REMEDIAL INVESTIGATION REPORT

TAPPAN TERMINAL SITE
HASTINGS-ON-HUDSON
WESTCHESTER COUNTY, NEW YORK

(SITE REGISTRY NO. 3-60-015)

PREPARED FOR

NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

BY

DVIRKA AND BARTILUCCI
CONSULTING ENGINEERS
SYRACUSE, NEW YORK

SEPTEMBER 1999

TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION REPORT

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

List of Figures

List of Tables

List of Sheets

List of Appendices

1.0 INTRODUCTION

As part of New York State's program to investigate and remediate hazardous waste sites, the New York State Department of Environmental Conservation (NYSDEC) issued a Work Assignment to Dvirka and Bartilucci Consulting Engineers (D&B) of Woodbury, New York to conduct a Remedial Investigation/Feasibility Study (RI/FS) for the Tappan Terminal Site located in Hastings-on-Hudson, Westchester County, New York. This work assignment has been issued under the Superfund Standby Contract between D&B and NYSDEC. The registry number for this New York State Class 2 inactive hazardous waste site is 3-60-015. The RI/FS for this site is being performed with funds allocated under the New York State Superfund Program.

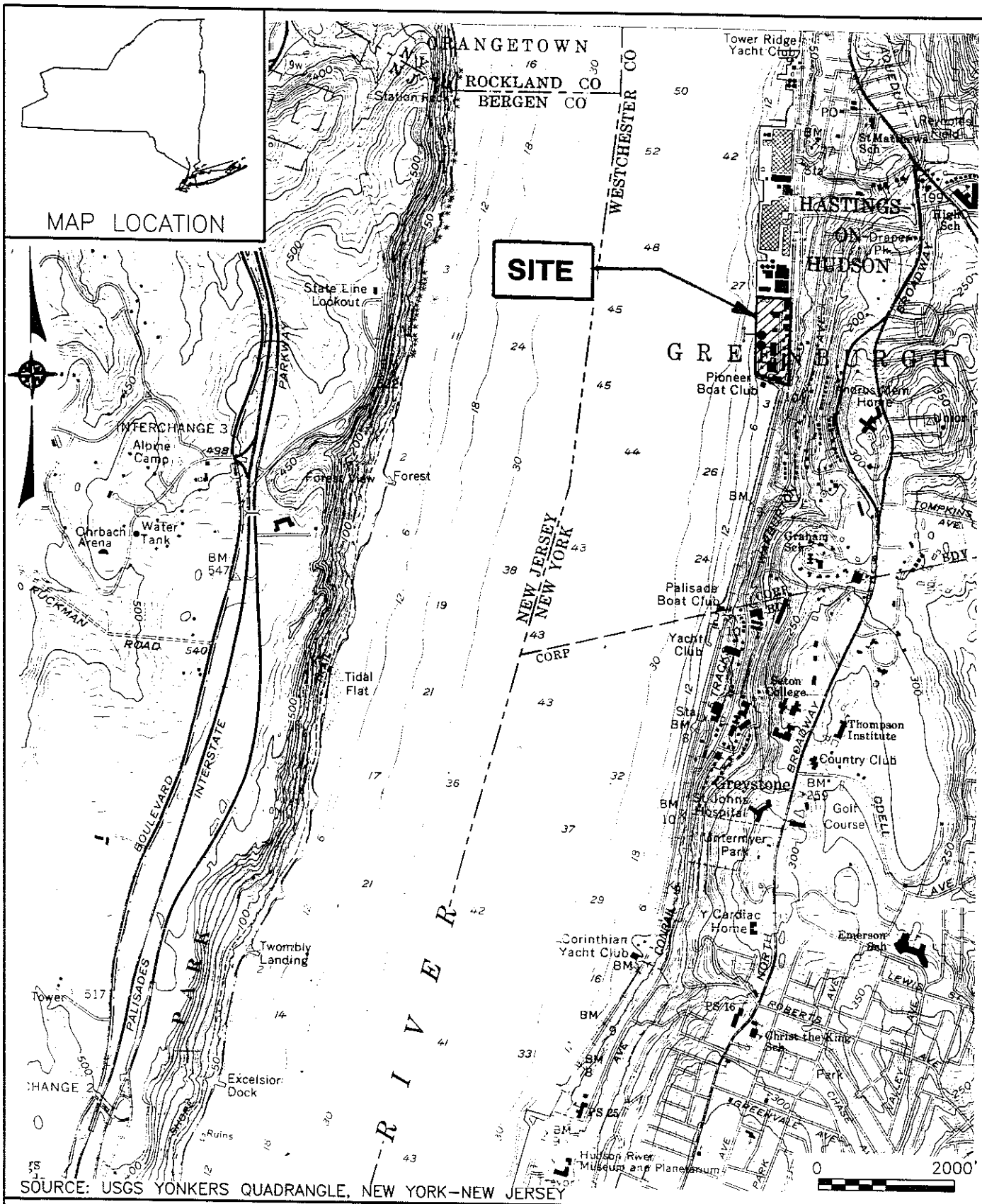
1.1 Project Objective

The purpose of the RI/FS for the Tappan Terminal Site is to perform a remedial investigation (RI) to determine the nature and extent of contaminated soil, groundwater at the site and sediment adjacent to the site. This information will be used to determine the risk to human health and the environment, and to perform a Feasibility Study (FS) which identifies, evaluates and recommends a remedial action for the site.

This document presents a detailed description of the activities conducted as part of the RI and the results of those activities. The report has been prepared in accordance with the Federal Comprehensive Emergency Response Compensation and Liability Act (CERCLA), Superfund Amendments and Reauthorization Act (SARA) and the NYSDEC Superfund Program, including NYSDEC Technical and Administrative Guidance Memorandum "Guidelines for Remedial Investigation/Feasibility Studies."

1.2 Site Location, Ownership and Access

The Tappan Terminal Site is located on 15 acres of man-made fill adjacent to the Hudson River in Hastings-on-Hudson, New York (see Figure 1-1). The site is comprised of two property parcels. One parcel is owned by Mobil Oil Corporation and the other parcel is owned by the



SOURCE: USGS YONKERS QUADRANGLE, NEW YORK–NEW JERSEY

DIR: 1570 FILE: USGSMAP.DWG

TAPPAN TERMINAL SITE
HASTINGS–ON–HUDSON, NEW YORK

SITE LOCATION MAP

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 1–1

Uhlich Color Company, Inc. Historical releases of petroleum and hazardous wastes have caused documented contamination of soil and groundwater at the site. A remedial investigation performed on the Mobil property confirmed that groundwater is contaminated with chlorobenzene, ethyl ether and other volatile organic contaminants. Dichlorobenzene, naphthalene, fluoranthene and other semivolatile organic compounds have also been identified at levels that exceed groundwater standards and guidance values at the Mobil property.

Access to the Tappan Terminal site is from Railroad Avenue at the southwest corner of the site. Railroad Avenue connects Southside Avenue with the site via the Zinsser bridge over the Metro North railroad tracks. Railroad Avenue ends at the gatehouse for the Uhlich Company. The gatehouse is manned 24 hours a day and an automated gate restricts access. Entrance to the Uhlich Property must be made with approval of the on-duty gatekeeper. Exit from the property is by automatic sensor that is triggered by slowly driving up to the gate. A chain link fence that is in good repair surrounds the remainder of the Uhlich property.

The Mobil property is surrounded on three sides by a chain link fence that is in good repair. The fourth side of the property is the Hudson River shoreline. Access to the site can be obtained by driving through a locked gate on the south side of the property adjacent to the Uhlich gatehouse or a locked gate on the southwest corner of the property near the river. Pedestrian access can be made at low tide by walking around the fence at the Hudson River shoreline on the southern portion of the site. Access to this location would require passing through a roped gate and trespassing on the Pioneer Boat Club Property. Similarly, access can be obtained from the northwest corner of the property from the bulkhead on the Atlantic Richfield Company (ARCO) property which borders the site to the north. Access from this location requires the trespasser to negotiate unsure footing over large boulder riprap, climbing a steep, loose stone berm and walking through dense woody brush.

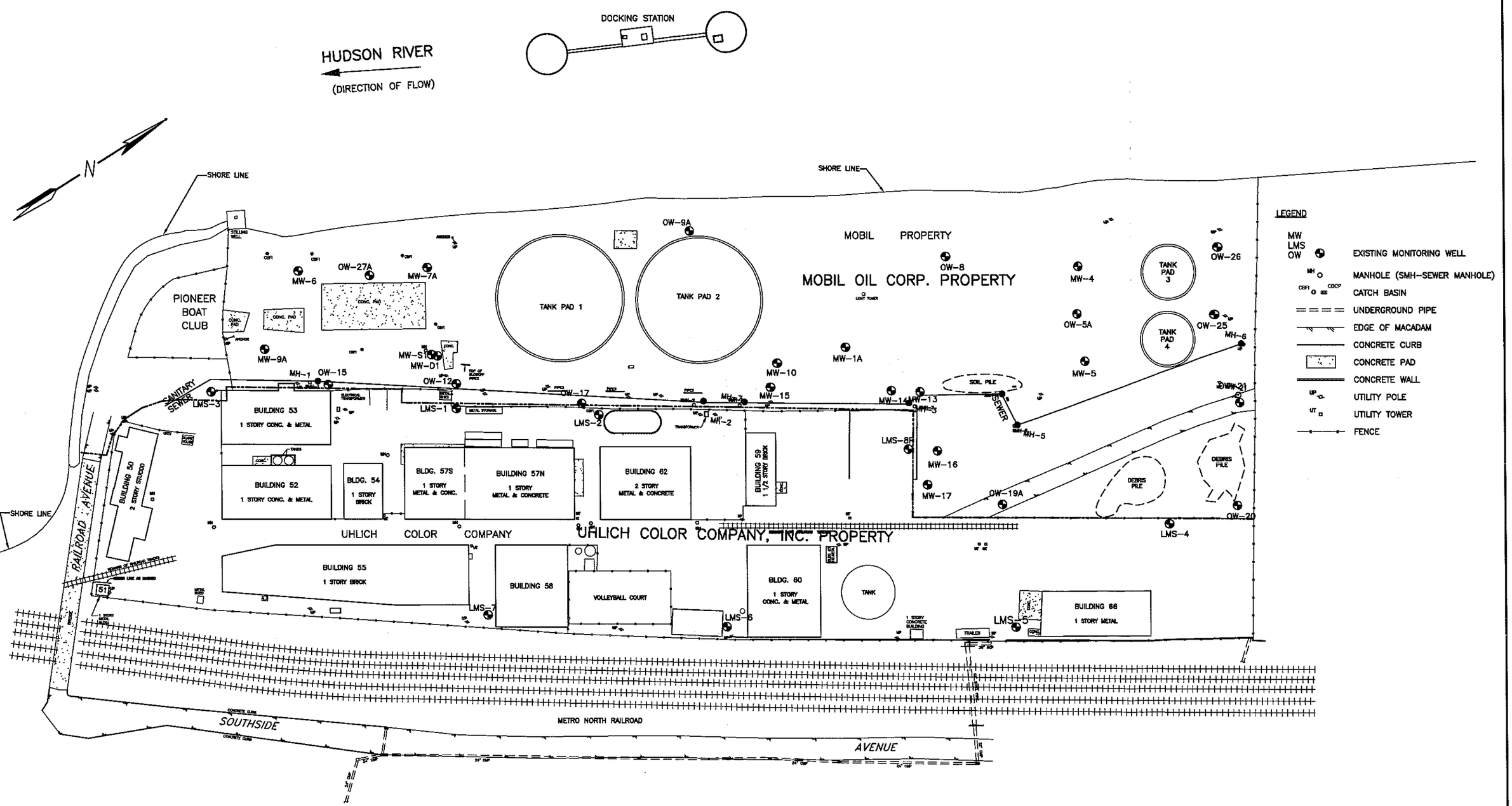
1.3 Site Description

The Tappan Terminal Site is located in the southwestern portion of the Village of Hastings-on-Hudson, Town of Greenburgh, Westchester County, New York. The site is located on the east bank of the Hudson River at approximately river mile 22. The site is comprised of the Mobil Oil property (7.7 acres) on the western portion and the Uhlich Color Company property (7.2 acres) on the eastern portion (see Figure 1-2). The Uhlich Color Company is an active pigment manufacturing facility. The Mobil property was formerly operated as a major oil storage facility and is currently vacant, except for a small portion at the southwest corner that is leased by the Pioneer Boat Club and operated as a boat launch and storage area. Oil storage operations on the Mobil property were discontinued in 1985.

The Harbor-at-Hastings Site (also known as the ARCO site or the Anaconda site) borders the Tappan Terminal site to the north. The Harbor-at-Hastings Site was formerly occupied by the Anaconda Wire Company and used for the manufacture of electrical wire and other electrical equipment. This site is currently undergoing an RI/FS as a Class 2 inactive hazardous waste site, for which ARCO is a Potentially Responsible Party (PRP). Subsurface soil and river sediment contaminated with polychlorinated biphenyls (PCBs), polyaromatic hydrocarbons (PAHs) and metals are the primary focus of the ongoing investigation at the site.

1.3.1 Climate

The Tappan Terminal Site has a continental climate with a moderating influence on temperatures caused by the Atlantic Ocean. Moisture from the Atlantic Ocean causes high humidity. Winter temperatures in Westchester County average 32 degrees Fahrenheit and summer temperatures average 72 degrees Fahrenheit. The average annual precipitation is 48 inches and the average annual snowfall is 37 inches.



FILE NAME: 1570-11 DATE: RH/04-21-99

TAPPAN TERMINAL SITE
HASTINGS-ON-HUDSON, NEW YORK

SITE MAP

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 1-2

1.3.2 Regional Setting

The Tappan Terminal site is located in the New England Uplands physiographic province of New York State. The New England Uplands province is geologically complex with prevalent folding and faulting. Bedrock beneath the site is mapped as the Inwood Marble, with occurrences of biotite-hornblende gneiss in the vicinity and outcrops of the Palisades diabase on the western bank of the Hudson River (Fisher, 1970). The Hudson River is a major physiographic feature in this area.

Unconsolidated sediments beneath the site consist of fill material used to create developable land along the Hudson River shoreline. Beneath the fill lies fluvial silt deposited by the Hudson River. The land surface at the site is approximately 10 feet above sea level. A few hundred feet east of the site, the banks of the Hudson River rise steeply to elevations of over 350 feet above sea level. Across the Hudson River to the west, the Palisade Cliffs of New Jersey rise to 500 feet above sea level.

1.4 Site History

The Tappan Terminal Site has a long history of manufacturing and chemical usage by several owners and occupants. Table 1-1 presents a detailed list of the history of site ownership and occupancy. A summary of historic site buildings and features is shown on Sheet 1-1 in a map pocket at the end of this report. A summary of the site history is provided below.

The landmass at the site was largely constructed between 1868 and 1970, with minor shoreline modifications occurring as recently as 1989. The land area was enlarged by progressive placement of man-made fill behind a series of intermediate bulkheads along the Hudson River. Filling began in the northeast corner of the property and progressed to the southwest. The fill material consisted of silt, sand and gravel mixed with bricks, concrete, stone, timber, ash, cinder, coal, slag, shells and other debris.

Table 1-1

TAPPAN TERMINAL SITE REMEDIAL INVESTIGATION
HISTORY OF SITE OWNERSHIP, OCCUPANCY AND DEVELOPMENT

Date	Description*
1868	The site was approximately 2 acres in size and the shoreline included the northern end of the current Uhlich property and extended southeastward to the Metro North property line.
1897-1955	Owned by Zinsser & Co., manufacturer of dyes, pigments and photographic chemicals, leased to U.S. during World War I until 1920.
1920	Shoreline was largely coincident with the current Uhlich/Mobil property line.
1955	Zinsser purchased by Harshaw and operated until 1961. The shoreline was extended to include most of the current Mobil property.
1961	Tappan Tanker Terminal, Inc. (TTT) purchases property from Harshaw.
1961-1962	Sanitary sewer constructed on what is now Mobil property.
1962-1979	Petroleum Heat & Power leases Building 66 from TTT (to 1975) and from Uhlich 1975-1979, fuel delivery truck maintenance garage.
1962-?	Steri Research Laboratory leased west portion of 1st floor of Building 50 from TTT for unknown use.
By 1964	TTT constructs large fuel oil storage tanks on current Mobil property, operated fuel oil storage facility until 1971.
1964-?	Phillip Eades Trucking & Hauling rented building 57N from TTT.
1964-1975	Paul Uhlich & Co., Inc. leases east portion of property, occupied buildings 50, 52, 53, 55 and 49A, made organic pigments.
1964-1974	Villard Contracting Co. stored trucks and equipment in building 57S, general contractor and carpenter.
1966-1975	J.F. Macri stored trucks and equipment in building 57N, machinery moving business.
1967	Mobil bought Tappan Terminal from TTT.
1967-1970	Geigy Chemical Corp. leases building 59 from TTT, stored pesticides.
1967-1972	Quirk, Lawler & Matusky Engineers rented 1st floor building 50 from TTT, sanitary wet chemical laboratory.
1968-1970	U.S. Army Corps of Engineers authorizes disposal at sea by TTT of Nepera Chemical Co. waste which were stored in one of two smaller fuel oil storage tanks on north end of present Mobil property: wastes included toluene, benzene, pyridene, a and b picoline.
1970-1974	Mobil leases west portion from TTT.
1977	Shoreline development is complete and looks much as it does today.
1971-1975	TTT Properties leased and sold portions of property.
1972->1989	Ricci Brothers, general contractor, leases building 57S (1972-1979) and former building 12 (1979-1985) for storage and maintenance of earthmoving/paving equipment. 1985-1989 or later, Ricci leases vacant land north of building 60 for same use.

Table 1-1 (continued)

TAPPAN TERMINAL SITE REMEDIAL INVESTIGATION
HISTORY OF SITE OWNERSHIP, OCCUPANCY AND DEVELOPMENT

Date	Description*
1975	Mobil purchases west portion from TTT, storage and distribution of No. 2, 4 and 6 fuel oils.
Pre 1975-1984	Hastings Roofing, Inc. leases building 59 from TTT until 1975 and from Uhlich until 1984, roofing material storage and vehicle maintenance.
Pre 1975-1989 or later	Hastings Moving & Storage leases buildings 58 and 57N from Uhlich and before from TTT.
1975	Uhlich purchases property it currently owns, begins to lease portions to others.
1975-1981	Donald Brown Roofers occupies building 57S (1975-1979) and building 12 (1979-1981) storing trucks and roofing materials.
1975-1983	Koski & Schmidt Services rents building 61, storing machinery and trucks.
1977-1989 or later	Awards Etc. rented first floor of building 50 to 1982 and buildings 60/61 until at least 1989, makes trophies, stores electroplating chemicals.
1979-1985	Whaleco Fuel Oil assumes Petroleum Heat & Power lease for above PH & P use.
1985	Mobil ceased storage and distribution operations.
1986	May, Legette, Brashears and Graham (LBG) conducts preliminary site investigation, including drilling and chemical analyses of soil and groundwater.
1986	October, LBG contracted to conduct full site evaluation for the presence of contamination.
1987	NYSDOH site inspection, May 1.
1987	A report was published entitled "Mobil Oil Corporation, Tappan Terminal Environmental Sampling, June, 1987" by someone as discussed in 12/14/88 reference below.
1987->1989	Caldara Movers leased building 66, storage of household goods.
1994	Mobil, Uhlich and NYSDEC establish Stipulation Agreement to investigate and clean up No. 6 fuel oil spill.
1994	No. 6 fuel oil investigation conducted by excavating backhoe test pits on Uhlich Property in July and August. Oil sheen remediated by biological activity in open test pits.
1994	No. 6 fuel oil investigation on Mobil property results in 29 gallons of oil recovered from test pits in September.
1996	Mobil enters into a Voluntary Agreement with NYSDEC for a RI and FS for the western portion of the site.
1997	RI Report by Mobil Oil Corporation submitted to NYSDEC.
1998	Draft FS Report by Mobil Oil Corporation submitted to NYSDEC.

*Historical information obtained from LMS, 1989 and LBG, 1989.

The 1868 shoreline included the northern end of the current Uhlich property and extended southeastward to the current location of Building 60. From that point south, the current western boundary of the Metro North property was the Hudson River shoreline. By 1920, the shoreline was largely coincident with the current Uhlich/Mobil property line. In 1955, the landmass was extended to include most of the current Mobil property. At that time, the land currently occupied by the Pioneer Boat Club, the stilling well and the former Mobil loading racks, was non-existent. By 1970, the shoreline was filled to look much as it does today. Minor changes in the shoreline between 1970 and 1989 apparently involved the construction of a seawall and shoreline maintenance with riprap.

From 1897 to 1955, Zinsser and Company owned the site, which was a manufacturing facility for dyes, pigments and photographic processing chemicals. A 1955 map of the Zinsser property depicts site facilities and the locations and contents of chemical storage tanks (LMS, 1989). Historic maps of the plant also indicate that a solvent recovery system was operated on the site. In the 1910s, the site was leased to the United States Military.

In 1955, Zinsser was acquired by Harshaw Chemical Company, which continued this manufacturing until 1961. Between 1961 and 1971, the Tappan Tanker Terminal operated the site as a fuel oil storage facility. These operations were conducted in the western portion of the site, while buildings in the eastern portion of the site were leased to various enterprises. During this period, two large oil storage tanks were constructed on the current Mobil property, along with two smaller storage tanks on the northern portion of the site, used for the storage of waste toluene, benzene, pyridine and picoline. Mobil leased the western portion of the site beginning in 1970, and purchased that portion in 1975. From 1970 through 1985, Mobil received, stored and distributed Number 2, 4 and 6 fuel oils at the site. Mobil also operated two steam boilers using No. 6 fuel oil stored on the Uhlich property. In 1985, when Mobil closed the facility, several bulk storage violations and oil spills were discovered. Sampling and soil removal actions were conducted by Mobil under the Regional Oil Spill Program.

The Uhlich Color Company began leasing the eastern portion of the site in 1964, and purchased that portion from Tappan Tanker Terminal in 1975. Uhlich has manufactured organic pigments at the site throughout its tenancy. Uhlich has also leased buildings on this portion to various tenants since 1975.

Potentially Responsible Parties

In addition to the site owners discussed above, additional parties have potential liability as successors to former site owners. In 1966, Harshaw Chemical Company was purchased by Kewanee Industries, which was in turn acquired by Gulf Oil Corporation in 1977. As the result of a 1985 merger, Gulf became the Chevron Chemical Company.

In summary, the following is a list of PRPs as determined by the NYSDEC.

- Zinsser Company
- Harshaw Chemical Company
- Tappan Tank Terminal
- Mobil Oil Company
- Kewanee Industries
- Gulf Oil Company
- Chevron Chemical Company
- Paul Uhlich Company
- Uhlich Color Company

After refusing to enter into an Order on Consent, Mobil entered a Voluntary Agreement with NYSDEC to perform a Remedial Investigation and Feasibility Study for its parcel in September 1996. A Remedial Investigation Report was submitted in April 1997, which indicated the need to further investigate contamination on the Uhlich property. A draft Feasibility Study

Report was submitted to NYSDEC in July 1998, however the recommendations of the report have not been formally accepted by NYSDEC.

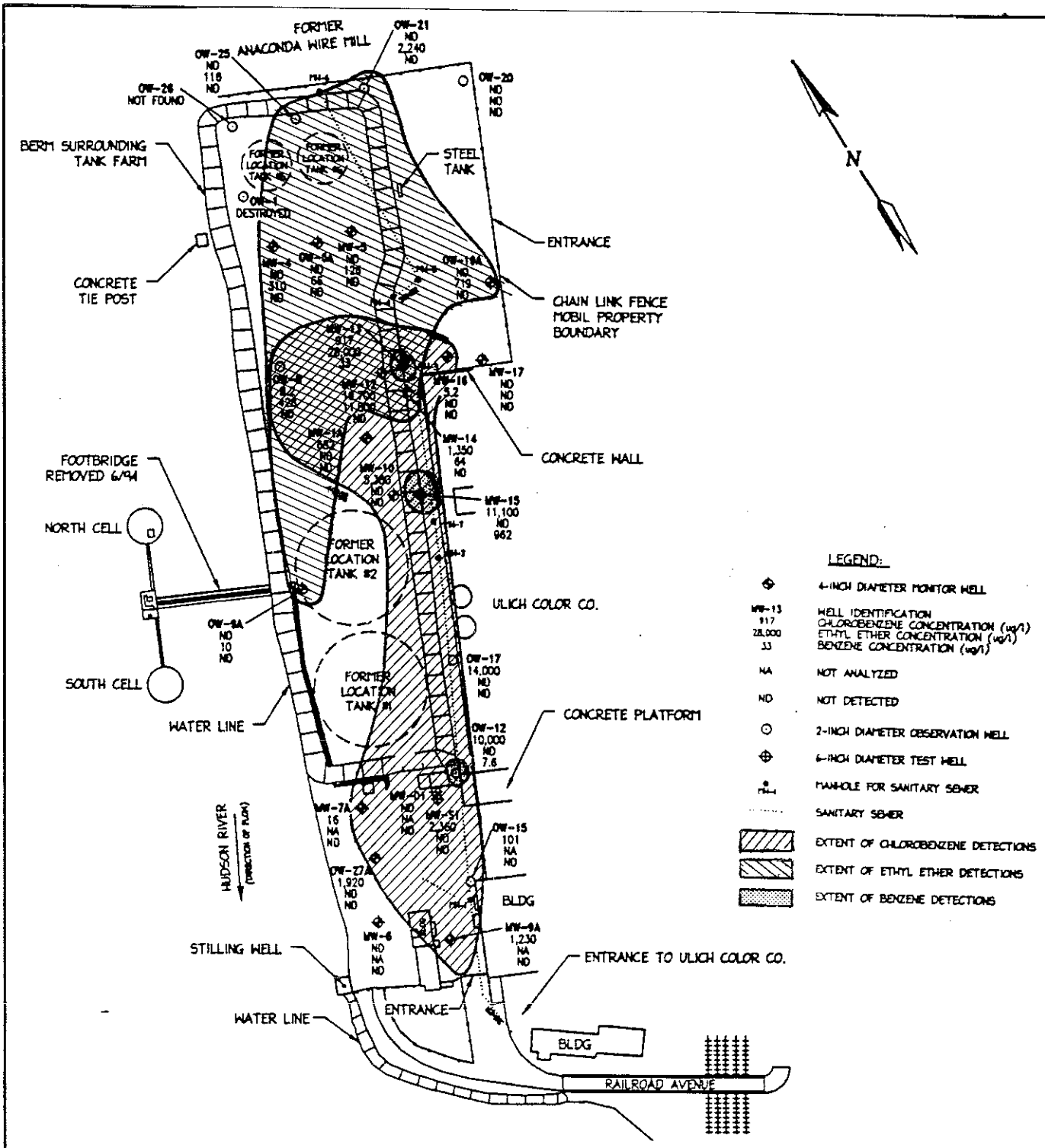
During negotiations between NYSDEC and the three known and viable PRPs (Mobil, Uhlich and Chevron) all denied liability for the release of contaminants and declined to undertake a remedial program at the site.

1.5 Findings from Previous Investigations

Several investigations were conducted by property owners at the Tappan Terminal Site between 1988 and 1997, and over 20 documents have been submitted to NYSDEC regarding the site. Table A-1, in Appendix A, provides an annotated bibliography of the various documents. Available data from these documents have been summarized on Sheet 1-2 (surface soil, surface water and sediment), Sheet 1-3 (subsurface soil) and Sheet 1-4 (groundwater). These sheets are located in map pockets at the end of this report. Locations of some structures and samples shown on these sheets were interpreted due to poor reproduction quality in report figures or the lack of a scaled drawing.

As a result of previous investigations 35 groundwater monitoring wells were installed on-site with 28 monitoring wells on the Mobil property and 7 wells on the Uhlich property. In addition, 12 piezometers were constructed on the Uhlich property. Several soil investigations have been also performed on both properties.

Groundwater sample results indicate that groundwater beneath the site is contaminated with chlorobenzene, ethyl ether, toluene, dichlorobenzene, naphthalene, fluoranthene, tetrachloroethene, benzene, petroleum hydrocarbons, lead, copper and iron above Class GA groundwater standards and guidance values. Groundwater plumes of chlorobenzene and ethyl ether have been delineated based on 1989 and 1997 sampling data. Figure 1-3 depicts the groundwater plumes identified in previous investigations



NOTE: THIS FIGURE ADAPTED FROM LEGGETTE, BRASHEARS AND GRAHAM INC. REMEDIAL INVESTIGATION REPORT, MOBIL OIL CORP. 1997

DIR: 1570 FILE: 1570-8.DWG

TAPPAN TERMINAL SITE
HASTINGS-ON-HUDSON, NEW YORK

GROUNDWATER CONTAMINATION IDENTIFIED IN PREVIOUS INVESTIGATION

Dvirka and Bartilucci Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 1-3

The primary contaminants detected in on-site soils are petroleum hydrocarbons and polycyclic aromatic hydrocarbons (PAHs) related to fuel storage activities at the site; however, these prior studies were limited to select analytes. PCBs were detected at two locations on the Mobil property at concentrations exceeding 1 ppm (maximum of 3.8 parts per million (ppm) Aroclor-1260). Several pigment releases have occurred on the Uhlich Color Company property, reportedly due to sewer backups. It is unclear from previous investigations whether any soil contamination is associated with these releases. Prior operations at the site may also have resulted in the release of aniline-based dyes to soils. Petroleum-contaminated soil and groundwater were removed from both properties as part of tank removal and oil spill response actions conducted under separate 1994 stipulation agreements between NYSDEC and Mobil and between NYSDEC and Uhlich.

1.6 Remedial Investigation Report Organization

The Tappan Terminal Site Remedial Investigation/Feasibility Study was designed to locate and confirm the source of documented groundwater contamination, determine the threat to human health and the environment, and provide recommendations for remediation of the site. The approach of the remedial investigation was to use existing data obtained from previous investigations as the basis for design of the field investigation. The field investigation was designed to provide a comprehensive analysis of the entire site (Uhlich and Mobil properties combined) and to fill data gaps for analytes not previously studied.

This report is presented in a format that allows for a logical and ordered progression of the descriptions and findings of the remedial investigation. Section 1.0 discusses the project objectives, background and review of the site history, including a discussion of previous investigations and a summary of their results. Section 2.0 is a detailed description of the elements and activities of the field program. Section 3.0 describes the physical characteristics of the study area, including surface features, geology and hydrogeology as determined from data obtained during this investigation. Section 4.0 discusses the nature and extent of the contamination, including discussions of the standards, criteria and guidelines for the various media sampled,

data validation, analytical results, and fate and transport of the contaminants detected. Section 5.0 presents the conclusions of the remedial investigation and Section 6.0 provides a preliminary evaluation of contaminated areas and media of concern.

The results of the remedial investigation will be used to evaluate the potential risks associated with the site. A Quantitative Risk Assessment, based upon the RI findings, will document the potential human health risks and will be contained in a separate document. A Feasibility Study incorporating the RI findings and risk assessment results, and evaluating remedial alternatives that minimize environmental risks, reduce and prevent further contamination, and protect human health will also be presented in a separate document.

2.0 STUDY AREA INVESTIGATION

The purpose of this section is to document field activities and techniques used to evaluate the Tappan Terminal Site. The RI was conducted during the fall of 1998. The field program was conducted in accordance with the site-specific Work Plan (D&B, 1998) approved by the NYSDEC in conjunction with the New York State Department of Health.

2.1 Site Facilities

Facilities used during the performance of the field investigation of the Tappan Terminal Site were temporary and short term. Due to the relatively short duration of field activities on site, a field office was not established. Project meetings were held on site when necessary, and deliveries, and telephone and fax communications occurred through a local hotel, the Uhlich Color Company or by other means. Field activities were directed from a truck or van that contained monitoring and sampling equipment, and accompanied drillers and other field personnel during the investigation. The Uhlich Color Company provided temporary storage space as well as access to ice and potable water as needed.

Temporary decontamination areas were established on each of the properties. Tools and equipment that were used on each property stayed on that property until decontaminated in order to minimize the potential for cross contamination between properties. Contaminant levels encountered at the site were below health screening levels established in the work plan, and after being determined not to be grossly contaminated by visual inspection and screening with a photoionization detector (PID), wash water was allowed to drain into surrounding on-site soils with approval of the NYSDEC. Water used for decontamination and drilling was obtained from a potable water source inside one of the Uhlich buildings.

2.2 Base Map Development

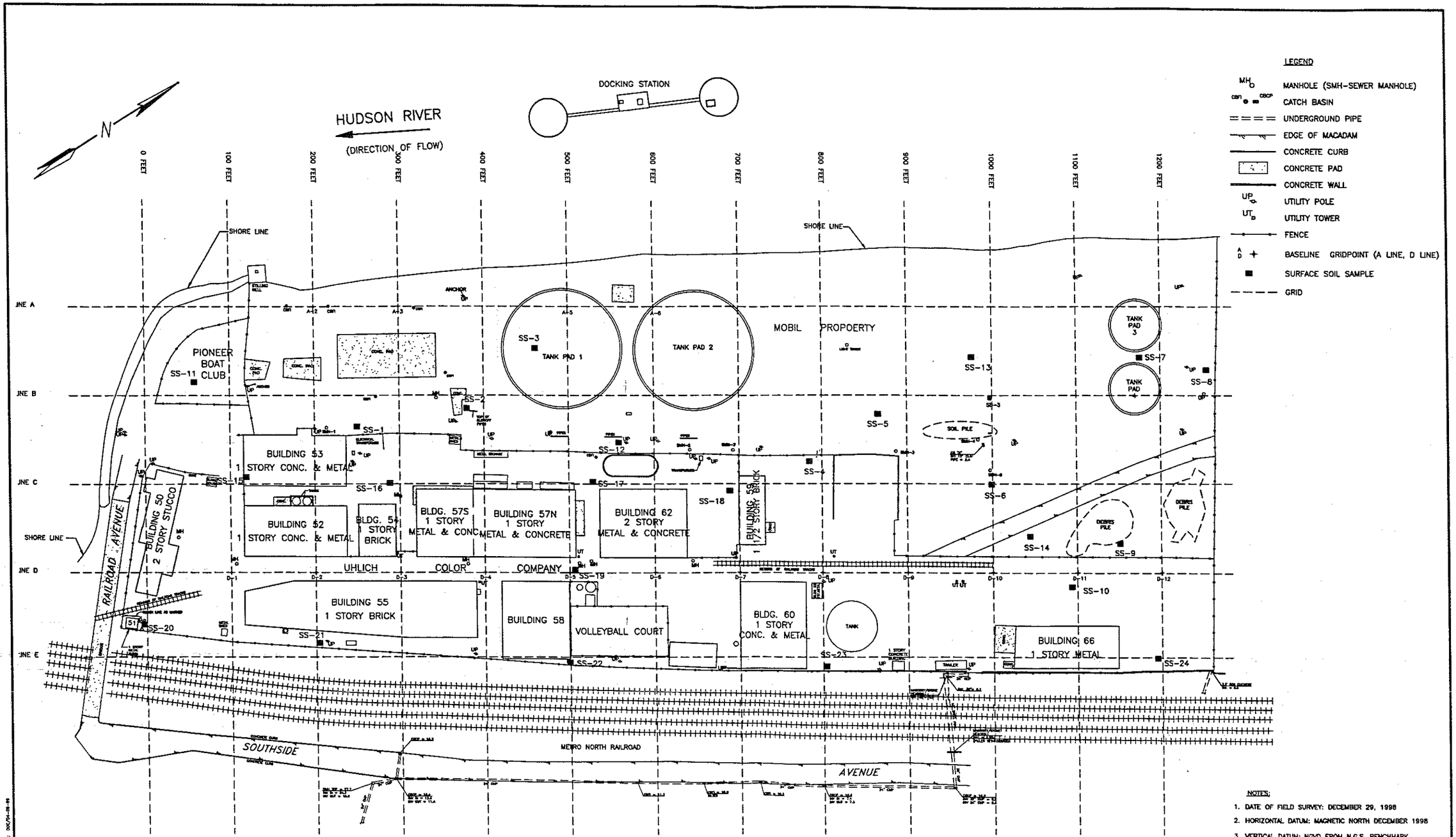
Previous work at the Tappan Terminal Site had focused on the Mobil and Uhlich properties as individual sites. In order to provide a comprehensive overview of the two properties as a single site, a site features map indicating property boundaries, facilities, structures and previous sample locations from both sites was compiled. The map was constructed by digitizing an Uhlich site map obtained from a previous report into a CAD file provided by Mobil. The historic site features map is presented as Sheet 1-1 in the map pocket at the end of this report.

