

SITE INVESTIGATION REPORT UNDERGROUND STORAGE TANK CLOSURE

Merit Oil of New York, Inc.

Merit Ralph

1885 Atlantic Avenue & Ralph Avenue

Brooklyn, New York

June 27, 1994

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1.0 INTRODUCTION

Groundwater & Environmental Services, Inc. (GES) was contracted by Merit Oil of New York, Inc. (Merit) to oversee and document the removal of four 4,000-gallon and two 2,000-gallon, steel, single-walled, gasoline underground storage tanks (USTs), one 550-gallon and one 2,000-gallon single-walled, steel waste water USTs; 11 550-gallon single-walled, steel gasoline USTs, (one of which was abandoned in place with concrete slurry, all found in an unknown tank field), and three dispenser islands at its Ralph gasoline station located at 1885 Atlantic Avenue and Ralph Avenue, Brooklyn, New York. Figure 1 is an annotated 7.5-minute series United States Geological Survey quadrangle map (Brooklyn, NY) showing the site location, surface topography, drainage patterns, and cultural features. Figure 2 is a Site Plan which illustrates the locations of the excavated USTs, dispensers, buildings, and property boundaries. Tank decommissioning and removal activities were conducted by Merit's general contractor, Larry E. Tyree Company, Inc. (Tyree), of Farmingdale, New York. The excavated tanks were replaced with five 4,000-gallon, double-walled, fiberglass, gasoline USTs and one 550-gallon, double-walled, fiberglass waste water UST.

In accordance with applicable federal and state requirements, GES documented the removal of the 18 USTs, screened the soil removed from the tank excavations with a photoionization detector (PID) and conducted post-excavation soil sampling for laboratory analyses. On October 21, 1993, Merit notified the New York State Department of Environmental Conservation (NYSDEC) prior to the removal of the USTs.

2.0 HEALTH AND SAFETY

A site specific Health and Safety Plan (HASP) was prepared for all GES field personnel involved in site activities. The HASP outlines the required monitoring equipment, protective clothing, action levels, anticipated compounds, and emergency responses. All sampling and supervisory activities were conducted in Level D protection. Air monitoring was conducted during sampling and excavation of the USTs using Photoionization detector (PID). All GES field personnel involved in field investigations are trained and certified according to Federal Occupational Safety and Health Administration requirements.



Merit Ralph June 15, 1994

3.0 GASOLINE UST CLOSURE

GES Senior Geologist, Donald Griffin was on site on June 14 and 15, 1993, to document the removal of the six gasoline USTs (four 4,000-gallon and two 2,000-gallon) and collect post-excavation soil samples. Prior to the removal of the gasoline USTs, all residual product and sludge was removed from the USTs and transferred to 55-gallon drums for later disposition by Merit. Upon removal of the USTs from the gasoline tank field they were inspected. The USTs had no observable corrosion, pitting, holes, or perforations. Photographs of the excavated gasoline USTs are presented in Appendix I. On July 29, 1993, four drums containing residual product and tank bottom sludges were transported by Tyree to S&W Waste, Inc. in South Kearny, New Jersey for recycling. The gasoline USTs were removed from the site by Tyree and transported to Lieberman Koren Corporation and Kings County Scrap Iron, in Brooklyn, New York, where they were recycled as scrap metal. No groundwater was observed in the gasoline UST excavation, however, free-phase product and petroleum hydrocarbon odors with PID readings up to 500 ppm were encountered.

During the removal of the USTs, all excavated soils that registered PID readings more than 100 ppm were stockpiled on and covered with plastic pending off-site disposition. Excavated soils with PID levels less than 100 ppm were used as backfill material.

4.0 DISPENSER ISLAND REMOVAL

GES Senior Geologist, Donald Griffin was on site on June 15, 1993 to collect post-excavation soil samples from beneath three former dispenser islands. The soil beneath the dispensers were screened for volatile organics in the field with a PID. PID readings give an indication of ionizable compounds that may be present, but the results are neither compound specific nor quantitative. Ionizable compounds ranged from 4.2 to 24 parts per million (ppm). Table 1 summarizes the PID field screening locations and results. No groundwater, free-phase product or petroleum hydrocarbon stained soils were observed during sampling procedures.



5.0 WASTE WATER USTs CLOSURE

GES Senior Geologist, Donald Griffin was on site on June 22, 1993 to document the removal of one 550-gallon and one 2,000-gallon waste water USTs, and to collect post-excavation soil samples from the UST excavation. Prior to the removal of the USTs, all residual product and sludge was removed from the USTs and transferred to 55-gallon drums for later disposal by Merit. The USTs were then purged, cleaned, and removed from the excavation. Upon removal, the USTs were inspected. The USTs had corrosion present, however, pitting, holes, or perforations were not observed. Photographs of the excavated USTs are presented in Appendix I. The USTs were removed from the site and transported by Tyree to Lieberman Koren Corporation and Kings County Scrap Iron, both in Brooklyn, New York, where they were recycled as scrap metal. No groundwater, petroleum hydrocarbon stained soils or free-phase product was observed in the excavation.

