	ND	ppb	NA	ppb
TP-3	8-9	12/06/99	B70604	ALL PESTICIDES/PCBs	ND	ppb	NA	ppb
TP-4	5	12/06/99	B70605	ALL PESTICIDES/PCBs	ND	ppb	NA	ppb
TP-5	3	12/06/99	B70606	ALL PESTICIDES/PCBs	ND	ppb	NA	ppb
TP-8	3	12/06/99	B70607	ALL PESTICIDES/PCBs	ND	ppb	NA	ppb
TP-10	4	12/06/99	B70610	ALL PESTICIDES/PCBs	ND	ppb	NA	ppb

ND- Not Detected
NA- Not Applicable

Table 21. Summary of Subsurface Soil Sample Results
Toxicity Characteristic Leachate Procedure
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Depth (ft)	Sample Date	Sample Number	Compound	Concentration	Units	Standard/ Guidance	Units
TP-1	3-5	12/06/99	B70601	BARIUM	910	ppb	100000	ppb
TP-1	3-5	12/06/99	B70601	LEAD	57.2	ppb	5000	ppb
TP-1	3-5	12/06/99	B70601	All TCLP HERBICIDES	ND	ppb	NA	ppb
TP-1	3-5	12/06/99	B70601	All TCLP SVOCs	ND	ppb	NA	ppb
TP-1	3-5	12/06/99	B70601	All TCLP VOCs	ND	ppb	NA	ppb
TP-1	3-5	12/06/99	B70601	ALL TCLP PESTICIDES/PCBs	ND	ppb	NA	ppb
TP-1	7-8	12/06/99	B70602	BARIUM	381	ppb	100000	ppb
TP-1	7-8	12/06/99	B70602	LEAD	62.0	ppb	5000	ppb
TP-1	7-8	12/06/99	B70602	MERCURY	0.18	ppb	200.0	ppb
TP-1	7-8	12/06/99	B70602	2-BUTANONE	11.0	ppb	200000	ppb
TP-1	7-8	12/06/99	B70602	BENZENE	97.0	ppb	500	ppb
TP-1	7-8	12/06/99	B70602	All TCLP HERBICIDES	ND	ppb	NA	ppb
TP-1	7-8	12/06/99	B70602	All TCLP SVOCs	ND	ppb	NA	ppb
TP-1	7-8	12/06/99	B70602	ALL TCLP PESTICIDES/PCBs	ND	ppb	NA	ppb

ND- Not Detected
NA- Not Applicable

Table 22. Summary of Groundwater Sample Results
Semi-Volatile Organic Compounds Sorted by Compound
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Sample Date	Sample Number	Compound	Concentration	Units	Standard/ Guidance	Units
MW-2	02/23/00	B70624	4-METHYLPHENOL	0.80	ppb	1S	ppb
MW-2	02/23/00	B70624	ACENAPHTHENE	0.60	ppb	20G	ppb
MW-2	02/23/00	B70624	CARBAZOLE	0.90	ppb	NA	ppb
MW-2	02/23/00	B70624	DIBENZOFURAN	0.60	ppb	NA	ppb
MW-2	02/23/00	B70624	DI-N-OCTYLPHTHALATE	0.80	ppb	50S	ppb
MW-2	02/23/00	B70624	FLUORENE	0.80	ppb	50G	ppb
MW-2	02/23/00	B70624	NAPHTHALENE	1.00	ppb	10G	ppb
MW-1	02/23/00	B70623	PHENOL	7.00	ppb	1S	ppb
MW-1	02/23/00	B70623	TOTAL SVOC TICs	1250	ppb	NA	ppb
MW-2	02/23/00	B70624	TOTAL SVOC TICs	125	ppb	NA	ppb
MW-3	02/23/00	B70622	TOTAL SVOC TICs	67	ppb	NA	ppb
MW-3	02/23/00	B70622	ALL TCL SVOCs	ND	ppb	NA	ppb

ND- Not Detected
NA- Not Applicable
S- 6 NYCRR Part 703 groundwater standard.
G- TOGS 1.1.1 groundwater guidance value.
TCL- Target Compound List

Table 23. Summary of Groundwater Sample Results
Total Petroleum Hydrocarbons
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Sample Date	Sample Number	Compound	Concentration	Units	Standard/ Guidance	Units
MW-1	02/23/00	B70623	TOTAL PETROLEUM HYDROCARBONS	3.70	ppm	NA	ppb
MW-2	02/23/00	B70624	TOTAL PETROLEUM HYDROCARBONS	ND	ppm	NA	ppb
MW-3	02/23/00	B70622	TOTAL PETROLEUM HYDROCARBONS	ND	ppm	NA	ppb

ND- Not Detected
NA- Not Applicable

Table 24. Summary of Groundwater Sample Results
Volatile Organic Compounds Sorted by Compound
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Sample Date	Sample Number	Compound	Concentration	Units	Standard/ Guidance	Units	Comments
MW-1	02/23/00	B70623	1,1,2-TRICHLOROETHANE	2.00	ppb	1S	ppb	
MW-2	02/23/00	B70624	1,1-DICHLOROETHANE	13.0	ppb	5S	ppb	
MW-1	02/23/00	B70623	1,1-DICHLOROETHANE	7.00	ppb	5S	ppb	
MW-1	02/23/00	B70623	ACETONE	28.0	ppb	50G	ppb	
MW-2	02/23/00	B70624	ACETONE	14.0	ppb	50G	ppb	
MW-1	02/23/00	B70623	BENZENE	95.0	ppb	1S	ppb	
MW-1	02/23/00	B70623	ETHYL BENZENE	49.0	ppb	5S	ppb	
QA/QC	02/23/00	Trip Blank	METHYLENE CHLORIDE	9.00	ppb	NA	ppb	
MW-1	02/23/00	B70623	METHYLENE CHLORIDE	8.00	ppb	5S	ppb	Result is invalid due to laboratory contamination.
MW-2	02/23/00	B70624	METHYLENE CHLORIDE	8.00	ppb	5S	ppb	Result is invalid due to laboratory contamination.
MW-3	02/23/00	B70622	METHYLENE CHLORIDE	8.00	ppb	5S	ppb	Result is invalid due to laboratory contamination.
MW-1	02/23/00	B70623	TOLUENE	4.00	ppb	5S	ppb	
MW-1	02/23/00	B70623	XYLENE (total)	190	ppb	5S	ppb	
MW-1	02/23/00	B70623	TOTAL VOC TICs	650	ppb	NA	ppb	
MW-2	02/23/00	B70624	TOTAL VOC TICs	ND	ppb	NA	ppb	
MW-3	02/23/00	B70622	TOTAL VOC TICs	ND	ppb	NA	ppb	

ND- Not Detected
NA- Not Applicable
S- 6 NYCRR Part 703 groundwater standard.
G- TOGS 1.1.1 groundwater guidance value.