2.3 Grid Network Survey

A 100-foot by 100-foot grid network was developed on-site using surveyed points and field measurements. Two parallel base lines were surveyed through the site and staked at 100 foot intervals. Base line A runs north-south on the Mobil property and base line D runs north-south on Uhlich property (see Figure 2-1). The locations of surface soil, subsurface soil, direct push groundwater and sediment samples were identified in the field by measuring from base line markings and existing monitoring wells. The actual surface soil, subsurface soil and direct push groundwater sample locations were staked at the time of sample collections and surveyed at the completion of field work in December 1998. Sediment sample locations were determined by aligning the sampling boat with on-shore stakes located using the grid. The actual sample locations were recorded from the boat using a hand held global positioning system receiver.

2.4 Surface Soil Sampling

Twenty-five surface soil samples (SS-1 through SS-24) were collected from selected areas of the site. Ten biased samples were collected in areas known or suspected as sources of contamination and in the vicinity of reportedly remediated portions of the site. Four biased samples were collected in areas of stained soil or stressed vegetation. Ten unbiased surface soil samples were collected based on the grid network. These samples were collected from accessible, 200 feet spaced, grid nodes on the Uhlich property to provide uniform coverage of the



TAPPAN TERMINAL SITE
HASTINGS-ON-HUDSON, NEW YORK

GRID NETWORK AND SURFACE SOIL SAMPLE LOCATION MAP

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 2-1

site. Some nodes were not sampled due to the presence of buildings or utilities. The samples were collected to assess conditions where the site is reportedly unimpacted. Analyses of surface soil samples were for Target Compound List +30 (TCL +30) organic compounds, Target Analyte List (TAL) metals and cyanide. Sample Information Records and Chain of Custody forms are presented in Appendix B.

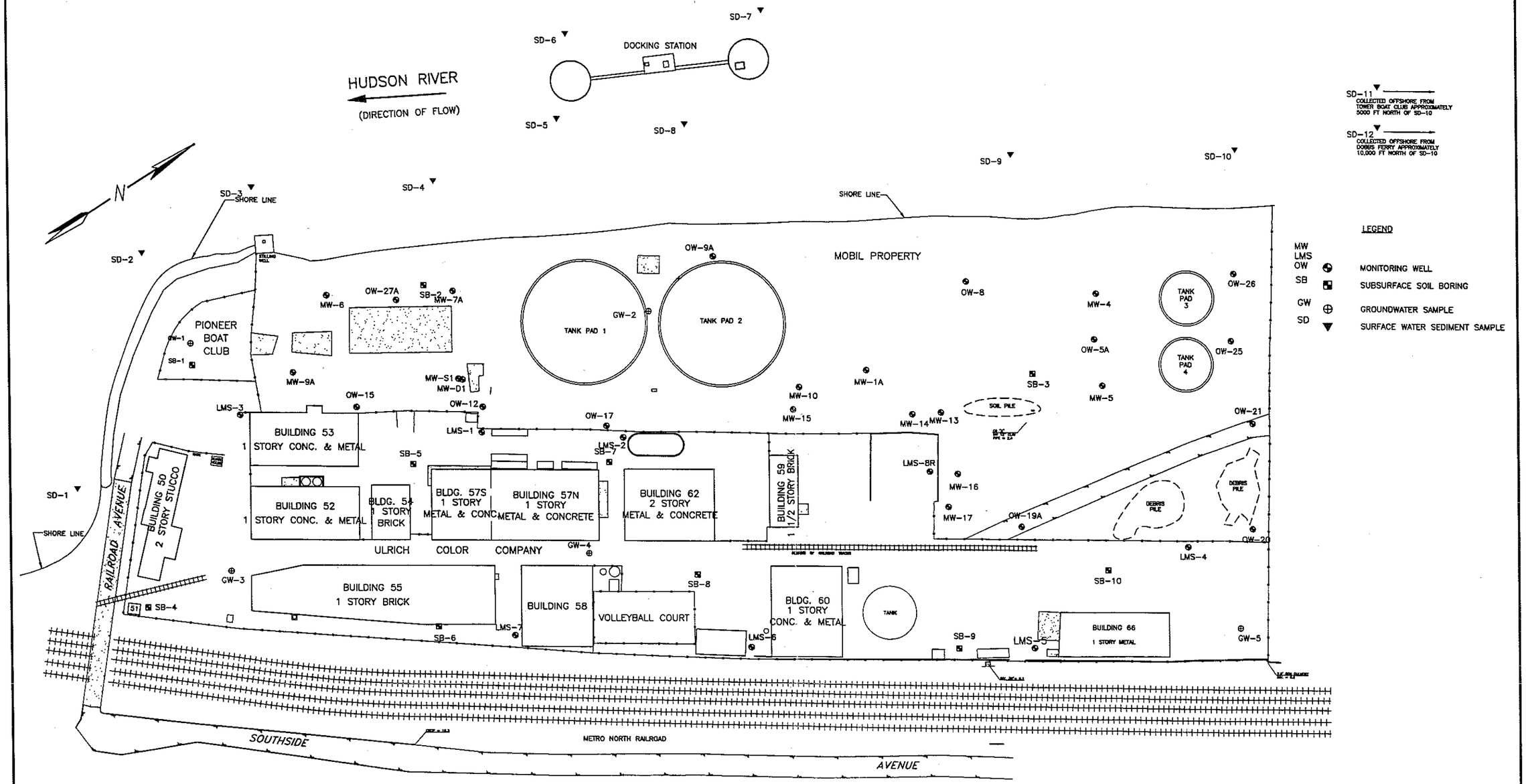
The ten biased samples for possible source areas and previous remediation are labeled SS-1 through SS-10 on Figure 2-1. SS-11 through SS-14 were collected in areas of stained soil and stressed vegetation, and are located on the Mobil property. SS-15 through SS-24 were unbiased and collected on the 100-foot grid network superimposed on the Uhlich portion of the site. These unbiased samples were collected on the Uhlich property since little data exist for this portion of the site.

Samples collected through asphalt pavement were collected at a depth deep enough (3 to 11 inches below asphalt) to minimize possible effects of asphalt related PAHs on the analytical results. Samples from unpaved areas were collected at a depth of 0 to 3 inches.

All soil samples were collected using a dedicated sterile polystyrene scoop or dedicated sterile wooden tongue depressor.

2.5 Subsurface Soil Sampling

Ten subsurface soil samples (SB-1 through SB-10) were collected from areas of the site for which no previous data were available or where known or suspected sources were located. Figure 2-2 presents the locations of subsurface soil samples. Subsurface soil samples were collected from within the unsaturated zone between 2 inches below ground surface and the water table located approximately 5 feet below ground surface. Samples were obtained using a decontaminated split spoon sampler or dedicated direct push sampling device. Samples were visually evaluated for staining, screened for odor and scanned with a PID to measure total organic vapors. All samples were transferred into a sample container using a dedicated sterile polystyrene



TAPPAN TERMINAL SITE
HASTINGS-ON-HUDSON, NEW YORK

SUBSURFACE SOIL, GROUNDWATER AND SEDIMENT SAMPLE LOCATION MAP

Dvirka and Bartilucci Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 2-2

FILE NAME: 1370-13 DATE: 06/04-09-99

scoop or wooden tongue depressor. At the conclusion of each boring, one sample per boring was collected from a discreet interval based upon the likelihood that it exhibited the most severe contamination based upon field screening. Sample Information Records and Chain of Custody Forms are provided in Appendix B. Boring logs indicating the visual and textural characteristics of the samples are presented in Appendix C.

Subsurface soil samples SB-1 and SB-2 were collected on the Mobil property. SB-1 was located on the Pioneer Boat Club property, a location likely to be unaffected by the petroleum bulk storage operations at the site. SB-2 was located at the edge of the reported chlorobenzene groundwater plume and near a truck loading area. Soil borings SB-4 through SB-10 were obtained from unbiased locations based on the sampling grid established on the Uhlich property.

2.6 Existing Monitoring Well Survey

Existing groundwater monitoring wells and piezometers were evaluated for integrity and suitability for water level measurement and sampling. Protective casing locks were opened with a key, if possible, or cut. Locks that were cut on the Uhlich property were replaced with new locks. Liquid levels were measured using an electronic water level indicator. A bailer was lowered into each well to evaluate plumbness, depth and water conditions. The exterior of the well was examined for physical damage, subsidence or heaving that may affect the accurate determination of groundwater elevations. A determination was made as to the suitability of existing elevation survey data for the wells. All sampled wells were re-surveyed. A total of 34 wells was evaluated and determined suitable for groundwater sampling. Table 2-1 presents the well specifications and inspection results.

2.7 Water Level Monitoring

Water levels in selected wells were measured and recorded through several tidal cycles using electronic dataloggers and transducers. Wells MW-4, MW-5A, MW-5 and OW-19A on the Mobil property and LMS-5 and LMS-7 on the Uhlich property were monitored for three tidal

Table 2-1.
Tappan Terminal Site Remedial Investigation
Monitoring Well Specifications and Inspection Results

Well I.D.	Screen Top (feet bgs)	Screen Bottom (feet bgs)	Screen Length (feet)	Well Diam. (inches)	Boring Depth (feet bgs)	1998 Inspection Results	Notes
MW-S1	3	23	20	6	28.50	OK	with 5' sump to 28', stainless steel well
MW-D1	46.5	66.5	20	4	66.5	OK	
MW-1A	-	-	-	-	25	OK	
MW-4	1	11	10	4	11	OK	
OW-5A	-	-	-	-	-	OK	0.04 free oil on 11/17/93
MW-5	0	10	10	4	10	OK	
MW-6	0.55	10.55	10	4	11	OK	
MW-7A	-	-	-	-	-	OK	
OW-8	1.46	12.46	11	2	12	OK	
OW-9A	2	12	10	-	-	OK	
MW-9A	-	-	-	-	-	OK	
MW-10	1.5	11.5	10	4	11.5	OK	
OW-12	1	15	14	2	12	OK	
MW-13	1.5	11.5	10	4	11.5	OK	
MW-14	1.5	11.5	10	4	11.5	OK	
OW-15	1.84	15.84	14	-	12	OK	
MW-15	1	11	10	-	-	OK	
MW-16	1	11	10	-	-	OK	
OW-17	1.9	15.9	14	2	16	OK	well bottom found to be 6.6' shallower than reported
MW-17	3	13	10	-	-	OK	
OW-19A	-	-	-	-	-	OK	
OW-20	1.73	11.73	10	2	13	OK	
OW-21	1	16	15	2	16	OK	
OW-25	1	11	10	2	12	OK	
OW-26	1	11	10	2	12	OK	
OW-27A	-	-	-	-	-	OK	
LMS-1	4	14	10	2	15	OK	
LMS-2	3	13	10	2	14	OK	thick purple product on 7/6/89
LMS-3	3	13	10	2	14	OK	
LMS-4	3	13	10	2	14	OK	
LMS-5	3	13	10	2	16	OK	
LMS-6	3	13	10	2	15	OK	
LMS-7	5	15	10	2	18	OK	
LMS-8R	1.99	11.99	10	-	-	OK	

* Sources: LBG 3/87, table 1, Ground-Water and Soil Quality Investigation at Tappan Terminal
LBG, 10/88, table 1, Additional Hydrogeologic Investigation at Tappan Terminal
LMS, 11/89, table 2-1, Report on Subsurface Investigation at Uhlich
LMS, 11/89, appendiz K, Report on Subsurface Investigation at Uhlich
LBG, 6/92, Monitor Well Installation Report
LBG, 1/94, table 2, November 1993 Groundwater Quality Results
LBG, 4/97, table 3, RI Report for Tappan Terminal

OK = Well details match those reported in previous reports with regard to diameter, depth and construction material and can be sampled.

cycles. Graphs of the water levels versus time are presented in Appendix D. These data were used to evaluate the responsiveness of the groundwater flow system to the tidal cycles in the Hudson River.

In addition to the tidal evaluation discussed above, six rounds of groundwater level measurements were obtained from 32 to 33 wells. Groundwater level measurements of all wells were made using a Solinst 150-foot electronic water level indicator within a period of uniform weather conditions and typically within 1 to 2 hours. Additionally, water levels were obtained from the Hudson River by installing a fixed measuring point at the stilling well located at the southwest end of the Mobil property.

Groundwater levels on-site are influenced by the tide in the Hudson River. Water level measurements were made in such a manner as to minimize the tidal influence on data interpretation. Water levels were generally collected first near the river and then further away from shore toward areas of lesser tidal influence, to minimize the potential change of groundwater elevations during the time of measurement and allow a synoptic view of water levels.

All water level measurements were made using a fixed reference point at each measurement location. Downhole instruments were decontaminated between measurement locations. The static water level was measured to the nearest 0.01 foot. Groundwater level data were used to construct groundwater potentiometric surface maps and to determine local horizontal flow direction as well as vertical gradient. Water level data are presented in Appendix D.

2.8 Monitoring Well Sampling

Groundwater samples were collected from 33 of the existing monitoring wells. Each sample was analyzed for TCL +30 organic compounds, TAL metals (filtered and unfiltered) and cyanide (unfiltered only).

Disposable polyethylene bailers with disposable polypropylene rope were used for purging and sampling of shallow wells. Deep wells were purged using a decontaminated submersible pump and sampled with disposable bailers. The wells were purged until a minimum of three to five bore volumes was removed and groundwater temperature, pH and conductivity had stabilized. Sampling was conducted once the wells were sufficiently purged. Purge water from the wells was disposed of on the ground surface of the Mobil property, with approval of the NYSDEC, and temporarily contained in drums on the Uhlich site for later disposal by Uhlich personnel in the Uhlich facility wastewater treatment system.

2.9 Direct Push Groundwater Sampling

Five groundwater samples (GW-1 through GW-5) were collected using direct push drilling techniques. Samples were attempted from areas of the site for which existing monitoring well coverage is inadequate. Direct push sample locations are presented in Figure 2-2.

Direct push groundwater sample GW-1 was located in the southwest corner of the site inside an area used by the Pioneer Boat Club to store boats on land. This location was chosen as a background location, since it is believed not to have been used by Mobil or previous site occupants for petroleum storage operations or other industrial purposes and is not downgradient of any previously identified source areas. GW-2 was located between the bottoms of the two large former aboveground storage tanks on the Mobil property. This location was chosen to determine possible tank or piping leaks and to evaluate the southwestern extent of the chlorobenzene plume delineated in previous investigations. Sample GW-2 was collected from the base of the fill layer (top of marine silt) to determine the possible presence of dense non-aqueous phase liquid (DNAPL). GW-3 was located at the southeast corner of the Uhlich property to cover an area not previously sampled. GW-4 was located between two of the older buildings on the Uhlich property that were in existence during the period of time the Zinsser Company occupied the site. GW-5 was located in the northeast corner of the site and serves as an upgradient location to the Tappan Terminal Site and a down- or side-gradient location to the ARCO site.

Shallow groundwater samples were collected by advancing a borehole to a depth of approximately 5 feet below the water table. A temporary 1.5-inch diameter PVC well screen was placed in the borehole and allowed to accumulate groundwater. Groundwater was then bailed from the temporary well and collected in sample containers. Once an adequate sample volume was collected, the PVC screen was removed and the borehole was abandoned by backfilling with bentonite. The deep sample (GW-2) was obtained by sampling subsurface soils until the marine silt was identified. A second boring was advanced to the top of the marine silt (as determined by the depth of the initial boring) and the temporary screen was installed immediately above the silt layer. The samples were analyzed for TCL +30 compounds, TAL metals (filtered and unfiltered) and cyanide (unfiltered only).

2.10 Surface Water Sediment Sampling

Ten sediment samples (SD-1 through SD-10) were collected from the Hudson River adjacent to the site using ponar dredges. Samples were collected from a pontoon boat along the shoreline of the Tappan Terminal Site. The samples were all collected from below the tidal zone, approximately 50 to 100 feet offshore. Two samples (SD-11 and SD-12) were collected from background locations upstream of the site. SD-11 was collected adjacent to the Tower Boat Club and SD-12 was collected near the Dobbs Ferry train station. Figure 2-2 shows the locations of sediment samples. Sample Information Records and Chain of Custody Forms are presented in Appendix B. Sediment samples were analyzed for TCL +30 compounds.

2.11 Surveying and Mapping

Sampling and monitoring well locations were surveyed by a New York State licensed surveyor for horizontal and vertical control. Vertical and horizontal control of monitoring well casings allows calculation of groundwater elevations for the development of groundwater elevation contour maps. The ground surface elevation and the elevation of the measuring point in the inner casing of each existing well were surveyed.

Sediment samples were located by measuring the depth to bottom of the river from the water surface and visually locating stakes on the shore. Global positioning system (GPS) coordinates were recorded on a Magellan ProMARK X GPS receiver as the sample was collected at each location. Using GPS locations simultaneously recorded at a fixed base station in Latham, New York and post-processing software, the sample locations were corrected to provide increased accuracy. The resulting sample location latitude and longitude coordinates have a horizontal accuracy of plus or minus 9 feet.

Additional site features were also surveyed using conventional land surveying equipment. The additional features were identified during the site investigation as items that may be significant to identifying contaminant sources or migration pathways. These additional features include, among other items, sewer manholes, exposed piping, catch basins, storm drains, concrete pads and disturbed soil.

A licensed surveyor surveyed all borings and monitoring wells for location and elevation. Survey data were collected during and following the field activities at the site. Surveying was conducted under the supervision of D&B's field manager. Tabulated survey results are presented in Appendix E.

2.12 Health and Safety Program

A site-specific Health and Safety Plan (HASP) was prepared for the RI field program. The HASP was prepared to provide site-specific health and safety information and is contained in the approved project Work Plan (D&B, 1998). Activities conducted during the field investigation were performed in accordance with the HASP.

2.13 Quality Assurance/Quality Control Program

The Quality Assurance/Quality Control (QA/QC) Plan is included in the approved project Work Plan (D&B, 1998). Work performed during the field investigation was conducted in accordance with procedures described in the QA/QC Plan. The QA/QC Plan was designed to maximize the quality and validity of the data collected during the field investigation. The QA/QC Plan describes detailed sampling and analytical procedures, as well as necessary QA/QC sampling and analyses for each sampling matrix investigated. Adherence to QA/QC protocols allows for data validation and usability analyses. In accordance with the QA/QC Plan, Chain of Custody Forms and Sample Information Records were completed for each sample collected and are presented, along with shipping records, in Appendix B.

2.14 Data Validation

A Data Usability Summary Report (DUSR) was prepared in order to determine whether data presented by the analytical laboratory met the project-specific criteria for data quality and data use. The DUSR was prepared in accordance with NYSDEC Division of Environmental Remediation guidance for the development of DUSRs, dated September 1997. Industrial Corrosion Management Laboratories (ICM) provided analyses of all environmental samples collected. ICM is a New York State Department of Health (NYSDOH) Environmental Laboratory Approved Program (ELAP) certified laboratory. Laboratory reporting was performed in accordance with NYSDEC 10/95 Analytical Services Protocol (ASP) Category B deliverables. The DUSR is included as Section 4.4 of this report.

3.0 PHYSICAL CHARACTERISTICS OF STUDY AREA

The physical characteristics of the Tappan Terminal Site include manmade and natural features that influence the occurrence and migration of contaminants on and beneath the site. These physical characteristics include the influence of the Hudson River on groundwater flow, the nature of fill material and various shoreline features including bulkheads, rip rap, piers and docks. The development of the land surface also impacts the occurrence of contaminants on-site. Land development includes construction of buildings and installation of buried utilities, including water lines, sewers, storm drains and chemical piping. Transportation corridors, including railroad beds and roadways, also influence the site. The influence of these features, as well as subsurface geology, affect groundwater flow at the site. The following sections describe the findings of the investigation as they relate to surface features, geology and hydrogeology.

3.1 Surface Features

The Tappan Terminal Site is relatively flat with low relief. The Mobil property is currently decommissioned and unused. The Uhlich property consists of several buildings and is active as a pigment manufacturing operation. Ground surface elevations range from 3 to 12 feet above mean sea level (amsl) over most of the site. The lowest portion of the site is approximately 3 feet amsl in the northwest corner of the site. The western portion of the site (Mobil property) generally ranges from 3 to 5 feet amsl, however, the berm formerly serving as spill containment for the decommissioned petroleum bulk storage tanks is about 8 feet amsl. The highest portion of the site is along the eastern boundary where the Uhlich Color Company property abuts the Metro North Commuter Railroad property. Elevations along this boundary range between 8 and 12 feet amsl.

Off-site, ground surface elevations rise steeply to the east. Ground surface rises from 10 feet amsl at Southside Avenue (250 feet east of the site) to over 300 feet amsl near U.S. Route 9 (approximately 1,000 feet east of the site). North of the site, the ground surface is flat-lying and elevations are similar to those on the Tappan Terminal Site.

The shoreline of the Hudson River bounds the site to the west and south. On the west side, the shoreline is relatively straight and featureless adjacent to the site. The shoreline consists of riprap within the tidal zone, an earthen berm above the tidal zone in the northern portion of the west shoreline and a concrete seawall along the southern portion of the west shoreline. The site's southern shoreline consists of boulder fill that rises steeply from a quiet water bay. This has not always been the case, however. The shoreline has been built westward and southward over time. Beginning in the late 1800s, landfilling was begun. By 1920, the shoreline roughly paralleled the current boundary between the Uhlich and Mobil properties. A boat slip or bulkhead existed in the central portion of the site near monitoring wells MW-13, MW-14, MW-16 and MW-17. This area was later filled and the resulting shoreline was located near the former 5-million gallon storage tanks. Continued filling extended the shoreline further west to its current location. The northern boundary between Mobil and ARCO was once a bulkhead separating land on the ARCO side and the Hudson River on the Mobil side. Currently a small east-west trending, rip-rap lined swale separates the Mobil property from the ARCO property. The swale becomes partially submerged during high tide.

The Hudson River has a net southward flow. The river elevation varies depending on tides and upstream flow volume. During the remedial investigation, river elevations fluctuated between 0.8 feet below and 3.7 feet above mean sea level as measured at the stilling well. Historical records indicate that these water levels are typical.

There are no flowing surface water bodies on site, however a small swale occupies a location along the boundary of the Uhlich and Mobil properties between the bulk oil tank containment berm and the fence. The swale extends from the approximate location of the former chlorobenzene tank (near MW-s1 and MW-D1) and the approximate location of the former boat slip or bulkhead near monitoring wells MW-13, MW-14, MW-16 and MW-17. The swale has no outlet channel and occasionally accumulates surface water run-off after rain events. Standing water in the swale was infrequently observed, however the soil remained muddy during most of the investigation. Storm drains are reported to flow under the site and into the Hudson River, however the exact routes could not be confirmed during the site investigation. One such system originates east of the site at a corrugated metal pipe near Southside Avenue (see Figure 2-1). The

pipe originates from a steep hill rising east of the site and probably drains storm water runoff from Warburton Road or other roads in the Village of Hastings-on-Hudson. Flow from this pipe is directed beneath Southside Avenue in a westerly direction. The pipe likely passes beneath the Metro North railroad tracks and onto Uhlich Color Company property. Manholes, catch basins or other indicators of the piping could not be identified on the Uhlich property, however, the piping probably passes near or under Building 55. The location of other utilities and buildings, and the absence of an outfall along the Mobil property shoreline, suggest that the pipe may turn southward and flow into the river south of Railroad Avenue. Settlement observed in the walls and roofline of Building 55 also suggests a variation in subsurface materials beneath the building. The differential settling of Building 55 may be related to storm sewer leakage, settlement or erosion of storm sewer bedding material, or heterogeneous material used for land-filling or building foundation support.

A second storm water piping system appears to flow under the north end of the site near Uhlich Building 66 (see Figure 2-1). This system consists of a 42-inch diameter steel pipe that flows under the Metro North railroad tracks to a headwall located south of Building 66. At this location, the pipe is buried and no manholes are visible. The pipe may extend westward through the Uhlich Site and onto the Mobil property. A catch basin was observed near a soil pile approximately 250 feet west of the headwall. The inlet pipe to the catch basin appears to trend westward toward the headwall. A pipe exiting the catch basin trends southwestward toward the Hudson River. No outfalls have been observed along the river shoreline and no discharge plumes could be identified by examination of aerial photographs of the shoreline.

A set of storm drains was identified on the southwestern portion of the Mobil property. These drains apparently drained precipitation from the paved loading rack area of the Mobil site. The drains and buried piping appear to be confined to the paved portion of the loading area.

A sanitary sewer line formerly ran through the Mobil site, roughly parallel to the Uhlich/Mobil property line. The sanitary sewer line was reportedly constructed in 1961. This pipe was reportedly damaged and partially removed during excavation of contaminated soil conducted by Mobil in 1994. Wastewater from on-site facilities once flowed from south to north

through the pipe. The break in the pipe occurred in a low-lying area that was once a boat slip. Currently cattails grow in this location, suggesting wetter than usual conditions. This has appeared as frequently wet in aerial photographs suggesting potential chronic leakage of the pipe or a hydraulic connection with the Hudson River.

The Mobil property has been unused since 1985. The site is covered largely with grassy vegetation over earthen groundcover. The southern portion of the site has asphalt and concrete pads that were used when vehicle traffic was prevalent on the site. The northern two thirds of the site was once surrounded by an earthen berm built as secondary containment for aboveground storage tanks. Two 5-million gallon aboveground storage tanks were once located on the middle portion of the site. Only the concrete tank bottoms remain. Precipitation periodically ponds inside the concrete rings that remain.

Two smaller tanks (60 feet in diameter) were located within the berm on the northern portion of the site. Only the bottoms of these tanks remain. The berm is largely intact with the exception of a breech east of the northernmost 5-million gallon tank. Driftwood and manmade debris deposited near the tank bottom indicate that the Hudson River occasionally flows through the breech during periods of high flow and high tide. No such flow was observed during the RI field program. Portions of the berm have also been removed along the border with the Uhlich property. The Pioneer Boat Club is located at the southern end of the Mobil property on land reportedly leased from Mobil. The land surface consists of crushed stone and asphalt. The building associated with the boat club is supported on piers in the river.

The Uhlich property is almost entirely paved or covered with buildings. Only the northern portion of the site is unpaved, and this portion is covered with crushed stone, cinders or weathered asphalt. Surface water drainage at the Uhlich site occurs as runoff from the pavement. Water runs off site to the east near monitoring wells LMS-2 and MW-13. Water is also collected at a catch basin near the guardhouse at the southeastern portion of the site.

3.2 Site Geology

The general subsurface stratigraphy at the Tappan Terminal Site has been determined during previous investigations using available data from the Mobil, Uhlich and ARCO properties. The uppermost layer consists of a manmade fill unit ranging in thickness from 11 to 32 feet. Beneath the fill is a Marine Grey silt unit that overlies basal sand deposits. The basal sand deposits overlie bedrock. The following describes the geologic units in more detail based upon information obtained in the RI and from previous investigations.

The fill unit consists predominantly of sand and silt size particles with some gravel and some clay. Ten subsurface borings were installed during the RI. Nine of the borings were advanced to a depth of 12 feet or less and all nine encountered fill between the ground surface and the final depth. The fill includes silt, sand, gravel, ash, slag, glass, metal debris, wood, crushed stone, paper, coal, sawdust and brick fragments. The fill appears typical of similar landfilled areas created in the late 1800s and early 1900s. The source of fill was likely coal ash and incinerator residues, as well as construction and demolition debris.

The Marine Grey silt unit underlies the manmade fill. This unit was observed in one boring (GW-2) during the investigation and is characterized by gray to black silt, trace fine sand and trace white shell fragments 1 to 2 millimeters in diameter. At this location, the Marine Grey silt was encountered at a depth of 16 feet below ground surface but was not fully penetrated. At this location the Marine Grey silt is at least 8 feet thick. The Marine Grey silt has been reported by others (Golder, 1996) to be 10 to 40 feet thick with the thinner portions to the east.

Basal sand deposits reportedly underlie the Marine Grey silt. The basal sand deposits consist of medium-dense to dense gray and brown coarse sands and gravels with laterally discontinuous red silts, and clay laminations. The basal sand deposit unit is reported to be between 10 and 70 feet thick in the vicinity of the site (Golder, 1996).

Bedrock was not encountered during the remedial investigation, however, the site is close to the mapped contact between the Inwood Marble and Fordham Gneiss (Fisher, 1970) and either

bedrock type could be present beneath the site. Depth to bedrock is reported to be 50 to 100 feet below ground surface at the ARCO site (Golder, 1996).

3.3 Site Hydrogeology

The Hudson River is a regional hydrogeologic boundary and, as such, is a groundwater discharge zone for local and regional groundwater flow systems. Regional groundwater discharging to the river comes from the bedrock and the basal sand deposits beneath the site. Shallow groundwater flow also discharges to the river from the fill unit in the shallow subsurface. The Marine Grey silt is a low permeability aquitard that confines deep groundwater in the basal sand deposits and limits downward flow of shallow groundwater in the fill unit. The Marine Grey silt is presumed to be continuos beneath the site, however most onsite borings and wells have been completed at depths too shallow to verify this.

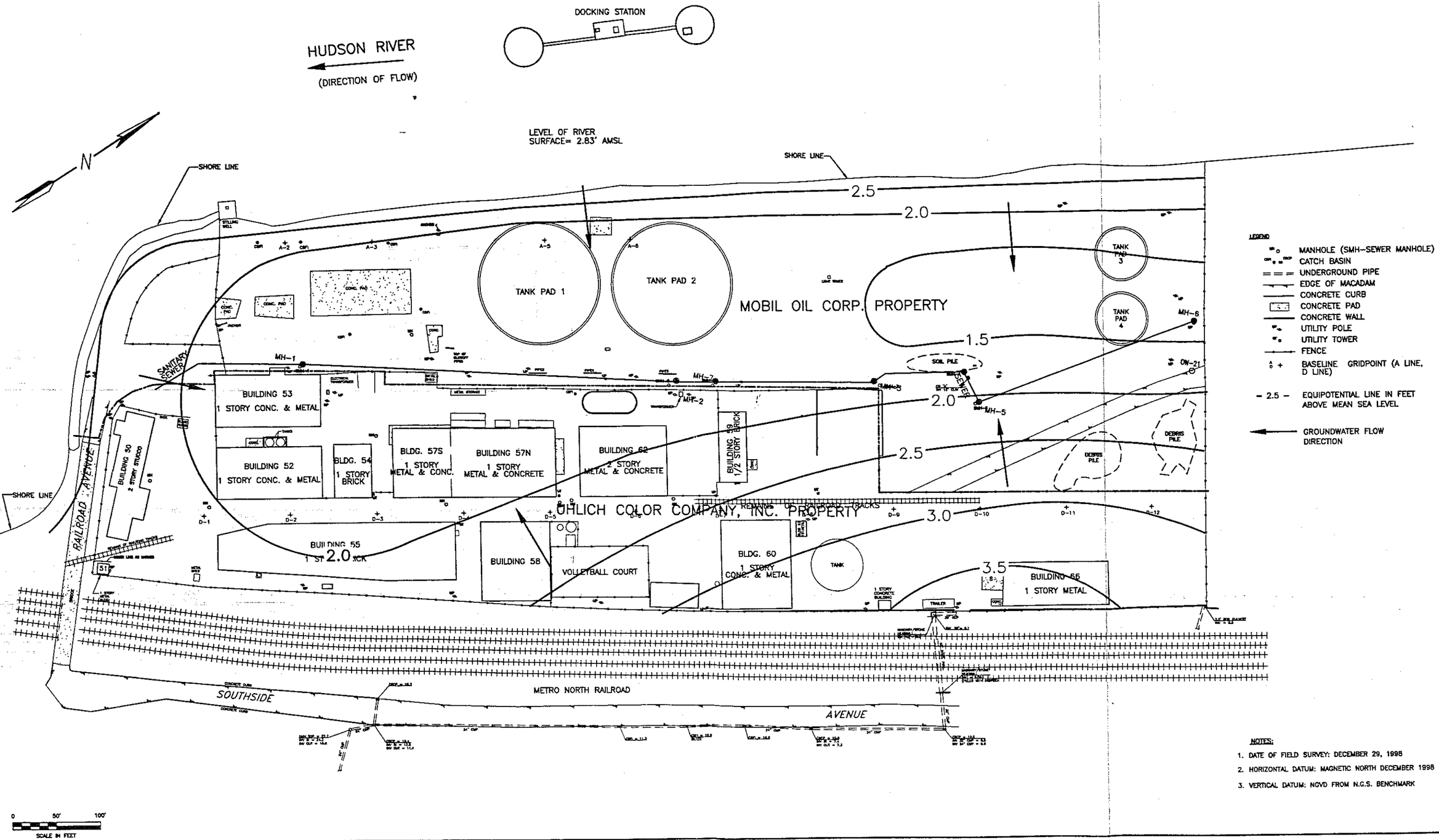
Shallow groundwater is of primary interest at the Tappan Terminal Site. Shallow groundwater flow occurs in a water table groundwater flow system within the fill unit at the site. The depth to groundwater in the fill ranges from 2 to 7 feet below ground surface and varies with the tidal fluctuations of the river. Groundwater flow is generally to the west toward the Hudson River and enters the site as lateral groundwater flow from the east and precipitation over the entire site.

Hydraulic conductivity in the fill unit is generally high, but varies due to the heterogeneity of the fill materials. Buried structures, such as large boulders, piers, utility lines, abandoned bulkheads, seawalls and boat slips, all influence groundwater flow. Hydraulic conductivity values of 9.0×10^{-2} to 3.7×10^{-1} centimeters per second were calculated for wells screened in the fill (LMS-1, 2, 3 and 4) on the Uhlich property in previous investigations (LMS, 1989). A pump test conducted in the fill unit at monitoring well MW-S1 on the Mobil property (LBG, 1989) yielded 10 gallons per minute for 30 hours. The transmissivity of the fill was calculated at 11,968 gallons per day per foot for an approximate hydraulic conductivity of 3×10^{-2} centimeters per second.

During the RI, water levels were measured in the Hudson River and 32 or 33 wells present at the site on six different occasions between September 23, 1998 and December 15, 1998. Water level measurements were timed to coincide with high tide on September 24 and low tide on September 25. The range in river elevation was from –0.8 feet amsl at the lowest low tide to 3.7 feet amsl at the highest high tide recorded during the investigation. Figure 3-1 depicts shallow groundwater elevations under high tide conditions. Figure 3-2 shows a potentiometric surface contour map for shallow groundwater under low tide conditions. Groundwater flow is generally to the west and southwest and all groundwater beneath the site discharges to the Hudson River.

Based on these observations of the water table, the influence of the Hudson River tide on groundwater flow occurs within approximately 100 feet from the shoreline. Wells at a greater distance generally show no tidal influence. One notable exception is monitoring well LMS-7 located on the Uhlich property near the Metro North property boundary more than 450 feet from the shore. At this well, significant tidal influence was observed. Water level changes in LMS-7 were as much as 2.3 feet, the greatest of any well observed at any distance from the shoreline.

In order to further evaluate the tidal influence on the site and the apparent anomaly at LMS-7, continuous groundwater level monitoring was conducted in selected wells screened in the fill. Six wells and a measuring point in the Hudson River were each equipped with a self-contained datalogger and pressure transducer. Electronic clocks in each logger were synchronized and water level measurements were recorded at five-minute intervals through three full tide cycles over a period of more than 48 hours. The river level was recorded by submerging a transducer at the stilling well. The transducer was placed inside a 2-inch diameter PVC pipe in order to dampen the effects of waves generated by boat traffic and wind. Transducers were also placed in wells located in a line roughly perpendicular to the shore at distances ranging from approximately 90 feet to 450 feet from shore. These wells included MW-4, OW-5A, MW-5 and OW-19A on the Mobil property and LMS-5 on the Uhlich property. LMS-7 was also monitored due to the unusually large amount of variation observed in previous water level measurements.