The excavated soils from the waste water USTs excavation were screened for volatile organics in the field with a PID. Ionizable compounds from the excavated soils ranged in concentration from 12 ppm to 40 ppm. Table 1 summarizes the PID field screening locations and analytical results. Since none of the PID readings were more than 100 ppm, all excavated soils were returned to the excavation.

6.0 UNKNOWN GASOLINE UST CLOSURE

GES Senior Geologist, Donald Griffin was on site on June 25 and 28, 1993, to document the removal of ten 550-gallon single-walled, steel gasoline USTs, the abandonment of one 550-gallon single-walled steel gasoline UST, all of which were found in an unknown tank field, and the collection of post-excavation soil samples. The abandonment of one 550-gallon UST was required due to its close proximity to the canopy's structural footing. Prior to the removal and abandonment of the gasoline USTs, all residual product and sludges was removed from the USTs and transferred into 55-gallon drums and subsequently removed from the site by Tyree to S&W Waste Inc. for recycling. Upon removal of the USTs, they were inspected. The gasoline USTs had some observable corrosion, however no pitting, holes, or perforations were present. Photographs of the excavated gasoline USTs are presented in Appendix I. The gasoline USTs were removed



from the site by Tyree and transported to Lieberman Koren Corporation and Kings County Scrap Iron, in Brooklyn, New York, where they were recycled as scrap metal. No groundwater was observed in the gasoline UST excavation, however, free-phase product and petroleum hydrocarbon odors with PID readings up to 500 ppm were encountered.

During the removal of the USTs, all excavated soils that registered PID readings greater than 100 ppm were stockpiled on and covered with plastic for future off-site disposition.

7.0 POST EXCAVATION SOIL SAMPLING

Three post-excavation soil samples (PI-1 through PI-3) were collected from beneath the north, east and south dispenser islands on June 15, 1993 (Table 2). A Dispenser Island Sampling Plan is provided depicting the location of the dispensers and soil samples (Figure 3).

Six post-excavation soil samples (TF-1 through TF-6) were collected from the bottom of the gasoline tank excavation on June 15, 1993 (Table 2). Soil samples were not collected from the walls of the excavation due to the close proximity to the kiosk, electrical conduits, and presence of fill material. A Gasoline Tank Excavation Map is provided depicting the locations of the gasoline USTs and the locations of the post-excavation soil samples (Figure 4).

Three post-excavation soil samples (WW-1 through WW-3) were collected from the south wall, center bottom and west wall of the waste water USTs excavation on June 22, 1993 (Table 2). A Waste Water Tank Excavation Map is provided depicting the locations of the USTs and post-excavation soil samples (Figure 5).

Four post-excavation soil samples (UT-1 through UT-4) were collected from the walls of the unknown gasoline tank excavation on June 28, 1993 (Table 2). Soil samples were not collected from all the walls of the gasoline tank excavation due to the close proximity to the kiosk, electrical conduits, and presence of the abandoned tank. An Unknown Gasoline Tank Excavation Map is provided depicting the locations of the unknown gasoline USTs and the locations of the post-excavation soil samples (Figure 6).



8.0 POST EXCAVATION SOIL ANALYTICAL RESULTS

All post-excavation soil samples were analyzed for total petroleum hydrocarbons (TPH) via U.S. EPA test Method 418.1, and benzene, toluene, ethylbenzene, and total xylenes (BTEX) via U.S. EPA test Method 8020. A chain-of-custody accompanied all samples from the time of collection to the time they were received by the laboratory. All analyses were conducted by Analab, Inc., of Edison, New Jersey (NY certification #11104).

The analytical results for the three soil samples collected from beneath the dispenser islands indicated TPH concentrations ranging from 143 ppm in sample PI-1 to 164 ppm in sample PI-2. Only toluene and total xylenes were detected in only one dispenser island sample at 0.00452 and 0.00490 ppm, respectively. All other post-excavation samples reported not detected for BTEX compounds (Figure 3).

The analytical results of the post-excavation soil samples collected from the gasoline UST excavation indicated a TPH concentration ranging from not detected in samples TF-1, TF-5 and TF-6 to 428 ppm in sample TF-2. Total BTEX compounds ranged from not detected in sample TF-3 to 14.997 ppm in sample TF-2 (Figure 4).