Table 25. Summary of Groundwater Sample Results
Inorganic Compounds Sorted by Location
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Sample Date	Sample Number	Compound	Concentration	Units	Standard/ Guidance	Units
MW-1	02/23/00	B70623	ALUMINUM	7380	ppb	NA	ppb
MW-1	02/23/00	B70623	ARSENIC	7.60	ppb	25S	ppb
MW-1	02/23/00	B70623	BARIUM	202	ppb	1000S	ppb
MW-1	02/23/00	B70623	BERYLLIUM	0.68	ppb	3G	ppb
MW-1	02/23/00	B70623	CALCIUM	212000	ppb	NA	ppb
MW-1	02/23/00	B70623	CHROMIUM	10.0	ppb	50S	ppb
MW-1	02/23/00	B70623	COBALT	6.30	ppb	NA	ppb
MW-1	02/23/00	B70623	COPPER	15.2	ppb	200S	ppb
MW-1	02/23/00	B70623	IRON	21700	ppb	300S	ppb
MW-1	02/23/00	B70623	LEAD	11.1	ppb	25S	ppb
MW-1	02/23/00	B70623	MAGNESIUM	76200	ppb	35000G	ppb
MW-1	02/23/00	B70623	MANGANESE	1130	ppb	300S	ppb
MW-1	02/23/00	B70623	NICKEL	19.4	ppb	100S	ppb
MW-1	02/23/00	B70623	POTASSIUM	5090	ppb	NA	ppb
MW-1	02/23/00	B70623	SODIUM	23600	ppb	20000S	ppb
MW-1	02/23/00	B70623	VANADIUM	12.0	ppb	NA	ppb
MW-1	02/23/00	B70623	ZINC	149	ppb	2000G	ppb
MW-2	02/23/00	B70624	ALUMINUM	4210	ppb	NA	ppb
MW-2	02/23/00	B70624	ARSENIC	17.0	ppb	25S	ppb
MW-2	02/23/00	B70624	BARIUM	246	ppb	1000S	ppb
MW-2	02/23/00	B70624	BERYLLIUM	0.44	ppb	3G	ppb
MW-2	02/23/00	B70624	CADMIUM	0.87	ppb	5S	ppb
MW-2	02/23/00	B70624	CALCIUM	158000	ppb	NA	ppb
MW-2	02/23/00	B70624	CHROMIUM	7.60	ppb	50S	ppb
MW-2	02/23/00	B70624	COBALT	4.40	ppb	NA	ppb
MW-2	02/23/00	B70624	COPPER	18.4	ppb	200S	ppb
MW-2	02/23/00	B70624	IRON	18700	ppb	300S	ppb
MW-2	02/23/00	B70624	LEAD	15.9	ppb	25S	ppb
MW-2	02/23/00	B70624	MAGNESIUM	50500	ppb	35000G	ppb
MW-2	02/23/00	B70624	MANGANESE	1730	ppb	300S	ppb
MW-2	02/23/00	B70624	NICKEL	13.1	ppb	100S	ppb
MW-2	02/23/00	B70624	POTASSIUM	6480	ppb	NA	ppb
MW-2	02/23/00	B70624	SODIUM	10800	ppb	20000S	ppb
MW-2	02/23/00	B70624	VANADIUM	8.50	ppb	NA	ppb
MW-2	02/23/00	B70624	ZINC	263	ppb	2000G	ppb
MW-3	02/23/00	B70622	ALUMINUM	4010	ppb	NA	ppb
MW-3	02/23/00	B70622	ARSENIC	6.90	ppb	25S	ppb
MW-3	02/23/00	B70622	BARIUM	99.3	ppb	1000S	ppb
MW-3	02/23/00	B70622	BERYLLIUM	0.40	ppb	3G	ppb
MW-3	02/23/00	B70622	CADMIUM	0.46	ppb	5S	ppb
MW-3	02/23/00	B70622	CALCIUM	137000	ppb	NA	ppb
MW-3	02/23/00	B70622	CHROMIUM	6.20	ppb	50S	ppb
MW-3	02/23/00	B70622	COBALT	3.50	ppb	NA	ppb
MW-3	02/23/00	B70622	COPPER	30.4	ppb	200S	ppb
MW-3	02/23/00	B70622	IRON	9360	ppb	300S	ppb
MW-3	02/23/00	B70622	LEAD	62.4	ppb	25S	ppb
MW-3	02/23/00	B70622	MAGNESIUM	49600	ppb	35000G	ppb
MW-3	02/23/00	B70622	MANGANESE	181	ppb	300S	ppb
MW-3	02/23/00	B70622	MERCURY	0.23	ppb	0.7S	ppb
MW-3	02/23/00	B70622	NICKEL	10.7	ppb	100S	ppb
MW-3	02/23/00	B70622	POTASSIUM	10700	ppb	NA	ppb
MW-3	02/23/00	B70622	SODIUM	152000	ppb	20000S	ppb

Table 25. Summary of Groundwater Sample Results
Inorganic Compounds Sorted by Location
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Sample Date	Sample Number	Compound	Concentration	Units	Standard/ Guidance	Units
MW-3	02/23/00	B70622	VANADIUM	7.20	ppb	NA	ppb
MW-3	02/23/00	B70622	ZINC	274	ppb	2000G	ppb

NA- Not Applicable
S- 6 NYCRR Part 703 groundwater standard.
G- TOGS 1.1.1 groundwater guidance value.