NOTES:

1. DATE OF FIELD SURVEY: DECEMBER 29, 1998
2. HORIZONTAL DATUM: MAGNETIC NORTH DECEMBER 1998
3. VERTICAL DATUM: NGVD FROM N.G.S. BENCHMARK

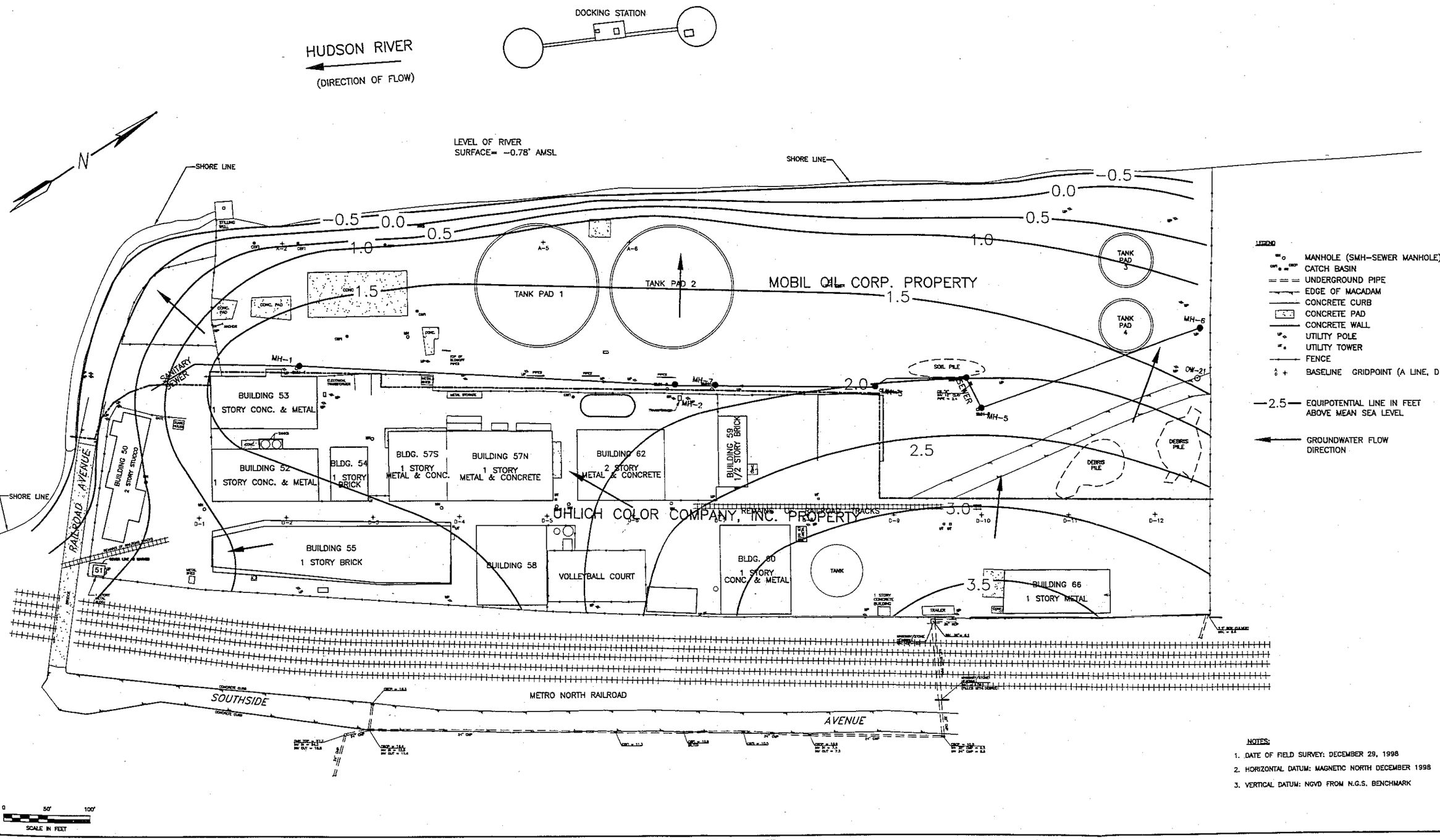
FILE NAME: 1570-14A DATE: 09/4-15-99

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

TAPPAN TERMINAL SITE
HASTINGS-ON-HUDSON, NEW YORK

WATER TABLE SURFACE
HIGH TIDE
SEPTEMBER 24,1998

FIGURE 3-1



LEGEND

- MANHOLE (SMH=SEWER MANHOLE)
- CATCH BASIN
- UNDERGROUND PIPE
- EDGE OF MACADAM
- CONCRETE CURB
- CONCRETE PAD
- CONCRETE WALL
- UTILITY POLE
- UTILITY TOWER
- FENCE
- BASELINE GRIDPOINT (A LINE, D
- —2.5— EQUIPOTENTIAL LINE IN FEET ABOVE MEAN SEA LEVEL
- GROUNDWATER FLOW DIRECTION

NOTES:

1. DATE OF FIELD SURVEY: DECEMBER 29, 1998
2. HORIZONTAL DATUM: MAGNETIC NORTH DECEMBER 1998
3. VERTICAL DATUM: NGVD FROM N.G.S. BENCHMARK

FILE NAME: 1270-13 DATE: 01/4-19-99

TAPPAN TERMINAL SITE
HASTINGS-ON-HUDSON, NEW YORK

WATER TABLE SURFACE
LOW TIDE
SEPTEMBER 25,1998

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 3-2

The results of the continuous monitoring confirm the trends observed in the periodic water level rounds. Tidal influence was observed as cyclic water level fluctuations decreasing with distance from the shore in wells MW-4, MW-5A, and MW-5. There was no discernable water level change in OW-19 or LMS-5. Well LMS-7, the well farthest from the shore, again yielded the greatest variation in water levels. The cause of this variation may be due to the occurrence of a highly permeable fill zone or buried structure connecting the river to the vicinity of LMS-7.

As described above, a low permeability layer of marine silt and clay underlies the fill unit and forms the lower boundary of the shallow groundwater flow system. Monitoring well MW-D1 is screened within the Marine Grey silt and exhibits a groundwater elevation that is consistently higher than the groundwater elevation in well MW-S1, which is located adjacent to MW-D1 and screened in the fill unit. This relationship indicates upward groundwater flow between the Marine Grey silt and the overlying fill.

A pumping test conducted at MW-D1 during a previous investigation (LBG, Dec.1989) indicates that the Marine Grey Silt layer is an aquitard. MW-D1 was pumped at 6 gpm for 6 hours. Eight monitoring wells within a 150 foot radius, including MW-S1 (10 feet away) were monitored and indicated no drawdown associated with pumping. Permeability values for the Marine Grey Silt layer were not presented in the report.

Upward groundwater flow has also been reported from the bedrock aquifer and basal sand and gravel deposit, and is consistent with the Hudson River being a regional groundwater discharge zone.

The groundwater quality at the site is influenced by the influx of river water during high tides. There is a salt-water wedge consisting of a mixture of saline ocean water and fresh river water that moves up and downstream based upon tidal cycles and weather conditions. The zone of mixing begins with slightly "freshened" saline water at approximately river mile 20 near Yonkers (Hastings-on-Hudson is located approximately at river mile 23) and ends with entirely fresh water at approximately river mile 69, near Poughkeepsie, NY. High concentrations of

sodium and chloride are present adjacent to the Tappan Terminal site and are evident in groundwater samples collected near the river.

3.4 Site Ecology

This section provides an overall habitat-based assessment of the Tappan Terminal Site. This assessment conforms to the guidelines contained in Step 1 of the NYSDEC Technical and Administrative Guidance Memorandum entitled, "Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites" dated October, 1994. The purpose of this section is to provide a description of the existing ecology of the site, including a site-specific description of major habitat types with associated fish and wildlife populations, and identify any other significant on-site resources. The information contained in this section was obtained during the RI, as supplemented by data from outside sources, including the NYSDEC, United States Fish and Wildlife Service and New York State Historic Preservation Officer. The field survey for this assessment was conducted in November 1998.

3.4.1 Major Habitat Types

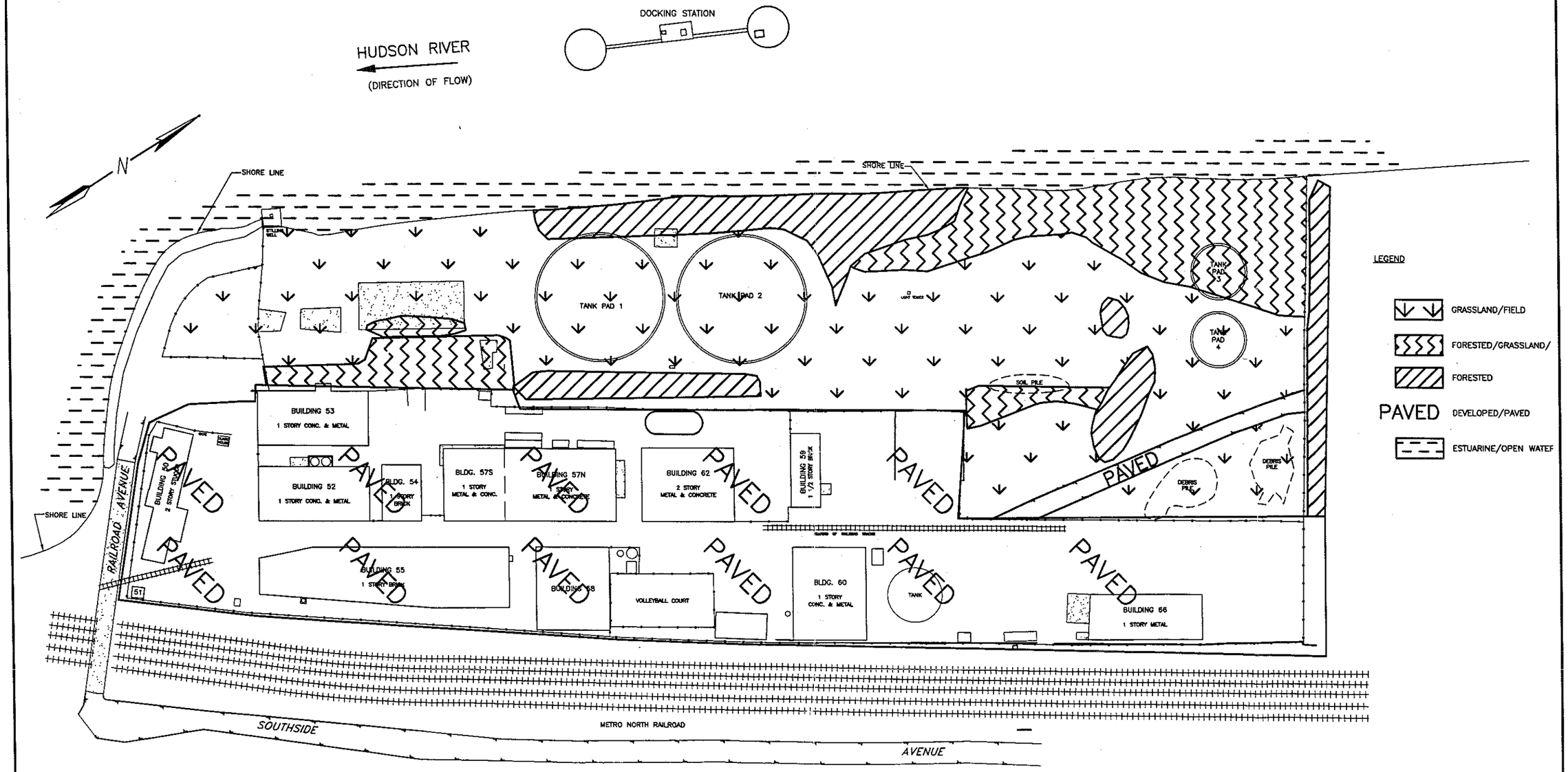
The Tappan Terminal Site is an upland site which borders on the Hudson River within an area that would be characterized as estuarine because of the encroachment of the salt wedge during tidal exchanges. The site is bordered on the north by the former ARCO site, on the south by a small marina, to the east by Metro North Railroad, and by the Hudson River on the west. The property was created between 1850 and 1977 by placement of fill material into the Hudson River and covers approximately 13 acres. The upland portion of the site is characterized by an active industrial operation on the eastern half of the property and naturally vegetated upland on the western half bounded by a fence at the edge of the active industrial area and a riprapped shore at the river's edge. The northern part of the vegetated area supports vegetation that has established between seams in both a concrete and macadam pavement that is largely intact. The central portion of the vegetated area is largely devoid of vegetation due to the former presence of two large oil storage tanks which each covered an area of 150 feet in diameter. The southern part of the vegetated area has been revegetated by invasive species such as common reed and sumac.

The shoreline of the property is completely riprapped and in generally functional condition. Seaward of the riprap, the depth drops sharply leading to an off-shore sea island which is in place, but no longer has an intact walkway or pipeline connection to shore. This area is largely 5 to 8 feet deep which minimizes opportunity for aquatic vegetation to establish. The riprap provides a substrate for some seaweeds such as fucus to establish. The shoreline is most exposed to winds from the north, south and west. The Hudson River is approximately one mile wide at this location with the Palisades escarpments on the west bank which may have some influence at the site on westerly winds. The major habitat types for the Tappan Terminal Site are shown on Figure 3-3 as:

- Grassland/Field (25%): Herbaceous, non-woody growth ranging from 1 to 6 feet tall;
- Forested/Grassland/Field (5%): Mixture of herbaceous and woody vegetation where trees are present, but not dominant;
- Estuarine Subtidal Habitat (<5%, adjacent to upland site): Areas inundated throughout regardless of tidal disposition, including the riprapped shoreline and adjacent open water unvegetated river bottom;
- Disturbed Unvegetated Habitat (<1%): Areas devoid of vegetation due to the past presence of fuel storage tanks; and
- Developed (65%): Includes paved roadways and standing structures.

Habitat types bordering the site are not shown, but fall into four categories: paved industrial area, estuarine subtidal habitat, residential development, and mature forest. Aside from the Hudson River, the site is bordered by both active and inactive industrial sites to the north, the marina and open water to the south, and residential development atop a forested river valley wall to the east.

The distribution of habitat types for the site are illustrated on Figure 3-3. Detailed discussion of the major communities found on the site is provided below. A list of vegetative



SURVEY NOTES:

1. DATE OF FIELD SURVEY: DECEMBER 29, 1998
2. HORIZONTAL DATUM: MAGNETIC NORTH DECEMBER 1998
3. VERTICAL DATUM: NGVD FROM N.G.S. BENCHMARK

FILE NAME: 1370-14 DATE: 00/04-06-99

TAPPAN TERMINAL SITE
HASTINGS-ON-HUDSON, NEW YORK

DISTRIBUTION OF HABITAT TYPES

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 3-3

species observed during the November 1998 site visit to the site is provided in Appendix F, Table F-1.

3.4.1.1 - Grassland/Field

This cover type is found over approximately 25% of the site. Grasslands are located mostly on the southwestern portion of the property. This area contains minimal disturbance and has naturally revegetated with invasive species. This habitat type can also be found in the northwest portion of the site as predominantly wildflowers growing through the seams in concrete and macadam pads. The southern area is dominated by common reed (Phragmites communis) throughout most of the grassland area with mixtures of goldenrod (Solidago sp.), daisies (Chrysanthemum sp), Queen Anne's Lace (Daucus carota), and butter and eggs (Linaria vulgaris). The common reed was generally 4 to 7 feet tall with most other plants up to 2 feet.

3.4.1.2 - Forested/Grassland/Field

This cover type represents approximately 5 percent of the site and differs from the grassland/field cover type by the interspersal of sassafras, black cherry (Prunus serotina) and aspens up to 20 feet tall. This habitat is found predominantly along a berm behind the riprapped shoreline, along a berm at the fence line bordering the Uhlich property, and in scattered areas in the south-central and northwest parts of the site. Pawlonia to 20 feet tall are growing at the edges of the concrete and macadam pads on the north part of the property.

3.4.1.3 - Estuarine Subtidal Habitat

This habitat encompasses the riprap shore edge and the Hudson River as it flows past the site to the west. No acreage estimate is provided for this habitat since it would only mask the upland cover types. At least 3 acres of this habitat are included along the 1,200 feet of shorefront extending out to the sea island.

3.4.1.4 - Disturbed Unvegetated Habitat

This area includes approximately 15,000 square feet of mostly barren sand on top of a subsurface concrete foundation that was the former location of two petroleum storage tanks. Common reed and some sedges (Scirpis sp.) are slowly starting to migrate into these unvegetated areas. Several common reed rhizomes were noted branching into the unvegetated areas.

3.4.1.5 - Developed

This area represents about 65 percent of the property and includes the entire eastern half of the site plus some of the intact paved areas in the northwestern part of the site. This area is paved and includes many buildings that comprise an active manufacturing facility (Uhlich Color Company, Inc). Most areas are macadam covered with some concrete and some areas that are crushed, compacted stone. A paved road also extends through the site toward the north as an entrance to the ARCO site. The paved area includes runoff diversion to the vegetated portion of the property to the west and several storage areas for product and heating fuel.

3.4.2 Wetlands

The upland portion of the site contains no freshwater wetlands. The Hudson River in this location likely consisted of coastal shoals which were dredged to provide fill and water depth at the location. As a result, the area waterward of the riprapped shoreline ranges in depth from 5 - 20 feet and is wholly classified as littoral zone. The riprapped shoreline is the extent of an unvegetated intertidal zone that does not support rooted aquatic vegetation but provides an anchor base for some opportunistic aquatic seaweeds such as fuscus. Immediately south of the property the fill ends at the marina creating a small shallow cove of coastal shoals habitat as the property bends eastward back to the natural shore. This coastal shoal area is generally unvegetated fine to coarse sand with accumulations of floating aquatic vegetation. No mapped or regulated wetlands are present in the site area landward of the shore edge.

3.4.3 Mammals

The presence of active industrial activities, numerous abandoned structures on the Anaconda Site, and vegetated areas west of the industrial property at the Tappan Terminal Site generally do not support large mammals or mammals that are less inclined to co-habitate with human presence. Raccoon (Procyon lotor) and cottontail rabbit (Sylvilagus floridanus) tracks were observed in the unvegetated former tank areas. The only mammals observed during the site walkover were the eastern chipmunk (Tamias striatus), gray squirrel (Sciurus carolinensis), and Norway rat (Rattus norvegicus). The area is likely to contain feral dogs and cats which would utilize the abandoned structures for shelter. In addition, tracks, runways and scats were observed that would indicate the presence of white-footed mice (Peromyscus leucopus), meadow voles (Microtus pennsylvaticus), cottontail rabbits and raccoons. Probable mammal inhabitants are listed in Appendix F, Table F-2.

3.4.4 Birds

Herring gulls (Larus argentatus) were the most common birds and bird carcasses observed on the pier area and the northern paved area. From the items present in this area it appears the gulls were using the area to drop shelled items prior to consuming them. Cormorants (Phalacrocorax auritus) were also observed basking near the pier. Upland bird species were present and actively feeding in the grassland/field, grassland/forested, and deciduous forested habitats. Mourning doves (Zenaida macroura) were especially prominent and frequently moved between the grasslands and trees through the upland portions of the site. The grassland/shrub edges supported numerous finches (Carpodacus sp.), mockingbirds (Mimus polyglottus), and sparrows (Melospiza sp.), as well as birds of prey such as kestrels (Falco sparverius). Although no other hawk species were observed, this area would certainly be used by several species migrating along the Hudson River and the Atlantic Flyway.

Cormorants were observed during site visits sunning on the sea island and actively feeding in the littoral zone adjacent to the property. Observations have also been reported by NYSDEC personnel of Canadian geese utilizing the unvegetated former tank locations during the

spring when wet weather results in ponding in this area. The geese are likely utilizing this area as a protected waterway with feeding opportunities available from emerging scirpus and other grasses at the vegetated edges of the former tank locations. It would be expected that many species of duck would utilize the protected cove south of the site and shoreward of the pier as resting areas during migration, because of the general lack of human activity along the water's edge in these locations. Diving ducks, such as mergansers, likely utilize the south cove as a shallow area in which to drive fish for capture. No breeding was observed although breeding indications would be limited at the time of the site survey. A subset of the New York State Bird Atlas listing for Westchester County, New York is presented in Appendix F, Table F-3 which provides species observed or expected to utilize the site.

3.4.5 Fish

As indicated earlier, the Tappan Terminal Site is within the zone of influence of the salt wedge which moves up the river on incoming tides and mixes with the fresh water of the flowing river. This creates a low salinity, estuarine environment that can be inhabited by both salt water and fresh water fishes that are tolerant of some salinity. The soft sediment of the river bottom provides habitat for burrowing invertebrates that attract bottom dwelling fish. The riprapped shoreline also creates a habitat for sessile organisms that support small fish that will utilize the riprap as cover from predatory species. This portion of the river is particularly known for the sport fishing opportunities with striped bass (Morone saxatilis) and white perch (Morone americana). Baitfish that would utilize the riprapped shoreline include the Atlantic silverside (Menidia menidia) and bay anchovy (Anchoa mitchilli). Besides the striped bass, other recreationally important species, such as bluefish (Pomatomus saltatrix) and winter flounder (Pseudopleuronectes americana), likely move through the area in lesser numbers. Past studies conducted by the U.S. Fish and Wildlife Service (1985) have also found a strong presence by another flatfish, the hogchoker (Trinectes maculatus). A list of finfish species which likely frequent this area on a seasonal basis are provided in Appendix F, Table F-4.

3.4.6 Reptiles and Amphibians

No reptiles or amphibians were observed on the site. The property includes some discarded construction material that would offer cover to snakes common to the area. Grasslands likely provide habitat for common toad species and possibly box turtles. The developed nature of the site and the riprapped shoreline limits the potential for brackish water reptiles to utilize the area, although transient sea turtles or terrapins could feed within the offshore areas. Appendix F, Table F-5 contains a list of reptiles and amphibians common to the area that could likely inhabit the site and/or surrounding areas.

3.4.7 Rare Species and Critical Habitats

Based on a review of the New York Natural Heritage files by the NYSDEC Wildlife Resources Center, there are no rare species or critical habitats known to occur on or adjacent to the Tappan Terminal Site. The peregrine falcon is known to nest both on the Palisades on the opposite shore and on the bridges which traverse the Hudson River. It is possible that these birds could occasionally feed within a 2-mile radius of the project site. However, it is unlikely that a major portion of the birds' life support is derived from this area. The shortnose sturgeon is also a known endangered inhabitant of the Hudson River, but is generally farther upstream and has not been identified as a concern. Therefore, except for occasional transient individuals, no federally listed or proposed endangered or threatened species exist within a two mile radius of the site according to the U.S. Department of the Interior, Fish and Wildlife Service. Appendix F, Table F-6 provides a list of all federally listed and proposed threatened or endangered species in New York State.

3.4.8 Biological Associations Found in the Site Vicinity

The area surrounding the Tappan Terminal Site within a 2.5 mile radius varies greatly. The Hudson River dominates the aquatic environment although the steep banks in this section of the river do not permit the establishment of marshes that are present near the Tappan Zee Bridge to the north. Industrial operations or former operations predominate the upland areas which offer

limited opportunities for biological associations. Outside the river, the grasslands/shrub/tree habitats on the eastern portion of the property and the forested habitats along the river bank east of the filled land represent the primary habitat associations. An association of cover types with common dominant species is presented in Appendix F, Table F-7. The biological associations observed are common for this general area.

3.4.9 Observations of Stress Potentially Related to Site Contaminants

Despite the removal of the fuel storage tanks from the property, the revegetation of this area has been slow compared to the surrounding areas. Vegetative encroachment has occurred from the edges of the unvegetated area. Revegetation has otherwise been limited to rhizomal movement, primarily by common reed. Limiting factors that could be naturally deterring revegetation of this area are the limited nutrients in the sandy soils and the shallow depth to a concrete slab beneath the sand (less than 1 foot in some areas). Another limiting factor could be the decompression of this fill material from heavy loading over time. Each of these factors would slow plant invasion and growth, but should not result in an area like this to remain largely devoid of vegetation. This area would warrant additional investigation as to whether chemical contamination has impacted vegetative growth.

Although direct observation of aquatic flora and fauna were not available to evaluate the potential for environmental stress from contamination, analyses of sediment samples collected from the littoral zone adjacent to the shoreline of the property out to the sea island permit some insights to local environmental stress. Sediment samples generally exceeded toxicity screening levels throughout the area evaluated for polychlorinated biphenyls and benzene based compounds. Most sampling areas also exceeded the Effects-Range Low (ERL) for PCBs established by Long (Long et al 1995). Some values approached but did not exceed the ERL level. Given these values and the moderate total organic carbon content of the soils, there is a strong potential for chronic impacts to the local benthic community. Impacts to fauna not directly associated with the bottom would be difficult to predict because of the mobility of the inhabitants in the water column. Fisheries data from NYSDEC for this portion of the river show some bioaccumulation of PCBs in predators at levels that could result in chronic toxicity to the

fish, however, no correlation can be made to this level of toxicity and the area under investigation. Chronic toxicity to benthic fauna will likely manifest as both lethal and sublethal impacts including tumors, susceptibility to parasites, skin lesions, and genetic alterations. Because levels are below the ERL, chronic toxicity is not expected to be widespread.

3.4.10 Habitat Values of Vegetative Zones within the Project Site

The assessment of habitat value provides for assessments of primary functions, such as food chain production, specialized habitat and hydrologic interactions. As part of the analysis, cultural values concerning recreation, aesthetics or other special features are also considered.

The information gathered during the remedial investigation can provide for a hierarchy of habitat values for the cover types found at the Tappan Terminal Site. It should be noted that this approach is highly subjective. Those functions assumed to be valuable in relative efficiency or importance are ranked as 3 (high), 2 (moderate) or 1 (low). Specific factors and brief descriptions that were utilized in the habitat value analysis of the site's qualitative evaluation are as follows:

Nutrient Transport Function - Transport of nutrients in detrital-based food chains is strongly dependent on the hydrologic characteristics of the particular ecosystem. For example, wetlands located in lower lying areas export more detrital material than do the higher marsh areas infrequently affected by creek/river overflow. Similarly, detrital transport in the riverine systems is dependent on the river flow regime, especially during periods of peak discharge. In contrast, very little detrital material is exported from isolated ponds and marshes, except during periods of episodic overflow resulting from exceptionally high precipitation.

Food Chain Support - This function refers to the secondary productivity values of consumer species that a particular ecosystem can support. Secondary productivity is an overall measure of the efficiency of the habitat in terms of nutrient transfer to higher trophic levels.

Hydroperiod - This factor refers to the frequency of inundation either by river flow runoff or direct precipitation. Areas of good hydrologic linkage help maintain a regular interchange of nutrients and other materials necessary to support diverse flora and fauna.

Elevational Location - From the above, it is apparent that hydrologic relationships will progressively deteriorate as the depth of flooding decreases. The weakest hydrologic linkages exist in those areas physically isolated from other areas in the system.

Cultural Evaluation - This particular factor is difficult to assess in detail because of the number of socio-economic considerations that may be involved. Hence, the evaluation in relation to local residential, commercial or industrial development is largely left to the professional judgement of the project personnel on a specific case-by-case basis.

Recreation - Recreation is a vital personal and social need which provides opportunity for self-expression, physical exercise and a change of pace from normal or routine activities. Outdoor recreation is a major leisure activity and is growing in national importance with a trend towards a higher standard of living. A significant portion of the total recreational output is water based or water related. As such, greater weight is given to those types of habitats.

Socio-Economic - This factor pertains to benefits which can be attributed directly to renewable resources, recreational enjoyment or other features associated with a particular habitat.

Aesthetics - Selected types of habitats are distinctive landscape features which can please the aesthetic sense through the intrinsic appreciation of natural beauty. Wetlands, or any other type of natural landscape, can also be offensive if their features have been adversely modified by incompatible human activities. Aesthetic value can be largely determined by the degree of visual diversity and contrast between the physical elements, such as landforms, water bodies, vegetation types and land use types.

Food Chain Production - This factor determines the growth of vegetation in a habitat and influences the populations and secondary productivity of animals that feed on the plants, or that feed at high trophic levels in the community.

Primary Productivity - Primary productivity is a measure of the stored food potential of the vegetation in excess of that used by the plants in metabolism. This determination provides an overall measure of the energy input directly available to the consumer species. It should be noted that the possible range of productivity values, both within and between particular environments, is extremely variable and dependent on a number of local conditions. For the present analysis, literature values for primary productivity as a function of biomass were utilized.

Water Purification Factor - Through a variety of physical, biological and chemical processes, some habitats function to naturally purify water by removing organic and mineral particulate matter from runoff and/or rivers and streams. For example, wetlands may be significant in minimizing some of the harmful effects of pollutants introduced into natural ecological systems by the activities of man. Thus, wetlands, especially when part of riverine or estuarine systems, can be an integral part of water quality and pollution control objectives.

Based on the above factors, a qualitative analysis of the habitat value of the vegetative and aquatic communities at the Tappan Terminal Site are presented in Table 3-1. Based upon these results, the open water represents a high value habitat. This habitat is prominent in primary productivity, nutrient transport and food chain support while also providing aesthetic and recreational opportunities that would likely not otherwise be available in this location. The remainder of the habitat types do not possess any remarkable properties that would distinguish them as highly productive areas and offer little protection to the valuable riverine system. This property, presuming any identified contaminant concerns are remediated, has the potential to provide opportunity for expanded water-dependent businesses, passive recreational opportunities such as fishing and bird watching, and businesses that depend on waterborne transport of goods or services. The cove immediately south of the site has the potential to develop into an important area for food chain production, primary productivity and aesthetics as well.

Table 3-1

TAPPAN TERMINAL SITE REMEDIAL INVESTIGATION
QUALITATIVE HABITAT VALUE ANALYSIS
WITHIN THE TAPPAN TERMINAL SITE

Evaluation Factor	Grassland/ Field	Forested/ Grassland/ Field	Estuarine/ Open Water	Developed/ Paved	Forested
Food Chain Production	2	2	3	1	2
Primary Productivity	2	2	2	1	2
Nutrient Transport	1	1	3	1	2
Food Chain Support	2	2	3	1	2
Hydroperiod	1	1	3	1	1
Elevational Location	2	2	2	2	2
Cultural Location	1	1	2	1	2
Recreation	1	2	3	2	2
Socio-Economic	1	1	2	2	2
Aesthetics	2	2	3	1	3
Water Purification Factor	2	2	1	1	2
Totals	*17*	*18*	*27*	*14*	*22*

4.0 NATURE AND EXTENT OF CONTAMINATION

The purpose of this section is to provide a discussion of the environmental sampling results obtained as a part of the remedial investigation conducted at the Tappan Terminal Site. The results are compared to standards, criteria and guidelines to determine potential impacts on human health and the environment. The nature and extent of contamination found at, and in the vicinity of the site during the remedial investigation is described below.

4.1 Identification of Standards, Criteria and Guidelines

This section provides a presentation of the standards, criteria and guidelines (SCGs) that were used as screening values to determine the significance of the analytical results and contamination found at the site. Exceedance of the SCGs does not necessarily imply that remediation is required, but rather identifies the contaminants, areas of the site and media of potential concern for further evaluation. The contaminants of concern and exposure pathways that require remediation will be further evaluated in the risk assessment.

4.1.1 Surface and Subsurface Soil

Screening of surface and subsurface soil analytical results was performed utilizing the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 "Determination of Soil Cleanup Objectives and Cleanup Levels," dated January, 1994. The TAGM lists specific objectives for soil clean-up concentrations. In many cases, the clean-up objective can be a specific value or the value of site background concentration as determined by the analysis of native soils thought to be free of contaminants associated with site uses. It should be noted that the specific values provided in the TAGM for organic contaminants are based on protection of human health for residential land use or protection of drinking water, whichever is more stringent. Inorganic contaminant values are based on protection of human health, again based on residential exposure, or eastern USA background levels.

The determination of site background at the Tappan Terminal Site is complicated by the fact that all soils present on and under the site consist of historic fill and exhibit levels of carcinogenic PAHs (CaPAHs) and metals that exceed specific clean-up objectives. There is no location on site that is not underlain by historic fill, therefore, a sample of undisturbed native soil cannot be collected. In order to try to establish background levels, samples were collected from a portion of the site underlain by historic fill, but believed to have never been associated with site-related sources of contaminants of concern. These locations were surface soil sample SS-11 and subsurface soil sample SB-1, collected from the Pioneer Boat Club, located on the southern portion of the Mobil property that was never occupied by buildings associated with on-site industrial activities. Results of the analyses at SB-1 indicate CaPAH and some metal concentrations that are greater than any other surface soil sample collected on site. Similarly, CaPAH and metals concentrations at SS-11 are similar to, or higher than, those found at sample locations near potential contaminant sources (e.g., SS-2, SS-3, SS-7 and SS-13). As a result of CaPAH and metals concentrations at the background locations occurring at higher levels than locations possibly affected by on-site contaminant sources, it is assumed that the source of CaPAHs and metals is the historic fill material.

Unless otherwise noted in the following sections, the detected concentrations of CaPAHs and metals are considered to be fill-related.

4.1.2 Groundwater

Screening of groundwater analytical results was performed utilizing the NYSDEC Technical and Operational Guidance Series (TOGS 1.1.1) "Ambient Water Quality Standards and Guidance Values," dated June 1998. Analytical results obtained for groundwater samples are compared to Class GA groundwater standards and guidance values. Some groundwater samples obtained from portions of the site are influenced by tides in the Hudson River and probably have chloride concentrations above 250,000 micrograms per liter (ug/l). These groundwater samples are saline or Class SGA, however, Class GA standards that are protective of potable water and are more stringent than those for Class SGA were used for screening groundwater sample analyses.

4.1.3 Surface Water Sediment

Screening of surface water sediment analytical results was performed utilizing the NYSDEC Division of Fish and Wildlife "Technical Guidance for Screening Contaminated Sediment," dated November 22, 1993. The determination of screening values using this guidance is dependent on the concentration of total organic carbon (TOC) in the sediments of concern. TOC analyses were not performed on individual samples collected offshore from the Tappan Terminal Site. However, TOC for Hudson River sediments at the ARCO site, adjacent to the Tappan Terminal Site to the north, has been determined to be on average, 1.5 percent. Screening criteria for sediments are established based on several categories of toxicity, including aquatic acute and chronic toxicity, human health acute and chronic toxicity, and wildlife acute and chronic toxicity. In all instances where more than one toxicity level was applicable, the most protective level (i.e., lowest concentration) was selected for screening.

4.2 Results of Site Characterization

The results of environmental sampling performed at the Tappan Terminal Site are provided below. The analytical results are presented and discussed in groups by environmental media. The following sections describe exceedances of SCGs only. Within each environmental media subsection, the discussion is separated into descriptions of analyte groups. Volatile organic compounds (VOCs) are discussed first, followed by semivolatile organic compounds (SVOCs), pesticides, PCBs, metals and cyanide. Tabulated results for all analyses, including results above and below SCGs, are presented in Appendix G.

4.2.1 Surface Soil

A total of 24 surface soil samples were collected at the locations indicated on Figure 2-1. Results of the surface soil sample analyses are summarized in Tables 4-1 and 4-2. Sheet 4-1 (located in a map pocket at the end of this report) presents the exceedances of SCGs for VOCs, SVOCs, pesticides and PCBs. In order to maintain clarity on Sheet 4-1, because of the large

Table 4-1

TAPPAN TERMINAL SITE REMEDIAL INVESTIGATION
SUMMARY OF CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS
IN SURFACE SOILS EXCEEDING SCGs

Compound	SCG (ug/kg)	Number and percentage of samples exceeding SCGs*	Mean** Concentration (ug/kg)	Median** Concentration (ug/kg)	Maximum** Concentration (ug/kg)
Benzo(a)anthracene	224	18/75%	2,324	645	23,000
Chrysene	400	16/67%	2,442	680	25,000
Benzo(b)fluoranthene	1,100	9/38%	2,641	880	23,000
Benzo(k)fluoranthene	1,100	8/33%	2,291	770	25,000
Benzo(a)pyrene	61	21/88%	2,384	790	25,000
Dibenzo(a,h)anthracene	14	18/75%	780	220	7,900

* A total of 24 samples were analyzed.

**Includes all reported concentrations greater than nondetect.

Table 4-2

TAPPAN TERMINAL SITE REMEDIAL INVESTIGATION
SUMMARY OF METALS IN SURFACE SOILS EXCEEDING SCGs

Metal	SCG (ug/kg)	Number and percentage of samples exceeding SCGs*	Mean** Concentration (ug/kg)	Median** Concentration (ug/kg)	Maximum** Concentration (ug/kg)
Arsenic	7.5	13/54%	14	9	90
Barium	300	10/42%	718	296	8,120
Beryllium	0.16	23/96%	0.8	0.5	8.1
Chromium	50	3/13%	30	23	97
Copper	25	23/96%	335	241	1,110
Iron	2,000	24/100%	21,022	20,800	33,600
Lead	400	9/38%	396	332	1,320
Mercury	0.1	21/88%	1	0.7	2.8
Nickel	13	20/83%	29	22	119
Selenium	2	2/8%	1.4	1.3	2.5
Vanadium	150	3/13%	156	44	2,190
Zinc	20	24/100%	662	432	3,200

* A total of 24 samples were analyzed.
**Includes all reported concentrations greater than nondetect.

number of exceedances, metals results are not presented on this sheet. The full list of surface soil analytes and concentrations appears in Appendix G, Table G-1. Samples were collected at a depth of 0 to 3 inches below ground surface at locations where soils were exposed at ground surface. Samples collected from beneath pavement were obtained from depths 3 to 11 inches below the pavement surface.

One VOC was detected slightly above SCGs in one of the 24 surface soil samples. Acetone was identified at location SS-12 near the boundary of the Uhlich and Mobil properties at a concentration of 250 micrograms per kilogram (ug/kg). This location occurs on Mobil property at a point where surface water drains off pavement on the Uhlich property under a chain link fence and into soil. No other samples exhibited exceedances for VOCs.