The analytical results for the three post-excavation soil samples collected from the waste water UST indicated TPH concentrations ranging from 4,960 ppm in sample WW-2 to 24,200 ppm in sample WW-1. All three waste water UST samples detected toluene only at concentrations ranging from 0.00386 ppm (estimated concentration) to 0.0952 ppm. All other BTEX compounds were not detected in the three soil samples (Figure 5).

The analytical results of the post-excavation soil samples collected from the unknown gasoline UST excavation indicated a TPH concentration ranging from 44.8 ppm in sample UT-1 to 882 ppm in sample UT-3. Total BTEX compounds ranged from not detected in sample UT-1 and UT-4 to 348.40 ppm in sample UT-3 (Figure 6).



Table 3 summarizes the soil analytical results for the post-excavation samples collected from the two excavations and the dispenser islands. The summary laboratory analytical package is included in Appendix III. Tune data, calibration data, and chromatographs are available from GES upon request.

9.0 SUMMARY

On June 15, three soil samples were obtained from beneath the former dispenser islands. No separate-phase product was observed beneath the dispenser islands. Petroleum hydrocarbon odors were observed during the sampling procedures and PID readings from the excavated soils ranged from 4.2 ppm (sample PI-2) to 24 ppm (sample PI-1). The analytical results of the soil samples collected from the dispenser islands indicated a TPH concentration ranging from 143 ppm to 164 ppm. Only toluene and total xylenes were detected in one sample (PI-2) at estimated concentrations of 0.00452 and 0.00490 ppm, respectively.

On June 15 1993, four, 4,000-gallon and two, 2,000-gallon, single-walled, steel gasoline USTs were removed. The USTs had some observable corrosion, but no pitting, holes, or perforations. Groundwater was not present in the gasoline tank field excavation. Separate-phase product was observed in the gasoline tank excavation. Petroleum hydrocarbon odors were observed during the removal of the USTs and PID readings from the excavated soils ranged from 36 ppm to 500 ppm (1-4 feet below grade above the USTs). The analytical results of the post-excavation soil samples collected from the gasoline tank field excavation indicated a TPH concentration ranging from not detected to 428 ppm. Total BTEX ranged in concentration from not detected to 14.997 ppm.

On June 22, 1993, one 550-gallon and one 2,000-gallon, single-walled, steel waste water USTs were removed. The UST had some corrosion, however, pitting, holes, or perforations were not observed. No groundwater was observed in the excavation. The analytical results for the post-excavation soil samples collected from the UST excavation indicated TPH concentrations ranging from 4,960 ppm to 24,200 ppm. Three post-excavation samples detected toluene only at concentrations ranging from 0.00386 ppm (estimated concentration) to 0.0952 ppm.



On June 28 1993, ten unknown 550-gallon single-walled, steel gasoline USTs were removed and post-excavation soil samples were collected. An eleventh 550-gallon single walled, steel gasoline UST was discovered. It had to be abandoned in place with concrete slurry due to its close proximity to the canopy's structural footing. The gasoline USTs had some observable corrosion, however, no pitting, holes, or perforations were present. No groundwater was observed in the excavation. Separate-phase product was observed in the gasoline tank excavation. Petroleum hydrocarbon odors were observed during the removal of the USTs and PID readings from the excavated soils ranged from 20 ppm to 500 ppm (1-4 feet below grade). The analytical results of the post-excavation soil samples collected from the unknown gasoline tank field excavation indicated a TPH concentration ranging from 44.8 to 882 ppm. Total BTEX ranged in concentration from not detected to 348.40 ppm.