Table 26. Summary of Groundwater Sample Results
Inorganic Compounds Sorted by Compound
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Sample Date	Sample Number	Compound	Concentration	Units	Standard/ Guidance	Units
MW-1	02/23/00	B70623	ALUMINUM	7380	ppb	NA	ppb
MW-2	02/23/00	B70624	ALUMINUM	4210	ppb	NA	ppb
MW-3	02/23/00	B70622	ALUMINUM	4010	ppb	NA	ppb
MW-2	02/23/00	B70624	ARSENIC	17.0	ppb	25S	ppb
MW-1	02/23/00	B70623	ARSENIC	7.60	ppb	25S	ppb
MW-3	02/23/00	B70622	ARSENIC	6.90	ppb	25S	ppb
MW-2	02/23/00	B70624	BARIUM	246	ppb	1000S	ppb
MW-1	02/23/00	B70623	BARIUM	202	ppb	1000S	ppb
MW-3	02/23/00	B70622	BARIUM	99.3	ppb	1000S	ppb
MW-1	02/23/00	B70623	BERYLLIUM	0.68	ppb	3G	ppb
MW-2	02/23/00	B70624	BERYLLIUM	0.44	ppb	3G	ppb
MW-3	02/23/00	B70622	BERYLLIUM	0.40	ppb	3G	ppb
MW-2	02/23/00	B70624	CADMIUM	0.87	ppb	5S	ppb
MW-3	02/23/00	B70622	CADMIUM	0.46	ppb	5S	ppb
MW-1	02/23/00	B70623	CALCIUM	212000	ppb	NA	ppb
MW-2	02/23/00	B70624	CALCIUM	158000	ppb	NA	ppb
MW-3	02/23/00	B70622	CALCIUM	137000	ppb	NA	ppb
MW-1	02/23/00	B70623	CHROMIUM	10.0	ppb	50S	ppb
MW-2	02/23/00	B70624	CHROMIUM	7.60	ppb	50S	ppb
MW-3	02/23/00	B70622	CHROMIUM	6.20	ppb	50S	ppb
MW-1	02/23/00	B70623	COBALT	6.30	ppb	NA	ppb
MW-2	02/23/00	B70624	COBALT	4.40	ppb	NA	ppb
MW-3	02/23/00	B70622	COBALT	3.50	ppb	NA	ppb
MW-3	02/23/00	B70622	COPPER	30.4	ppb	200S	ppb
MW-2	02/23/00	B70624	COPPER	18.4	ppb	200S	ppb
MW-1	02/23/00	B70623	COPPER	15.2	ppb	200S	ppb
MW-1	02/23/00	B70623	IRON	21700	ppb	300S	ppb
MW-2	02/23/00	B70624	IRON	18700	ppb	300S	ppb
MW-3	02/23/00	B70622	IRON	9360	ppb	300S	ppb
MW-3	02/23/00	B70622	LEAD	62.4	ppb	25S	ppb
MW-2	02/23/00	B70624	LEAD	15.9	ppb	25S	ppb
MW-1	02/23/00	B70623	LEAD	11.1	ppb	25S	ppb
MW-1	02/23/00	B70623	MAGNESIUM	76200	ppb	35000G	ppb
MW-2	02/23/00	B70624	MAGNESIUM	50500	ppb	35000G	ppb
MW-3	02/23/00	B70622	MAGNESIUM	49600	ppb	35000G	ppb
MW-2	02/23/00	B70624	MANGANESE	1730	ppb	300S	ppb
MW-1	02/23/00	B70623	MANGANESE	1130	ppb	300S	ppb
MW-3	02/23/00	B70622	MANGANESE	181	ppb	300S	ppb
MW-3	02/23/00	B70622	MERCURY	0.23	ppb	0.7S	ppb
MW-1	02/23/00	B70623	NICKEL	19.4	ppb	100S	ppb
MW-2	02/23/00	B70624	NICKEL	13.1	ppb	100S	ppb
MW-3	02/23/00	B70622	NICKEL	10.7	ppb	100S	ppb
MW-3	02/23/00	B70622	POTASSIUM	10700	ppb	NA	ppb
MW-2	02/23/00	B70624	POTASSIUM	6480	ppb	NA	ppb
MW-1	02/23/00	B70623	POTASSIUM	5090	ppb	NA	ppb
MW-3	02/23/00	B70622	SODIUM	152000	ppb	20000S	ppb
MW-1	02/23/00	B70623	SODIUM	23600	ppb	20000S	ppb
MW-2	02/23/00	B70624	SODIUM	10800	ppb	20000S	ppb
MW-1	02/23/00	B70623	VANADIUM	12.0	ppb	NA	ppb
MW-2	02/23/00	B70624	VANADIUM	8.50	ppb	NA	ppb
MW-3	02/23/00	B70622	VANADIUM	7.20	ppb	NA	ppb
MW-3	02/23/00	B70622	ZINC	274	ppb	2000G	ppb

Table 26. Summary of Groundwater Sample Results
Inorganic Compounds Sorted by Compound
Former Vacuum Oil Company
1999-2000 Site Invesigation

Location Id.	Sample Date	Sample Number	Compound	Concentration	Units	*Standard/* Guidance	Units
MW-2	02/23/00	B70624	ZINC	263	ppb	2000G	ppb
MW-1	02/23/00	B70623	ZINC	149	ppb	2000G	ppb

NA- Not Applicable
S- 6 NYCRR Part 703 groundwater standard.
G- TOGS 1.1.1 groundwater guidance value.

APPENDIX A

1999-2000 SITE INVESTIGATION

TEST PIT LOGS
SOIL BORING LOGS
WELL INSTALLATION LOGS
WELL DEVELOPMENT LOGS
GROUNDWATER SAMPLING FIELD PARAMETER MEASUREMENTS

Test Pit Log

Site No: 828089P			Test Pit No: TP-1
Project Name: Former Vacuum Oil Company			Sheet 1 of 1
Contractor: SLC	Geologist:	Jennifer League	By: JL Date:12/06/99
Operator: Ken Kuhn	Date Started:	6-Dec-1999	
Equipment: Komatsu 35R	Date Completed:	6-Dec-1999	

DEPTH (FT.)	PID (PPM)	SAMPLE DESCRIPTION
-0-	0	0'-1': 3" Topsoil;9" Brn sand, little gravel, l.clay, l.silt, moist (fill)
	0	1': Brn. silty sand, moist (fill)
-2-	0	2.5'-3.5': slag & brick fill w/sand, moist
-4-	14	3.5'-4.7': Blk. silt and f/c sand, l.gravel, l.clay, moist, petroleum odor (ML/fill)
		4.7'-5': Lt. grey 3" layer
-6-	50 (5'-7.7') 200 at 7.7'	5'-8.5': Blk. silt, s.f.sand, s.clay, tr.gravel, wet (ML/fill)
-8-	6	8.5': Lt. grey silt and clay
	0	9': l.f/c sand, wet (ML) not much staining present; bottom of pit
-10-		
-12-		

Comments:	Samples Collected:
Excavation Dimensions	B70601 (3-5')
9.7'Lx2'Wx9'D	B70602 (7-8')

Test Pit TP-1

Test Pit Log

Site No: 828089P			Test Pit No: TP-2
Project Name: Former Vacuum Oil Company			Sheet 1 of 1
Contractor: SLC	Geologist: Jennifer League		By: JL Date:12/06/99
Operator: Ken Kuhn	Date Started: 6-Dec-1999		
Equipment: Komatsu 35R	Date Completed: 6-Dec-1999		

DEPTH (FT.)	PID (PPM)	SAMPLE DESCRIPTION
-0-	0	0'-2.8': 3" topsoil, Dk. brn sand, brick, *tr.slag*, *tr.* tile, moist
-2-	0	2.8'-4.5': Roofing shingles
-4-	0	4.5'-5': Brn. flc sand, s.slag, moist (fill) At 5', encountered concrete slab that excavator could not penetrate.
-6-		
-8-		
-10-		
-12-		

Comments:	Samples Collected:
Excavation Dimensions 8'Lx4'Wx5'D	B70603 (5')

Test Pit TP-2

Test Pit Log

Site No: 828089P				Test Pit No: TP-3
Project Name: Former Vacuum Oil Company				Sheet 1 of 1
Contractor: SLC		Geologist:	Jennifer League	By: JL Date: 12/06/99
Operator: Ken Kuhn		Date Started:	6-Dec-1999	
Equipment: Komatsu 35R		Date Completed:	6-Dec-1999	

DEPTH (FT.)	PID (PPM)	SAMPLE DESCRIPTION
-0-	0	Dk. drn f/m sand, l.gravel, l.silt, tr. roots, moist (fill)
-2-	0	Brn. f.sand and silt, some clay, tr. brick, moist (fill)
-4-	0	4'-8.5': Brn silt, some clay, l.f. sand, tr. gravel, moist (ML)
-6-		
-8-	0	8.5': Grey silt and clay, l.f.sand, moist (ML); bottom of excavation
-10-		
-12-		