SVOCs detected in surface soil samples in exceedance of SCGs consisted almost exclusively of CaPAHs. This family of compounds consists of benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene and dibenzo(a,h)anthracene. One or more of these compounds was detected above SCGs at 21 of the 24 surface soil sample locations. Table 4-1 lists the individual CaPAHs and the number of samples that exceed SCGs for each compound. In general, high concentrations of CaPAHs (greater than 10,000 ug/kg) were detected at locations SS-16, SS-18, SS-20, SS-22, SS-23 and SS-24 on the Uhlich property. The highest concentrations found at SS-16 and SS-18 collected beneath pavement may be attributable, in part, to CaPAHs commonly found in asphalt. In addition, SS-16 also contained indeno(1,2,3-cd)pyrene at a concentration above its SCG.

Three surface soil samples exhibited exceedances of pesticides or PCBs. Samples SS-8 and SS-9 on the Mobil property, bordering the ARCO property, and SS-15 beneath pavement near the gatehouse at the southern end of the Uhlich property, each contained Aroclor-1260 in exceedance of the surface soil SCG, which is 1,000 µg/kg. The concentrations of Aroclor-1260 were 2,500 ug/kg in SS-8, 1,200 ug/kg in SS-9 and 4,400 ug/kg in SS-15.

Twelve metals have been identified in exceedance of SCGs in surface soil samples. Table 4-2 provides a summary of the metals found in exceedance of the SCGs. Beryllium, copper, iron,

mercury, nickel and zinc were each identified in exceedance of SCGs in 20 or more of the 24 surface soil samples analyzed and are considered typical for historic fill material and not known to be associated with site activities.

Cyanide was not detected above SCGs in any surface soil samples.

4.2.2 Subsurface Soil

Ten subsurface samples were collected from soil borings performed on the site. Subsurface soil samples were collected between the ground surface and the water table from depths of 1 to 6 feet below ground surface. As noted in the Data Usability Summary Report in Section 4.4, sample SB-1 was inadvertently not analyzed for VOCs. Six VOCs were detected above SCGs in three of the subsurface samples. One sample (SB-3) exhibited a petroleum-like odor and sheen, however the analyses did not identify any SCG exceedances. Exceedances of SCGs are depicted on Sheet 4-1. Results of all analyses for all sampling locations are reported in Appendix G, Table G-2.

Vinyl chloride was detected in one sample, SB-8, on the interior paved portion of the Uhlich property at a concentration of 1,800 ug/kg (SCG of 200 ug/kg). 1,2-Dichloroethene was detected in SB-8 at a concentration of 23,000 ug/kg (SCG of 300 ug/kg). Chloroform was detected in SB-7, also on the Uhlich property, at an estimated concentration of 830 ug/kg (SCG of 300 ug/kg). Trichloroethene (SCG of 700 ug/kg) was identified above SCGs in SB-5 and SB-8 (Uhlich property) at concentrations of 2,500 ug/kg and 15,000 ug/kg, respectively. Tetrachloroethene was identified in three samples, SB-5 (42,000 ug/kg), SB-7 (2,100 ug/kg) and SB-8 (50,000 ug/kg), above its SCG of 1,400 ug/kg. Chlorobenzene (SCG of 1,700 ug/kg) was identified at two subsurface sample locations, including SB-5 (5,200 ug/kg) and SB-7 (31,000 ug/kg). Sheet 4-2 presents the chlorobenzene results from the RI subsurface samples as well as chlorobenzene results from previous investigations. Table 4-3 presents a summary of VOCs detected above SCGs.

Table 4-3

TAPPAN TERMINAL SITE REMEDIAL INVESTIGATION SUMMARY OF VOLATILE ORGANIC COMPOUNDS IN SUBSURFACE SOILS EXCEEDING SCGs

VOC	SCG (ug/kg)	Number and percentage of samples exceeding SCGs*	Mean** Concentration (ug/kg)	Median** Concentration (ug/kg)	Maximum** Concentration (ug/kg)
Vinyl Chloride	200	1/11%	NA	NA	1,800
1,2-Dichloroethene	300	1/11%	NA	NA	23,000
Chloroform	300	1/11%	NA	NA	830
Trichloroethene	700	2/22%	5,860	2,400	15,000
Tetrachloroethene	1,400	3/33%	31,367	42,000	50,000
Chlorobenzene	1,700	2/22%	12,067	18,100	31,000

* A total of 9 samples were analyzed.
**Includes all reported concentrations greater than nondetect.
NA – not applicable

Sample SB-3, as described above, exhibited a petroleum-like odor and was saturated with a thick, oil-like liquid that produced a sheen. Several sample attempts were made at the targeted sample depth (2 to 4 feet) in order to obtain sufficient sample to fill the appropriate sample containers. Each sample exhibited the same odor and visual characteristics. Analyses of this sample indicated that there were no VOC or SVOC detections above SCGs, however, review of the chromatogram indicated many interfering VOC and SVOC peaks. The interference of the peaks prevents positive identification of probable contaminants. Results also indicated many tentatively identified hydrocarbon compounds. This sample location, although not exceeding SCGs, will be considered as likely contaminated for the purpose of identifying areas of concern.

Nitrobenzene is the only non-CaPAH SVOC identified above SCGs in subsurface soil samples. Nitrobenzene (SCG of 200 ug/kg) was identified at a concentration of 650 ug/kg in sample SB-1 at the Pioneer Boat Club. CaPAHs were found above SCGs for individual PAH compounds in SB-1 and SB-2 on the Mobil property and SB-6, SB-7, SB-8, SB-9 and SB-10 on the Uhlich property. A summary of CaPAHs in subsurface soil samples appears in Table 4-4.

There were no exceedances of SCGs for pesticides and PCBs in the subsurface soil samples.

Twelve metals have been identified in exceedance of SCGs in subsurface soil samples. Table 4-5 provides a summary of the metals found in exceedance of SCGs. Beryllium, copper, iron, mercury and zinc were identified in exceedance of SCGs in 8 or more of the 10 surface soil samples analyzed. These metals are considered to occur at typical historic fill concentrations.

Cyanide was not detected above SCGs in any subsurface soil samples.

4.2.3 Groundwater

A total of 38 groundwater samples, collected from 33 monitoring wells and five direct push samples, were analyzed during the remedial investigation. Eight wells (each with prefix

Table 4-4

TAPPAN TERMINAL SITE REMEDIAL INVESTIGATION
SUMMARY OF CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS
IN SUBSURFACE SOILS EXCEEDING OF SCGs

Compound	SCG (ug/l)	Number and percentage of samples exceeding SCGs*	Mean** Concentration (ug/l)	Median** Concentration (ug/l)	Maximum** Concentration (ug/l)
Benzo(a)anthracene	224	5/50%	782	335	2,400
Chrysene	400	3/30%	826	370	2,400
Benzo(b)fluoranthene	1,100	3/30%	943	330	2,800
Benzo(k)fluoranthene	1,100	3/30%	695	340	1,900
Benzo(a)pyrene	61	7/70%	701	325	1,700
Dibenzo(a,h)anthracene	14	4/40%	232	265	330

* A total of 10 samples were analyzed.
**Includes all reported concentrations greater than nondetect.

Table 4-5

TAPPAN TERMINAL SITE REMEDIAL INVESTIGATION
SUMMARY OF METALS IN SUBSURFACE SOILS EXCEEDING SCGs

Metal	SCG (ug/kg)	Number and percentage of samples exceeding SCGs*	Mean** Concentration (ug/kg)	Median** Concentration (ug/kg)	Maximum** Concentration (ug/kg)
Arsenic	7.5	5/50%	8	7	15
Barium	300	4/40%	647	180	3,650
Beryllium	0.16	8/80%	0.24	0.24	0.29
Cadmium	10	1/10%	16.6	1.2	122
Chromium	50	1/10%	25	15	120
Copper	25	9/90%	3,040	164	28,700
Iron	2,000	10/100%	13,654	15,150	17,400
Lead	400	2/20%	501	164	3,090
Mercury	0.1	9/90%	0.35	0.24	1.1
Nickel	13	5/50%	145	14	1,120
Selenium	2	33/30%	2.2	2.1	2.7
Zinc	20	10/100%	4,632	222	43,500

* A total of 10 samples were analyzed.
**Includes all reported concentrations greater than nondetect.

LMS-) and three direct push locations (GW-3, GW-4 and GW-5) were sampled on the Uhlich property, and 25 wells (with prefixes OW- and MW-) and 2 direct push locations (GW-1 and GW-2) were sampled on the Mobil property. Each well was purged of at least three volumes of water prior to collection of samples. VOCs, SVOCs, pesticides, PCBs, metals and cyanide analyses of groundwater were conducted using unfiltered samples. In addition, metals were also analyzed for filtered groundwater. Exceedances of groundwater SCGs are depicted on Sheet 4-3 located in a map pocket at the end of this report. The full list of analytes and concentrations is presented in Appendix G, Table G-3 for monitoring wells and Table G-4 for direct push groundwater samples.

Nine VOCs were identified at concentrations exceeding SCGs for groundwater. Of the nine VOCs found in exceedance of SCGs, chlorobenzene, benzene and methylene chloride were the only compounds that exceeded the SCGs in more than one sample. Chlorobenzene (SCG of 5 ug/l) exceedances were identified in 19 samples. The highest concentrations were identified at sample locations near the former chlorobenzene tank. Eighteen of the exceedances for chlorobenzene occurred along the abandoned sanitary sewer line (MW-S1, MW-1A, MW-6, MW-7A, OW-8, MW-9A, MW-10, OW-12, MW-13, MW-14, MW-15, OW-15, OW-17, OW-27A, LMS-1, LMS-2, LMS-3, and GW-2) on the east portion of the Mobil property near the Uhlich property line. One sample (GW-5) that exceeded SCGs for chlorobenzene is not associated with the sewer line and is located at the northeast corner of the Uhlich property. Exceedances of SCGs for chlorobenzene range from 9 ug/l to 11,000 ug/l.

Benzene was identified in exceedance of SCGs (1 ug/l) in seven samples (MW-S1, MW-1A, MW-10, MW-15, OW-15 and OW-17) all located along the abandoned sewer line. Benzene concentrations range from 5 ug/l to 170 ug/l. Methylene chloride was identified above SCGs (5 ug/l) in five samples with (OW-5A, OW-12, MW-14, LMS-1 and LMS-2) concentrations ranging from 8 ug/l to 350 ug/l. Other VOCs that were detected at concentrations above SCGs in only one sample include vinyl chloride (9 ug/l at GW-4), acetone (920 ug/l at MW-14), 1,2–dichloroethene (7 ug/l at OW-15), 1,1,2,2-tetrachloroethane (15 ug/l at MW-9A), toluene (10 ug/l at OW-17) and total xylenes (6 ug/l at OW-17).

Ten SVOCs were identified at concentrations exceeding SCGs in groundwater. The most frequently exceeded SCG was 2-chlorophenol. 2-Chlorphenol exceeded SCGs (1 ug/l) in six samples (MW-10, OW-12, MW-14, MW-15, OW-17 and LMS-2) located along the abandoned sewer line. These concentrations ranged from 14 ug/l to 61 ug/l. SCGs for 1,4-dichlorobenzene (3 ug/l) were exceeded in five samples (MW-1A, MW-10, MW-14, MW-15 and OW-17) near the contaminated soil removal area on the Mobil property. Concentrations of 1,4-dichlorobenzene ranged from 8 ug/l to 170 ug/l. SCG exceedances occurred for 4-chloranaline (SCG of 5 ug/l) at four sample locations (MW-9A, OW-27A, LMS-3 and GW-2) on the southern portion of the Mobil property. Concentrations of 4-chloranaline ranged from 9 ug/l to 25 ug/l.

The SCG for naphthalene (10 ug/l) was also exceeded in four samples (MW-10, OW-12, MW-13 and LMS-2) along the abandoned sewer with concentrations ranging from 14 ug/l to 70 ug/l. SCGs were also exceeded for 1,3 dichlorobenzene and 1,2 dichlorobenzene (SCG for each is 3 ug/l) at three sample locations near the contaminated soil removal area on the Mobil site, each with concentration ranges of 4 ug/l to 38 ug/l and 7 ug/l to 18 ug/l, respectively. Bis (2-ethylhexyl) phthalate was identified in two samples in exceedance of SCGs. Concentrations of this SVOC were 12 ug/l at OW-12 on Mobil property and 41 ug/l at LMS-2 on Uhlich property. Phenol (4 ug/l in MW-15), 2,4-methylphenol (42 ug/l in MW-14) and 2,4-dichlorophenol (4 ug/l in MW-14) were each identified in one sample in exceedance of SCGs.

Two pesticide compounds were identified in exceedance of SCGs in groundwater samples. The SCG for 4,4'-DDD (0.3 ug/l) was exceeded in three samples (MW-13, MW-14 and LMS-2) with concentrations ranging from 0.41 ug/l to 1.5 ug/l. Beta BHC was identified in exceedance of SCGs (0.04 ug/l) in two samples (MW-9A and MW-13) with concentrations ranging from 0.17 ug/l to 0.79 ug/l.

No PCBs were identified above SCGs in groundwater samples collected during the remedial investigation.

Several metals were detected above SCGs in groundwater. Both filtered and unfiltered samples were collected and analyzed. Table 4-6 presents a summary of the results of total metals analyses. Table 4-7 presents a summary of the results for dissolved metals analyses.

Cyanide was not detected in groundwater at the site.

4.2.4 Surface Water Sediment

Ten surface water sediment samples (locations SD-1 through SD-10) were collected from the Hudson River adjacent to the Tappan Terminal Site. Two background locations (SD-11 and SD-12) were sampled upstream from the site. SD-11 was collected adjacent to the Tower Boat Club and SD-12 was collected near the Dobbs Ferry train station. Only one VOC was detected above SCGs and was identified in only one of the sediment samples. Sample SD-6 contained 1,1,2,2-tetrachloroethane at a concentration of 5 ug/kg. Sheet 4-1 presents sediment SCG exceedances. Table G-5 in Appendix G presents the results of all analyses on surface water sediment samples.

SVOCs detected above SCGs include acenaphthylene and CaPAHs. Sample SD-3 contained acenaphthylene (SCG of 16 ug/kg) at a concentration of 34 ug/kg. CaPAHs were detected above screening levels at 11 of the 12 sample locations. Sample SD-7 was the only sample that did not exceed SCGs for CaPAHs. CaPAH concentrations ranged from below detection limits to 848 ug/kg. The two background locations (SD-11 at 475 ug/kg and SD-12 at 445 ug/kg) exhibited CaPAH concentrations that were greater than the CaPAHs in five of the samples collected adjacent to the site. There is no apparent trend in CaPAH concentrations with respect to sample proximity to the site. This result suggests that the CaPAH concentrations found in samples adjacent to the site are not attributable to the site and are indistinguishable from background sources.

One pesticide was identified above SCGs in the sediment samples. The pesticide 4,4'-DDD was detected at SD-5 in exceedance of the SCG of 0.02 ug/kg at a concentration of 30 ug/kg. One PCB compound, Aroclor 1248, was identified in exceedance of SCGs in eight of

Table 4-6

TAPPAN TERMINAL SITE REMEDIAL INVESTIGATION
SUMMARY OF
TOTAL METALS IN GROUNDWATER EXCEEDING SCGs

Metal	SCG (ug/l)	Number and percentage of samples exceeding SCGs*	Mean** Concentration (ug/l)	Median** Concentration (ug/l)	Maximum** Concentration (ug/l)
Antimony	3	19/50%	9	7	29
Arsenic	25	2/5%	13	8	38
Barium	1,000	10/26%	658	575	2,250
Beryllium	3	1/3%	1.1	0.7	4.2
Cadmium	5	2/5%	6	2	50
Chromium	50	1/3%	7	3	46
Copper	200	9/24%	231	49	1,850
Iron	300	37/97%	14,953	4,320	239,000
Lead	25	19/50%	130	19	722
Magnesium	35,000	19/50%	50,401	34,300	217,000
Manganese	300	30/79%	926	582	7,470
Selenium	10	0/0%	-	-	-
Sodium	20,000	38/100%	489,897	367,000	1,990,000
Thallium	0.5	6/16%	6	5	12
Zinc	2000	2/5%	580	163	8,220

* A total of 38 samples were analyzed.
**Includes all reported concentrations greater than nondetect.

Table 4-7

TAPPAN TERMINAL SITE REMEDIAL INVESTIGATION
SUMMARY OF
DISSOLVED METALS IN GROUNDWATER EXCEEDING SCGs

Metal	SCG (ug/l)	Number and percentage of samples exceeding SCGs*	Mean** Concentration (ug/l)	Median** Concentration (ug/l)	Maximum** Concentration (ug/l)
Antimony	3	10/26%	12	7	47
Arsenic	25	1/3%	12	8	40
Barium	1,000	10/26%	655	520	2,180
Cadmium	5	0/0%	4	4	4
Chromium	50	0/0%	7	4	37
Copper	200	1/3%	54	2	506
Iron	300	26/68%	13,403	3,000	261,000
Lead	25	1/3%	24	4	261
Magnesium	35,000	23/61%	51,180	36,700	194,000
Manganese	300	30/79%	939	633	8140
Selenium	10	14/37%	9	9	17
Sodium	20,000	38/100%	508,506	333,000	1,520,000
Thallium	0.5	2/5%	5	4	8
Zinc	2,000	0/0%	51	17	549

* A total of 38 samples were analyzed.
**Includes all reported concentrations greater than nondetect.

the 12 sediment samples. Aroclor-1248 was detected in exceedance of the SCG of 0.012 ug/kg at concentrations ranging from 70 ug/kg to 140 ug/kg. One of the background samples (SD-11) contained Aroclor-1248 at a concentration of 98 ug/kg. As with CaPAHs, it appears that PCB concentrations found in samples adjacent to the site are not attributable to the site and are indistinguishable from background sources.

Sediment samples were not analyzed for metals, based on review of preliminary soil and groundwater sampling results. Metals at the site are fill related and similar fill is known to occur along much of the lower Hudson River shoreline. Similar metals have been reported above SCGs in river sediments both up and downstream of the site and are related to urban land use (Wall, 1998). Therefore, it is unlikely that metals data from river sediment adjacent to the site could be meaningfully distinguished from other sources.

4.3 Tentatively Identified Compounds

The analytical results of samples collected at the Tappan Terminal Site indicate the presence of VOCs and SVOCs that are not included on the Target Compound List. These compounds appear on laboratory reports as tentatively identified compounds (TICs). An absolute concentration cannot be determined since the compound is often unknown or tentatively identified.

The occurrence of TICs is very often coincident with the identification of one or more target compounds in the analysis. The target compound and TICs are often part of a group of related compounds often found in association with each other (e.g. hydrocarbons). Target compounds are compounds of concern whose identification allows assessment for the protection of human health and the environment. SCGs, exposure limits and health effects are often well established for target compounds. Such is not the case for TICs. The occurrence of TICs is noteworthy for an overall site assessment, however the comparison of individual TICs with SCGs is not possible. Likewise, the analyses of risk associated with TICs involves the evaluation of sparse or nonexistent information regarding these compounds.

4.3.1 Surface Soils

TICs identified in surface soils can be generally categorized as dye-related, petroleum and asphalt-related, and fill-related, although several contaminants may belong in one or more of these categories. The most common dye-related contaminants are standard ingredients, intermediates and by-products in the production of aniline and anthraquinone dyes, including:

Aniline	Chloro and Dichloro Benzenediamines
Chloro and Dichloroanilines	9,10-Anthracenediones (Anthraquinones)
Methyl benzamines (Toluidines)	Hydroxy and Dihydroxy Anthraquinones

These contaminants were found in fourteen surface soil samples SS-1, SS-2, SS-4, SS-5, SS-6, SS-9, SS-12, SS-14, SS-16, SS-17, SS-19, SS-21, SS-23 and SS-24. Seven of these locations are on the Uhlich property, and six of the remaining seven locations are within 50 feet of the property boundary. The highest concentrations of dye-related TICs were found in samples SS-16 and SS-17, where total identified and unknown TIC concentrations were estimated to be approximately 0.1% (one million ppb) and 1.0% (ten million ppb), respectively. These locations are in the central portion of the Uhlich property, to the northwest and southwest of Building 57.

Petroleum-related TICs were identified as specific and unknown hydrocarbons. Petroleum-related TICs were prevalent in surface soil samples SS-8, SS-9, SS-10, SS-12, SS-15, SS-18, SS-19, and SS-20.

A number of substituted Polycyclic Aromatic Hydrocarbons, such as methyl- and dimethyl -naphthalene, -anthracene, and -phenanthrene, were detected at several locations, notably SS-4, SS-8, SS-10, SS-14, S-15, SS-21, SS-22, SS-23 and SS-24. At these locations, an asphalt surface is present, and high levels of quantified carcinogenic PAHs were also found. However, these contaminants are known ingredients in dye manufacturing processes, and in several locations, elevated levels of dye-related TICs were also found.

4.3.2 Subsurface Soils

Dye-related TICs were detected in samples from SB-2 and SB-3, located on the Mobil property, and from SB-5, SB-6, and SB-7 located on the Uhlich property. Substituted PAH TICs were found in borings SB-1, SB-6, SB-8, and SB-10 beneath paved surfaces on the Uhlich and Pioneer Boat Club properties. Petroleum-related contaminants were the predominant TICs at locations SB-4, SB-5, SB-9 and SB-10, all beneath paved surfaces on the Uhlich property.

4.3.3 Groundwater

Ethyl ether and diisopropyl ether were found in monitoring wells MW4, MW-5, OW-19A, OW-25 and OW-26. These wells are all located in the northern portion of the property, downgradient of the former ethyl ether storage tanks. The highest combined concentration of ethers was found in well OW26, where a total estimated concentration of 770 ug/l was detected. There is currently no groundwater standard or guidance value for ethyl ether or diisopropyl ether.

Dichlorobenzenes (1,3- and 1,4-) were identified as TICs in monitoring wells MW-10 and MW-15. The estimated concentration of dichlorobenzenes (DCB) in MW-15 is 55 ug/l for 1,4-DCB and 257 ug/l for 1,3-DCB, as compared to the groundwater standard of 3.0 ug/l for each.

A number of dye-related TICs were detected in monitoring wells MW-9A, OW27A, MW-1A, MW-10, MW-15, OW-17, and GW-2. The wells are all downgradient of the former dye manufacturing operations, and all except MW-9A contain high concentrations of chlorobenzene. The greatest number and highest concentration of dye-related contaminants were found in MW-1A, where several substituted phenols and anilines were identified and the concentration of o-chloroanaline was estimated as 130 ug/l. Several dye-related contaminants were also found in OW-17, where the level of p-aminotoluene was estimated to be 150 ug/l.

4.4 Data Usability Summary Report (DUSR)

As part of the field investigation at the Tappan Terminal Site the following samples were collected: 24 surface soil, 10 subsurface soil, 12 sediment, 33 monitoring well groundwater and 5 direct push groundwater samples. The surface soil samples were analyzed for Target Compound List (TCL) +30 organic compounds, Target Analyte List (TAL) metals and cyanide. Subsurface soil samples were analyzed for TCL +30 compounds, TAL metals and total organic carbon (TOC). The sediment samples were analyzed for TCL +30 compounds, and the groundwater samples were analyzed for TCL +30 compounds, TAL metals (total and dissolved) and cyanide.

Sample analysis was performed in accordance with NYSDEC 10/95 Analytical Services Protocol (ASP) methods by Industrial Corrosion Management Inc. (ICM), an ELAP certified laboratory and a subcontractor to Dvirka and Bartilucci Consulting Engineers (D&B), in accordance with the approved RI/FS Work Plan. A Data Usability Summary Report (DUSR) was prepared by D&B's Quality Assurance officer for the data packages submitted by ICM. The data packages were reviewed for completeness and compliance to NYSDEC 10/95 ASP QA/QC requirements and the findings are summarized below.

In general, sample analysis was performed in accordance with the NYSDEC 10/95 ASP methods specified in the Work Plan. The only discrepancy was that the volatile organic sample vials provided by the laboratory for the groundwater samples were preserved with hydrochloric acid (HCL). The NYSDEC was notified and indicated that the vials could be utilized, however, the samples were to be analyzed within holding time for unpreserved VOCs (7 days of verified time of sample receipt [VTSR]) rather than the 10 days specified in the ASP for preserved volatile organics.

A representative of the laboratory did not sign the copy of the chain of custody provided in the data package for Sample Delivery Group (SDG) SS-1. The VTSR was September 25, 1998 based upon the signature of a Federal Express representative on September 24, 1998.

Several samples required reanalysis at secondary dilutions due to compound concentrations exceeding instrument calibration ranges. The results for those particular compounds were taken from the diluted analysis and are flagged "D" on the data summary tables. Reanalysis was also performed on samples due to surrogate recoveries and/or internal standard area counts being outside QC limits. The results from the analysis that were considered the most compliant are included in the data summary tables.

Sample SB-1 was inadvertently not analyzed for volatile organics.

The semivolatile fraction of sample SS-17 was analyzed at medium level with a 1:10 dilution and the only compound found was bis(2-ethylhexyl)phthalate. No other semivolatile analysis was performed on this sample. Due to the high dilution, the results are qualified as estimated with possible false negatives being reported.

Methylene chloride and acetone have been qualified as nondetect in many samples due to laboratory contamination. That is, the method blanks associated with the qualified samples also contained methylene chloride and acetone, and the sample concentrations were less than five times the concentrations found in the blanks.

A comparison was made between the total and dissolved metal results for the groundwater samples. In almost all cases the dissolved metal results were the same or lower than the total results as expected. One exception was the analysis for sample OW-17 that indicated that the results for the filtered sample (dissolved) were much higher than that of the unfiltered sample. The laboratory was contacted and examined the sample containers for total and dissolved metals analyses obtained from OW-17. The container labeled for dissolved analyses contained an accumulation of sediment on the bottom. This is inconsistent with expected conditions after field filtering. The sample container labeled for total metals analyses contained no sediment which is inconsistent with observations of the unfiltered sample recorded on the sample information record for that well. Therefore, it has been assumed that the containers were mislabeled in the field and that the results should be switched.

The chlorobenzene result for sample OW-8 has been qualified as estimated, possibly resulting from carryover from sample OW-27A, which was run prior to OW-8 and had a concentration of chlorobenzene which exceeded the instrument calibration range.

No other problems were found with the data packages. All results are deemed valid and usable for site characterization purposes as qualified above.

5.0 CONCLUSIONS

The results of the remedial investigation for the Tappan Terminal Site indicate that the site contains elevated concentrations of a number of contaminants resulting from fill used to create the site, as well as from industrial activities which took place on the site, and that migration of contaminants off-site is possible. Volatile organic compounds (VOCs) including most notably, chlorobenzene and benzene in soil and groundwater, and to a lesser extent tetrachloroethene, trichloroethene, 1,2-dichloroethene and vinyl chloride in soil, are considered primary contaminants of concern. Primary contaminants of concern also include carcinogenic polycyclic aromatic hydrocarbons (CaPAHs), a family of semivolatile organic compounds (SVOCs), and metals in soil. The sources of these contaminants are likely spills and disposal of waste from former dye manufacturing and solvent storage and recovery, and fill. PCBs and pesticides have also been found at the site, but are considered secondary contaminants because their occurrences are isolated and infrequent, and the concentrations of these contaminants do not significantly exceed standards, criteria and guidelines (SCGs). The following describes the conclusions regarding contaminants for each environmental media investigated.

5.1 Surface Soil

Based on the results of the investigation and comparison to the SCGs selected for preliminary screening, the contaminants of concern in surface soils at the Tappan Terminal Site are primarily CaPAHs and metals, with isolated areas of acetone and PCB contamination. Elevated concentrations of CaPAHs were found essentially in all areas of the site. No one location can be described as a particular source of these contaminants. Higher concentrations of CaPAHs were found in samples collected immediately below asphalt surfaces, which may result, in part, from the asphalt itself. These locations are on the Uhlich property, which is nearly entirely paved.

Due to the ubiquitous nature of PAHs in soil at the Tappan Terminal Site, historic fill used to create the site is likely the primary source of PAHs. However, site related sources such as boiler emissions and ash disposal may also have contributed to PAHs in soil. PAHs are

formed mainly as the byproducts of combustion, such as fossil-fuel power generation, numerous industrial processes and forest fires (Neff, 1979).

The concentrations of PAHs are generally consistent (within the same order of magnitude) over most of the site. The PAH concentrations found at the site are generally less than those found at the ARCO site immediately to the north, and many other fill sites located along the lower Hudson River, based on other NYSDEC site investigations. The origin of PAHs at these sites is likely from the once common practice of ash disposal and the use of construction and demolition debris for fill material for land reclamation.

CaPAHs are of potential concern at the site because they exceed SCGs in many instances. The risk assessment will further define the CaPAH contaminants of concern and unacceptable exposure pathways.

PCBs were detected (1,200 to 4,400 ug/kg) slightly above SCGs (1,000 ug/kg) at three of 24 surface soil locations. Two of the locations (SS-8 and SS-9) are located in the northern portion of the site on either side of a paved roadway that connects the ARCO site and the Mobil property. Aroclor 1260 was identified at these locations and its source is likely attributable to the use of PCBs in wire manufacturing conducted by the Anaconda Corporation on the Harbor-at-Hastings (ARCO) site. Aroclor 1260 has been identified as a widespread soil contaminant at the ARCO site.

The third sample location (SS-15) near the Uhlich gatehouse at the southern end of the Tappan Terminal Site also contained 4,400 µg/kg of Aroclor 1260. There is no history of use of PCBs in the manufacturing and petroleum distribution on the site. Transformers that may have contained PCBs reportedly were not in proximity to this sample location. PCBs at this location may have been carried from the ARCO site. A roadway that once connected Railroad Avenue with the ARCO site passed by the Uhlich gatehouse. Vehicles transporting equipment or products to and from the Anaconda Company may have traveled this route. One possibility is that PCB contaminated soil was released from a vehicle near the Uhlich gatehouse.

Acetone was detected at one location (SS-12) on the site. This location occurs on Mobil property at a point where surface water drains off pavement on the Uhlich property under a chain link fence and into soil. The soil sampled at this location exhibited a pinkish stain, presumably from pigments that washed onto the soil from the Uhlich property. According to Uhlich Color Company personnel, acetone is not used on site. The drainage in the area has reportedly been modified so that surface water on the Uhlich site is collected and no longer flows off site along the Mobil property boundary. The detection of acetone may be due to laboratory contamination and is considered spurious. As a result, acetone is not a concern at the site.

Metals concentrations in exceedance of SCGs, such as for barium, copper, lead and zinc, occur throughout the Tappan Terminal Site. The only metal that appears to be associated with current operations on the site is barium, which is used by Uhlich as a pigment source. The highest concentration of barium (8,120 µg/kg) was found in the pink stained soil described above. Lower levels of barium were found in surface soils on both the Uhlich and Mobil parcels. Of these, the highest levels were found in locations on the Mobil property that were selected as possible source areas. Although barium compounds were not known to have been used on the Mobil parcel, the proximity of these locations to the Uhlich property and the path of the sewer line indicate the possibility of migration. It is unclear whether these detections are fill-related or process-related.

The widespread occurrence of metals is most likely attributable to the industrial nature of the fill material on site. Isolated areas of metals concentrations that are higher than others (SS-2 with arsenic and lead, SS-13 with mercury and vanadium, and SS-20 with high concentrations of beryllium, chromium, iron, nickel and zinc) are likely due to the heterogeneous nature of the fill and possible release from site operations that are no longer conducted, such as the manufacture of dyes.

Soil studies performed in Westchester County (1994), including samples collected from the Tappan Terminal Site, indicate that the concentrations of copper, lead and tin are not unusually high when compared to the entire county. As with PAHs, exceedances of SCGs for metals are typical of soils at fill sites along the lower Hudson River that have been investigated

by NYSDEC. Metals are of potential concern in surface soil at the site because they exceed SCGs at many locations. The degree to which metals contaminated surface soil at the site will require remediation will be dependent on the results of the risk assessment, which will further define the metal contaminants of concern and unacceptable exposure pathways.

5.2 Subsurface Soil

Subsurface soil contaminants include CaPAHs and metals throughout the site. There are also several isolated areas of exceedances of SCGs for tetrachloroethene (PCE), trichloroethene (TCE), 1,2-dichloroethene (DCE), vinyl chloride and nitrobenzene. Contaminants of concern are discussed below in order of most prevalent to least prevalent.

CaPAHs and metals are found in exceedance of SCGs in most of the subsurface soil samples collected. The concentrations of CaPAHs and metals are similar to those found in surface soils. As for surface soils, there is no discernable on-site source or areas of elevated CaPAHs. These contaminants were likely brought to the site in the fill used to reclaim land from the Hudson River. As previously discussed, the concentrations of CaPAHs and metals are similar to those exhibited in soils found at similar fill sites investigated by the NYSDEC along lower Hudson River shoreline areas. Barium, however, is a potential process-related contaminant. All exceedances of SCGs for barium in surface soil occurred on the Uhlich property (SB-5, SB-6, SB-8 and SB-9). Barium is of potential concern for this reason. CaPAHs are also of potential concern in subsurface soils at the site because they exceed SCGs, however, the need for remediation will be based on the results of the risk assessment and future use of the site.

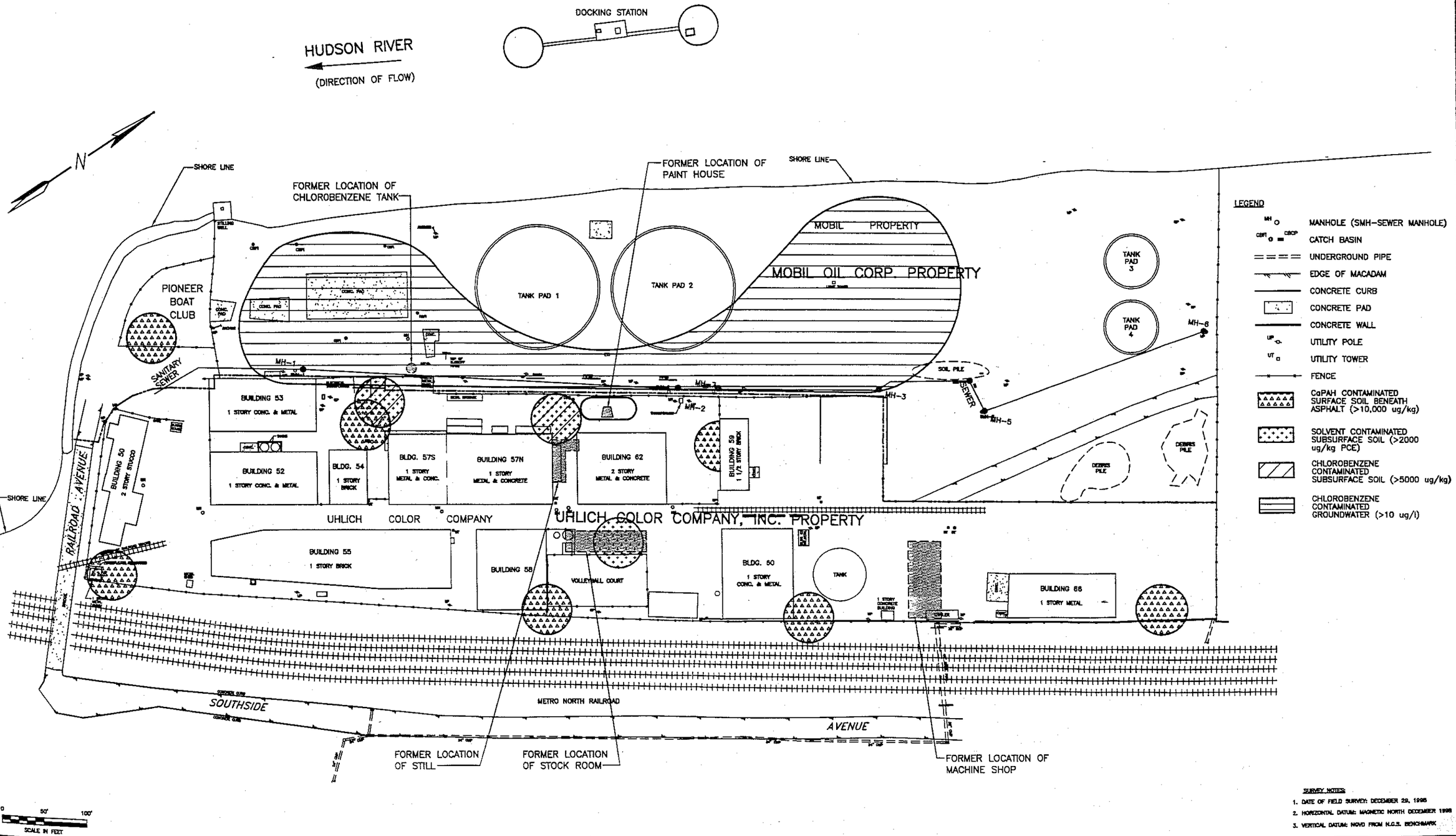
Chlorobenzene was detected at concentrations above the SCGs in subsurface soil samples from borings SB-5 and SB-7. These locations are adjacent to a suspected source area of chlorobenzene. Historic maps of the site during the operation of the Zinnser Company indicate the presence of a chlorobenzene storage tank on what is now the Mobil property. The tank was located southeast of the southern-most former tank pad near surface sample location SS-2. This area of chlorobenzene-contaminated subsurface soil also corresponds with an area of chlorobenzene contaminated groundwater (see Section 5.3). Subsurface soil was likely

contaminated from spills or leaks of chlorobenzene stored in the tank. Chlorobenzene in subsurface soils is of potential concern at the site due to the exceedance of SCGs and migration into groundwater, as well as possible migration to the Hudson River.