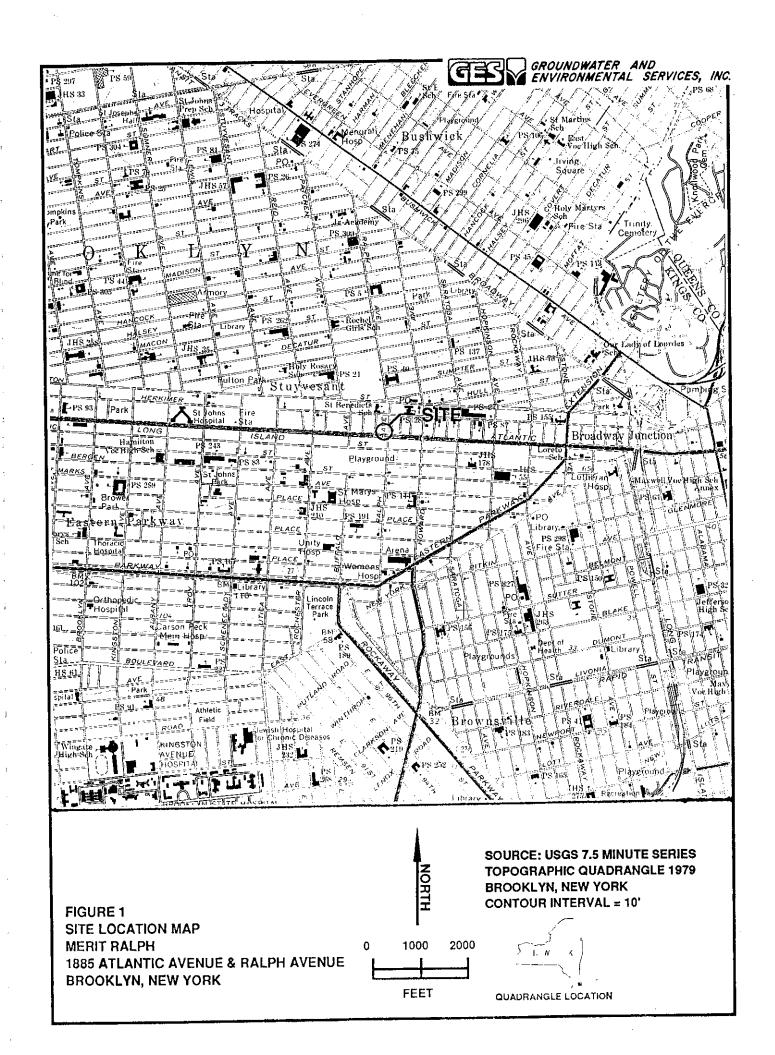
Approximately 980 tons of petroleum impacted soil were excavated during UST closure activities and transported by Blue Waters Environmental Services, Inc. of Farmingdale, New York to Posillico Brothers Asphalt Company of Farmingdale, New York where it was thermally processed and recycled into hot mix asphalt.

10.0 CONCLUSION

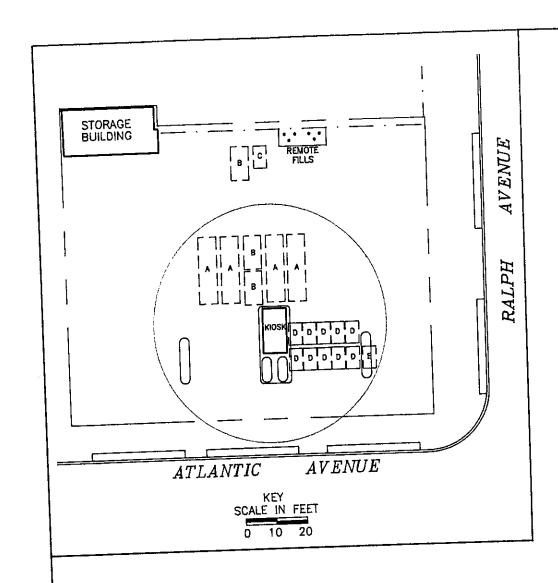
The analysis of all post-excavation soil samples reported below the allowable BTEX concentration limits for benzene (24 ppm), toluene (20,000 ppm), ethylbenzene (8,000 ppm) and total xylenes (200,000 ppm) as specified in the NYSDEC August 1992 Petroleum-Contaminated Soil Guidance Policy. The highest benzene and ethylbenzene concentrations were detected in soil sample TF-2 at respective concentrations of 0.105 ppm and 2.350 ppm. The highest toluene and total xylene concentrations were detected in soil sample UT-3 at respective concentrations of 10.40 ppm and 338 ppm. Although separate-phase product impacted soils were present across the site, 980 tons of these soils were removed and replaced with clean fill. Therefore, GES recommends no further action be taken at this time regarding soil removal at the site. A Phase I Environmental Assessment will be completed by GES on behalf of Merit to determine if soluble-phase hydrocarbons have impacted the groundwater at the site.



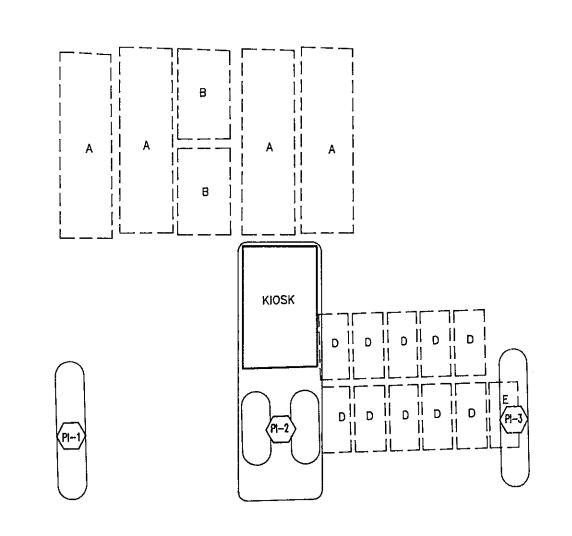
FIGURES



RS0011



SAMPLE	TPH	BENZENE	TOLUENE	ETHYL Benzene	XYLENES	TOTAL BTEX
			pr	om		
PI1 PI2 PI3	143 164 151	ND ND ND	ND 0.00452J ND	DN DN DN	ND 0.00490J ND	ND 0.00942J ND