Comments:	Samples Collected:
Excavation Dimensions 11'Lx3'Wx8.5'D	B70604 (8-9')

Test Pit TP-3

Test Pit Log

Site No: 828089P			Test Pit No: TP-4
Project Name: Former Vacuum Oil Company			Sheet 1 of 1
Contractor: SLC	Geologist:	Jennifer League	By: JL Date:12/06/99
Operator: Ken Kuhn	Date Started:	6-Dec-1999	
Equipment: Komatsu 35R	Date Completed:	6-Dec-1999	

DEPTH (FT.)	PID (PPM)	SAMPLE DESCRIPTION
-0-	0	0'-1.5': 6" topsoil & roots; Dk. brn f/c sand, tr.gravel, tr.silt, tr.roots,moist (Topsoil/SM)
-2-	0	1.5'-4.2': Brn. silt, sand, s. clay, tr. gravel, moist (ML) 4.2' Bottom of excavation
-4-		
-6-		
-8-		
-10-		
-12-		

Comments:	Samples Collected:
Excavation Dimensions 7.4'Lx4'Wx4.2'D	B70605 (5')

Test Pit TP-4

Test Pit Log

Site No: 828089P			Test Pit No: TP-5
Project Name: Former Vacuum Oil Company			Sheet 1 of 1
Contractor: SLC	Geologist: Jennifer League		By: JL Date:12/06/99
Operator: Ken Kuhn	Date Started: 6-Dec-1999		
Equipment: Komatsu 35R	Date Completed: 6-Dec-1999		

DEPTH (FT.)	PID (PPM)	SAMPLE DESCRIPTION
-0-	0	0'-1': 3" topsoil; Dk. brn f/c sand, ~~s.~~silt, l.gravel, tr.slag, tr.brick, tr.roots, moist (fill)
-2-	0	1'-5': Blk f/m sand, tr.silt, tr.gravel, moist (fill- material has appearance of ground coal)
-4-		
-6-	0	5'-6.2': Brn. silt and clay, l.f. sand, tr.gravel, moist (ML) 6.2': Bottom of excavation
-8-		
-10-		
-12-		

Comments:	Samples Collected:
Excavation Dimensions 10'Lx3'Wx6.2'D	B70606 (3')

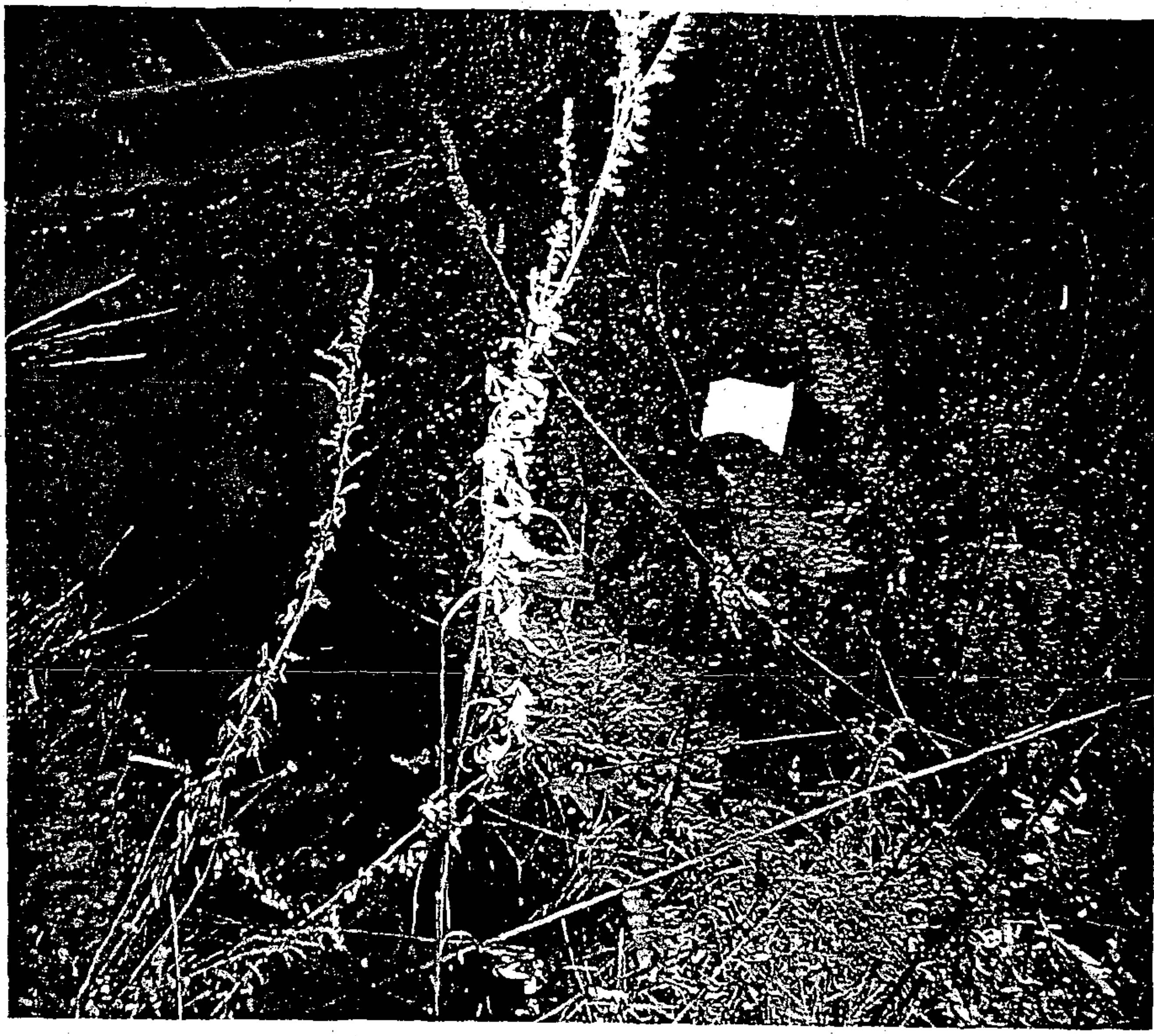
Test Pit TP-5

Test Pit Log

Site No:	828089P			Test Pit No: TP-6
Project Name:	Former Vacuum Oil Company			Sheet 1 of 1
Contractor:	SLC	Geologist:	Jennifer League	By: JL Date:12/06/99
Operator:	Ken Kuhn	Date Started:	6-Dec-1999	
Equipment:	Komatsu 35R	Date Completed:	6-Dec-1999	