Chlorinated solvents, including PCE, TCE, 1,2-DCE and vinyl chloride, have been identified in exceedance of SCGs at locations SB-5, SB-7 and SB-8 on the Uhlich property. The maximum concentrations occur at SB-8 and include PCE at 50,000 ug/kg, TCE at 15,000 ug/kg, DCE at 23,000 ug/kg and vinyl chloride at 1,800 ug/kg. PCE, TCE, DCE and vinyl chloride are reportedly not used by Uhlich Color Company. The locations of solvent contaminated soils are between buildings that have been identified on the historic maps as a machine shop and still (near SB-8) and a paint shop (near SB-7) where solvents may have been used. Figure 5-1 depicts areas of potential concern and the former locations of tanks and buildings that may have been sources of contamination.

The Zinnser Company was reported to have been engaged in solvent recovery at the site (possibly at the still mentioned above) and may have handled or used these solvents. Currently, this contaminated subsurface soil is overlain by asphalt and these solvents have not been detected significantly above SCGs in groundwater. PCE has been detected in low concentrations in groundwater at MW-S1 (3 ug/l), MW-9A (15 ug/l), MW-10 (3 ug/l) and OW-15 (7 ug/l), which indicates some migration of PCE toward the Hudson River. In addition, low concentrations of TCE and vinyl chloride have been detected in groundwater. These solvent-related contaminants are of potential concern in subsurface soil at the site due to exceedances of SCGs and the potential to migrate more readily to groundwater and the river if the asphalt is damaged or removed.

Nitrobenzene was identified slightly in exceedance of SCGs at one location on the Pioneer Boat Club portion of the Mobil property. This location, SB-1, was not part of the Zinnser facility or the Mobil Terminal. Nitrobenzene is an SVOC that is not associated with activities at a boat club, but is associated with dye manufacturing. The source of nitrobenzene may be from contaminants transported from the Zinnser facility or the industrial fill material brought to the site. The concentration of nitrobenzene is low and there are no other exceedances on-site,



TAPPAN TERMINAL SITE
HASTINGS-ON-HUDSON, NEW YORK

AREAS OF POTENTIAL CONCERN

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 5-1

indicating that the occurrence is isolated. As a result, nitrobenzene is of minor concern due to its isolated occurrence and minor exceedance of SCGs.

Petroleum-like characteristics were observed in subsurface soil sample SB-3. This sample was collected from a location adjacent to an area where petroleum contaminated soil was excavated on the Mobil property. Although analyses failed to identify compounds in exceedance of SCGs, a large number of tentatively identified hydrocarbon compounds were detected and the observed characteristics of this sample suggest that this area of the site may be of concern.

5.3 Groundwater

The predominant groundwater contaminant at the Tappan Terminal Site is chlorobenzene. Chlorobenzene is used in the preparation of aniline and as a dyestuff intermediate. According to reports from previous investigations (ChemRisk, 1990, LMS, 1989) its use was prevalent at the former Zinnser facility. According to Uhlich personnel, chlorobenzene is not, and has not been, used at the Uhlich pigment manufacturing facility. A plume of chlorobenzene contaminated groundwater has been established in previous investigations and was confirmed by sampling in this remedial investigation. The plume source appears to be near the former Zinnser chlorobenzene tank location near SS-2 and generally follows the abandoned sanitary sewer line on the Mobil property near the border with the Uhlich property. The highest concentrations of chlorobenzene are near the source tank location and along the sewer. The plume extends northwestward and southwestward in diminishing concentrations.

The sewer was installed in 1961, after the Zinnser Corporation and Harshaw Company were no longer on-site, and prior to the Uhlich Color Company commencing operations. The sewer was installed beneath a drainage swale that ran between the former location of the chlorobenzene tank and the northern portion of the site. Leaking chlorobenzene may have migrated along the drainage swale before infiltrating the ground surface. Additionally, chlorobenzene contaminated soil may have been spread along the sewer bed during construction. The apparent northward migration of the plume may be due to the release of chlorobenzene from

contaminated soil or preferred flow of contaminants along the sewer bed. Migration of chlorobenzene contaminated groundwater may have occurred by preferential flow through the disturbed soils used to backfill the excavation. Contaminants may also have been disturbed during the excavation of a portion of the sewer to remediate petroleum contaminated soils. This excavation was conducted in response to a number 6 fuel oil spill on the Uhlich and Mobil properties that was remediated in 1994. The westward migration of the plume is due to the westward flow of shallow groundwater toward the Hudson River.

Chlorobenzene is of potential concern at the site due to its presence significantly above SCGs and the potential for migration to the river, as well as to overlying structures as a result of volatilization, if the site is developed in the future.

Benzene was identified in groundwater at concentrations slightly above SCGs. Benzene is used in the manufacture of aniline, dyes and other organic chemicals and its use would have been possible at the Zinnser facility. Benzene occurrences are largely coincident with chlorobenzene and occur along the abandoned sewer line. Benzene is of potential concern due to exceedances of SCGs and the potential for off-site migration.

Ethyl ether and di-isopropyl ether are present in groundwater at estimated concentrations. These contaminants have been detected at the northern portion of the Mobil property near the former locations of ethyl ether storage tanks. There are no SCGs for these compounds and therefore no exceedances, however the presence of these compounds is a potential concern.

Other groundwater contaminants found at a lower frequency than chlorobenzene and benzene include 2-chlorophenol, 4-chloraniline, 1,2-, 1,3- and 1,4-dichlorobenzene, phenols and naphthalene. Each of these compounds either is used in, or is a breakdown component of chemicals used in dye manufacturing. The occurrence of these compounds in groundwater is limited to the portion of the site near the abandoned sewer line. These compounds are of some concern due to exceedances of SCGs, however the occurrence of the compounds appears isolated on interior portions of the site and migration does not appear to be extensive. In addition, as described above, PCE, as well as TCE and vinyl chloride have been detected in groundwater at

the site. Although the concentrations are presently low, should site conditions change in the future, concentrations of these contaminants could increase in groundwater and potentially migrate off site, and as a result, are of potential concern.

The pesticides, 4,4'-DDD and beta BHC, slightly exceed SCGs and are found in three isolated, unrelated groundwater samples. These pesticides were not detected above SCGs in on-site soils and the concentrations are slightly elevated, therefore, these contaminants are of minor concern due to low and infrequent exceedances of SCGs.

Although no site related contaminants have been identified in sediment samples collected from the Hudson River adjacent to the site, groundwater represents a migration pathway for dissolved-phase contaminants to enter the Hudson River. The possible migration of dissolved-phase contaminants in groundwater is a concern at the site.

5.4 Surface Water Sediment

Surface water sediment samples collected from the Hudson River adjacent to the Tappan Terminal Site contain CaPAHs and PCBs in exceedance of SCGs. The concentrations of these compounds is similar to those found in sediment samples collected from numerous locations in the lower Hudson River and are considered background for the river (Wall, 1998). Analyses of background sediment samples collected during the remedial investigation from locations between 1 and 2 miles north of the site contain similar contaminants and concentrations to those adjacent to the site. The source of sediment contaminants are likely not attributable to the Tappan Terminal Site. Sediment contaminants are of potential concern due to exceedances of SCGs, however, the concentrations are considered background for the lower Hudson River.

6.0 RECOMMENDATIONS

Results of the remedial investigation indicate that elevated concentrations of contaminants are present at the Tappan Terminal Site, and there is the possibility of human and environmental exposure to these contaminants. The following describes on a preliminary basis, based on a comparison of contaminant concentrations to the standards, criteria and guidelines (SCGs) selected for the site, media and areas of the site that are of potential concern and may be considered for remediation. Contaminants of concern will be evaluated in a quantitative risk assessment to further define media, areas of concern and exposure pathways that require remediation. Recommendations are also provided below for additional investigation to define the extent of contamination in select areas of the site that may require remediation.

6.1 Surface Soil

Elevated concentrations of CaPAHs and metals in surface soil indicate a potential concern regarding human and environmental exposure to these contaminants. Although the Uhlich site is almost entirely paved, the Mobil site allows direct contact with surface soils, particularly by wildlife. Due to the possible release of PCB-contaminated material from vehicles traveling from the Anaconda site through the Tappan Terminal Site and detection of PCBs above SCGs near the property boundary of the ARCO site, additional sampling for PCBs along roadways and in the northern portion of the Tappan Terminal Site should be conducted. Consideration of the impact of these contaminants and remediation of surface soils, including these on the Uhlich property should site use change, should be addressed in the risk assessment.

6.2 Subsurface Soil

In addition to chlorobenzene, which was detected in elevated concentrations in subsurface soil in the area east of the former chlorobenzene storage tank, areas with elevated levels of PCE, TCE, DCE and vinyl chloride could act as a significant source of contaminant migration to groundwater. These areas, west of the volleyball court and west of Buildings 54 and 57 on the Uhlich property, should be evaluated in the risk assessment and possibly considered for

remediation. For evaluation of remediation in the feasibility study, additional subsurface soil sampling should be conducted to delineate the extent of the chlorobenzene and solvent-contaminated soils.

The risk assessment and feasibility study should also consider the Mobil property in the area of the former petroleum spill and soil excavation in the northern portion of the site. A subsurface soil sample collected at SB-3, near the eastern extent of the excavation, was observed to contain a petroleum-like liquid with a petroleum-like odor. The analyses for the sample did not identify VOCs or SVOCs, but did indicate many tentatively identified compounds that are petroleum related. Significant petroleum contaminated subsurface soil may be present at this location and may require remediation. Additional subsurface soil sampling is required to determine the extent of this petroleum-contaminated soil.

6.3 Groundwater

A plume of chlorobenzene-contaminated groundwater is present beneath the site. The plume is generally confined to the interior portion of the site near the abandoned sanitary sewer line. Groundwater flow observations recorded during the field investigation suggest the possible migration of contaminants into the Hudson River, however, sediment samples collected from the river bottom adjacent to the site do not indicate detectable concentrations of site related contaminants. In order to better evaluate the potential for groundwater contamination of the Hudson River, an estimate of groundwater contaminant flux, based on hydraulic characteristics observed in the field investigation, is recommended. The need for and evaluation of remedial measures for groundwater will be considered based on the results of the risk assessment and discussed in the feasibility study.

For evaluation of remediation in the feasibility study, groundwater sampling should be conducted at, and in the vicinity of, monitoring well LMS-2 with a fuel fingerprint analysis to identify light non-aqueous phase liquid (LNAPL) observed during groundwater sampling and the extent of LNAPL.

6.4 Surface Water Sediment

Surface water sediments analyzed during the remedial investigation, while containing elevated concentrations of CaPAHs and PCBs, do not indicate a contaminant source attributable to the Tappan Terminal Site. Exposure to these sediments and need for remediation will be evaluated in the risk assessment.

7.0 REFERENCES

Dvirka and Bartilucci, 1998. Remedial Investigation and Feasibility Study Work Plan, Tappan Terminal Site, Hasting-on-Hudson, New York, August 1998.

Fisher, D. W., 1970. Geologic Map of New York, Lower Hudson Sheet, New York State Museum and Science Service: map.

Golder Associates, 1996. Remedial Investigation Report, Harbor at Hastings, Hastings-on-Hudson, New York.

LBG, 1989. Environmental Assessment and Evaluation of Remedial Alternatives at Tappan Terminal, prepared for Mobil Oil Corporation, March 1989.

LMS, 1989. Report on Subsurface Investigation at adjacent Paul Uhlich and Co. Plant Property, EPA Technical Directive Document No. 02-8809-01.

Neff, J.M., 1979. Polycyclic aromatic hydrocarbons in the aquatic environment-sources, fates and biological effects. London, Applied Science Publishers, 262p.

U.S. Fish and Wildlife Service, 1985. Nearshore shallow water fish survey of Newark Bay, Kill Van Kull and Hudson River Estuary, Planning Aid Report.

Walls, G. R., K. Riva-Murray, et al. (1998). Water quality in the Hudson River Basin. New York and adjacent states, 1992-95. Denver, US Geological Survey.

Westchester County Department of Health, 1994. February 17 Letter from Elizabeth Hendrick (DOH) to Neil Hess, Village of Hastings-on-Hudson Administrator re: Copper, lead and tin in surface soil samples in Westchester County.

APPENDIX A

Annotated Bibliography and Historical References

Table A-1.
Tappan Terminal Site Remedial Investigation
Annotated Bibliography of Site Investigation Reports

Reports are listed chronologically by site.
LBG=Leggette, Brashears and Graham

Mobil Site

LBG, 1987. "Ground-Water and Soil Quality Investigation at the Mobil Oil Corporation Tappan Terminal, Hastings-on-Hudson, Greenburgh, NY", March 1987.

- Groundwater flow described as water table aquifer
- TPH identified in soils on east boundary of Mobil property
- Dye extracts identified in soils
- Chlorobenzene identified in soil
- Well logs provided
- Water table maps
- Tide fluctuations investigations
- discusses field work in May and November 1986
- 9 subsurface soil composites from MW-1 through MW-9;
- 9 groundwater samples for TPH MW-1 through MW-9
- 57 subsurface soil for TPH at 27 boring locations
- 8 groundwater samples for ether compounds
- 5 subsurface soil for SVOCs (B/N and AEs)
- 17 water (16 GW/1 SW) for VOCs, SVOCs, P/P, and metals
- 4 Dye analyses in subsurface soil

NUS, 1988. "Final Draft Preliminary Assessment Mobil Oil Tappan Terminal, Hastings-on-Hudson, New York", December 14, 1988.

- prepared for USEPA
- LBG investigations of 1986 and 1987 and recommends further work
- groundwater and soil and free product results, dates unclear

TSL, 1989. January 10 letter report Re: "Analytical Report for: Tappan Terminal Remediation Assessment Investigation, October 1988 Sampling".

- Prepared for Mobil Oil Corp, TSL is a laboratory division of Mobil Corp.
- Discusses results of sampling performed by LBG in October 1988
- Companion to march 1989 LBG reference discussed below

TSL, 1989. January 27 letter report Re: "Tappan Terminal NYSDEC Split Sampling."

- an analytical report
- prepared apparently for NYSDEC
- analytical results for samples collected by NUS for NYSDEC as splits with LBG/Mobil in October 1988
- companion to March 1989 LBG reference discussed below and the others associated with it

LBG, 1989. "Mobil Oil Corporation Environmental Assessment and Evaluation of Remedial Alternatives at Tappan Terminal", March 1989.

- Prepared for Mobil Oil Corp.
- 1961 property survey fold out map – shows access road west of Uhlich buildings
- fold out maps of soil and groundwater contaminants
- composite map combining Uhlich and Mobil sites
- composite maps depicts chlorobenzene tank, drain and piping to river, electroplator building near tennis court
- Chlorobenzene - soil gas survey, 2 well installations/pumping tests, 3 test pits
- Ethyl Ether - 3 test pits, 46 shovel test pits, remediation pilot test
- Dyes/Pigments - 3 test pits (same as chlorobenzene), 6 test borings

LBG, 1989. "Mobil Oil Corporation Additional Hydrogeologic Investigation at Tappan Terminal, October, 1988, December, 1989.

- Prepared for Mobil Oil Corp.
- Sample location map provided
- Well logs included
- Transmissivity calculations = 11,500 gpd/ft
- Pumping tests indicate no connection between upper and lower aquifers
- 2 well installations, 21 test borings, pumping tests
- samples collected but no analyses
- another companion to or a partial final version of March, 1989 reference discussed above

LBG, 1990. "Mobil Oil Corporation Tappan Terminal, Hastings-on-Hudson, Greenburgh, NY, Second Quarter, 1990", August 1990.

- Prepared for Mobil Oil Corp.
- Second quarter EPA 503.1 and DOH 310.3 sampling results for groundwater from 3 wells (MW-7, OW-8, OW-27)

LBG, 1991. "Mobil Oil Corporation Tappan Terminal, Hastings-on-Hudson, Greenburgh, NY, Second Quarter 1991", August 1991.

- Prepared for Mobil Oil Corp.
- 2nd quarter (4/23/91) EPA 503.1 and DOH 310.13 sampling results for MW-7, OW-8 and OW-27
- includes first ever detection for TCE (OW-27) at site

LBG, 1992. April 14 letter report re: "March 1992 Ground-Water Quality Results, Tappan Terminal, Hastings-on-Hudson, Greenburgh, NY".

- Prepared for Mobil Oil Corp.
- summary of groundwater sampling results from 15 wells sampled on 3/18
- 9 wells EPA 624, 6 wells EPA 624 plus App.IX plus ethyl ether
- a well installation
- chlorobenzene and ether identified in groundwater

LBG, 1992. June 5, 1992 letter report re: "Monitor Well Installation, Tappan Terminal, Hastings-on-Hudson, Greenburgh, NY".

- Prepared for Mobil Oil Corp.
- discusses 5 well installations (MW-10 through MW-14) installed to delineate free phase oil along east property line during sewer excavation
- no analyses; concluded oil coming from off-site to the east, water table at 2'
- fluid levels presented
- well logs provided

LBG, 1993. July 27 letter report re: "Tappan Terminal, Soil-Quality Results, June 16, 1993."

- Prepared for Mobil Oil Corp.
- 2 subsurface soil samples (2.7-3.25' bgs) - EPA 8240 and modified EPA 8100

LBG, 1994. January 6 letter report re: "November 1993 Ground-Water Quality Results, Tappan Terminal, Hastings-on-Hudson, Greenburgh, NY."

- Prepared for Mobil Oil Corp.
- groundwater sampling results from 15 wells for VOCs
- groundwater flow maps provided
- fluid levels for November 17, 1993

LBG, 1994. "River Bottom Soil-Sediment Sample, Tappan Terminal, Hastings, NY", January 7, 1994.

- Prepared for Mobil Oil Corp.
- low tide riverbed sediment sample from southwest edge of site, 13 ppb chlorobenzene
- apparently incomplete data set

Mobil Oil Corporation, 1994. May 10 letter report re: "Results of Soil Sampling at the Former Tappan Terminal, Hastings-on-Hudson, NY."

- prepared by Mobil for NYSDEC
- geoprobe points and soil sampling and analyses (18 samples from 8 locations)
- methods SW846 8020, EPA 8270, SW846 8010, EPA 418.1 modified
- scoping cleanup methods for contaminated soil

LBG, 1994. November 1 letter report re: "Monitor Well Installation, Tappan Terminal, Hastings-on-Hudson, Greenburgh, NY," November 1, 1994.

- Prepared for Mobil Oil Corp.
- 4 well installations to replace ones removed during no. 6 fuel oil spill (new, OW-9A, MW-15, MW-16, MW-17)
- no sampling for analyses
- includes well logs and diagrams

LBG, 1994. December 12 letter report re: "Former Tappan Terminal, Hastings-on-Hudson, NY, Removal of Soil Containing No. 6 Fuel Oil."

- Prepared for Mobil Oil Corp.
- site dewatering/water treatment and contaminated soil removal to 6' bgs
- water sampling of influent and effluent - EPA 602, 625, 150.1
- 1000 cubic yards soil removed - soil samples TPH, VOCs (8240), BTEX, TCLP metals, PCBs, corrosivity, reactivity, flashpoint
- 1 test pit in stockpile area
- recycle contaminated soil as asphalt for later on-site use for road and berm construction
- dewatering system dismantled

LBG, 1997. "Remedial Investigation Report, Mobil Oil Corporation, Former Tappan Terminal, Hastings-on-Hudson, NY", April 1997.

- Prepared for Mobil Oil Corp.
- discusses field work 9/20-27/96
- groundwater, 26 wells for EPA 8240, 21 of above 26 including ethyl ether by 8240
- surface soil, 5 Cr/Pb, 4 asbestos, 5 VOCs, 5 SVOCs, 2 TOC, 10 PCBs
- subsurface soil, 1 VOCs, 1 SVOCs
- includes 4 volume work plan dated November 1998 for focused RI/FS
- CP plan
- Includes boring logs

Uhlich Site

LMS = Lawler, Matusky and Skelly Engineers

LMS, 1989. Report on Subsurface Investigation at Adjacent Paul Uhlich and Co. Plant Property Tappan Terminal, Hastings-on-Hudson, NY, NYSDEC Inactive Hazardous Waste Site Code 360015, EPA Technical Directive Document, No. 02-8809-01, November 1989, Two Volumes.

- prepared at the request of legal counsel Whiteman, Osterman and Hanna of Albany
- 2 phases (January-April & June-July)
- extensive historical shoreline information and long list of prior owners of property
- 19 borings and 7 wells installed
- magnetometer survey of UST – results inconclusive
- soil gas survey conducted
- discovery of SE groundwater flow through Uhlich property
- hydraulic conductivities for LMS- wells is 10^{-1} cm/s
- water table maps provided
- sewer surveyed and profiled
- identification of drainage swale near chlorobenzene tank
- discussion of solvent recovery system and electroplating at Zinsser

ChemRisk, 1990. "Risk Assessment Report for Former Zinsser Operations at the Mobil/Uhlich Hastings-on-Hudson Site", January 25, 1990.

- prepared for Chevron Chemical Company
- risk assessment for possible remediation and future development based upon review of previous investigations
- identifies chemicals used by Zinsser
- concludes no increased risk due to site contaminants

LMS, 1994. "Modified Work Plan for Remediation Near Former No. 6 Fuel Oil Tank", August 1994.

- Prepared for Uhlich Color Co., Inc.
- Describes excavation of petroleum contaminated soil
- Includes maps of test pit locations
- Wooden bulkhead uncovered
- results of water and soil sampling on July 19, 1994
- 4 surface water samples from pits previously excavated - EPA 503.1 (6 analytes)
- 2 soil samples from excavated soil piles - VOCs, TCLP metals, flash, reactivity, sulfide, CN, TPH, PCBs

LMS, 1995. "Monitoring Well Replacement and Groundwater Sampling Near Former No. 6 Fuel Oil Tank", March 1995.

- prepared for Uhlich Color Company, Inc. pursuant to 1994 stipulation agreement w/ NYSDEC
- NYS Spill No. 91-13317
- 3 well installations (LMS-8R, 9R,11R) to replace wells removed during excavation of contaminated soil
- 3 new wells sampled and GW analyzed by EPA 503.1 (6 analytes)
- This report results in NYSDEC agreeing that no further action is required for fuel oil spill investigation.

Table A-1.
Tappan Terminal Site
Mobil and Uhlich Properties
Well Information *

Well I.D.	Screen Top (feet bgs)	Screen Bottom (feet bgs)	Screen Length (feet)	Top of PVC (feet relative to assumed 100')	Elevation Top of PVC (feet amsl)	Ground Surface Elevation (feet amsl)	Well Diam. (inches)	Boring Depth (feet bgs)	Location		Comments
									North (feet)	East (feet)	
OW-1	1	12	11	97.57	4.90	2.59	2	12	-	-	possibly destroyed as of 9/96
MW-S1	3	23	20	-	6.86	5.50	6	28.50	-	-	with 5' sump to 28', stainless steel well; useable in 1996
MW-D1	46.5	66.5	20	-	6.81	5.68	4	66.5	-	-	PVC; useable in 1996
MW-1A	-	-	-	-	5.26	-	-	25	786034.28	661465.57	useable in 1996
MW-1B	-	-	-	-	-	-	-	76	786034.95	661471.83	on Anaconda property?, perhaps a boring only
MW-2A	-	-	-	-	-	-	-	20	786501.29	661661.38	on Anaconda property?, perhaps a boring only
MW-3A	-	-	-	-	-	-	-	18	787926.51	661516.72	on Anaconda property?, perhaps a boring only
MW-3B	-	-	-	-	-	-	-	91	787925.05	661521.67	on Anaconda property?, perhaps a boring only
MW-4	1	11	10	97.95	5.12	3.00	4	11	-	-	useable in 1996
OW-5	0.71	10.71	10	98.47	5.74	3.72	2	11	-	-	
OW-5A	-	-	-	-	5.98	-	-	-	-	-	0.04 free oil on 11/17/93; useable in 1996
MW-5	0	10	10	97.29	4.58	3.80	4	10	-	-	useable in 1996
MW-6	0.55	10.55	10	99.26	6.28	4.31	4	11	-	-	useable in 1996
MW-7	1	11	10	100.50	7.56	5.31	4	11	-	-	
MW-7A	-	-	-	-	7.01	-	-	-	-	-	useable in 1996
OW-8	1.46	12.46	11	98.19	5.41	3.38	2	12	-	-	useable in 1996
MW-8	1	11	10	99.59	7.04	6.06	4	11	-	-	
OW-9	0.5	15	14.5	99.19	6.60	4.01	2	16	-	-	
OW-9A	2	12	10	-	6.56	-	-	-	-	-	useable in 1996
MW-9A	-	-	-	-	7.56	-	-	-	-	-	useable in 1996
MW-10	1.5	11.5	10	-	5.39	-	4	11.5	-	-	useable in 1996
OW-12	1	15	14	101.55	8.68	7.50	2	12	-	-	useable in 1996
MW-12	1.5	11.5	10	-	4.53	-	4	11.5	-	-	5.47 TOC elevation 9/96; useable in 1996
MW-13	1.5	11.5	10	-	6.84	-	4	11.5	-	-	useable in 1996
MW-14	1.5	11.5	10	-	5.09	-	4	11.5	-	-	useable in 1996
OW-15	1.84	15.84	14	100.37	7.77	5.80	-	12	-	-	useable in 1996
MW-15	1	11	10	-	6.15	-	-	-	-	-	useable in 1996
OW-16	2	17	15	97.64	97.64	-	4	17	-	-	
MW-16	1	11	10	-	9.63	-	-	-	-	-	useable in 1996
OW-17	1.9	15.9	14	101.10	8.25	6.27	2	16	-	-	useable in 1996
MW-17	3	13	10	-	9.82	-	-	-	-	-	useable in 1996
OW-18	1	11	10	98.01	5.49	3.74	2	11	-	-	0.02' free oil on 4/22/92 & on 11/17/93
OW-19	1	16	15	100.35	7.69	5.94	2	16	-	-	
OW-19A	-	-	-	-	5.29	-	-	-	-	-	useable in 1996
OW-20	1.73	11.73	10	101.12	8.33	5.95	2	13	-	-	useable in 1996
OW-21	1	16	15	98.63	5.86	4.50	2	16	-	-	useable in 1996
OW-25	1	11	10	97.60	4.78	2.97	2	12	-	-	useable in 1996
OW-26	1	11	10	97.09	4.28	2.24	2	12	-	-	useable in 1996
OW-27	1.95	16	14.05	100.04	7.17	5.49	2	16	-	-	
OW-27A	-	-	-	-	4.91	-	-	-	-	-	useable in 1996
Andrus	-	-	-	-	-	-	-	-	-	-	

Table A-1 (continued).
Tappan Terminal Site
Mobil and Uhlich Properties
Well Information *

Well I.D.	Screen Top (feet bgs)	Screen Bottom (feet bgs)	Screen Length (feet)	Top of PVC (feet relative to assumed 100')	Elevation Top of PVC (feet amsl)	Ground Surface Elevation (feet amsl)	Well Diam. (inches)	Boring Depth (feet bgs)	Location		Comments
									North (feet)	South (feet)	
MW-1	0.5	10	9.5	98.17	5.40	3.71	4	10	-	-	no apparent analyses
MW-2	0	10	10	98.38	5.64	3.42	4	10	-	-	no apparent analyses
MW-3	1	11	10	97.99	5.11	3.04	4	11	-	-	no apparent analyses
MW-9	0	10	10	100.27	7.49	5.61	4	10	-	-	no apparent analyses
MW-11	1.5	11.5	10	destroyed	-	-	4	11.5	-	-	no apparent analyses
LMS-1	4	14	10	100.22	-	-	2	15	-	-	
LMS-2	3	13	10	101.21	-	-	2	14	-	-	thick purple product on 7/6/89
LMS-3	3	13	10	100.50	-	-	2	14	-	-	
LMS-4	3	13	10	98.54	-	-	2	14	-	-	
LMS-5	3	13	10	99.39	-	-	2	16	-	-	
LMS-6	3	13	10	100.07	-	-	2	15	-	-	
LMS-7	5	15	10	103.06	-	-	2	18	-	-	
LMS-8R	1.99	11.99	10	-	-	-	-	-	-	-	
LMS-9R	1.96	11.96	10	-	-	-	-	-	-	-	
LMS-11R	0.9	10.9	10	-	-	-	-	-	-	-	
P-1	-	-	-	98.97	-	-	-	-	-	-	piezometer, previous elevation, 100.61
P-2	-	-	-	102.42	-	-	-	-	-	-	piezometer
P-3	-	-	-	98.86	-	-	-	-	-	-	piezometer
P-4	-	-	-	102.12	-	-	-	-	-	-	piezometer, removed
P-5	-	-	-	101.08	-	-	-	-	-	-	piezometer
P-6	-	-	-	101.53	-	-	-	-	-	-	piezometer
P-7	-	-	-	98.27	-	-	-	-	-	-	piezometer
P-8	-	-	-	99.07	-	-	-	-	-	-	piezometer
P-9	-	-	-	99.63	-	-	-	-	-	-	piezometer
P-10	-	-	-	98.73	-	-	-	-	-	-	piezometer
P-11	-	-	-	99.80	-	-	-	-	-	-	piezometer
P-12	-	-	-	101.34	-	-	-	-	-	-	piezometer

* Sources: LBG 3/87, table 1, Ground-Water and Soil Quality Investigation at Tappan Terminal
LBG, 10/88, table 1, Additional Hydrogeologic Investigation at Tappan Terminal
LMS, 11/89, table 2-1, Report on Subsurface Investigation at Uhlich
LMS, 11/89, appendix K, Report on Subsurface Investigation at Uhlich
LBG, 6/92, Monitor Well Installation Report
LBG, 1/94, table 2, November 1993 Groundwater Quality Results
LBG, 4/97, table 3, RI Report for Tappan Terminal

APPENDIX B

Chain of Custody, Shipping and Sample Information Records

Surface Soil Sampling

ICM Laboratories
1152 Route 10, Randolph, NJ 07869
201-584-0330 Fax: 201-584-0515

Chain of Custody

NJ Certification #14116

Client: Dvirka & Bartilucci
Address: PO Box 56, 5875 Fisher Rd E. Syracuse, NY 13057
Phone #: 315 437-1142
Project: Tappan Terminal
Project Mgr: Gerry Gould
Invoice to: Gerry Gould
Report to: Gerry Gould
Copies: 2 Bound/Unbound

Deliverables:
___ NJ Reduced (Non CLP)
___ NJ Regulatory
___ Reduced (CLP) ___ Full (CLP)
___ NPDES
___ PA: ___ Std. ___ Reduced I
✓ NY: ___ ASPA ✓ ASPB ___ CLP
___ State Specific: _____
___ Results Only

SRP Diskette: Yes___ No___
SRP #: _____

Turnaround Required:
Fax Preliminary: _____
Hard Copy: _____

Additional Information:
___ State Forms Required
___ NJ Cleanup Levels Required
___ NJ Groundwater Quality Stds. Required
___ State Specific Levels Required: _____

Expected Sample Concentration:
High ___ Medium ___ Low ✓
Known Hazard: metals, chlorobenzene

Lab #	Sample Identification	Sample Date/Time	Composite	Grab	Soil	Aqueous	Other	# Bottles	Analysis/Method/Pollutant List: TCL 30	TAL metals	CN⁻	Preservation: H_2SO_4	HNO_3	HCl	NaOH	Other
	SS-1, MS/MSD	9/24/98 10:30		✓	✓			12	✓	✓	✓					
	SS-2	10:45		✓	✓			4	✓	✓	✓					
	SS-3	12:30		✓	✓			4	✓	✓	✓					
	SS-4	9:25		✓	✓			4	✓	✓	✓					
	SS-5	11:56		✓	✓			4	✓	✓	✓					
	SS-6	12:06		✓	✓			4	✓	✓	✓					
	SS-7	11:15		✓	✓			4	✓	✓	✓					
	SS-8	11:10		✓	✓			4	✓	✓	✓					
	SS-9	9/24 12:16		✓	✓			4	✓	✓	✓					
	SS-10	9/23/98 15:07		✓	✓			4	✓	✓	✓					

Samples have been collected, preserved & handled in accordance with NJAC 7:18

Sampled by: J. Gould Date/Time: 9/24/98 15:46
Relinquished by: Sean Stahl Date/Time: 9/24/98 17:00
Received by: Fed-X Date/Time: 9/24/98 17:00
Relinquished by: _____ Date/Time: _____
Received by: _____ Date/Time: _____
Relinquished by: _____ Date/Time: _____
Received by: _____ Date/Time: _____

Comments: _____

If analysis is for informational purposes only, please sign the following:
"Analysis is for informational purposes, not to be used for compliance or regulatory purposes." _____

Cooler Temp: _____ Condition: Intact/Broken/Leaking
Custody Seals: ___ Present ___ Absent Seal #: _____

ICM Laboratories
1152 Route 10, Randolph, NJ 07869
201-584-0330 Fax: 201-584-0515

Chain of Custody

NJ Certification #14116

Client: D & B
Address:
Phone #:
Project: Tallen Terminal
Project Mgr: G Gould
Invoice to: G. Gould
Report to: G. Gould
Copies: ___ Bound/Unbound

Deliverables:
___ NJ Reduced (Non CLP)
___ NJ Regulatory
___ Reduced (CLP) ___ Full (CLP)
___ NPDES
___ PA: ___ Std. ___ Reduced I
✓ NY: ___ ASPA ✓ ASPB ___ CLP
___ State Specific:
___ Results Only

SRP Diskette: Yes___ No___
SRP #:

Turnaround Required:
Fax Preliminary:
Hard Copy:

Additional Information:
___ State Forms Required
___ NJ Cleanup Levels Required
___ NJ Groundwater Quality Stds. Required
___ State Specific Levels Required:

Expected Sample Concentration:
High ___ Medium ___ Low ___
Known Hazard:

Lab #	Sample Identification	Sample Date/Time	Composite	Grab	Soil	Aqueous	Other	# Bottles	Analysis/Method/Pollutant List: TCL+TIC	TAL metals	CN⁻	Preservation: H_2SO_4	HNO_3	HCl	NaOH	Other
	SS-11	9/24/98 10:00		✓	✓			4	✓	✓	✓					
	SS-12	9/24/98 12:57						4	✓	✓	✓					
	SS-13	9/24 13:08						4	✓	✓	✓					
	SS-14	9/24 13:30						4	✓	✓	✓					
	SS-15	9/23/98 14:42						4	✓	✓	✓					
	SS-16	9/23 15:35						4	✓	✓	✓					
	SS-17	15:30						4	✓	✓	✓					
	SS-18	15:20						4	✓	✓	✓					
	SS-19	14:54						4	✓	✓	✓					
	SS-20	9/24 8:15		✓	✓			4	✓	✓	✓					

Samples have been collected, preserved & handled in accordance with NJAC 7:18
Sampled by: see page 1 Date/Time:
Relinquished by: Date/Time:
Received by: Date/Time:
Relinquished by: Date/Time:
Received by: Date/Time:
Relinquished by: Date/Time:
Received by: Date/Time:

Comments:

If analysis is for informational purposes only, please sign the following:
"Analysis is for informational purposes, not to be used for compliance or regulatory purposes."

Cooler Temp: Condition: Intact/Broken/Leaking
Custody Seals: ___ Present ___ Absent Seal #:

ICM Laboratories
1152 Route 10, Randolph, NJ 07869
201-584-0330 Fax: 201-584-0515

Chain of Custody

NJ Certification #14116

Client: D&B
Address:
Phone #:
Project: Tuffon Terminal
Project Mgr: G. Gould
Invoice to: G. Gould
Report to:
Copies: 2 Bound/(Unbound)

Deliverables:
___ NJ Reduced (Non CLP)
___ NJ Regulatory
___ Reduced (CLP) ___ Full (CLP)
___ NPDES
___ PA: ___ Std. ___ Reduced I
✓ NY: ___ ASPA ✓ ASPB ___ CLP
___ State Specific:
___ Results Only

SRP Diskette: Yes___ No___
SRP #:

Turnaround Required:
Fax Preliminary:
Hard Copy:

Additional Information:
___ State Forms Required
___ NJ Cleanup Levels Required
___ NJ Groundwater Quality Stds. Required
___ State Specific Levels Required:

Expected Sample Concentration:
High ___ Medium ___ Low ___
Known Hazard:

Lab #	Sample Identification	Sample Date/Time	Composite	Grab	Soil	Aqueous	Other	# Bottles	Analysis/Method/Pollutant List: TCL+30	TAL metals	CN^-	Preservation: H_2SO_4	HNO_3	HCl	NaOH	Other
	SS-21	9/24/98 8:25		✓	✓			4	✓	✓	✓					
	SS-22	9/24/98 8:35		✓	✓			4	✓	✓	✓					
	SS-23	9/24/98 8:45		✓	✓			4	✓	✓	✓					
	SS-24	9/24/98 8:55		✓	✓			4	✓	✓	✓					

Samples have been collected, preserved & handled in accordance with NJAC 7:18

Sampled by: See page 1 Date/Time:
Relinquished by: Date/Time:
Received by: Date/Time:
Relinquished by: Date/Time:
Received by: Date/Time:
Relinquished by: Date/Time:
Received by: Date/Time:

Comments:

If analysis is for informational purposes only, please sign the following:
"Analysis is for informational purposes, not to be used for compliance or regulatory purposes."