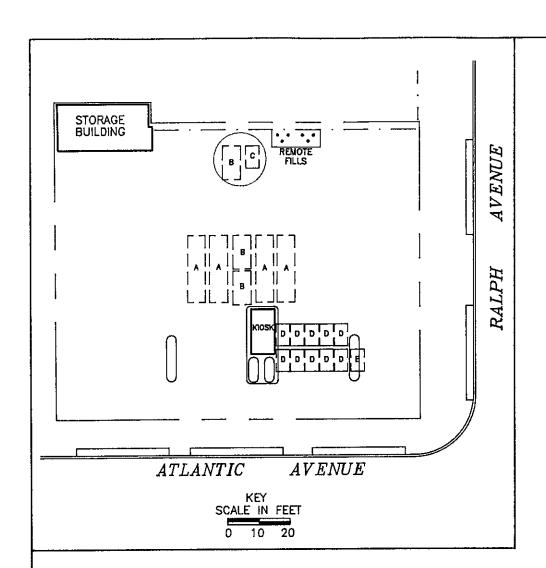


LEGEND DENOTES LOCATION OF SAMPLING POST EXCAVATION SOIL SAMPLE FORMER DISPENSER ISLAND FORMER 4,000 GAL UNDERGROUND STORAGE TANK FORMER 2,000 GAL UNDERGROUND STORAGE TANK В FORMER 550 GAL UNDERGROUND STORAGE TANK FORMER 550 GAL GASOLINE UNDERGROUND STORAGE TANK ABANDONED 550 GAL GASOLINE UNDERGROUND STORAGE TANK PROPERTY BOUNDARY TOTAL PETROLEUM HYDROCARBONS PARTS PER MILLION NOT DETECTED DETECTION LIMIT OF 0.005 ppm BTEX BENZENE, TOLUENE, ETHYLBENZENE, XYLENES ESTIMATED CONCENTRATION

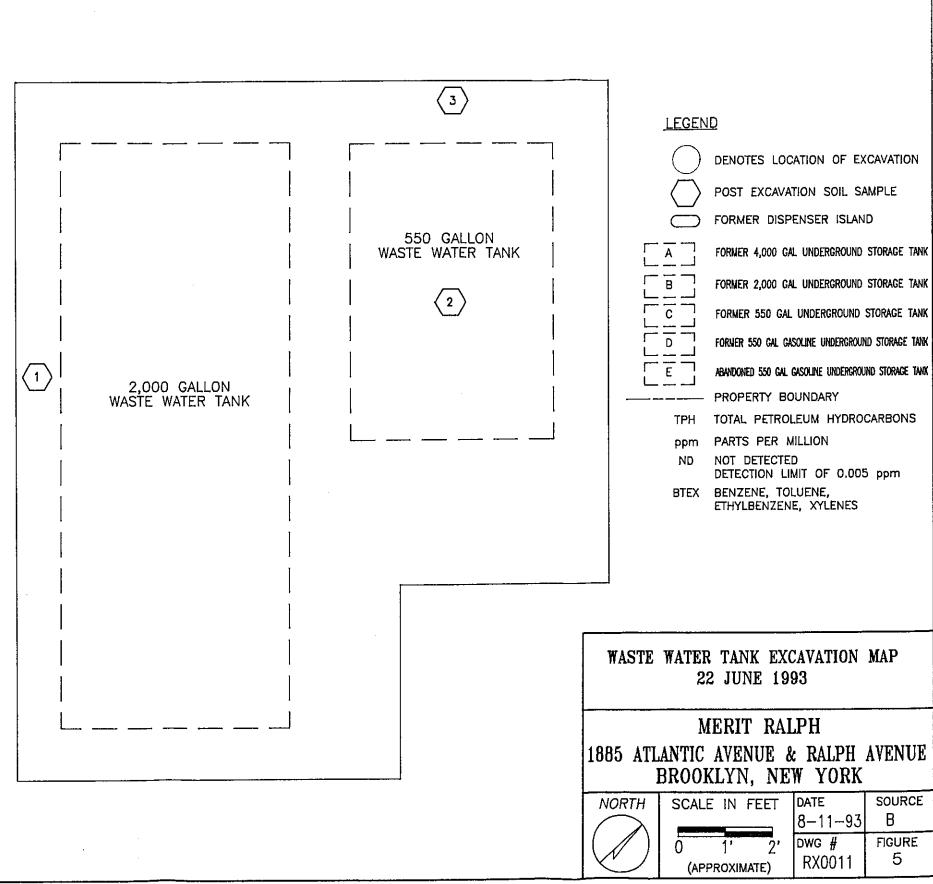
DISPENSER ISLAND SAMPLING PLAN 15 JUNE 1993