DEPTH (FT.)	PID (PPM)	SAMPLE DESCRIPTION
-0-	0	0'-1.3': Grey/dk. grey gravel, l.f/c-sand, moist (fill)
	0	1.3'-1.7': Dk. brn f/c sand, l.gravel, moist (fill)
-2-	0	1.7'-2.5': Brn. f/c sand and silt, l. clay, tr.gravel, tr.brick (fill)
	0	2.5'-3.2': Dk. brn f/c sand and silt, l.gravel, tr.glass (SM/fill)
-4-	0	3.2'-4.2': Dk. brn to Lt. grey f/c sand (ash-like), l.gravel, tr.silt, tr.glass, saturated (fill)
		4.2': Bottom of excavation; groundwater encountered
-6-		
-8-		
-10-		
-12-		

Comments:	Samples Collected:
Excavation Dimensions 7'Lx2'Wx4.2'D	No samples collected



Test Pit TP-6

Test Pit Log

Site No:	828089P			Test Pit No: TP-7
Project Name:	Former Vacuum Oil Company			Sheet 1 of 1
Contractor:	SLC	Geologist:	Jennifer League	By: JL Date:12/06/99
Operator:	Ken Kuhn	Date Started:	6-Dec-1999	
Equipment:	Komatsu 35R	Date Completed:	6-Dec-1999	

DEPTH (FT.)	PID (PPM)	SAMPLE DESCRIPTION
-0-		5" Topsoil
	0	Dk. brn f/m sand, l.silt, l.gravel, tr.roots, moist (SM)
-2-		
	0	Brn. grey (mottled) clay and silt, f/c sand, tr.gravel, moist (CL)
-4-		4.3': Bottom of Excavation
-6-		
-8-		
-10-		
-12-		

Comments:	Samples Collected:
Excavation Dimensions 7'Lx2'Wx4.3'D	No samples collected

Test Pit TP-7

Test Pit Log

Site No:	828089P			Test Pit No: TP-8
Project Name:	Former Vacuum Oil Company			Sheet 1 of 1
Contractor:	SLC	Geologist:	Jennifer League	By: JL Date:12/06/99
Operator:	Ken Kuhn	Date Started:	6-Dec-1999	
Equipment:	Komatsu 35R	Date Completed:	6-Dec-1999	

DEPTH (FT.)	PID (PPM)	SAMPLE DESCRIPTION
-0-		5" Topsoil
	0	0.5'-3': Dk. brn/blk. fine to coarse sand, l.gravel, moist grading to saturated (fill)
-2-		this is a coal-like material similar to what was in TP-5
	0	3' Grey silt and clay, l.f/c sand, saturated
-4-		3.1': Bottom of Excavation, groundwater encountered
-6-		
-8-		
-10-		
-12-		

Comments:	Samples Collected:
Excavation Dimensions 8'Lx2'Wx3.1'D	B70607 (3')

Test Pit Log

Site No:	828089P			Test Pit No: TP-9
Project Name:	Former Vacuum Oil Company			Sheet 1 of 1
Contractor:	SLC	Geologist:	Jennifer League	By: JL Date:12/06/99
Operator:	Ken Kuhn	Date Started:	6-Dec-1999	
Equipment:	Komatsu 35R	Date Completed:	6-Dec-1999	

DEPTH (FT.)	PID (PPM)	SAMPLE DESCRIPTION
-0-		3" Topsoil
-2-	0	0.25'-5': Lt. brn silt and f.sand, l.clay, tr.gravel, tr.roots, moist (ML)
-4-		
		5'-5.8': Brn. grey clay and silt, tr.gravel, moist (CL)
-6-	0	5.8': Bottom of excavation; groundwater trickling into excavation
-8-		
-10-		
-12-		

Comments:	Samples Collected:
Excavation Dimensions 6.5'Lx2'Wx5.8'D	No samples collected

Test Pit TP-9

Test Pit Log

Site No: 828089P			Test Pit No: TP-10
Project Name: Former Vacuum Oil Company			Sheet 1 of 1
Contractor: SLC	Geologist:	Jennifer League	By: JL Date:12/06/99
Operator: Ken Kuhn	Date Started:	6-Dec-1999	
Equipment: Komatsu 35R	Date Completed:	6-Dec-1999	

DEPTH (FT.)	PID (PPM)	SAMPLE DESCRIPTION
-0-	0	0'-1': Dk. brn f/c sand, s.silt, l.gravel, moist (fill)
	0	1'-2': Grey silt, s.f.sand, l.clay, l.gravel, moist (fill-ML)
-2-	0	2'-3.7': Blk. gravel, s.f/c sand, l.silt, tr.brick, l.clay, wet grades to saturated with increasing depth (fill)
-4-		3.7': Bottom of Excavation, groundwater encountered, slight sheen
-6-		
-8-		
-10-		
-12-		

Comments:	Samples Collected:
Excavation Dimensions 8'Lx2'Wx3.7'D	No samples collected

Test Pit TP-10

Boring Log

Site No: 828089P Project Name:Former Vacuum Oil Company	Well/Boring No: MW-1 Sheet 1 of 1 By: JL Date: 2/08/00
Drilling Contractor: MAXIM Technologies Inc. Driller: Ron Brown Geologist: Jennifer League Drill Rig: CME 850 Drilling Method: HSA Sample Spoon I.D.: 2" SS Drive Hammer Wt.: 140 Date Started: 02/08/00 Date Completed: 02/09/00	Borehole Completion Depth: 16.5' Borehole Diameter: 4.25" Ground Surface El.:

DEPTH (FT.)	SAMPLE NO.	SAMPLING INTERVAL	PID SCREEN (PPM)	RECOVERY (in)	BLOWS	SAMPLE DESCRIPTION
-0-	1	0-2	3	13	3 5 7 4	Brn stiff silt and f/c sand, l.gravel, tr.brick, tr.cinders, tr.clay, moist (fill)
-2-	2	2-4	3	13	20 38 50/5	7" Brn. hard silt s.f/c sand, tr.gravel, tr.clay, tr.brick, moist (fill) 6" Brn/grey v.dense gravel and concrete, l.brick, dry (fill)
-4-	3	4-6	88	22	9 5 3 4	11" Dk. brn. loose f/c sand, gravel, l.silt, tr.clay, wet (fill) petroleum odor 11" Blk/grey stiff silt, s.f/m sand, l.clay, wet (ML) petroleum odor
-6-	4	6-8	189	21	3 3 4 3	Blk. stiff silt, f.sand, tr.clay, wet (ML) Strong petroleum odor and black petroleum product throughout sample
-8-	5	8-10	340	21	3 4 9 9	19" Blk./grey stiff silt and clay, s.f.sand, tr.wood, wet (ML/CL) strong petroleum odor 2" Grey stiff silt and clay, hr.f. sand, wet (CL)
-10-	6	10-12	25 (top) 95 (bot.)	22	4 6 6 10	Grey/blk. stiff silt and clay, tr. f/c sand, tr.roots, wet (ML) Petroleum odor w/black stains
-12-	7	12-14	470	22	20 19 10 10	Grey v.stiff silt, s.clay, tr. f.sand, wet (ML) Petroleum odor
-14-	8	14-16	12	18	WH 1 1 1	Grey v.soft silt, s.f/m sand, s.clay, wet (ML) Petroleum odor w/black stains
-16-	9	16-16.5	350	22	1 50/1	Top 16" assumed collapse; Brn. v.dense sand, s.gravel, wet (SM); Refusal at 16.5'
-18-						