Cooler Temp: Condition: Intact/Broken/Leaking
Custody Seals: ___ Present ___ Absent Seal #:

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould / D. Stahl / C. Morris

SAMPLE LOCATION/WELLNO. SS-1

FIELD SAMPLE I.D. NUMBER SS-1 DATE 9/24/98

TIME 1030 WEATHER Sunny TEMPERATURE 55°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL Surface Soil OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS: N/A

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) _____

CONSTITUENTS SAMPLED: (Collect MS/MSD) Metals TCL +30

cyanide

REMARKS: PID = 0.0 ppm

Dark Black fine Sand, silt, trace roots, angular gravel, dry

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould / D. Stahl / C. Morris

SAMPLE LOCATION/WELL NO. SS-2

FIELD SAMPLE I.D. NUMBER SS-2 DATE 9/24/98

TIME 1045 am WEATHER Sunny TEMPERATURE 55°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL Surface Soil OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS: N/A

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) _____

CONSTITUENTS SAMPLED:

_____	TCL 130	Cyanide	_____
_____	TAL metals	_____	_____

REMARKS: PID = 0.0 ppm

Light Brown fine sand and silt, gravel, twigs, weeds.

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould/D. Stahl/C. Morris

SAMPLE LOCATION/WELLNO. SS-3

FIELD SAMPLE I.D. NUMBER SS-3 DATE 9/24/98

TIME 12:30 WEATHER Sunny TEMPERATURE 72°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL Surface Soil OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS: N/A

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) _____

CONSTITUENTS SAMPLED:

	TCL+30	metals	CN^-

REMARKS: PID = 0.0 ppm
inside tank ring on Mobil
light brown f-m sand

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould/D. Stahl/C. Morris

SAMPLE LOCATION/WELLNO. SS-4

FIELD SAMPLE I.D. NUMBER SS-04 DATE 9/24/98

TIME 925hr WEATHER Sunny TEMPERATURE 55

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL Surface Soil OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS: N/A

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) _____

CONSTITUENTS SAMPLED:

	TCL+30	metals	
	cyanide		

REMARKS: PID = 0.0

Dark Black f Sand, silt, fine gravel, dry

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

E. Robins ~~Gould~~

SITE Tappan Terminal SAMPLE CREW G. Gould / D. Stahl / ~~G. Mavis~~

SAMPLE LOCATION/WELL NO. SS-5

FIELD SAMPLE I.D. NUMBER SS-5 DATE 9/24/98

TIME 11:56 WEATHER Sunny ~~72°F~~ TEMPERATURE 72°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL Surface Soil OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS: N/A

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) _____

CONSTITUENTS SAMPLED:

	TCL+30	metals	CN^-

REMARKS: 0.0 ppm on PID, dark brown to black f. sand & silt ≈ 100' west of concrete wall

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould/D. Stahl/C. Morris

SAMPLE LOCATION/WELL NO. SS-6

FIELD SAMPLE I.D. NUMBER SS-6 DATE 9/24/98

TIME 12:06 WEATHER Sunny TEMPERATURE 72° F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL Surface Soil OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS: N/A

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) _____

CONSTITUENTS SAMPLED:

	TCL + 30	Metals	CN-

REMARKS: 0.0 ppm on PID
sample ≈ 12' east of MH-5
dry brown silt, sand, tr. gravel

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould / D. Stahl / C. Morris

SAMPLE LOCATION/WELLNO. SS-7

FIELD SAMPLE I.D. NUMBER SS-7 DATE 9-24-98

TIME 11:15 WEATHER Sun TEMPERATURE 60°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL Surface Soil OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS: N/A

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) _____

CONSTITUENTS SAMPLED:

TCL+30	metals	cyanide	

REMARKS: between 2 tank pads.
Dry, brown m sand, f gravel

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould/D. Stahl/C. Morris

SAMPLE LOCATION/WELL NO. SS-8

FIELD SAMPLE I.D. NUMBER SS-8 DATE 9-24-98

TIME 11:10 WEATHER Sunny TEMPERATURE 60°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL Surface Soil OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS: N/A

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) _____

CONSTITUENTS SAMPLED:

TCL 4 30	metals	Cyanide	

REMARKS: PID = 0.0 ppm

Dry, brown silt, w/ organics

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould/D. Stahl/C. Morris

SAMPLE LOCATION/WELLNO. SS-9

FIELD SAMPLE I.D. NUMBER SS-9 DATE 9/24/98

TIME 12:16 WEATHER Sunny TEMPERATURE 72°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL Surface Soil OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS: N/A

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) _____

CONSTITUENTS SAMPLED:

	TCL+TO	metals	CN^-

REMARKS: 0.0 ppm on PID

@ ≈ 20' west of fence, near N end of Uhlich Bldg 6C

Mod Prp light brown silt sand w/ roots

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

K. Rollins

SITE Tappan Terminal SAMPLE CREW G. Gould / D. Stahl / ~~C. Collins~~

SAMPLE LOCATION/WELLNO. SS-10

FIELD SAMPLE I.D. NUMBER SS-10 DATE 9/23/94

TIME 15:07 WEATHER Sunny N wind 5-10 TEMPERATURE 70°F.

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL Surface Soil OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS: N/A

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) _____

CONSTITUENTS SAMPLED:

	TCL+30	metals	CN'

REMARKS: 0.0 ppm on PID
black sand/silt 6" below top of blacktop

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould / D. Stahl / C. Morris

SAMPLE LOCATION/WELL NO. SS-11

FIELD SAMPLE I.D. NUMBER SS-11 DATE 9-24-98

TIME 10:00 WEATHER Sun TEMPERATURE 55-60°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL Surface Soil OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS: N/A

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) _____

CONSTITUENTS SAMPLED:

TCL+30	metals	cyanide	

REMARKS: PID = 0.0 ppm

Dry, dark brown f sand, silt, gravel, grass - white pea size gravel - collected beneath root grass mass

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould/D. Stahl/C. Morris

SAMPLE LOCATION/WELLNO. SS-12

FIELD SAMPLE I.D. NUMBER SS-12 DATE 9/24/98

TIME 12:57 WEATHER Sunny TEMPERATURE 72°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL Surface Soil OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS: N/A

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) _____

CONSTITUENTS SAMPLED:

	TCL+30	Metals	CN-

REMARKS: 0.0 ppm on PID
reddish brown f-m sand, tr. gray silt/clay

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould / D. Stahl / C. Morris

SAMPLE LOCATION/WELL NO. SS-13

FIELD SAMPLE I.D. NUMBER SS-13 DATE 9/24/98

TIME 13:08 WEATHER Sunny TEMPERATURE 72° F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL Surface Soil OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS: N/A

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) _____

CONSTITUENTS SAMPLED:

	TCL+30	metals	CN-

REMARKS: PID: 0.0 ppm

brown black f-m sand, silt, gravel, cinder slag

- area of no grass near OW-5

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould/D. Stahl/C. Morris

SAMPLE LOCATION/WELLNO. SS-14

FIELD SAMPLE I.D. NUMBER SS-14 DATE 9/24/98

TIME 13:30 WEATHER Sunny TEMPERATURE 72°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL Surface Soil OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS: N/A

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) _____

CONSTITUENTS SAMPLED:

_____	TCL+30	metals	CN^-
_____	_____	_____	_____

REMARKS: PID: 0.0 ppm
gray f-c sand, tr. gravel
near gate to Uhlich & paved road at N. end of Mobil

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould / D. Stahl / ~~C. Hayes~~ K. Robins

SAMPLE LOCATION/WELLNO. SS-15

FIELD SAMPLE I.D. NUMBER SS-15 DATE 9/23/98

TIME 14:42 WEATHER Sunny, N wind 5-10 TEMPERATURE 70°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL Surface Soil OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS: N/A

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) _____

CONSTITUENTS SAMPLED:

_____	TCL + 30	metals	CN
_____	_____	_____	_____

REMARKS: black soil through blacktop
0.0 ppm on PID

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

K. Robb MS

SITE Tappan Terminal SAMPLE CREW G. Gould / D. Stahl / ~~C. Thomas~~

SAMPLE LOCATION/WELL NO. SS-16

FIELD SAMPLE I.D. NUMBER SS-~~09~~ 16 9T DATE 9/23/91

TIME 15:35 WEATHER Sunny N wind 5-10 TEMPERATURE 70°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL Surface Soil OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS: N/A

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) _____

CONSTITUENTS SAMPLED:

	TCL+30	CN	Metals

REMARKS: 0.0 ppm on PID - black sand/silt below black top - 9" deep

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

L. Robins

SITE Tappan Terminal SAMPLE CREW G. Gould / D. Stahl / ~~C. Hayes~~

SAMPLE LOCATION/WELLNO. SS-17

FIELD SAMPLE I.D. NUMBER SS-17 DATE 9/23/98

TIME 15:30 WEATHER Sunny, N wind 5-10 TEMPERATURE 70°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL Surface Soil OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS: N/A

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) _____

CONSTITUENTS SAMPLED:

	TCL+TO	CN^-	metals

REMARKS: 0.0 ppm on PID
6" below black top, black fill

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould / D. Stahl / K. Robins ~~C. Harris~~

SAMPLE LOCATION/WELLNO. SS-18

FIELD SAMPLE I.D. NUMBER SS-18 DATE 9/23/98

TIME 15:20 WEATHER Sunny N winds 5-10 TEMPERATURE 70°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL Surface Soil OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS: N/A

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) _____

CONSTITUENTS SAMPLED:

_____	TCL + 30	metals	CN^-
_____	_____	_____	_____

REMARKS: 0.0 ppm on PID
brown f-m sand, 8" deep below asphalt surface

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould / D. Stahl / ~~E. Harris~~ K. Robins

SAMPLE LOCATION/WELL NO. SS-19

FIELD SAMPLE I.D. NUMBER SS-19 DATE 9/23/98

TIME 14:59 WEATHER Sunny N wind 5-10 ~~70°F~~ TEMPERATURE 70°F

SAMPLE TYPE:

GROUNDWATER ______ SEDIMENT ______

SURFACE WATER/STREAM ______ AIR ______

SOIL Surface Soil OTHER (Describe, i.e., septage, leachate) ______

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER ______ MEASUREMENT METHOD ______

DEPTH OF WELL ______ MEASUREMENT METHOD ______

VOLUME REMOVED ______ REMOVAL METHOD ______

FIELD TEST RESULTS: N/A

COLOR ______ pH ______ ODOR ______

TEMPERATURE (°F) ______ SPECIFIC CONDUCTANCE (umhos/cm) ______

OTHER (OVA, Methane meter, etc.) ______

CONSTITUENTS SAMPLED: TCL+30 metals CN

REMARKS: 0.0 ppm on PID
black-brown m-f sand fill, beneath black top surface 6"-9"

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

K. Robins

SITE Tappan Terminal SAMPLE CREW G. Gould/D. Stahl/~~[illegible]~~

SAMPLE LOCATION/WELLNO. SS-20

FIELD SAMPLE I.D. NUMBER SS-20 DATE 9/24/98

TIME 915 WEATHER Cool, 50°F TEMPERATURE 50°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL Surface Soil OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS: N/A

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) _____

CONSTITUENTS SAMPLED:

_____	TCL TIO,	cyanide	_____
_____	metals	_____	_____

REMARKS: PID = 0.0

Black - Brown f Sodium dry Sand and silt, trace gravel concrete fragments twigs,

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

K. Robins

SITE Tappan Terminal SAMPLE CREW G. Gould / D. Stahl / ~~E. Mathis~~

SAMPLE LOCATION/WELL NO. SS-21

FIELD SAMPLE I.D. NUMBER SS-21 DATE 9/24/98

TIME 925 WEATHER Sunny, cool TEMPERATURE 50

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL Surface Soil OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS: N/A

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) _____

CONSTITUENTS SAMPLED:

_____	TCL + TO	_____	_____
_____	metals	cyanide	_____

REMARKS: PID = 0.0

Black fill from Sand, trace silt gravel predominately sand slag and cinder

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

K. Robins

SITE Tappan Terminal SAMPLE CREW G. Gould / D. Stahl / ~~[illegible]~~

SAMPLE LOCATION/WELLNO. SS-22

FIELD SAMPLE I.D. NUMBER SS-22 DATE 9-24-98

TIME 0835 WEATHER Sunny TEMPERATURE 55°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL Surface Soil OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS: N/A

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) _____

CONSTITUENTS SAMPLED:

TCL+30	metals	cyan. de	

REMARKS: PID = 0.0 ppm

Dry, Dk brown f sand + silt w/ leaves, twigs

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould / D. Stahl / C. Morris

SAMPLE LOCATION/WELLNO. SS-23

FIELD SAMPLE I.D. NUMBER SS-23 DATE 9/24/98

TIME 845 WEATHER Sunny cool TEMPERATURE 55°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL Surface Soil OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS: N/A

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) _____

CONSTITUENTS SAMPLED: TCL 130 cyanide

TAL metals

REMARKS: PID = 0.0

Brown LT Brown fine sand, silt, gravel, dry

fr twigs, grass roots

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

K. Robins

SITE Tappan Terminal. SAMPLE CREW G. Gould/D. Stahl/~~Cattanis~~

SAMPLE LOCATION/WELLNO. SS-24

FIELD SAMPLE I.D. NUMBER SS-24 DATE 9-24-98

TIME 08:55 WEATHER Sunny TEMPERATURE 55°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL Surface Soil OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS: N/A

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) _____

CONSTITUENTS SAMPLED:

TCL+30	metals	cyanide	

REMARKS: PID = 0.0 ppm

Dry, Br-Bk sand, silt, gravel, cinders

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

Subsurface Soil Sampling

ICM Laboratories
1152 Route 10, Randolph, NJ 07869
201-584-0330 Fax: 201-584-0515

Chain of Custody

NJ Certification #14116

Client: Durka & Bertolucci
Address: PO Box 56 5877 Fitzhugh E. Syracuse, NY 13057
Phone #: 315 437-1142
Project: ~~G. Gould~~ Tappan Terminal
Project Mgr: G. Gould
Invoice to: G. Gould
Report to: G. Gould
Copies: 2 Bound/Unbound

Deliverables:
___ NJ Reduced (Non CLP)
___ NJ Regulatory
___ Reduced (CLP) ___ Full (CLP)
___ NPDES
___ PA: ___ Std. ___ Reduced I
✓ NY: ___ ASPA ✓ ASPB ___ CLP
___ State Specific: _____
___ Results Only

SRP Diskette: Yes ✓ No ___
SRP #: _____

Turnaround Required:
Fax Preliminary: _____
Hard Copy: _____

Additional Information:
___ State Forms Required
___ NJ Cleanup Levels Required
___ NJ Groundwater Quality Stds. Required
___ State Specific Levels Required: _____

Expected Sample Concentration:
High ___ Medium ✓ Low ✓
Known Hazard: _____

Lab #	Sample Identification	Sample Date/Time	Composite	Grab	Soil	Aqueous	Other	# Bottles	Analysis/Method/Pollutant List: VOA	BNA	PID	Total Metals	TOC	Preservation: H_2SO_4	HNO_3	HCl	NaOH	Other
	SB-1 (2'-6')	10/6/98 9:38		✓	✓			4	✓	✓	✓	✓	✓					
	SB-2 (2'-4')	10/6/98 14:30		✓	✓			4	✓	✓	✓	✓	✓					
	SB-3 MS/MSD (2'-4')	10/6/98 15:45		✓	✓			12	✓	✓	✓	✓	✓					
	SB-4 (1'-5')	10/6/98 7:50		✓	✓			4	✓	✓	✓	✓	✓					
	SB-5 (2'-5')	10/6/98 9:04		✓	✓			4	✓	✓	✓	✓	✓					
	SB-6 (2'-4')	10/5/98 15:35		✓	✓			4	✓	✓	✓	✓	✓					
	SB-7 (2'-6')	10/6/98 8:27		✓	✓			4	✓	✓	✓	✓	✓					
	SB-8 (2'-6')	10/6/98 7:25		✓	✓			4	✓	✓	✓	✓	✓					
	SB-9 (1'-4')	10/5/98 14:57		✓	✓			4	✓	✓	✓	✓	✓					
	SB-10 (2-4')	10/6/98 15:09		✓	✓			4	✓	✓	✓	✓	✓					

Samples have been collected, preserved & handled in accordance with NJAC 7:18

Sampled by: G. Gould Date/Time: 10/6/98 17:15
Relinquished by: G. Gould Date/Time: 10-6-98 19:00
Received by: Federal Express Date/Time: 10-6-98 19:00
Relinquished by: _____ Date/Time: _____
Received by: _____ Date/Time: _____
Relinquished by: _____ Date/Time: _____
Received by: _____ Date/Time: _____

Comments: SB-3 contains petroleum

If analysis is for informational purposes only, please sign the following:
"Analysis is for informational purposes, not to be used for compliance or regulatory purposes." _____

Cooler Temp: _____ Condition: Intact/Broken/Leaking
Custody Seals: ___ Present ___ Absent Seal #: _____

FedEx USA Airbill FedEx Tracking Number 801182370326

0200 Form I.D. No.

SLA11

Sender's Copy

1 From (please print and press hard)

Date 10-6-98 Sender's FedEx Account Number 1245-6133-7

Sender's Name Dean Stahl Phone (315) 437-1142

Company DVIRKA AND BARTILUCCI

Address 5879 FISHER RD Dept./Floor/Suite/Room

City EAST SYRACUSE State NY ZIP 13057

2 Your Internal Billing Reference Information (Optional) (First 24 characters will appear on invoice)

3 To (please print and press hard)

Recipient's Name Sample Control Phone (973) 584-0330

Company ICM Laboratories

Address 1152 Route 10 ☐ Check here if residence (Extra charge applies for FedEx Express Saver)

(To "HOLD" at FedEx location, print FedEx address here) (We Cannot Deliver to P.O. Boxes or P.O. ZIP Codes) Dept./Floor/Suite/Room

City Randolph State NJ ZIP 07869

For HOLD at FedEx Location check here
☐ Hold Weekday (Not available with FedEx First Overnight)
☐ Hold Saturday (Not available at all locations) (Available for FedEx Priority Overnight and FedEx 2Day only)

For Saturday Delivery check here
☐ (Extra Charge. Not available to all locations) (Available for FedEx Priority Overnight and FedEx 2Day only)

Service Conditions, Declared Value, and Limit of Liability – By using this Airbill, you agree to the service conditions in our current Service Guide or U.S. Government Service Guide. Both are available on request. SEE BACK OF SENDER'S COPY OF THIS AIRBILL FOR INFORMATION AND ADDITIONAL TERMS. We will not be responsible for any claim in excess of $100 per package whether the result of loss, damage, or delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, and document your actual loss in a timely manner. Your right to recover from us for any loss includes intrinsic value of the package, loss of sales, interest, profit, attorney's fees, costs, and other forms of damage, whether direct, incidental, consequential, or special, and is limited to the greater of $100 or the declared value but cannot exceed actual documented loss. The maximum declared value for any FedEx Letter and FedEx Pak is $500. Federal Express may, upon your request, and with some limitations, refund all transportation charges paid. See the FedEx Service Guide for further details.

4a Express Package Service *Packages under 150 lbs.* Delivery commitment may be later in some areas.
☑ FedEx Priority Overnight (Next business morning)
☐ FedEx Standard Overnight (Next business afternoon)
☐ FedEx 2Day* (Second business day)
☐ FedEx Express Saver* (Third business day)
☐ FedEx First Overnight (Earliest next business morning delivery to select locations) (Higher rates apply)

* FedEx Letter Rate not available. Minimum charge: One pound rate.

4b Express Freight Service *Packages over 150 lbs.* Delivery commitment may be later in some areas.
☐ FedEx Overnight Freight (Next business day)
☐ FedEx 2Day Freight (Second business day)
☐ FedEx Express Saver Freight (Up to 3 business days)

(Call for delivery schedule. See back for detailed descriptions of freight services.)

5 Packaging ☐ FedEx Letter ☐ FedEx Pak (Declared value limit $500) ☐ FedEx Box ☐ FedEx Tube ☑ Other Pkg.

6 Special Handling
Does this shipment contain dangerous goods? ☐ Yes (As per attached Shipper's Declaration) ☐ Yes (Shipper's Declaration not required)
☐ Dry Ice Dry Ice, 9, UN 1845 III ___ x ___ kg 904 (Dangerous Goods Shipper's Declaration not required)
CA ☐ Cargo Aircraft Only

7 Payment
Bill to: ☑ Sender (Account no. in section 1 will be billed) ☐ Recipient ☐ Third Party ☐ Credit Card (Enter FedEx account no. or Credit Card no. below) ☐ Cash/Check

FedEx Account No.

Credit Card No. Exp. Date

Total Packages	Total Weight	Total Declared Value*	Total Charges
1	207	$ .00	$

* When declaring a value higher than $100 per shipment, you pay an additional charge. See SERVICE CONDITIONS, DECLARED VALUE, AND LIMIT OF LIABILITY section for further information.

8 Release Signature *Sign to authorize delivery without obtaining signature*

Your signature authorizes Federal Express to deliver this shipment without obtaining a signature and agrees to indemnify and hold harmless Federal Express from any resulting claims.

287

WCSL 0997 Rev. Date 5/97 Part #150364 ©1994-97 FedEx PRINTED IN U.S.A.

Questions?
Call 1·800·Go·FedEx (800)463-3339

The World On Time

003253734 7

RETAIN THIS COPY FOR YOUR RECORDS

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gold / D. Stahl

SAMPLE LOCATION/WELLNO. SB-1 (2'-6')

FIELD SAMPLE I.D. NUMBER SB-1 DATE 10/6/98

TIME 9:38 WEATHER Sunny TEMPERATURE 55°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL ✓ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS:

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) PID = 0.2 ppm

CONSTITUENTS SAMPLED:

	TCL + TO	TOC	

REMARKS: Pioneer Boat Club sample

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould / D. Stahl

SAMPLE LOCATION/WELLNO. SB-2 (2'-4')

FIELD SAMPLE I.D. NUMBER SB-2 DATE 10/6/98

TIME 14:30 WEATHER Sunny TEMPERATURE 60°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL ✓ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS:

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) PID = 0.0 ppm

CONSTITUENTS SAMPLED: TCL+TO TOC

REMARKS:

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould / D Stahl

SAMPLE LOCATION/WELLNO. SB-3 (2'-4')

FIELD SAMPLE I.D. NUMBER SB-3 DATE 10/6/98

TIME 15:45 WEATHER Sunny TEMPERATURE 60°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL ✓ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS:

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) PID = 4.3

CONSTITUENTS SAMPLED:

	TCL+TO	TOL	

REMARKS: MS/MSD collected here; oily residue in sample

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould | D. Stahl

SAMPLE LOCATION/WELLNO. SB-4 (1'-5')

FIELD SAMPLE I.D. NUMBER SB-4 DATE 10/6/98

TIME 7:57 WEATHER Sunny TEMPERATURE 55° F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL _____ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS:

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) PID = 0.5 ppm

CONSTITUENTS SAMPLED:

	TCL +30	TOC	

REMARKS: _____

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould / D. Stahl

SAMPLE LOCATION/WELL NO. SB-5 (2'-5')

FIELD SAMPLE I.D. NUMBER SB-5 DATE 10/6/98

TIME 9:04 WEATHER Sunny TEMPERATURE 55°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL ✓ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS:

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) PID = 0.8 ppm

CONSTITUENTS SAMPLED:

	TCL + TO	TOC	

REMARKS: _____

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G.Gauld / D. Stahl

SAMPLE LOCATION/WELLNO. SB-6 (2'-4')

FIELD SAMPLE I.D. NUMBER SB-6 DATE 10/5/98

TIME 15:35 WEATHER Sunny TEMPERATURE 70° F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL ✓ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS:

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) PID = 0.2 ppm

CONSTITUENTS SAMPLED: TCL+30 TOC

REMARKS: behind Building 55

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould / D. Stahl

SAMPLE LOCATION/WELLNO. SB-7 (2'-5')

FIELD SAMPLE I.D. NUMBER SB-7 DATE 10/6/98

TIME 8:27 WEATHER Sunny TEMPERATURE 55°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL ✓ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS:

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) PID = 0.7 ppm

CONSTITUENTS SAMPLED:

	TCL +TO	TOC	

REMARKS: purple liquid in soil.

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW C. Gould / D. Stahl

SAMPLE LOCATION/WELLNO. SB-8 (2'-6')

FIELD SAMPLE I.D. NUMBER SB-8 DATE 10/6/98

TIME 7:25 WEATHER Sunny TEMPERATURE 50° F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL ✓ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS:

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) PID = 3.1 ppm

CONSTITUENTS SAMPLED: TCL +30 TOC

REMARKS:

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould / D. Stahl

SAMPLE LOCATION/WELLNO. SB-9 (1'-4')

FIELD SAMPLE I.D. NUMBER SB-9 DATE 10/5/98

TIME 14:57 WEATHER Sunny TEMPERATURE 70°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL ✓ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS:

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) PID = 0.3 ppm

CONSTITUENTS SAMPLED:

	TCL+30	TOC	

REMARKS: _____

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould / D. Stahl

SAMPLE LOCATION/WELLNO. SB-10 (2'-4')

FIELD SAMPLE I.D. NUMBER SB-10 DATE 10/6/98

TIME 15:09 WEATHER Sunny TEMPERATURE 60°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL ✓ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL _____ MEASUREMENT METHOD _____

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS:

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) PID = 0.5 ppm

CONSTITUENTS SAMPLED: TCL + 30 TOC

REMARKS:

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

Monitoring Well Groundwater Sampling

ICM Laboratories
1152 Route 10, Randolph, NJ 07869
201-584-0330 Fax: 201-584-0515

Chain of Custody

NJ Certification #14116

Client: Dvirka + Bartilucci, P.C.
Address: 5879 Fisher Road
E. Syracuse, NY 13057
Phone #: (315) 437-1142
Project: Tappan Terminal Site
Project Mgr: Geery Gould
Invoice to: Geery Gould
Report to: Geery Gould
Copies: 2 Bound/(Unbound)

Deliverables:
___ NJ Reduced (Non CLP)
___ NJ Regulatory
___ Reduced (CLP) ___ Full (CLP)
___ NPDES
___ PA: ___ Std. ___ Reduced I
___ NY: ___ ASPA ✓ ASPB ___ CLP
___ State Specific: _____
___ Results Only

SRP Diskette: Yes ✓ No ___
SRP #: _____

Turnaround Required:
Fax Preliminary: _____
Hard Copy: _____

Additional Information:
___ State Forms Required
___ NJ Cleanup Levels Required
___ NJ Groundwater Quality Stds. Required
___ State Specific Levels Required: _____

Expected Sample Concentration:
High ___ Medium ✓ Low ✓
Known Hazard: chlorobenzene, petroleum

Lab #	Sample Identification	Sample Date/Time	Composite	Grab	Soil	Aqueous	Other	# Bottles	Analysis/Method/Pollutant List: VOA	BNA	P/P	Total Metals	Filtered* Metals	Cyan, Le				Preservation: H_2SO_4	HNO_3	HCl	NaOH	Other
	MW-S1	9.28.98/10:25				✓		7	2	1	1	1	1	1					2	2	1	
	MW-D1	" /11:55				↓		↓	↓	↓	↓	↓	↓	↓					↓	↓	↓	
	OW-15	" /12:45				↓		↓	↓	↓	↓	↓	↓	↓					↓	↓	↓	
	MW-9A	" /13:45				↓		↓	↓	↓	↓	↓	↓	↓					↓	↓	↓	
	MW-6	" /14:30				↓		↓	↓	↓	↓	↓	↓	↓					↓	↓	↓	
	MW-7A	" /15:00				↓		↓	↓	↓	↓	↓	↓	↓					↓	↓	↓	
	Trip Blank	9.28.98				✓		2	2											2		

Samples have been collected, preserved & handled in accordance with NJAC 7:18

Sampled by: Dean V. Stahl Date/Time: 9.28.98/16:00
Relinquished by: Dean V. Stahl Date/Time: 9.28.98/17:30
Received by: Fed-X Date/Time: 9.28.98/17:30
Relinquished by: _____ Date/Time: _____
Received by: _____ Date/Time: _____
Relinquished by: _____ Date/Time: _____
Received by: _____ Date/Time: _____

Comments: TCL+30 compounds: VOA, BNA, P/P
Total Metals, Filtered Metals
*field filtered. Cyanide

If analysis is for informational purposes only, please sign the following:
"Analysis is for informational purposes, not to be used for compliance or regulatory purposes." _____

Cooler Temp: _____ Condition: Intact/Broken/Leaking
Custody Seals: ___ Present ___ Absent Seal #: _____

FedEx USA Airbill

FedEx Tracking Number: 801182370164

0200 Form I.D. No.

SLA11

Sender's Copy

1 From (please print and press hard)

Date: 9.28.98 Sender's FedEx Account Number: 1245-6133-7

Sender's Name: Dean Stahl Phone: (315) 437-1142

Company: DVIRKA AND BARTILUCCI

Address: 5879 FISHER RD Dept/Floor/Suite/Room:

City: EAST SYRACUSE State: NY ZIP: 13057

2 Your Internal Billing Reference Information (Optional) (First 24 characters will appear on invoice)

3 To (please print and press hard)

Recipient's Name: Sample Control Phone: (973) 584-0330

Company: Industrial Corrosion MGT.

☐ Check here if residence (Extra charge applies for FedEx Express Saver)

Address: 1152 State Rt. 10 (We Cannot Deliver to P.O. Boxes or P.O. ZIP Codes) Dept/Floor/Suite/Room:

(To "HOLD" at FedEx location, print FedEx address here)

City: Randolph State: NJ ZIP: 07869

For HOLD at FedEx Location check here

☐ Hold Weekday (Not available with FedEx First Overnight)

☐ Hold Saturday (Not available at all locations) (Available for FedEx Priority Overnight and FedEx 2Day only)

For Saturday Delivery check here

☐ (Extra Charge. Not available to all locations) (Available for FedEx Priority Overnight and FedEx 2Day only)

4a Express Package Service *Packages under 150 lbs.* * Delivery commitment may be later in some areas.

☑ FedEx Priority Overnight (Next business morning)

☐ FedEx Standard Overnight (Next business afternoon)

☐ FedEx 2Day* (Second business day)

☐ FedEx Express Saver* (Third business day)

☐ FedEx First Overnight (Earliest next business morning delivery to select locations) (Higher rates apply)

* FedEx Letter Rate not available. Minimum charge: One pound rate.

4b Express Freight Service *Packages over 150 lbs.* Delivery commitment may be later in some areas.

☐ FedEx Overnight Freight (Next business day)

☐ FedEx 2Day Freight (Second business day)

☐ FedEx Express Saver Freight (Up to 3 business days)

(Call for delivery schedule. See back for detailed descriptions of freight services.)

5 Packaging ☐ FedEx Letter ☐ FedEx Pak — Declared value limit $500 ☐ FedEx Box ☐ FedEx Tube ☑ Other Pkg.

6 Special Handling

Does this shipment contain dangerous goods? ☐ Yes (As per attached Shipper's Declaration) ☐ Yes (Shipper's Declaration not required)

☐ Dry Ice Dry Ice, 9, UN 1845 III x kg. 904 (Dangerous Goods Shipper's Declaration not required)

CA ☐ Cargo Aircraft Only

7 Payment

Bill to: ☑ Sender (Account no. in section 1 will be billed) ☐ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check — (Enter FedEx account no. or Credit Card no. below)

FedEx Account No.

Credit Card No. Exp. Date

Total Packages	Total Weight	Total Declared Value*	Total Charges
1	150	$ .00	$

* When declaring a value higher than $100 per shipment, you pay an additional charge. See **SERVICE CONDITIONS, DECLARED VALUE, AND LIMIT OF LIABILITY** section for further information.

8 Release Signature *Sign to authorize delivery without obtaining signature*

Your signature authorizes Federal Express to deliver this shipment without obtaining a signature and agrees to indemnify and hold harmless Federal Express from any resulting claims.

287

Service Conditions, Declared Value, and Limit of Liability – By using this Airbill, you agree to the service conditions in our current Service Guide or U.S. Government Service Guide. Both are available on request. SEE BACK OF SENDER'S COPY OF THIS AIRBILL FOR INFORMATION AND ADDITIONAL TERMS. We will not be responsible for any claim in excess of $100 per package whether the result of loss, damage, or delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, and document your actual loss in a timely manner. Your right to recover from us for any loss includes intrinsic value of the package, loss of sales, interest, profit, attorney's fees, costs, and other forms of damage, whether direct, incidental, consequential, or special, and is limited to the greater of $100 or the declared value but cannot exceed actual documented loss. The maximum declared value for any FedEx Letter and FedEx Pak is $500. Federal Express may, upon your request, and with some limitations, refund all transportation charges paid. See the FedEx Service Guide for further details.

Questions?
Call 1-800-Go-FedEx (800)463-3339

The World On Time

003253734 7

WCSL 0897
Rev. Date 5/97
Part #150164
©1994-97 FedEx
PRINTED IN U.S.A.