MERIT RALPH
1885 ATLANTIC AVENUE & RALPH AVENUE
BROOKLYN, NEW YORK

DIOOMATTI, TIES!								
NORTH	SCALE IN FEET	DATE 8-11-93	SOURCE B					
	0 5' 10' (APPROXIMATE)	owg # RX0011	FIGURE 3					

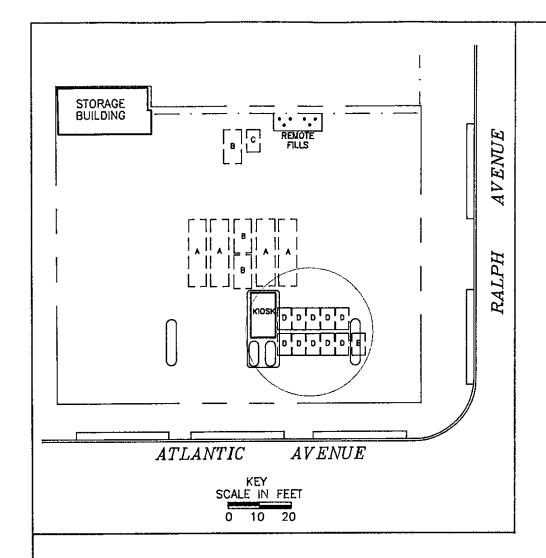


SAMPLE	TPH BENZENE		TOLUENE	ETHYL- Benzene	XYLENES	TOTAL BTEX		
		ppm						
WW1	24,200	ND	0.0952	ND	ND	0.0952		
WW2	4,960	ND	0.00386J	ND	ND	0.00386J		
ww3	9,000	ND	0.00901	ND	ND	0.00901		

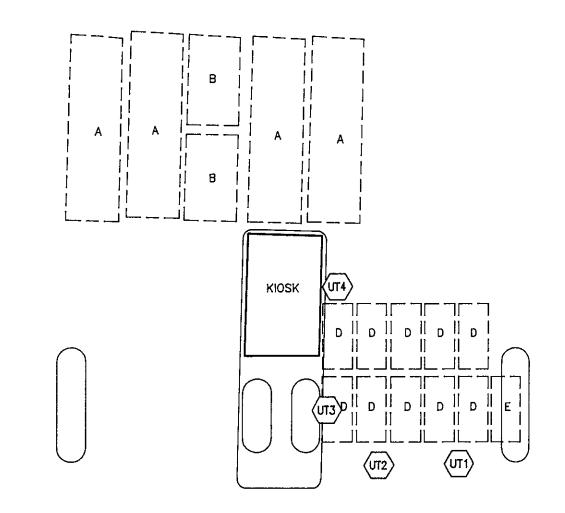


-GROUNDWATER &

ENVIRONMENTAL SERVICES, INC.



SAMPLE	TPH	BENZENE	TOLUENE	ETHYL— Benzene	XYLENES	TOTAL BTEX
	ppm					
UT1	44.8	ND	ND	ND	ND	ND
UT2	82.1	ND	2.34	1.72	9.06	13.12
UT3	882	ND	10.4	ND	338	348.4
UT4	151	ND	ND	ND	ND	ND



LEGEND DENOTES LOCATION OF EXCAVATION POST EXCAVATION SOIL SAMPLE FORMER DISPENSER ISLAND FORMER 4,000 GAL UNDERGROUND STORAGE TANK 8 FORMER 2,000 GAL UNDERGROUND STORAGE TANK c FORMER 550 GAL UNDERGROUND STORAGE TANK D FORNER 550 GAL GASOLINE UNDERGROUND STORAGE TANK ABANDONED 550 GAL GASOLINE UNDERGROUND STORAGE TANK PROPERTY BOUNDARY TOTAL PETROLEUM HYDROCARBONS PARTS PER MILLION NOT DETECTED DETECTION LIMIT OF 0.005 ppm BTEX BENZENE, TOLUENE, ETHYLBENZENE, XYLENES

UNKNOWN TANK EXCAVATION MAP 25 & 28 JUNE 1993

MERIT RALPH 1885 ATLANTIC AVENUE & RALPH AVENUE BROOKLYN, NEW YORK



SCALE IN FEET BAT 80 5' 10' DWG (APPROXIMATE)