Remarks

Boring Log

Site No: 828089P Project Name:Former Vacuum Oil Company	Well/Boring No: MW-2 Sheet 1 of 1 By: JL Date: 2/08/00

Drilling Contractor:	MAXIM Technologies Inc.			
Driller:	Ron Brown	Geologist:	Jennifer League	Borehole Completion Depth: 15.5'
Drill Rig:	CME 850	Drilling Method:	HSA	Borehole Diameter: 4.25"
Sample Spoon I.D.:	2" SS	Drive Hammer Wt.:	140	Ground Surface El.:
Date Started:	02/08/00	Date Completed:	02/08/00	

DEPTH (FT.)	SAMPLE NO.	SAMPLING INTERVAL	PID SCREEN (PPM)	RECOVERY (in)	BLOWS	SAMPLE DESCRIPTION
-0- -2- -4-						Augered directly to concrete slab Concrete slab encountered at 4.5' Augers were able to penetrate slab Slab was about 1' thick, began split spoon sampling at 6'
-6-	1	6-8	98	18	6 12 9 7	Grey v.stiff silt and clay, l.f.sand, moist (ML) petroleum odor
-8-	2	8-10	200	14	2 4 4 7	Grey stiff silt and clay, l.f.sand, wet (ML) petroleum odor
-10-	3	10-12	38 (top) 2 (bot.)	22	2 4 5 7	Grey stiff silt and clay, l.f.sand, wet (ML) petroleum odor at top of sample
-12-	4	12-14	5	24	2 3 3 3	Grey m.stiff silt and clay, l.f.sand, wet (ML) grades to sat at 20" into sample
-14-	5	14-15.5	NA	6	32 34 5/5	3" Grey/brn hard silt & clay, l.f/c sand, wet (ML) 3"Brn v.densegravel and f/c sand, sat (GM); Refusal at 15.5'
-16-						

Remarks
NA - Not Available

Boring Log

Site No: 828089P Project Name:Former Vacuum Oil Company	Well/Boring No: MW-3 Sheet 1 of 1 By: JL Date: 2/07/00
Drilling Contractor: MAXIM Technologies Inc. Driller: Ron Brown Geologist: Jennifer League Drill Rig: CME 850 Drilling Method: HSA Sample Spoon I.D.: 2" SS Drive Hammer Wt.: 140 Date Started: 02/07/00 Date Completed: 02/07/00	Borehole Completion Depth: 6' Borehole Diameter: 4.25" Ground Surface El.:

DEPTH (FT.)	SAMPLE NO.	SAMPLING INTERVAL	PID SCREEN (PPM)	RECOVERY (in)	BLOWS	SAMPLE DESCRIPTION
-0-	1	0-2	0	6	2 5 12 8	Dk. brn v.stiff silt and f/c sand, l.gravel, tr.brick, moist (fill)
-2-	2	2-4	0	3	4 3 3 3	Dk. brn med.stiff silt and f/c sand, l.gravel, wet (fill)
-4-	3	4-6	0	0	WH WH 2 2	Refusal at 6'. Only water recovered
-6-	4	6-8				
-8-	5	8-10				
-10-	6	10-12				
-12-						

Remarks

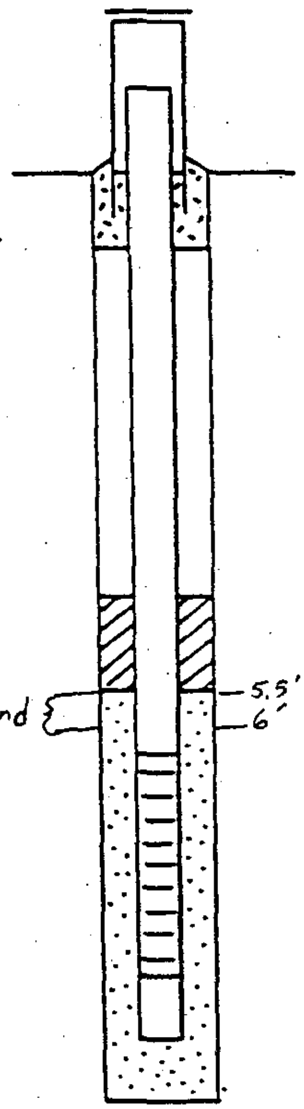
Site Vacuum Oil Company 828089P Well No. MW-1

Total Depth 16.5' Surface Elev. ______ Top Riser Elev. 517.81

Water Levels (Depth, Date, Time) ______ Date Installed 2/09/2000

	Dia.	Material	Length	
Riser:	2"	PVC	8'	
Screen:	2"	PVC	10'	Slot Size 0.01
Prot. Csg:				

SCHEMATIC



2.3'	Prot. Csg stickup
2.1'	Riser stickup
	Ground Surface
	Bottom Surface Seal
Portland Cement and Bentonite	Grout Type
3.5'	Top Seal
5.5'	Top Sand Pack
6.5'	Top Screen
16.5'	Bottom Screen
	Bottom Sump/Wellpoint
16.5'	Total Depth of Boring

Surface Seal Type Concrete

Seal Type Bentonite

0.5' Choke Sand

Sand Pack Type/Size - NO. 1 Choke Sand - 00

Comments ______

Driller Ron Brown

Geologist Jennifer League

Engineer Frank Sowers

Technical Person ______

DEC Inspector Bob Long

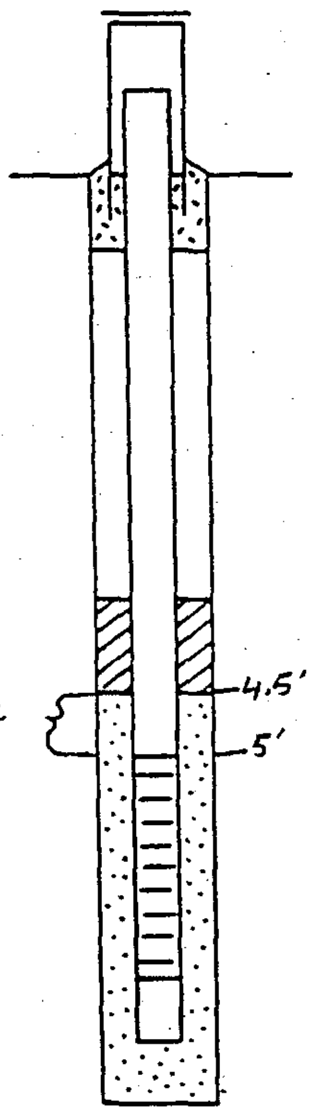
Site Vacuum Oil Company Well No. [illegible]

Total Depth 15.5' Surface Elev. ______ Top Riser Elev. 514.88

Water Levels (Depth, Date, Time) ______ Date Installed 2/08/2000

Riser: Dia. 2" Material PVC Length ~5.5'
Screen: Dia. 2" Material PVC Length 10' Slot Size 0.01
Prot. Csg: Dia. ______ Material ______ Length ______