RETAIN THIS COPY FOR YOUR RECORDS

ICM Laboratories
1152 Route 10, Randolph, NJ 07869
201-584-0330 Fax: 201-584-0515

Chain of Custody

NJ Certification #14116

Client: Dvirka & Bartilucci, P.C.
Address: 5879 Fisher Road, E. Syracuse NY 13057
Phone #: (315) 437-1142
Project: Tappan Terminal Site
Project Mgr: Gerry Gould
Invoice to: Gerry Gould
Report to: Gerry Gould
 # Copies: 2 Bound/(Unbound)

Deliverables:
___ NJ Reduced (Non CLP)
___ NJ Regulatory
___ Reduced (CLP) ___ Full (CLP)
___ NPDES
___ PA: ___ Std. ___ Reduced I
___ NY: ___ ASPA ✓ ASPB ___ CLP
___ State Specific: _____
___ Results Only

SRP Diskette: Yes ✓ No ___
SRP #: _____

Turnaround Required:
Fax Preliminary: _____
Hard Copy: _____

Additional Information:
___ State Forms Required
___ NJ Cleanup Levels Required
___ NJ Groundwater Quality Stds. Required
___ State Specific Levels Required: _____

Expected Sample Concentration:
High ___ Medium ✓ Low ___
Known Hazard: chlorobenzene, petroleum

Lab #	Sample Identification	Sample Date/Time	Composite	Grab	Soil	Aqueous	Other	# Bottles	Analysis/Method/Pollutant List: VOA	BNA	P/P	Total Metals	Filtered* Metals	Cyanide				Preservation: H_2SO_4	HNO_3	HCl	NaOH	Other
	OW-27A	9-29-98/08:55				✓		7	2	1	1	1	1	1					2	2	1	
	OW-9A	" /09:40				↓		↓	↓	↓	↓	↓	↓	↓					↓	↓	↓	
	OW-8	" /10:35				↓		↓	↓	↓	↓	↓	↓	↓					↓	↓	↓	
	MW-1A	" /11:10				↓		↓	↓	↓	↓	↓	↓	↓					↓	↓	↓	
	MW-10	" /11:45				↓		↓	↓	↓	↓	↓	↓	↓					↓	↓	↓	
	MW-15	" /12:20				↓		↓	↓	↓	↓	↓	↓	↓					↓	↓	↓	
	OW-17	" /13:30				↓		↓	↓	↓	↓	↓	↓	↓					↓	↓	↓	
	OW-12	" /14:00				↓		↓	↓	↓	↓	↓	↓	↓					↓	↓	↓	
	MW-5	" /14:55				↓		↓	↓	↓	↓	↓	↓	↓					↓	↓	↓	
	Trip Blank	9-30-98				✓		3	3											3		

Samples have been collected, preserved & handled in accordance with NJAC 7:18

Sampled by: Sean Stahl Date/Time: 9-29-98/15:00
Relinquished by: Sean Stahl Date/Time: 9-30-98/17:30
Received by: FedEx Date/Time: 9-30-98/17:30
Relinquished by: _____ Date/Time: _____
Received by: _____ Date/Time: _____
Relinquished by: _____ Date/Time: _____
Received by: _____ Date/Time: _____

Comments: TCL+30 compounds: VOA, BNA, P/P
Total Metals, Filtered Metals
*field filtered Cyanide

If analysis is for informational purposes only, please sign the following:
"Analysis is for informational purposes, not to be used for compliance or regulatory purposes." _____

Cooler Temp: _____ Condition: Intact/Broken/Leaking
Custody Seals: ___ Present ___ Absent Seal #: _____

ICM Laboratories
1152 Route 10, Randolph, NJ 07869
201-584-0330 Fax: 201-584-0515

Chain of Custody

NJ Certification #14116

Client: Dvirka + Bartilucci
Address: 5879 Fisher Road, E. Syracuse, NY 13057
Phone #: (315) 437-1142
Project: Tappan Terminal
Project Mgr: Gerry Gould
Invoice to: Gerry Gould
Report to: Gerry Gould
 # Copies: 2 Bound/(Unbound)

Deliverables:
___ NJ Reduced (Non CLP)
___ NJ Regulatory
___ Reduced (CLP) ___ Full (CLP)
___ NPDES
___ PA: ___ Std. ___ Reduced I
___ NY: ___ ASPA ✓ ASPB ___ CLP
___ State Specific: _____
___ Results Only

SRP Diskette: Yes ✓ No ___
SRP #: _____

Turnaround Required:
Fax Preliminary: _____
Hard Copy: _____

Additional Information:
___ State Forms Required
___ NJ Cleanup Levels Required
___ NJ Groundwater Quality Stds. Required
___ State Specific Levels Required: _____

Expected Sample Concentration:
High ___ Medium 1 ✓ Low ✓
Known Hazard: chlorobenzene, petroleum

Lab #	Sample Identification	Sample Date/Time	Composite	Grab	Soil	Aqueous	Other	# Bottles	Analysis/Method/Pollutant List: VOA	BNA	P/P	Total Metals	Filtered * Metals	Cyanide	Preservation: H_2SO_4	HNO_3	HCl	NaOH
	MW-4	9.30.98/08:00				✓		7	2	1	1	1	1	1		2	2	1
	MW-4-MS	" /08:00				↓		↓	↓	↓	↓	↓	↓	↓		↓	↓	↓
	MW-4-MSD	" /08:00				↓		↓	↓	↓	↓	↓	↓	↓		↓	↓	↓
	OW-5A	" /10:30				↓		↓	↓	↓	↓	↓	↓	↓		↓	↓	↓
	OW-25	" /11:35				↓		↓	↓	↓	↓	↓	↓	↓		↓	↓	↓
	OW-20	" /12:15				↓		↓	↓	↓	↓	↓	↓	↓		↓	↓	↓
	OW-19A	" /12:50				↓		↓	↓	↓	↓	↓	↓	↓		↓	↓	↓
	MW-17	" /13:30				↓		↓	↓	↓	↓	↓	↓	↓		↓	↓	↓
	Trip Blank	9.30.98				✓		3	3								3	

Samples have been collected, preserved & handled in accordance with NJAC 7:18

Sampled by: Dean Stahl Date/Time: 9-30-98/14:00
Relinquished by: Dean Stahl Date/Time: 9.30.98/17:00
Received by: Fed-X Date/Time: 9.30.98/17:00
Relinquished by: _____ Date/Time: _____
Received by: _____ Date/Time: _____
Relinquished by: _____ Date/Time: _____
Received by: _____ Date/Time: _____

Comments: TCL+30 compounds: VOA, BNA, P/P, Total Metals, Filtered Metals, Cyanide

If analysis is for informational purposes only, please sign the following:
"Analysis is for informational purposes, not to be used for compliance or regulatory purposes." _____

Cooler Temp: _____ Condition: Intact/Broken/Leaking
Custody Seals: ___ Present ___ Absent Seal #: _____

FedEx USA Airbill

FedEx Tracking Number 801182370142

0200 Form I.D. No.

SLA11 Sender's Copy

1 From (please print and press hard)

Date 4/30/98 Sender's FedEx Account Number 1245-6133-7

Sender's Name Dean Stahl Phone (315) 437-1142

Company DVIRKA AND BARTILUCCI

Address 5879 FISHER RD Dept./Floor/Suite/Room

City EAST SYRACUSE State NY ZIP 13057

2 Your Internal Billing Reference Information (Optional) (First 24 characters will appear on invoice)

3 To (please print and press hard)

Recipient's Name Sample Control Phone ( )

Company Industrial Corrosion Mgt.

Address 1152 State Rt. 10 (We Cannot Deliver to P.O. Boxes or P.O. ZIP Codes) Dept./Floor/Suite/Room

Check here if residence (Extra charge applies for FedEx Express Saver)

City Randolph State NJ ZIP 07869

For HOLD at FedEx Location check here

Hold Weekday (Not available with FedEx First Overnight)

Hold Saturday (Not available at all locations) (Available for FedEx Priority Overnight and FedEx 2Day only)

For Saturday Delivery check here (Extra Charge. Not available to all locations) (Available for FedEx Priority Overnight and FedEx 2Day only)

Service Conditions, Declared Value, and Limit of Liability – By using this Airbill, you agree to the service conditions in our current Service Guide or U.S. Government Service Guide. Both are available on request. SEE BACK OF SENDER'S COPY OF THIS AIRBILL FOR INFORMATION AND ADDITIONAL TERMS. We will not be responsible for any claim in excess of $100 per package whether the result of loss, damage, or delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, and document your actual loss in a timely manner. Your right to recover from us for any loss includes intrinsic value of the package, loss of sales, interest, profit, attorney's fees, costs, and other forms of damage, whether direct, incidental, consequential, or special, and is limited to the greater of $100 or the declared value but cannot exceed actual documented loss. The maximum declared value for any FedEx Letter and FedEx Pak is $500. Federal Express may, upon your request, and with some limitations, refund all transportation charges paid. See the FedEx Service Guide for further details.

Questions?
Call 1-800-Go-FedEx (800)463-3339

The World On Time

003253734 7

4a Express Package Service *Packages under 150 lbs.* Delivery commitment may be later in some areas.

- [x] FedEx Priority Overnight (Next business morning)
- [ ] FedEx Standard Overnight (Next business afternoon)
- [ ] FedEx 2Day* (Second business day)
- [ ] FedEx Express Saver* (Third business day)
- [ ] FedEx First Overnight (Earliest next business morning delivery to select locations) (Higher rates apply)

*FedEx Letter Rate not available. Minimum charge. One pound rate.

4b Express Freight Service *Packages over 150 lbs.* Delivery commitment may be later in some areas.

- [ ] FedEx Overnight Freight (Next business day)
- [ ] FedEx 2Day Freight (Second business day)
- [ ] FedEx Express Saver Freight (Up to 3 business days)

(Call for delivery schedule. See back for detailed descriptions of freight services.)

5 Packaging [ ] FedEx Letter [ ] FedEx Pak — Declared value limit $500 [ ] FedEx Box [ ] FedEx Tube [x] Other Pkg

6 Special Handling

Does this shipment contain dangerous goods? [ ] Yes (As per attached Shipper's Declaration) [ ] Yes (Shipper's Declaration not required)

- [ ] Dry Ice — Dry Ice, 9, UN 1845 III — x ____ kg, 904 (Dangerous Goods Shipper's Declaration not required)
- [ ] CA Cargo Aircraft Only

7 Payment

Bill to: [x] Sender (Account no. in section 1 will be billed) [ ] Recipient [ ] Third Party [ ] Credit Card [ ] Cash/Check — (Enter FedEx account no. or Credit Card no. below)

FedEx Account No. ____

Credit Card No. ____ Exp. Date ____

Total Packages	Total Weight	Total Declared Value*	Total Charges
6	376	$ .00	$

* When declaring a value higher than $100 per shipment, you pay an additional charge. See SERVICE CONDITIONS, DECLARED VALUE, AND LIMIT OF LIABILITY section for further information.

8 Release Signature *Sign to authorize delivery without obtaining signature*

Your signature authorizes Federal Express to deliver this shipment without obtaining a signature and agrees to indemnify and hold harmless Federal Express from any resulting claims.

287

WSSI 0997
Rev. Date 5/97
Part #150764
©1994-97 FedEx
PRINTED IN U.S.A.

RETAIN THIS COPY FOR YOUR RECORDS

ICM Laboratories
1152 Route 10, Randolph, NJ 07869
201-584-0330 Fax: 201-584-0515

Chain of Custody

NJ Certification #14116

Client: Dirka + Bartilucci P.C.
Address: 5879 Fisher Road
E. Syracuse, NY 13057
Phone #: (315) 437-1142
Project: Tappan Terminal Site
Project Mgr: Gerry Gould
Invoice to: Gerry Gould
Report to: Gerry Gould
 # Copies: 2 Bound/(Unbound)

Deliverables:
___ NJ Reduced (Non CLP)
___ NJ Regulatory
___ Reduced (CLP) ___ Full (CLP)
___ NPDES
___ PA: ___ Std. ___ Reduced I
___ NY: ___ ASPA ✓ ASPB ___ CLP
___ State Specific: _____
___ Results Only

SRP Diskette: Yes ✓ No ___
SRP #: _____

Turnaround Required:
Fax Preliminary: _____
Hard Copy: _____

Additional Information:
___ State Forms Required
___ NJ Cleanup Levels Required
___ NJ Groundwater Quality Stds. Required
___ State Specific Levels Required: _____

Expected Sample Concentration:
High ___ Medium ✓ Low ✓
Known Hazard: chlorobenzene, petroleum

Lab #	Sample Identification	Sample Date/Time	Composite	Grab	Soil	Aqueous	Other	# Bottles	Analysis/Method/Pollutant List: VOA	BNA	P/P	Total Metals	Filtered Metals	Cyanide	Preservation: H_2SO_4	HNO_3	HCl	NaOH	Other
	MW-16	10-1-98/11:00				✓		7	2	1	1	1	1	1		2	2	1	
	OW-26	" /12:45																	
	MW-13	" /13:00																	
	MW-14	" /13:15																	
	LMS-4	" /14:10																	
	LMS-5	" /14:45																	
	LMS-8R	" /15:15																	
	Trip Blank	9-30-98				✓		3	3								3		

Samples have been collected, preserved & handled in accordance with NJAC 7:18

Sampled by:	Dean Stahl	Date/Time:	10-1-98/16:00
Relinquished by:	Dean Stahl	Date/Time:	10-1-98/17:00
Received by:	Fed-X	Date/Time:	10-1-98/17:00
Relinquished by:		Date/Time:	
Received by:		Date/Time:	
Relinquished by:		Date/Time:	
Received by:		Date/Time:	

Comments: TCL + 30 compounds: VOA, BNA, P/P, Total Metals, Filtered Metals, Cyanide

If analysis is for informational purposes only, please sign the following:
"Analysis is for informational purposes, not to be used for compliance or regulatory purposes." _____

Cooler Temp: _____ Condition: Intact/Broken/Leaking
Custody Seals: ___ Present ___ Absent Seal #: _____

FedEx USA Airbill

FedEx Tracking Number 801182370153

0200 Form I.D. No.

SLA11

Sender's Copy

1 From (please print and press hard)

Date 10-1-98 Sender's FedEx Account Number 1245-6133-7

Sender's Name Dean Stahl Phone (315) 437-1142

Company DVIRKA AND BARTILUCCI

Address 5879 FISHER RD Dept./Floor/Suite/Room

City EAST SYRACUSE State NY ZIP 13057

2 Your Internal Billing Reference Information (Optional) (First 24 characters will appear on invoice)

3 To (please print and press hard)

Recipient's Name Sample Cortec! Phone 973) 584-0330

Company Industrial Corrosion Mgt

Address 1152 State Rt. 10 ☐ Check here if residence (Extra charge applies for FedEx Express Saver)

(To "HOLD" at FedEx location, print FedEx address here) (We Cannot Deliver to P.O. Boxes or P.O. ZIP Codes) Dept./Floor/Suite/Room

City Randolph State NJ ZIP 07869

For HOLD at FedEx Location check here

☐ **Hold Weekday** (Not available with FedEx First Overnight) ☐ **Hold Saturday** (Not available at all locations) (Available for FedEx Priority Overnight and FedEx 2Day only)

For Saturday Delivery check here

☐ (Extra Charge. Not available to all locations) (Available for FedEx Priority Overnight and FedEx 2Day only)

Service Conditions, Declared Value, and Limit of Liability – By using this Airbill, you agree to the service conditions in our current Service Guide or U.S. Government Service Guide. Both are available on request. SEE BACK OF SENDER'S COPY OF THIS AIRBILL FOR INFORMATION AND ADDITIONAL TERMS. We will not be responsible for any claim in excess of $100 per package whether the result of loss, damage, or delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, and document your actual loss in a timely manner. Your right to recover from us for any loss includes intrinsic value of the package, loss of sales, interest, profit, attorney's fees, costs, and other forms of damage, whether direct, incidental, consequential, or special, and is limited to the greater of $100 or the declared value but cannot exceed actual documented loss. The maximum declared value for any FedEx Letter and FedEx Pak is $500. Federal Express may, upon your request, and with some limitations, refund all transportation charges paid. See the FedEx Service Guide for further details.

Questions?
Call 1·800·Go·FedEx (800)463-3339

The World On Time

4a Express Package Service *Packages under 150 lbs.* Delivery commitment may be later in some areas.

☑ FedEx Priority Overnight (Next business morning) ☐ FedEx Standard Overnight (Next business afternoon) ☐ FedEx 2Day* (Second business day) ☐ FedEx Express Saver* (Third business day)

☐ FedEx First Overnight (Earliest next business morning delivery to select locations) (Higher rates apply)

*FedEx Letter Rate not available. Minimum charge: One pound rate.

4b Express Freight Service *Packages over 150 lbs.* Delivery commitment may be later in some areas.

☐ FedEx Overnight Freight (Next business day) ☐ FedEx 2Day Freight (Second business day) ☐ FedEx Express Saver Freight (Up to 3 business days)

(Call for delivery schedule. See back for detailed descriptions of freight services.)

5 Packaging ☐ FedEx Letter ☐ FedEx Pak (Declared value limit $500) ☐ FedEx Box ☐ FedEx Tube ☑ Other Pkg.

6 Special Handling

Does this shipment contain dangerous goods? ☐ Yes (As per attached Shipper's Declaration) ☐ Yes (Shipper's Declaration not required)

☐ Dry Ice Dry Ice, 9, UN 1845 ___ x ___ kg. 904 (Dangerous Goods Shipper's Declaration not required) CA ☐ Cargo Aircraft Only

7 Payment

Bill to: ☑ Sender (Account no. in section 1 will be billed) ☐ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check (Enter FedEx account no. or Credit Card no. below)

FedEx Account No.

Credit Card No. Exp. Date

Total Packages	Total Weight	Total Declared Value*	Total Charges
3	153	$ .00	$

*When declaring a value higher than $100 per shipment, you pay an additional charge. See **SERVICE CONDITIONS, DECLARED VALUE, AND LIMIT OF LIABILITY** section for further information.

8 Release Signature *Sign to authorize delivery without obtaining signature*

Your signature authorizes Federal Express to deliver this shipment without obtaining a signature and agrees to indemnify and hold harmless Federal Express from any resulting claims.

287

WCSL 0897
Rev. Date 5/97
Part #150364
©1994-97 FedEx
PRINTED IN U.S.A.

003253734 7

RETAIN THIS COPY FOR YOUR RECORDS

ICM Laboratories
1152 Route 10, Randolph, NJ 07869
201-584-0330 Fax: 201-584-0515

Chain of Custody

NJ Certification #14116

Client: Dvirka + Bartilucci, P.C.
Address: 5879 Fisher Road E. Syracuse, NY 13057
Phone #: (315) 437-1142
Project: Tappan Terminal Site
Project Mgr: Geney Gould
Invoice to: Gerry Gould
Report to: Gerry Gould
 # Copies: 2 Bound/(Unbound)

Deliverables:
___ NJ Reduced (Non CLP)
___ NJ Regulatory
___ Reduced (CLP) ___ Full (CLP)
___ NPDES
___ PA: ___ Std. ___ Reduced I
___ NY: ___ ASPA ✓ ASPB ___ CLP
___ State Specific: _____
___ Results Only

SRP Diskette: Yes ✓ No ___
SRP #: _____

Turnaround Required:
Fax Preliminary: _____
Hard Copy: _____

Additional Information:
___ State Forms Required
___ NJ Cleanup Levels Required
___ NJ Groundwater Quality Stds. Required
___ State Specific Levels Required: _____

Expected Sample Concentration:
High ___ Medium ✓ Low ✓
Known Hazard: chlorobenzene, petroleum

Lab #	Sample Identification	Sample Date/Time	Composite	Grab	Soil	Aqueous	Other	# Bottles	Analysis/Method/Pollutant List: VOA	BNA	P/P	Total Metals	Filtered* Metals	Cyanide	TPH			Preservation: H_2SO_4	HNO_3	HCl	NaOH	Other
	LMS-6	10-2-98/08:00				✓		7	2	1	1	1	1	1					2	2	1	
	LMS-7	" / 08:35				↓		↓	↓	↓	↓	↓	↓	↓					↓	↓	↓	
	LMS-1	" / 09:05																				
	LMS-3	" / 09:45						↓														
	LMS-2	" / 10:35				↓		8	↓	↓	↓	↓	↓	↓	1				↓	↓	↓	
	Trip Blank					✓		3	3											3		

Samples have been collected, preserved & handled in accordance with NJAC 7:18

Sampled by: Dean Stahl Date/Time: 10-2-98/11:00
Relinquished by: Dean Stahl Date/Time: 10-2-98/13:00
Received by: Fed-X Date/Time: _____
Relinquished by: _____ Date/Time: _____
Received by: _____ Date/Time: _____
Relinquished by: _____ Date/Time: _____
Received by: _____ Date/Time: _____

Comments: TCL+30 compounds: VOA, BNA, P/P, metals, filtered metals, cyanide. LMS-2 contains petroleum product probably

*field filtered

If analysis is for informational purposes only, please sign the following:
"Analysis is for informational purposes, not to be used for compliance or regulatory purposes." _____

Cooler Temp: _____ Condition: Intact/Broken/Leaking
Custody Seals: ___ Present ___ Absent Seal #: _____

FedEx USA Airbill

FedEx Tracking Number 801182370094

0200 Form I.D. No.

SLA11

Sender's Copy

1 From (please print and press hard)

Date 10-2-98 Sender's FedEx Account Number 1245-6133-7

Sender's Name Dean Stahl Phone (315) 437-1142

Company DVIRKA AND BARTILUCCI

Address 5879 FISHER RD Dept./Floor/Suite/Room

City EAST SYRACUSE State NY ZIP 13057

2 Your Internal Billing Reference Information (Optional) (First 24 characters will appear on invoice)

3 To (please print and press hard)

Recipient's Name Sample Control Phone (973) 584-0330

Company Industrial Corrosion Mgmt.

Address 1152 State Rt. 10 (We Cannot Deliver to P.O. Boxes or P.O. ZIP Codes) Dept./Floor/Suite/Room

☐ Check here if residence (Extra charge applies for FedEx Express Saver)

(To "HOLD" at FedEx location, print FedEx address here)

City Randolph State NJ ZIP 07869

For HOLD at FedEx Location check here

☐ **Hold Weekday** (Not available with FedEx First Overnight) ☐ **Hold Saturday** (Not available at all locations) (Available for FedEx Priority Overnight and FedEx 2Day only)

For Saturday Delivery check here

☑ (Extra Charge Not available to all locations) (Available for FedEx Priority Overnight and FedEx 2Day only)

4a Express Package Service *Packages under 150 lbs.* Delivery commitment may be later in some areas.

☑ FedEx Priority Overnight (Next business morning) ☐ FedEx Standard Overnight (Next business afternoon) ☐ FedEx 2Day* (Second business day) ☐ FedEx Express Saver* (Third business day)

☐ FedEx First Overnight (Earliest next business morning delivery to select locations) (Higher rates apply)

* FedEx Letter Rate not available. Minimum charge One pound rate.

4b Express Freight Service *Packages over 150 lbs.* Delivery commitment may be later in some areas.

☐ FedEx Overnight Freight (Next business day) ☐ FedEx 2Day Freight (Second business day) ☐ FedEx Express Saver Freight (Up to 3 business days)

(Call for delivery schedule. See back for detailed descriptions of freight services.)

5 Packaging ☐ FedEx Letter ☐ FedEx Pak (Declared value limit $500) ☐ FedEx Box ☐ FedEx Tube ☑ Other Pkg.

6 Special Handling

Does this shipment contain dangerous goods? ☐ Yes (As per attached Shipper's Declaration) ☐ Yes (Shipper's Declaration not required)

☐ Dry Ice Dry Ice, 9, UN 1845 III x kg, 904 (Dangerous Goods Shipper's Declaration not required) CA ☐ Cargo Aircraft Only

7 Payment

Bill to: ☑ Sender (Account no. in section 1 will be billed) ☐ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check (Enter FedEx account no. or Credit Card no. below)

FedEx Account No. Credit Card No. Exp. Date

Total Packages	Total Weight	Total Declared Value*	Total Charges
2	46	$ .00	$

* When declaring a value higher than $100 per shipment, you pay an additional charge. See SERVICE CONDITIONS, DECLARED VALUE, AND LIMIT OF LIABILITY section for further information

8 Release Signature *Sign to authorize delivery without obtaining signature*

Your signature authorizes Federal Express to deliver this shipment without obtaining a signature and agrees to indemnify and hold harmless Federal Express from any resulting claims.

287

Service Conditions, Declared Value, and Limit of Liability – By using this Airbill, you agree to the service conditions in our current Service Guide or U.S. Government Service Guide. Both are available on request. SEE BACK OF SENDER'S COPY OF THIS AIRBILL FOR INFORMATION AND ADDITIONAL TERMS. We will not be responsible for any claim in excess of $100 per package whether the result of loss, damage, or delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, and document your actual loss in a timely manner. Your right to recover from us for any loss includes intrinsic value of the package, loss of sales, interest, profit, attorney's fees, costs, and other forms of damage, whether direct, incidental, consequential, or special, and is limited to the greater of $100 or the declared value but cannot exceed actual documented loss. The maximum declared value for any FedEx Letter and FedEx Pak is $500. Federal Express may, upon your request, and with some limitations, refund all transportation charges paid. See the FedEx Service Guide for further details.

Questions?
Call 1·800·Go·FedEx (800)463-3339

The World On Time

003253734 7

WFSI 0897
Rev. Date 5/97
Part #150364
©1994-97 FedEx
PRINTED IN U.S.A.

RETAIN THIS COPY FOR YOUR RECORDS

ICM Laboratories
1152 Route 10, Randolph, NJ 07869
201-584-0330 Fax: 201-584-0515

Chain of Custody

NJ Certification #14116

Client: Dvirka + Bartilucci, PC
Address: 5879 Fisher Road
E. Syracuse, NY 13057
Phone #: (315) 437-1142
Project: Tappan Terminal Site
Project Mgr: Gerry Gould
Invoice to: Gerry Gould
Report to: Gerry Gould
 # Copies: 2 Bound/(Unbound)

Deliverables:
___ NJ Reduced (Non CLP)
___ NJ Regulatory
___ Reduced (CLP) ___ Full (CLP)
___ NPDES
___ PA: ___ Std. ___ Reduced I
___ NY: ___ ASPA ✓ ASPB ___ CLP
___ State Specific: _____
___ Results Only

SRP Diskette: Yes ✓ No ___
SRP #: _____

Turnaround Required:
Fax Preliminary: _____
Hard Copy: _____

Additional Information:
___ State Forms Required
___ NJ Cleanup Levels Required
___ NJ Groundwater Quality Stds. Required
___ State Specific Levels Required: _____

Expected Sample Concentration:
High ___ Medium ✓ Low ✓
Known Hazard: chlorobenzene, petroleum

Lab #	Sample Identification	Sample Date/Time	Composite	Grab	Soil	Aqueous	Other	# Bottles	Analysis/Method/Pollutant List: BNA	Preservation: H_2SO_4	HNO_3	HCl	NaOH	Other
	LMS-5	10.7.98/09:17				✓		1	1					

Replaces bottle broken in earlier shipment

Samples have been collected, preserved & handled in accordance with NJAC 7:18

Sampled by:	Sean Stahl	Date/Time:	10.7.98/09:17
Relinquished by:	Sean Stahl	Date/Time:	10.7.98/16:00
Received by:	Fed-X	Date/Time:	10.7.98/16:00
Relinquished by:		Date/Time:	
Received by:		Date/Time:	
Relinquished by:		Date/Time:	
Received by:		Date/Time:	

Comments: TCL+30 BNA

If analysis is for informational purposes only, please sign the following:
"Analysis is for informational purposes, not to be used for compliance or regulatory purposes." _____

Cooler Temp: _____ Condition: Intact/Broken/Leaking
Custody Seals: ___ Present ___ Absent Seal #: _____

Gerry S

FedEx *USA Airbill* FedEx Tracking Number 801182370212 0200 Form I.D. No.

SLA11
Sender's Copy

1 From (please print and press hard)

Date 10-7-98 Sender's FedEx Account Number 1245-6133-7 (P.O. #156)

Sender's Name Dean Stahl Phone (315) 437-1142

Company DVIRKA AND BARTILUCCI

Address 5879 FISHER RD Dept./Floor/Suite/Room

City EAST SYRACUSE State NY ZIP 13057

2 Your Internal Billing Reference Information (Optional) (First 24 characters will appear on invoice)

3 To (please print and press hard)

Recipient's Name Sample Control Phone (973) 584-0330

Company ICM Laboratories

Address 1152 State Rt. 10 (To "HOLD" at FedEx location, print FedEx address here) (We Cannot Deliver to P.O. Boxes or P.O. ZIP Codes) Dept./Floor/Suite/Room

☐ Check here if residence (Extra charge applies for FedEx Express Saver)

City Randolph State NJ ZIP 07869

For HOLD at FedEx Location check here
☐ Hold Weekday (Not available with FedEx First Overnight)
☐ Hold Saturday (Not available at all locations) (Available for FedEx Priority Overnight and FedEx 2Day only)

For Saturday Delivery check here
☐ (Extra Charge. Not available to all locations) (Available for FedEx Priority Overnight and FedEx 2Day only)

Service Conditions, Declared Value, and Limit of Liability - By using this Airbill, you agree to the service conditions in our current Service Guide or U.S. Government Service Guide. Both are available on request. SEE BACK OF SENDER'S COPY OF THIS AIRBILL FOR INFORMATION AND ADDITIONAL TERMS. We will not be responsible for any claim in excess of $100 per package whether the result of loss, damage, or delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, and document your actual loss in a timely manner. Your right to recover from us for any loss includes intrinsic value of the package, loss of sales, interest, profit, attorney's fees, costs, and other forms of damage, whether direct, incidental, consequential, or special, and is limited to the greater of $100 or the declared value but cannot exceed actual documented loss. The maximum declared value for any FedEx Letter and FedEx Pak is $500. Federal Express may, upon your request, and with some limitations, refund all transportation charges paid. See the FedEx Service Guide for further details.

4a Express Package Service *Packages under 150 lbs.* Delivery commitment may be later in some areas
☑ FedEx Priority Overnight (Next business morning)
☐ FedEx Standard Overnight (Next business afternoon)
☐ FedEx 2Day* (Second business day)
☐ FedEx Express Saver* (Third business day)
☐ FedEx First Overnight (Earliest next business morning delivery to select locations) (Higher rates apply)

*FedEx Letter Rate not available. Minimum charge One pound rate

4b Express Freight Service *Packages over 150 lbs.* Delivery commitment may be later in some areas
☐ FedEx Overnight Freight (Next business day)
☐ FedEx 2Day Freight (Second business day)
☐ FedEx Express Saver Freight (Up to 3 business days)

(Call for delivery schedule. See back for detailed descriptions of freight services.)

5 Packaging ☐ FedEx Letter ☐ FedEx Pak (Declared value limit $500) ☐ FedEx Box ☐ FedEx Tube ☑ Other Pkg.

6 Special Handling
Does this shipment contain dangerous goods? ☐ Yes (As per attached Shipper's Declaration) ☐ Yes (Shipper's Declaration not required)
☐ Dry Ice (Dry Ice, 9, UN 1845 III ___ x ___ kg 904) (Dangerous Goods Shipper's Declaration not required)
CA ☐ Cargo Aircraft Only

7 Payment
Bill to: ☑ Sender (Account no. in section 1 will be billed) ☐ Recipient ☐ Third Party ☐ Credit Card (Enter FedEx account no. or Credit Card no. below) ☐ Cash/Check

FedEx Account No. ______ Credit Card No. ______ Exp. Date ______

Total Packages	Total Weight	Total Declared Value*	Total Charges
1	10	$ .00	$

*When declaring a value higher than $100 per shipment, you pay an additional charge. See SERVICE CONDITIONS, DECLARED VALUE, AND LIMIT OF LIABILITY section for further information.

8 Release Signature *Sign to authorize delivery without obtaining signature*

Your signature authorizes Federal Express to deliver this shipment without obtaining a signature and agrees to indemnify and hold harmless Federal Express from any resulting claims.

287

WCSL 0897 Rev. Date 5/97 Part #154364 ©1994-97 FedEx PRINTED IN U.S.A.

RETAIN THIS COPY FOR YOUR RECORDS

Questions?
Call 1·800·Go·FedEx (800)463-3339

The World On Time

003253734 7

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW Stahl/Robins

SAMPLE LOCATION/WELLNO. MW-S1

FIELD SAMPLE I.D. NUMBER MW-S1 DATE 9-28-98

TIME 10:25 WEATHER Sun TEMPERATURE 70°F

SAMPLE TYPE:

GROUNDWATER ✓ SEDIMENT

SURFACE WATER/STREAM AIR

SOIL OTHER (Describe, i.e., septage, leachate)

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 6.23 MEASUREMENT METHOD water level meter

DEPTH OF WELL ~30 MEASUREMENT METHOD water level meter

VOLUME REMOVED 118 gal. REMOVAL METHOD Grundfos 2"/2" bailer

FIELD TEST RESULTS:

COLOR blue-green pH 6.62 ODOR sulfur

TEMPERATURE (°C) 16.1 SPECIFIC CONDUCTANCE (umhos/cm) 1.63 ms/cm

OTHER (OVA, Methane meter, etc.) PID = 0.1 ppm Bkgd and 1.2 ppm well

salinity = 0.07 turbidity = 1 NTU DO = 0.51 mg/l

CONSTITUENTS SAMPLED:

	CN-	VOC	metals
	P/P	BNA	D-metals

REMARKS:

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tapper Terminal SAMPLE CREW Stahl / Robins

SAMPLE LOCATION/WELLNO. MW-1A

FIELD SAMPLE I.D. NUMBER MW-1A DATE 9/29/98

TIME 11:10am WEATHER Sunny - warm TEMPERATURE _____

SAMPLE TYPE:

GROUNDWATER X SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL _____ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 4.65 MEASUREMENT METHOD water level meter

DEPTH OF WELL 14.01 MEASUREMENT METHOD water level meter

VOLUME REMOVED 24 gallons REMOVAL METHOD disposable bailer

FIELD TEST RESULTS:

COLOR Black-grey pH 6.34 ODOR slight sulfer

TEMPERATURE (°F) 15.6 SPECIFIC CONDUCTANCE (umhos/cm) 1.53 ms/cm

OTHER (OVA, Methane meter, etc.) PID = 0.4 ppm Turbidity = 340 ntus

DO = 3.20 mg/l, Salinity = 0.07 %

CONSTITUENTS SAMPLED:

	CN^-	Pest/PCBs	metals (Total/dissolve
	BNX	VOCs	

REMARKS: _____

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW D. Stahl/K. Roberts

SAMPLE LOCATION/WELL NO. MW-D1

FIELD SAMPLE I.D. NUMBER MW-D1 DATE 9-28-98

TIME 11:55 WEATHER Sunny TEMPERATURE 70°F

SAMPLE TYPE:

GROUNDWATER ✓ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL _____ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 4.66 MEASUREMENT METHOD Top of PVC

DEPTH OF WELL ~68.5 MEASUREMENT METHOD Top of PVC

VOLUME REMOVED 130gal REMOVAL METHOD 2" Grundfos/2" bailer

FIELD TEST RESULTS:

COLOR clear pH 7.73 ODOR slight sulfer odor

TEMPERATURE (°F) ~~(°C)~~ 15.1 SPECIFIC CONDUCTANCE (umhos/cm) 1.01 ms/cm

OTHER (OVA, Methane meter, etc.) PID = 0 ppm Turbidity = 7 ntus

DO = 1.14 mg/l, Salinity = 0.04 %

CONSTITUENTS SAMPLED:

	CN-		
metals (Total and dissolved	P/P (608)	BNA (625	VOC (624)

REMARKS: _____

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW Dean S. / Keith R.

SAMPLE LOCATION/WELL NO. MW-4

FIELD SAMPLE I.D. NUMBER MW-4 DATE 9/30/98

TIME 800 am WEATHER cloudy, cool TEMPERATURE 60 °F

SAMPLE TYPE:

GROUNDWATER X SEDIMENT

SURFACE WATER/STREAM AIR

SOIL OTHER (Describe, i.e., septage, leachate)

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 4.77 MEASUREMENT METHOD water level meter

DEPTH OF WELL 12.00 MEASUREMENT METHOD water level meter

VOLUME REMOVED 18 gallons REMOVAL METHOD disposable bailer

FIELD TEST RESULTS:

COLOR Black pH 6.51 ODOR none

TEMPERATURE (~~F~~) C° 13.1 SPECIFIC CONDUCTANCE (umhos/cm) 3.91 ms/cm

OTHER (OVA, Methane meter, etc.) PID = 0.0 ppm, Do = 4.05 mg/l, Salinity = 0.19%
Turbidity = 257

CONSTITUENTS SAMPLED:

	BNA	VOCs	CN⁻
	Pest/PCBs	Metals (Total/dissolved)	

REMARKS: MS + MSD location

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW Keith R./Deans

SAMPLE LOCATION/WELLNO. MW-5

FIELD SAMPLE I.D. NUMBER MW-5 DATE 9/29/98

TIME 2:55 pm WEATHER Sunny/warm TEMPERATURE 75°F

SAMPLE TYPE:

GROUNDWATER X SEDIMENT

SURFACE WATER/STREAM AIR

SOIL OTHER (Describe, i.e., septage, leachate)

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 3.98 MEASUREMENT METHOD water level meter

DEPTH OF WELL 11.00 MEASUREMENT METHOD well const. Log

VOLUME REMOVED 18 gallons REMOVAL METHOD disposable bailer

FIELD TEST RESULTS:

COLOR Green-Black pH 6.70 ODOR —

TEMPERATURE (°F) (C) 14.4° SPECIFIC CONDUCTANCE (umhos/cm) 2.53 ms/cm

OTHER (OVA, Methane meter, etc.) P.ID = 1.1 ppm DO = 2.92 mg/l

Salinity = 0.12 % Turbidity = 185 ntu

CONSTITUENTS SAMPLED:

	CN	BNA	Pest/PCBs
	VOCs	metals (Total/dissolved)	

REMARKS:

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW Keith Robins / Dean Stahl

SAMPLE LOCATION/WELL NO. ~~MW-05A~~ OW-5A

FIELD SAMPLE I.D. NUMBER MW-5A DATE 9/30/98

TIME 1030 am WEATHER Cloudy, cool TEMPERATURE 66°F

SAMPLE TYPE:

GROUNDWATER X SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL _____ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 5.60' MEASUREMENT METHOD water level meter

DEPTH OF WELL 14.00 MEASUREMENT METHOD well const. Log

VOLUME REMOVED 21 gallons REMOVAL METHOD disposable bailer

FIELD TEST RESULTS:

COLOR Black-Green pH 6.49 ODOR Sulfer, slight petroleum

TEMPERATURE ~~(°F)~~ °C 14.2 SPECIFIC CONDUCTANCE (umhos/cm) 3.00 ms/cm

OTHER (OVA, Methane meter, etc.) PID = 10.9 ppm Turbidity = 25 ntus

Do = 3.08 mg/l, Salinity = 0.14%

CONSTITUENTS SAMPLED:

	VOCs	Pest/PCBs	CN^-
	BNA	Metals (Total/dissolved)	

REMARKS: _____

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tarpen Terminal SAMPLE CREW Dean S. Keith R.