8-11-93 B
DWG # FIGURE
RX0011 6

SOURCE



TABLES



TABLE 1 PID FIELD SCREENING ANALYSIS MERIT RALPH 1885 ATLANTIC AVENUE & RALPH AVENUE BROOKLYN, NEW YORK

June 14, 1993 through June 28, 1993

Location		PID (ppm)
DISPENSER ISLANDS	FIGURE 3	
North Dispenser Island (2 fbg) West Dispenser Island (2 fbg) South Dispenser Island (2 fbg)	PI-1 PI-2 PI-3	24 4.2 6.5
GASOLINE TANK FIELD	FIGURE 4	
Above USTs (1-4 fbg) South Bottom (10 fbg) Southwest Bottom (10 fbg) East Center Bottom (10 fbg) West Center Bottom (10 fbg) Northeast Bottom (10 fbg) North Bottom (10 fbg)	TF-1 TF-2 TF-3 TF-4 TF-5 TF-6	36-500 58 >260 84 >210 84 166
(2) WASTE WATER USTs	FIGURE 5	
South Wall (6 fbg) Center Bottom (10 fbg) West Wall (6 fbg)	WW-1 WW-2 WW-3	40 30 12
UNKNOWN TANK FIELD	FIGURE 6	
Canopy Area, Below Concrete Pa Above USTs (1-4 fbg) Northeast Wall (5 fbg) East Wall (5 fbg) South Wall (5 fbg) Southwest Wall (5 fbg)	ad (1 fbg) UT-1 UT-2 UT-3 UT-4	30-360 250-500 20 28 56 114

PID = Photoionization Detector

ppm = parts per million fbg = feet below grade



TABLE 2 SOIL SAMPLE COLLECTION SUMMARY DATA FOR UNDERGROUND STORAGE TANK AND DISPENSER ISLAND CLOSURE MERIT RALPH 1885 ATLANTIC AVENUE & RALPH AVENUE

June 15, 22 and 28, 1993

BROOKLYN, NEW YORK

Location	Sample Number	Sample Date
DISPENSER ISLANDS (Figure 3))	15 June 1993
North Dispenser Island (2 fbg) West Dispenser Island (2 fbg) South Dispenser Island (2 fbg)	PI-1 PI-2 PI-3	
GASOLINE TANK FIELD (Figure	e 4)	15 June 1993
South Bottom (10 fbg) Southwest Bottom (10 fbg) East Center Bottom (10 fbg) West Center Bottom (10 fbg) Northeast Bottom (10 fbg) North Bottom (10 fbg)	TF-1 TF-2 TF-3 TF-4 TF-5 TF-6	
(2) WASTE WATER USTs (Figure	e 5)	22 June 1993
South Wall (6 fbg) Center Bottom (10 fbg) West Wall (6 fbg)	WW-1 WW-2 WW-3	
UNKNOWN TANK FIELD (Figur	re 6)	28 June 1993
Northeast Wall (5 fbg) East Wall (5 fbg) South Wall (5 fbg) Southwest Wall (5 fbg)	UT-1 UT-2 UT-3 UT-4	

fbg = feet below grade

TABLE 3
SOIL ANALYTICAL SUMMARY DATA
MERIT RALPH
1885 ATLANTIC AVENUE & RALPH AVENUE
BROOKLYN, NEW YORK

June 14, 15, 22, 25, and 28, 1993

(All results in parts per million)

Sample #	ТРН	Benzene	Toluene	Ethyl- Benzene	Total Xylenes	Total BTEX
PI-1	143	ND	ND	ND	ND	ND
PI-2	164	ND	0.00452J	ND '	0.00490J	0.00942J
PI-3	151	ND	ND	ND	ND	ND
TF-1	ND	0.00567	0.00331J	ND	ND	0.00898
TF-2	428	0.105	0.842	2.350	11.70	14.997
TF-3	44.8	ND	ND	.ND	ND	ND
TF-4	413	ND	0.0516	ND	0.580	0.6316
TF-5	ND	ND	0.00882	ND	0.0298	0.03862
TF-6	ND	0.00552	0.00306J	ND	ND	0.00858
WW-1	24,200	ND	0.0952	ND	ND	0.0952
WW-2	4,960	ND	0.00386J	ND	ND	0.00386J
WW-3	9,000	ND	0.00901	ND	ND	0.00901
UT-1	44.8	ND	ND	ND	ND	ND
UT-2	82.1	ND	2.340	1.720	9.060	13.120
UT-3	882	ND	10.40	ND	338	348.40
UT-4	151	ND	ND	ND	ND	ND