SCHEMATIC



2.3' Prot. Csg stickup

2.1' Riser stickup

Ground Surface

Surface Seal Type Concrete

____ Bottom Surface Seal

Grout Type Portland Cement and Bentonite

Seal Type Bentonite

3' Top Seal

4.5' Top Sand Pack

0.5' Choke Sand

5' Top Screen

Sand Pack Type/Size No. 1 Choke Sand - 00

15 Bottom Screen

____ Bottom Sump/Wellpoint

15.5 Total Depth of Boring

Comments ______

Driller Ron Brown
Geologist Jennifer League
Engineer Frank Sowers
Technical Person ______

DEC Inspector Bob Long

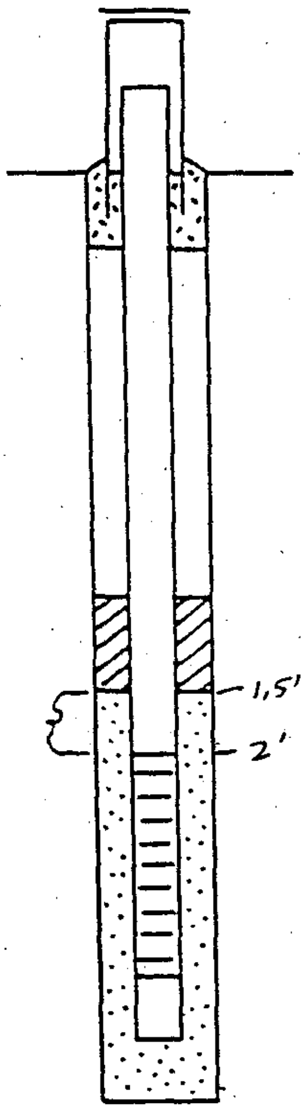
Site Vacuum Oil Company

Total Depth 6' Surface Elev. ______ Top Riser Elev. 511.95

Water Levels (Depth, Date, Time) ______ Date Installed 2/07/2000

Riser: Dia. 2" Material PVC Length 3.8'
Screen: Dia. 2" Material PVC Length 4' Slot Size 0.01
Prot. Csg: Dia. ______ Material ______ Length ______

SCHEMATIC



2.3' Prot. Csg stickup

1.8' Riser stickup

Ground Surface

Surface Seal Type Concrete

______ Bottom Surface Seal

Grout Type Portland Cement and Bentonite

Seal Type Bentonite

1' Top Seal

1.5' Top Sand Pack

0.5' Choke Sand

2' Top Screen

Sand Pack Type/Size No 1 Choke Sand - 001

6' Bottom Screen

______ Bottom Sump/Wellpoint

6' Total Depth of Boring

Comments ______

Driller Ron Brown
Geologist Jennifer League
Engineer Frank Sowers
Technical Person ______

DEC Inspector Bob Long

WELL DEVELOPMENT LOG

Former Vacuum Oil Company
Site #828089P

									Field Parameters				
Well Id.	Method	Depth to Water (ft.)	Depth of Well (ft.)	Well Diameter (inches I.D.)	Gallons per Foot of Depth	Volume of One Column of Water (gal.)	Volume of 10 Columns of Water (gal.)	Volume of Water Actually Removed (gal.)	Cumulative Volume (gal)	Temperature (F)	Conductivity (ms/cm)	pH	Turbidity (NTU)
MW-1	Bailer	9.7	18	2	0.163	1.35	13.53	9 gal. on 2/10/00 + 5 gal. on 2/11/00 = 14 gal.	5	46	1	7.41	>100
									8	45.9	1.04	7.25	>100
									11	43	0.69	7.53	>100
									14	39.8	0.88	7.51	>100
MW-2	Bailer	4.25	15	2	0.163	1.75	17.52	15 gal. on 2/09/00 + 6 gallons on 2/10/00 + = 21 gal.	13	50	0.70	7.76	NA
									15	48.5	0.71	7.50	NA
									16	45.1	0.62	7.81	>100
									17	44.2	0.61	7.73	>100
									18	44.1	0.68	7.63	>100
									19	44.6	0.67	7.45	>100
									20	42.4	0.65	7.41	>100
									21	44.6	0.70	7.34	>100
MW-3	Bailer	5	6	2	0.163	0.16	1.63	1 gal. on 2/09/00 + 0.5 gal. on 2/10/00 + 0.25 gal. on 2/11/00 = 1.75 gal.	1	52.5	1.46	6.7	NA
									1.5	NA	NA	NA	22.8

Water Sampling Field Parameters

Former Vacuum Oil Company

1999-2000 Site Investigation

Location Id.	Date	Temperature (F)	Conductivity (ms/cm)	pH	Turbidity (NTU)	Well Headspace PID Reading (ppm)
MW-1	02/23/00	53	1.56	7.07	700	400
MW-2	02/23/00	52.3	1.1	7.27	365	1.5
MW-3	02/23/00	49	0.98	7.49	Water was black. Turbidity was not measured	0.5

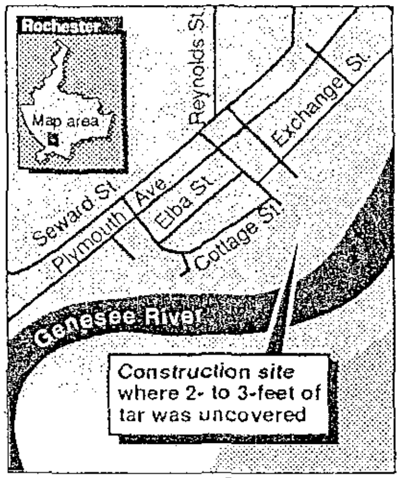
Appendix M

1989 Rochester Democrat and Chronicle News Article on the Petroleum Sludge Pits

12/1/89

Tar pits along Genesee River found to contain toxic metals

State DEC recommends designating area as hazardous



Democrat and Chronicle

By Sherrie Negrea
Democrat and Chronicle

Cyclists, joggers and pedestrians using a trail built along the Genesee River by the city of Rochester may be passing by a potentially hazardous waste site that contains toxic levels of arsenic and lead.

Officials from the regional office of the state Department of Environmental Conservation have recommended designating the area, which is centered around two tar pits adjacent to the river's west bank, as an inactive hazardous waste site for further evaluation and cleanup.

"There could be other areas we're not aware of," said Michael Khalil, who is in charge of the state superfund program at the DEC's Avon office. "That's why you need an investigation of the site."

Although the toxic metals do not pose a public health threat, the bureaucratic process that will determine the extent of the contamination and who will clean up the site could affect housing development proposed in the city's South River Corridor Plan, a $110 million project designed to spur investment south of downtown.

The tar pits are located within a general area designated for about 600 housing units to be built over a 10-year period across the river from the University of Rochester. The contaminated area is also about 1,000 feet away from a site where 14 housing units are being built near the intersection of Utica Place and Cottage Street.