BTEX = Benzene, Toluene, Ethylbenzene, Total Xylenes

TPH = Total Petroleum Hydrocarbons

ppm = parts per million

J = Estimated Concentration

ND = Not Detected



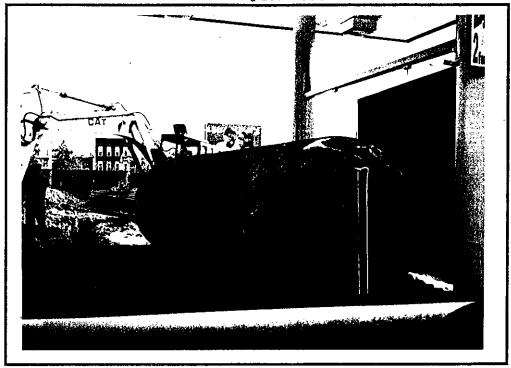


APPENDIX I

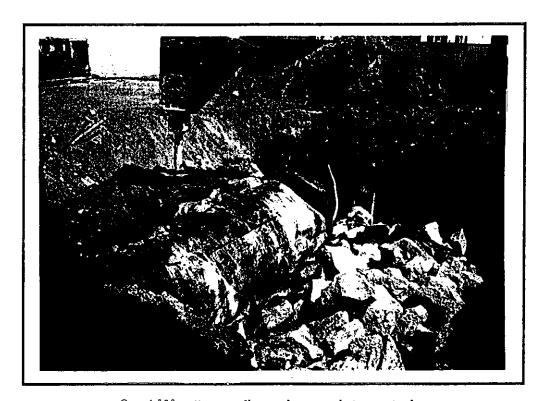
Photographs



SITE PHOTOGRAPHS MERIT RALPH 1885 ATLANTIC AVENUE & RALPH AVENUE BROOKLYN, NEW YORK 14 & 15 JUNE 1993



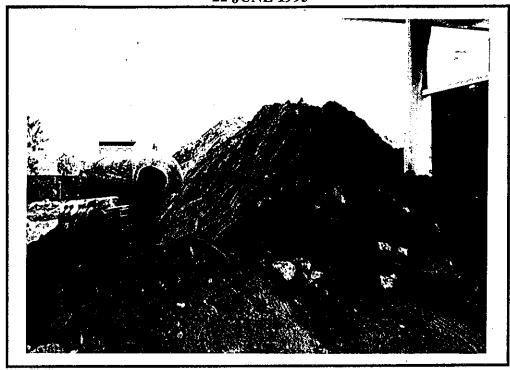
One excavated 4,000-gallon gasoline underground storage tank



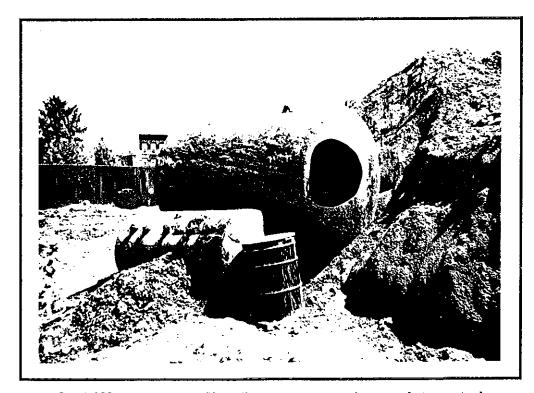
One 4,000-gallon gasoline underground storage tank



SITE PHOTOGRAPHS MERIT RALPH 1885 ATLANTIC AVENUE & RALPH AVENUE BROOKLYN, NEW YORK 22 JUNE 1993



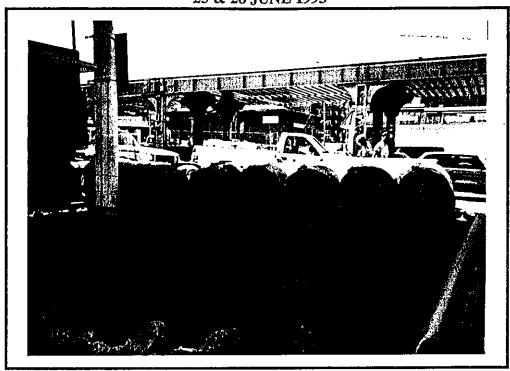
One 2,000-gallon and one 550-gallon waste water underground storage tank



One 2,000-gallon and one 550-gallon waste water underground storage tank



SITE PHOTOGRAPHS MERIT RALPH 1885 ATLANTIC AVENUE & RALPH AVENUE BROOKLYN, NEW YORK 25 & 28 JUNE 1993



Ten excavated 550-gallon gasoline underground storage tanks



One 550-gallon abandoned gasoline underground storage tank