TURN TO PAGE 6B

Pits contain toxic metals

FROM PAGE 1B

Larry Stid, the city's director of planning, said the housing project will not be affected by the contamination because the units are elevated from the area by a steep 50-foot hill. He also believes that the hazardous material will not delay development of additional housing in the area because construction is not scheduled for several years.

"It might create a little more paperwork but I don't think it will delay the schedule." he said.

The tar pits were discovered by a city bulldozer operator who was clearing land for a portion of the $70,000 riverfront trail last June. City officials had walked through the site but had not conducted extensive environmental testing along the proposed trail.

"We had no reason to believe there was any contamination," said Edward Doherty, commissioner of environmental services.

The city, however, was aware that a former oil refinery called Vacuum Oil had operated on some nearby property between 1866 and 1933, Stid said. City officials did soil testing before building the Utica-Cottage housing units, but

by a 20- by 20-foot barbed wire fence. Mayor Thomas P. Ryan Jr. formally opened the 3.4-mile trail to the public on Sept. 7.

"Obviously, we wouldn't have built the trail where there were hazardous materials," Doherty said. "We routed it around it safely."

The Monroe County Health Department, which was notified about the problem, determined that the contaminated area posed no threat to people who use the path, according to health officials.

Instead of having the area designated a suspected hazardous waste site, the city is offering to conduct testing on land its owns near the river trail, Doherty said. The tar pits are actually located on state-owned land.

"We would simply prefer that the state clean it up," said Doherty, who plans to meet with DEC officials next week. "Putting it on the hazardous waste registry does nothing."

Doherty noted that other hazardous waste sites in the city, such as the Fire Academy, have been tied up in lengthy bureaucratic delays once they go on the registry. There are 13 designated hazardous waste sites in the city and 64 in Monroe County, according to a DEC report.

The DEC, meanwhile, is at-

Pits contain toxic metals

FROM PAGE 1B

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The city, however, was aware that a former oil refinery called Vacuum Oil had operated on some nearby property between 1866 and 1933, Stid said. City officials did soil testing before building the Utica-Cottage housing units, but did not think such precautions were needed for paving a trail over an old rail bed, Stid said.

After the tar pits were found, however, the city conducted testing which detected eight toxic metals in the tar, including high levels of arsenic and lead, said Mark Gregor, an environmental analyst with the city.

With construction begun on the trail, the city then decided to reroute the pathway around the hazardous area, which was enclosed by a 20- by 20-foot barbed wire fence. Mayor Thomas P. Ryan Jr. formally opened the 3.4-mile trail to the public on Sept. 7.

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The DEC, meanwhile, is attempting to locate companies that may be responsible for disposal of the contaminated waste. Khalil said he suspects the metals may be part of a tank bottom of the oil refinery, which eventually was bought out by Mobil Oil Corp.

He said DEC has contacted Mobil but said the company does not know anything about the site.

Democrat and Chronicle *reporter Steve Orr contributed to this report.*

Appendix N

April 2001 NYSDEC Fact Sheet on Investigation Report Release

New York State Department of Environmental Conservation

FACT SHEET

April 2001

Investigation Report Released for Former Vacuum Oil Site

City of Rochester, Monroe County

The New York State Department of Environmental Conservation (DEC), in conjunction with the New York State Department of Health (DOH) and the Monroe County Health Department (MCHD), want to inform you about activities at the former Vacuum Oil property located along the western bank of the Genesee River between Flint Street and Serenity Circle (across from the University of Rochester) in Rochester (see map). DEC is providing this fact sheet to update the public on site environmental activities and explain how to get more information.

History of the Vacuum Oil Site:

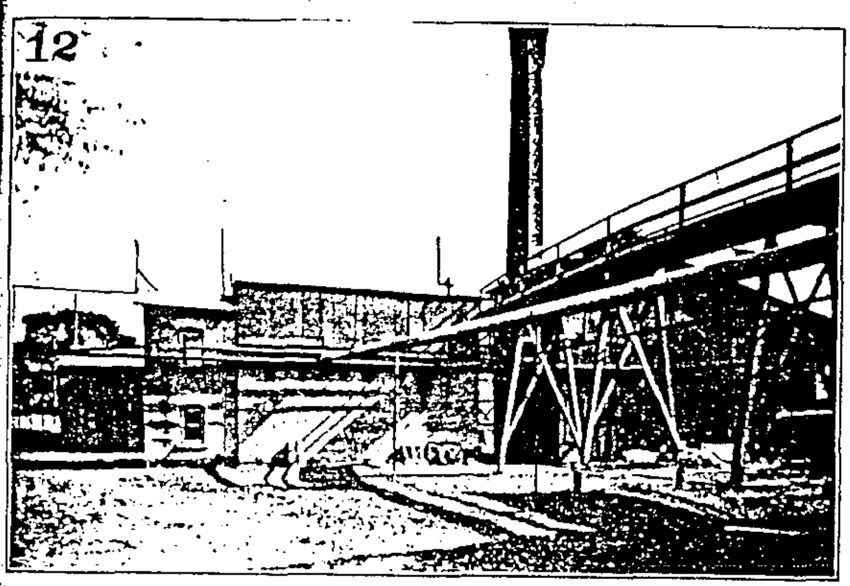
The former Vacuum Oil Company (the predecessor of Mobil Oil) operated as an oil refinery on the western bank of the Genesee River from c1866 to c1936. The Vacuum Oil facility consisted of several process and storage buildings, a rail yard, a tank farm area, and several pipelines. Reports from 1887 indicated that there were 135 tanks and six boilers at the refinery, and that the facility refined over 4 million gallons of crude oil per year. Many of the refinery structures were reportedly demolished in place. Building and tank foundations are still visible throughout the site.

Since 1936, portions of the site have been used for a variety of commercial purposes. Owners included a paper company, two tool and die companies, a printing company, a university, a scrap bailing company, a junkyard, and government agencies.

In 1989, the City of Rochester performed a limited environmental investigation on an approximately 11-acre portion of the former Vacuum Oil facility. The 1989 investigation, which focused on the northern section of the facility, did not identify any contaminants at levels above New York State standards and guidance values. In September 1992, the DEC removed approximately 400 to 500 tons of petroleum sludge located in the former rail yard area at the southeastern portion of the property near what is currently the Genesee River bike trail. The site is currently under multiple ownership and many of the properties are either vacant or underutilized.

The Investigation:

From 1999-2001, the DEC performed an environmental investigation on a 24-acre portion of the former Vacuum Oil facility to gather information on the types and locations of contamination at the site. The southern section of the Vacuum Oil facility was the focus of this investigation because it was not part of the 1989 investigation, it was accessible to the public, and the discovery of the petroleum sludge in 1992 indicated that additional contamination may be present in this area. The



This figure shows a typical Vacuum Oil lubricating still and its condenser. At the left of the condenser is a small brick building known as a "running house." There the still man separates the distillates as they come from the condenser, using an hydrometer to determine the quality of the distillates and to turn the stream from one tank to another as varying grades of distillates are reached. This distillation secures as near fractional distillation as is practicable, leaving a sweet and unburned residual oil instead of tar.

F I G U R E 2

A typical Vacuum Oil still