SAMPLE LOCATION/WELL NO. MW-4

FIELD SAMPLE I.D. NUMBER MW-6 DATE 9/28/98

TIME 2:28 pm WEATHER Sunny TEMPERATURE 70°F

SAMPLE TYPE:

GROUNDWATER X SEDIMENT

SURFACE WATER/STREAM AIR

SOIL OTHER (Describe, i.e., septage, leachate)

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 5.98 MEASUREMENT METHOD water level meter

DEPTH OF WELL 12.5 MEASUREMENT METHOD water level meter

VOLUME REMOVED 13 gallons REMOVAL METHOD disposable bailer

FIELD TEST RESULTS:

COLOR Brown pH 6.64 ODOR no

TEMPERATURE (°C) 18.9 SPECIFIC CONDUCTANCE (umhos/cm) 1.19 ms/cm

OTHER (OVA, Methane meter, etc.) PID = 0.0 Turbidity = 240 ntu's

salinity = 0.05% DO = 4.08 mg/l

CONSTITUENTS SAMPLED:

CVOC metals (Total/dissolved) VOC (water)

P/P (water) BNA (water)

REMARKS:

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappen Terminal SAMPLE CREW Keith Robins / Dennis

SAMPLE LOCATION/WELLNO. MW-7A

FIELD SAMPLE I.D. NUMBER MW-7A DATE 9/28/98

TIME 3:00 pm WEATHER Sunny / warm TEMPERATURE 70°F

SAMPLE TYPE:

GROUNDWATER X SEDIMENT

SURFACE WATER/STREAM AIR

SOIL OTHER (Describe, i.e., septage, leachate)

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 6.67 MEASUREMENT METHOD water level meter

DEPTH OF WELL 14.5 MEASUREMENT METHOD water level meter

VOLUME REMOVED 18 gallons REMOVAL METHOD bailer disposable

FIELD TEST RESULTS:

COLOR Brown pH 6.84 ODOR slight sulfer

TEMPERATURE (~~°F~~ °C) 16.6 SPECIFIC CONDUCTANCE (umhos/cm) 6.19 ms/cm.

OTHER (OVA, Methane meter, etc.) DO = 3.00 mg/l Turbidity = 174 ntus
Salinity = 0.32 %

CONSTITUENTS SAMPLED:

CN
metals (Total and dissolved)
P/P
BNA
VOCs

REMARKS:

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW Stahl / Robins

SAMPLE LOCATION/WELLNO. OW-8

FIELD SAMPLE I.D. NUMBER OW-8 DATE 9/-24/94

TIME 10:35 am WEATHER Sunny - clear TEMPERATURE 70°F

SAMPLE TYPE:

GROUNDWATER X SEDIMENT

SURFACE WATER/STREAM AIR

SOIL OTHER (Describe, i.e., septage, leachate)

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 5.13' MEASUREMENT METHOD water level meter

DEPTH OF WELL 15 FT MEASUREMENT METHOD water level meter

VOLUME REMOVED 6 gallons REMOVAL METHOD disposable bailer

FIELD TEST RESULTS:

COLOR Brown pH 6.53 ODOR none

TEMPERATURE (°F) C° 16.5 SPECIFIC CONDUCTANCE (umhos/cm) 3.26 ms/cm

OTHER (OVA, Methane meter, etc.) well 0.8 ppm. Turbidity = 15 ntus

Dissolved oxygen = 5.41 mg/l, Salinity = 0.16 ppt

CONSTITUENTS SAMPLED:

	metals (Total/dissolved)	BNA	CN⁻
	VOCs	Pest/PCBs	

REMARKS:

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW Stahl / Robins

SAMPLE LOCATION/WELLNO. OW 9A

FIELD SAMPLE I.D. NUMBER OW 9A DATE 9/29/98

TIME 0940 hrs WEATHER Sunny / clear TEMPERATURE 65-70°F

SAMPLE TYPE:

GROUNDWATER X SEDIMENT

SURFACE WATER/STREAM AIR

SOIL OTHER (Describe, i.e., septage, leachate)

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 6.69' MEASUREMENT METHOD water level meter

DEPTH OF WELL 15' MEASUREMENT METHOD water level meter

VOLUME REMOVED 20 gallons REMOVAL METHOD disposable bailer

FIELD TEST RESULTS:

COLOR black pH 7.00 ODOR —

TEMPERATURE (°F) 17.4 SPECIFIC CONDUCTANCE (umhos/cm) 9.70 ms/cm

OTHER (OVA, Methane meter, etc.) Do = 2.92 mg/l, Salinity = 0.42%

PID = 1.4 ppm Turbidity = 81 ntus

CONSTITUENTS SAMPLED:

	P/P	BNA	CN⁻
	VOCs	Metals (Total/dissolved)	

REMARKS:

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW Stahl/Robins

SAMPLE LOCATION/WELL NO. MW-9A

FIELD SAMPLE I.D. NUMBER MW-9A DATE 9-28-98

TIME 13:45 WEATHER Sunny TEMPERATURE 70°F

SAMPLE TYPE:

GROUNDWATER ✓ SEDIMENT

SURFACE WATER/STREAM AIR

SOIL OTHER (Describe, i.e., septage, leachate)

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 7.05 MEASUREMENT METHOD water level meter

DEPTH OF WELL ~14 MEASUREMENT METHOD water level meter

VOLUME REMOVED 18.0 gal REMOVAL METHOD 3" disposable bailer

FIELD TEST RESULTS:

COLOR black pH 6.50 ODOR Sulfur

TEMPERATURE (°C) (°F) 16.9 SPECIFIC CONDUCTANCE (umhos/cm) 1.79 ms/cm

OTHER (OVA, Methane meter, etc.) PID = 1.0 ppm Turbidity >999 NTU

DO = 2.44 mg/l Salinity = 0.08%

CONSTITUENTS SAMPLED:

	CN⁻	D-metals	BNA
	metals	P/P	VOA

REMARKS:

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW Dean Stahl / Keith Robins

SAMPLE LOCATION/WELLNO. MW-10

FIELD SAMPLE I.D. NUMBER MW-10 DATE 9/29/98

TIME 11:45 WEATHER Sunny / clear TEMPERATURE 65-70°F

SAMPLE TYPE:

GROUNDWATER X SEDIMENT

SURFACE WATER/STREAM AIR

SOIL OTHER (Describe, i.e., septage, leachate)

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 4.79 MEASUREMENT METHOD water level meter

DEPTH OF WELL 14.00 MEASUREMENT METHOD water level meter

VOLUME REMOVED 18 gallons REMOVAL METHOD disposable bailer

FIELD TEST RESULTS:

COLOR Black pH 6.35 ODOR slight petroleum

TEMPERATURE (°F) 16.2 SPECIFIC CONDUCTANCE (umhos/cm) 1.76

OTHER (OVA, Methane meter, etc.) PID = 4.4 ppm in well

Turbidity 259 DO = 3.06 mg/l Salinity = 0.08%

CONSTITUENTS SAMPLED:

	CN	Pest/PCB	metals (Total/dissc
	BNA	VOCs	

REMARKS:

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE: Mapen Terminal SAMPLE CREW: Keith K. / Dean S.

SAMPLE LOCATION/WELL NO.: OW-12

FIELD SAMPLE I.D. NUMBER: OW-12 DATE: 9/29/98

TIME: 1:00 pm WEATHER: Sunny/warm TEMPERATURE: ______

SAMPLE TYPE:

GROUNDWATER: X SEDIMENT: ______

SURFACE WATER/STREAM: ______ AIR: ______

SOIL: ______ OTHER (Describe, i.e., septage, leachate): ______

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER: 7.92 MEASUREMENT METHOD: water level

DEPTH OF WELL: 17.50 MEASUREMENT METHOD: well construction

VOLUME REMOVED: 6 gallons REMOVAL METHOD: disposable bailer

FIELD TEST RESULTS:

COLOR: black-Green pH: 6.09 ODOR: H_2S

TEMPERATURE (°F) C°: 15.9 SPECIFIC CONDUCTANCE (umhos/cm): 2.26 ms/cm

OTHER (OVA, Methane meter, etc.): PID = 26 ppm DO = 3.25 mg/l

Salinity = 0.10 % Turbidity = 758 ntus

CONSTITUENTS SAMPLED:

______ ______ ______ ______

______ ______ ______ ______

REMARKS: ______

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW Stahl/Robins

SAMPLE LOCATION/WELLNO. MW-13

FIELD SAMPLE I.D. NUMBER MW-13 DATE 10-1-98

TIME 13:00 WEATHER P. Sunny TEMPERATURE 70°F

SAMPLE TYPE:

GROUNDWATER ✓ SEDIMENT

SURFACE WATER/STREAM AIR

SOIL OTHER (Describe, i.e., septage, leachate)

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 6.01 MEASUREMENT METHOD water level meter

DEPTH OF WELL ~15 MEASUREMENT METHOD water level meter

VOLUME REMOVED 6 gal REMOVAL METHOD 3" disp. bailer

FIELD TEST RESULTS:

COLOR black pH 6.02 ODOR pet/sulfur

TEMPERATURE ~~(°F)~~ °C 16.3 SPECIFIC CONDUCTANCE (umhos/cm) 0.553 ms/cm

OTHER (OVA, Methane meter, etc.) PID = 0.0 Bkgd and 1.9 ppm well

Salinity = 0.02% turbidity = 230 NTU DO = 2.32 mg/l

CONSTITUENTS SAMPLED:

	CN⁻	BNA	D-metals
	P/P	metals	VOA

REMARKS: well bailed dry at ~6 gallons

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW Stahl/Robins

SAMPLE LOCATION/WELLNO. MW-14

FIELD SAMPLE I.D. NUMBER MW-14 DATE 10-1-98

TIME 13:15 WEATHER P. Sun TEMPERATURE 70°F

SAMPLE TYPE:

GROUNDWATER ✓ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL _____ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 4.11 MEASUREMENT METHOD water level meter

DEPTH OF WELL 13.5 MEASUREMENT METHOD water level meter

VOLUME REMOVED 8 gal REMOVAL METHOD 3" disp. bailer

FIELD TEST RESULTS:

COLOR black pH 6.61 ODOR sulfur

TEMPERATURE (°C) 16.9 SPECIFIC CONDUCTANCE (umhos/cm) 1.00 mc/cm

OTHER (OVA, Methane meter, etc.) PID = 0.0 Bkgd and 1.3 ppm well

salinity = 0.05% turbidity = >999 NTU DO = 1.03 mg/l

CONSTITUENTS SAMPLED:

	CN-	P/P	D-metals
	BNA	metals	VOA

REMARKS: well bailed dry at ~8 gallons

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tuppen Terminal SAMPLE CREW Keith Robins / Dennis.

SAMPLE LOCATION/WELLNO. ~~MW-015~~ OW-15

FIELD SAMPLE I.D. NUMBER ~~MW-015~~ OW-15 DATE 9/28/98

TIME 1245 pm WEATHER Sunny / warm TEMPERATURE 70°F

SAMPLE TYPE:

GROUNDWATER X SEDIMENT

SURFACE WATER/STREAM AIR

SOIL OTHER (Describe, i.e., septage, leachate)

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 7.23' MEASUREMENT METHOD water level meter

DEPTH OF WELL 18.00' MEASUREMENT METHOD water level meter

VOLUME REMOVED 6 gallons REMOVAL METHOD bailer disposible

FIELD TEST RESULTS:

COLOR Brown pH 6.41 ODOR —

TEMPERATURE ~~(°F)~~ °C 17.7 SPECIFIC CONDUCTANCE (umhos/cm) 1.71 ms/cm

OTHER (OVA, Methane meter, etc.) PID = 0.3 ppm Turbidity = 98 ntus

Salinity = 0.07 % D_o = 2-61 mg/l

CONSTITUENTS SAMPLED:

CN metals (total / dissolved)

VOCs BNA Pest/PCBs

REMARKS:

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW K. Robins / D. Stahl

SAMPLE LOCATION/WELLNO. MW-15

FIELD SAMPLE I.D. NUMBER MW-15 DATE 9/29/94

TIME 12:20 pm WEATHER Sunny/clear TEMPERATURE 70°F

SAMPLE TYPE:

GROUNDWATER X SEDIMENT

SURFACE WATER/STREAM AIR

SOIL OTHER (Describe, i.e., septage, leachate)

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 5.29 MEASUREMENT METHOD water level meter

DEPTH OF WELL 14.00 MEASUREMENT METHOD water level meter

VOLUME REMOVED 18 gallons REMOVAL METHOD disposable bailer

FIELD TEST RESULTS:

COLOR Black-Gray pH 6.44 ODOR Slight petroleum

TEMPERATURE (~~°F~~ °C) 17.3 SPECIFIC CONDUCTANCE (umhos/cm) 1.13 ms/cm

OTHER (OVA, Methane meter, etc.) DO = 3.40 mg/l PID = 4.2 ppm

Salinity 0.05 % Turbidity = 450 ntus

CONSTITUENTS SAMPLED:

	CN	BNA	Metals (Total/dissolv.
	VOCs	Pest/PCBs	

REMARKS:

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappen Terminal SAMPLE CREW Dean Stahl / Keith R.

SAMPLE LOCATION/WELLNO. MW-16

FIELD SAMPLE I.D. NUMBER MW-16 DATE 10/1/98

TIME 11:00 am WEATHER cloudy / cool TEMPERATURE 50

SAMPLE TYPE:

GROUNDWATER X SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL _____ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 8.24 MEASUREMENT METHOD water level meter

DEPTH OF WELL 13.00 MEASUREMENT METHOD well const log

VOLUME REMOVED 18 gallons REMOVAL METHOD disposable bailer

FIELD TEST RESULTS:

COLOR Black pH 7.09 ODOR _____

TEMPERATURE (°F) (C) 16.3 SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) PID = 0.3 ppm DO = 5.88 mg/l

Salinity = 0.27% Turbidity 24 ntu

CONSTITUENTS SAMPLED:

_____	CN	metals (Total/dissolved)	
_____	VOA	BNA	Pest/PCBs

REMARKS: _____

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW Dean S./KeithR

SAMPLE LOCATION/WELL NO. OW-17

FIELD SAMPLE I.D. NUMBER OW-17 DATE 9/29/95

TIME 1300 pm WEATHER Sunny warm TEMPERATURE 75°F

SAMPLE TYPE:

GROUNDWATER X SEDIMENT

SURFACE WATER/STREAM AIR

SOIL OTHER (Describe, i.e., septage, leachate)

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 7.65 MEASUREMENT METHOD water level meter

DEPTH OF WELL ≈16.00 MEASUREMENT METHOD well const logs

VOLUME REMOVED 6.0 REMOVAL METHOD disposable bailer

FIELD TEST RESULTS:

COLOR Dark Black pH 5.87 ODOR Petroleum

TEMPERATURE (~~°F~~) 17.3° SPECIFIC CONDUCTANCE (umhos/cm) 3.47

OTHER (OVA, Methane meter, etc.) PID = 2.6 ppm Turbidity = 470 ntus

DO = 1.99 mg/l Salinity = 0.17 %

CONSTITUENTS SAMPLED:

	Cn-	BNA	metals (Total/dissolved)
	VOCs	Pest/PCB	

REMARKS:

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappen Terminal SAMPLE CREW Keith Robins / Dean Stahl

SAMPLE LOCATION/WELLNO. MW-17

FIELD SAMPLE I.D. NUMBER MW-17 DATE 9/30/98

TIME _____ WEATHER cloudy TEMPERATURE 65°F

SAMPLE TYPE:

GROUNDWATER X SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL _____ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 8.03 MEASUREMENT METHOD water level meter

DEPTH OF WELL 16.00 MEASUREMENT METHOD well const. Log

VOLUME REMOVED 18 gallons REMOVAL METHOD disposable bailer

FIELD TEST RESULTS:

COLOR Black pH 7.07 ODOR Sulfer

TEMPERATURE ~~(°F)~~ °C 17.2 SPECIFIC CONDUCTANCE (umhos/cm) 5.78 ms/cm

OTHER (OVA, Methane meter, etc.) PID = 1.9 ppm Salinity = 0.30 ppt

D.O. = 2.83 mg/l Turbidity = 764 ntus

CONSTITUENTS SAMPLED:

_____	Cn^-	BNA	metals (Total/dissolved
_____	VOCs	Pest/PCBs	_____

REMARKS: _____

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappen Terminal SAMPLE CREW Keith Robins/Dean Stahl

SAMPLE LOCATION/WELLNO. OW-19A

FIELD SAMPLE I.D. NUMBER OW-19A DATE 9/30/98

TIME 1250 pm WEATHER Cloudy/cool TEMPERATURE 65°F

SAMPLE TYPE:

GROUNDWATER X SEDIMENT

SURFACE WATER/STREAM AIR

SOIL OTHER (Describe, i.e., septage, leachate)

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 3.41 MEASUREMENT METHOD water level meter

DEPTH OF WELL 11.35' MEASUREMENT METHOD water level meter

VOLUME REMOVED 18 gallons REMOVAL METHOD disposable bailer

FIELD TEST RESULTS:

COLOR Black Tint pH 6.84 ODOR Sulfur

TEMPERATURE ~~(°F)~~ (°C) 20.1 SPECIFIC CONDUCTANCE (umhos/cm) 3.92

OTHER (OVA, Methane meter, etc.) PID = 5.6 ppm Turbidity = 583 ntus

DO = 1.18 mg/l Salinity = %

CONSTITUENTS SAMPLED:

	BNA	metals (Total/dissolved)	Pest/PCBs
	SVOCs	CN⁻	

REMARKS:

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappen Terminal SAMPLE CREW Keith Robins / Dean S.

SAMPLE LOCATION/WELLNO. OW-20

FIELD SAMPLE I.D. NUMBER OW-20 DATE 9/30/98

TIME 1215 pm WEATHER cloudy, cool TEMPERATURE

SAMPLE TYPE:

GROUNDWATER X SEDIMENT

SURFACE WATER/STREAM AIR

SOIL OTHER (Describe, i.e., septage, leachate)

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 6.67 MEASUREMENT METHOD water level meter

DEPTH OF WELL 14.00 MEASUREMENT METHOD well const. log.

VOLUME REMOVED 6 gallons REMOVAL METHOD disposable bailer

FIELD TEST RESULTS:

COLOR Black pH 6.84 ODOR Sulfer odor

TEMPERATURE ~~(°F)~~ (°C) 17.7° SPECIFIC CONDUCTANCE (umhos/cm) 1.20 ms/cm

OTHER (OVA, Methane meter, etc.) PID = 1.3 ppm Turbidity = >999

DO = 3.68 mg/l, Salinity = 0.05%

CONSTITUENTS SAMPLED:

	CN⁻	Pest/PCBs	metals (total/dissolved)
	BNA	VOCs	

REMARKS:

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW Keith R. / Deans

SAMPLE LOCATION/WELLNO. MW 25

FIELD SAMPLE I.D. NUMBER OW-25 DATE 9/30/98

TIME 1135 WEATHER Cool, cloudy TEMPERATURE 65°F

SAMPLE TYPE:

GROUNDWATER X SEDIMENT

SURFACE WATER/STREAM AIR

SOIL OTHER (Describe, i.e., septage, leachate)

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 4.44 MEASUREMENT METHOD water level meter

DEPTH OF WELL 13.00 MEASUREMENT METHOD water level meter

VOLUME REMOVED 6 gallons REMOVAL METHOD disposable bailer

FIELD TEST RESULTS:

COLOR Cloudy - LT Black Tint pH 6.76 ODOR solvent odor

TEMPERATURE ~~(°F)~~ °C 15.9 SPECIFIC CONDUCTANCE (umhos/cm) 4.06 ms/cm

OTHER (OVA, Methane meter, etc.) PID = 1.9 ppm Turbidity = 19 ntus

DO = 5.10 mg/l Salinity = 0.20 o/o

CONSTITUENTS SAMPLED:

	CN	Pest/PCBs	VOCs
	BNA	Metals (Total/dissolved)	

REMARKS:

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW Stahl/Robbins

SAMPLE LOCATION/WELL NO. OW-26

FIELD SAMPLE I.D. NUMBER OW-26 DATE 10-1-98

TIME 12:45 WEATHER P. Sun TEMPERATURE 70°F

SAMPLE TYPE:

GROUNDWATER ✓ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL _____ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 3.86 MEASUREMENT METHOD water level meter

DEPTH OF WELL n/3 MEASUREMENT METHOD water level meter

VOLUME REMOVED _____ REMOVAL METHOD 2" disp. bailer

FIELD TEST RESULTS:

COLOR black pH 6.63 ODOR none

TEMPERATURE (°C) 14.1 SPECIFIC CONDUCTANCE (umhos/cm) 6.91 ms/cm

OTHER (OVA, Methane meter, etc.) PID = 0.0 ppm Bkgd and 0.0 ppm well

Salinity = 0.36% Turbidity = 183 NTU DO = 4.35 mg/l

CONSTITUENTS SAMPLED:

	CN	P/P	metals
	BNA	VOA	D-metals

REMARKS: _____

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW Stahl/Robins

SAMPLE LOCATION/WELLNO. OW-27A

FIELD SAMPLE I.D. NUMBER OW-27A DATE 9/29/98

TIME 855cm WEATHER Sunny TEMPERATURE 65°F

SAMPLE TYPE:

GROUNDWATER ✓ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL _____ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 4.58' MEASUREMENT METHOD Water level meter

DEPTH OF WELL 11.5' MEASUREMENT METHOD water level meter

VOLUME REMOVED 18 gallons REMOVAL METHOD disposable bailer

FIELD TEST RESULTS:

COLOR brown-green pH 6.46 ODOR Sulfer

TEMPERATURE (°F) 19.6 SPECIFIC CONDUCTANCE (umhos/cm) 4.91 ms/cm

OTHER (OVA, Methane meter, etc.) PID = 1.5 ppm. Turbidity = 14 ntus

Do = 2.65 mg/l, Salinity = 0.25%

CONSTITUENTS SAMPLED:

	T. Metals	BNA	VOC
	D. Metals	P/P	

REMARKS: _____

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW Keith R. / Dean Stahl

SAMPLE LOCATION/WELL NO. LMS-1

FIELD SAMPLE I.D. NUMBER LMS-1 DATE 10/2/98

TIME -- WEATHER cool, cloudy TEMPERATURE 50°F-60°F

SAMPLE TYPE:

GROUNDWATER X SEDIMENT

SURFACE WATER/STREAM AIR

SOIL OTHER (Describe, i.e., septage, leachate)

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 6.52' MEASUREMENT METHOD water level meter

DEPTH OF WELL 14.00' MEASUREMENT METHOD well const. Log

VOLUME REMOVED 6 gallons REMOVAL METHOD disposable bailer

FIELD TEST RESULTS:

COLOR Blue-Green pH 6.13 ODOR Sulfur

TEMPERATURE (°F) (°C) 18.9 SPECIFIC CONDUCTANCE (umhos/cm) 2.73

OTHER (OVA, Methane meter, etc.) DO = 4.36 mg/l Turbidity = 87 ntus

PID = 1.5 ppm Salinity = 0.13 %

CONSTITUENTS SAMPLED:

	BNA	VOCs	~~Metals~~
	Pest/PCBs	Metals (Total/dissolved)	CN-

REMARKS:

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappen Terminal SAMPLE CREW Keith Robins / Dean Stahl

SAMPLE LOCATION/WELLNO. LMS-2

FIELD SAMPLE I.D. NUMBER LMS-2 DATE 10/02/98

TIME 1035 hrs WEATHER cloudy cool TEMPERATURE 60°F

SAMPLE TYPE:

GROUNDWATER X SEDIMENT

SURFACE WATER/STREAM AIR

SOIL OTHER (Describe, i.e., septage, leachate)

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 8.48' MEASUREMENT METHOD water level meter

DEPTH OF WELL 15.00 MEASUREMENT METHOD water level meter

VOLUME REMOVED 6 gallons REMOVAL METHOD disposable bailer

FIELD TEST RESULTS:

COLOR Black pH 5.15 ODOR very strong petroleum

TEMPERATURE (°F) 18.7 SPECIFIC CONDUCTANCE (umhos/cm)

OTHER (OVA, Methane meter, etc.) PID = (178 ppm in well) Turbidity = 150 ntus

DO = 2.18 mg/l Salinity = 0.22%

CONSTITUENTS SAMPLED:

	TPHC	BNA	metals (Total/dissd
	VOCs	Pest/PCBs	CN-

REMARKS: noticeable oil sheen / floating product on water

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappen Terminal SAMPLE CREW Keith R. / Dean S.

SAMPLE LOCATION/WELL NO. LMS-3

FIELD SAMPLE I.D. NUMBER LMS-3 DATE 10/2/98

TIME 0945 am WEATHER cool, cloudy TEMPERATURE 55-60°F

SAMPLE TYPE:

GROUNDWATER X SEDIMENT

SURFACE WATER/STREAM AIR

SOIL OTHER (Describe, i.e., septage, leachate)

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 7.20 MEASUREMENT METHOD water level meter

DEPTH OF WELL 15.25' MEASUREMENT METHOD WATER level meter

VOLUME REMOVED 6 gallons REMOVAL METHOD disposable bailer

FIELD TEST RESULTS:

COLOR LT Brown pH 6.07 ODOR sulfer slight

TEMPERATURE (°C) 20.7 SPECIFIC CONDUCTANCE (umhos/cm) .693

OTHER (OVA, Methane meter, etc.) DO = 3.62 mg/l Turbidity = 66 mtrs

PID = 0.2ppm Salinity = 0.02 o/o

CONSTITUENTS SAMPLED:

	BNA	metals (Total / dissolved)	
	VOCs	Pest / PCBs	CN

REMARKS:

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tuppan Terminal SAMPLE CREW Stahl/Robbins

SAMPLE LOCATION/WELL NO. LMS-4

FIELD SAMPLE I.D. NUMBER LMS-4 DATE 10-1-98

TIME 14:10 WEATHER P. Sun TEMPERATURE 70°F

SAMPLE TYPE:

GROUNDWATER ✓ SEDIMENT

SURFACE WATER/STREAM AIR

SOIL OTHER (Describe, i.e., septage, leachate)

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 3.79 MEASUREMENT METHOD water level meter

DEPTH OF WELL ~13 MEASUREMENT METHOD water level meter

VOLUME REMOVED 6 gal REMOVAL METHOD 2" d.3p. bailer

FIELD TEST RESULTS:

COLOR brown pH 6.94 ODOR none

TEMPERATURE (°C) 19.8 SPECIFIC CONDUCTANCE (umhos/cm) 1.60 ms/cm

OTHER (OVA, Methane meter, etc.) PID = 0.0 ppm Bkgd and 0.0 ppm well

Salinity = 0.07% Turbidity = 58 NTU DO = 4.10 mg/l

CONSTITUENTS SAMPLED:

	CN^-	P/P	metals
	BNA	VOA	D-metals

REMARKS:

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	~~2-1/2" = 0.24~~	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW Stahl/Robins

SAMPLE LOCATION/WELLNO. LMS-5

FIELD SAMPLE I.D. NUMBER LMS-5 DATE 10-1-98

TIME 14:45 WEATHER P. Sun TEMPERATURE 70°F

SAMPLE TYPE:

GROUNDWATER ✓ SEDIMENT

SURFACE WATER/STREAM AIR

SOIL OTHER (Describe, i.e., septage, leachate)

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 3.85 MEASUREMENT METHOD water level meter

DEPTH OF WELL ~13 MEASUREMENT METHOD water level meter

VOLUME REMOVED 6 gal REMOVAL METHOD disposable bailer

FIELD TEST RESULTS:

COLOR brown pH 7.02 ODOR petro

TEMPERATURE (°C) 16.5 SPECIFIC CONDUCTANCE (umhos/cm) 6.47 ms/cm

OTHER (OVA, Methane meter, etc.) PID = 0.0 ppm Bkgd and 135 ppm well
Salinity = 0.34% Turbidity = 212 NTU DO = 4.61 mg/l

CONSTITUENTS SAMPLED:

	CN⁻	P/P	metals
	BNA	VOA	D-metals

REMARKS:

BNA bottle broken during shipment to laboratory. LMS-5 resampled for BNA on 10-7-98 at 09:17 after repurging.

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW Dennstahl / Keith R.

SAMPLE LOCATION/WELLNO. LMS-6

FIELD SAMPLE I.D. NUMBER LMS-2 DATE 10/2/98

TIME 800 am WEATHER cool, cloudy TEMPERATURE 50-60

SAMPLE TYPE:

GROUNDWATER X SEDIMENT

SURFACE WATER/STREAM AIR

SOIL OTHER (Describe, i.e., septage, leachate)

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 5.51 MEASUREMENT METHOD Water level meter

DEPTH OF WELL 13.00 MEASUREMENT METHOD well const Log

VOLUME REMOVED 6 gallons REMOVAL METHOD disposable bailer

FIELD TEST RESULTS:

COLOR Brown pH 6.83 ODOR ND

TEMPERATURE (°F) (C°) 18.0 SPECIFIC CONDUCTANCE (umhos/cm) 1.48 ms/cm

OTHER (OVA, Methane meter, etc.) PID = 0.0 ppm DO 5.01 mg/l

Salinity = 0.06 o/oo Turbidity = 77 ntus

CONSTITUENTS SAMPLED: CN⁻ metals (Total/dissolved)

VOCs BNA PEST/PCBs

REMARKS:

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tuppen Terminal SAMPLE CREW Keith Robins / Dem Stahl

SAMPLE LOCATION/WELLNO. LMS-7

FIELD SAMPLE I.D. NUMBER LMS-7 DATE 10/2/98

TIME 0835 am WEATHER cloudy, cool TEMPERATURE 50-60°F

SAMPLE TYPE:

GROUNDWATER X SEDIMENT

SURFACE WATER/STREAM AIR

SOIL OTHER (Describe, i.e., septage, leachate)

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 9.48' MEASUREMENT METHOD Water level meter

DEPTH OF WELL 15.00' MEASUREMENT METHOD well const. Log

VOLUME REMOVED 6 gallons REMOVAL METHOD disposable bailer

FIELD TEST RESULTS:

COLOR brown-LT Black pH 6.93 ODOR Strong sulfur

TEMPERATURE (°F) 19.1 SPECIFIC CONDUCTANCE (umhos/cm) 10.5 ms/cm

OTHER (OVA, Methane meter, etc.) PID = 0.0 Turbidity = 45 nTUs

DO = 2.91 mg/l Salinity = 0.59 %

CONSTITUENTS SAMPLED: Cn⁻ Pest/PCBs metals (Total/dissol

VOCs BNA

REMARKS:

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW Stahl/Robbins

SAMPLE LOCATION/WELLNO. LMS-8R

FIELD SAMPLE I.D. NUMBER LMS-8R DATE 10-1-98

TIME 15:15 WEATHER P. Sun TEMPERATURE 70°F

SAMPLE TYPE:

GROUNDWATER ✓ SEDIMENT

SURFACE WATER/STREAM AIR

SOIL OTHER (Describe, i.e., septage, leachate)

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER 4.13 MEASUREMENT METHOD water level meter

DEPTH OF WELL ~12 MEASUREMENT METHOD water level meter

VOLUME REMOVED 18 gal REMOVAL METHOD 3" disp. bailer

FIELD TEST RESULTS:

COLOR black pH 6.68 ODOR petrol

TEMPERATURE (~~°F~~ °C) 19.9 SPECIFIC CONDUCTANCE (umhos/cm) 4.68 ms/cm

OTHER (OVA, Methane meter, etc.) PID = 0.0 ppm Bkgd and 0.0 ppm well

Salinity = 0.24% Turbidity = 7999 NTU DO = 3.10 mg/l

CONSTITUENTS SAMPLED:

	CN-	P/P	metals
	BNA	VOA	D-metals

REMARKS:

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

Direct Push Groundwater Sampling

ICM Laboratories
1152 Route 10, Randolph, NJ 07869
201-584-0330 Fax: 201-584-0515

Chain of Custody

NJ Certification #14116

Client: Durka + Bartilucci, PC
Address: 3879 Fishee Road, E. Syracuse, NY 13057
Phone #: (315) 437-1142
Project: Tappan Terminal Site
Project Mgr: Gerry Gould
Invoice to: Gerry Gould
Report to: Gerry Gould
 # Copies: 2 Bound/(Unbound)

Deliverables:
___ NJ Reduced (Non CLP)
___ NJ Regulatory
___ Reduced (CLP) ___ Full (CLP)
___ NPDES
___ PA: ___ Std. ___ Reduced I
___ NY: ___ ASPA ✓ ASPB ___ CLP
___ State Specific: _____
___ Results Only

SRP Diskette: Yes ✓ No ___
SRP #: _____

Turnaround Required:
Fax Preliminary: _____
Hard Copy: _____

Additional Information:
___ State Forms Required
___ NJ Cleanup Levels Required
___ NJ Groundwater Quality Stds. Required
___ State Specific Levels Required: _____

Expected Sample Concentration:
High ___ Medium ✓ Low ✓
Known Hazard: chlorobenzene, petroleum

Lab #	Sample Identification	Sample Date/Time	Composite	Grab	Soil	Aqueous	Other	# Bottles	Analysis/Method/Pollutant List: VOA	BNA	P/P	Total Metals	Filtered * Metals	Cyanide				Preservation: H_2SO_4	HNO_3	HCl	NaOH	Other
	GW-1	10-6-98/12:50		✓		✓		8	3	1	1	1	1	1					2	3	1	
	GW-2	" /13:50		✓		↓		↓	↓	↓	↓	↓	↓	↓					↓	↓	↓	
	GW-3	" /15:50		✓																		
	GW-5	" /14:45		✓																		
	GW-4	10/6/ 17:45		✓		✓		8	3	1	1	1	1	1								

Samples have been collected, preserved & handled in accordance with NJAC 7:18

Sampled by:	Dan Stahl	Date/Time:	10-6-98/18:00
Relinquished by:	Dan Stahl	Date/Time:	10-6-98/19:00
Received by:	Fed-X	Date/Time:	10-6-98/19:00
Relinquished by:		Date/Time:	
Received by:		Date/Time:	
Relinquished by:		Date/Time:	
Received by:		Date/Time:	

Comments: TCL+30 compounds: VOA, BNA, P/P, metals, filtered metals, cyanide
*field filtered

If analysis is for informational purposes only, please sign the following:
"Analysis is for informational purposes, not to be used for compliance or regulatory purposes." _____

Cooler Temp: _____ Condition: Intact/Broken/Leaking
Custody Seals: ___ Present ___ Absent Seal #: _____

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould / D. Stahl

SAMPLE LOCATION/WELLNO. GW-1

FIELD SAMPLE I.D. NUMBER GW-1 DATE 10/6/98

TIME 12:50 WEATHER Sunny TEMPERATURE 60°F

SAMPLE TYPE:

GROUNDWATER ✓ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL _____ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL n/a MEASUREMENT METHOD n/a

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS:

COLOR brown pH 6.87 ODOR none

TEMPERATURE (°F) 20.3 SPECIFIC CONDUCTANCE (~~umhos/cm~~) 19.1 mS/cm

OTHER (OVA, Methane meter, etc.) PID = 29.9 ppm in well

CONSTITUENTS SAMPLED:

	TCL TAL	filtered metals	

REMARKS: temp. well, 2½ gallons purged
MS/MSD collected here

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Taffan Terminal SAMPLE CREW G. Gauld / D. Stahl

SAMPLE LOCATION/WELLNO. GW-2

FIELD SAMPLE I.D. NUMBER GW-2 DATE 10/6/98

TIME 13:50 WEATHER sunny TEMPERATURE 60° F

SAMPLE TYPE:

GROUNDWATER ✓ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL _____ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL n/a MEASUREMENT METHOD n/a

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS:

COLOR clear pH 6.36 ODOR sulfer odor

TEMPERATURE (°F) 15.6 SPECIFIC CONDUCTANCE (~~umhos/cm~~) mS/cm 1.89

OTHER (OVA, Methane meter, etc.) PID = 0.0 ppm

CONSTITUENTS SAMPLED:

_____ TCL+TO filtered metals _____

_____ _____ _____ _____

REMARKS: deep gw sample from top of marine silt layer at 16'

WELL CASING VOLUMES				
GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould / D. Stahl

SAMPLE LOCATION/WELLNO. GW-3

FIELD SAMPLE I.D. NUMBER GW-3 DATE 10/6/98

TIME 15:50 WEATHER Sunny TEMPERATURE 60° F

SAMPLE TYPE:

GROUNDWATER ✓ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL _____ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL n/a MEASUREMENT METHOD n/a

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS:

COLOR gray-brown pH 7.12 ODOR slight sulfer odor

TEMPERATURE (°F) 21° SPECIFIC CONDUCTANCE (~~umhos/cm~~) 5.26 mS/cm

OTHER (OVA, Methane meter, etc.) n/a

CONSTITUENTS SAMPLED: TCL+30 filtered metals _____

_____ _____ _____ _____

REMARKS: _____

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould / D Stahl

SAMPLE LOCATION/WELLNO. GW-4

FIELD SAMPLE I.D. NUMBER GW-4 DATE 10/6/98

TIME 17:45 WEATHER Sunny TEMPERATURE 52°F

SAMPLE TYPE:

GROUNDWATER ✓ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL _____ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL n/a MEASUREMENT METHOD n/a

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS:

COLOR gray pH na ODOR none

TEMPERATURE (°F) n/a SPECIFIC CONDUCTANCE (umhos/cm) na

OTHER (OVA, Methane meter, etc.) na

CONSTITUENTS SAMPLED:

	TCL+TO	filtered metals	

REMARKS: low yield prevented field parameter values

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould / D Stahl

SAMPLE LOCATION/WELLNO. GW-5

FIELD SAMPLE I.D. NUMBER GW-5 DATE 10/6/98

TIME 14:45 WEATHER Sunny TEMPERATURE 55°F

SAMPLE TYPE:

GROUNDWATER ✓ SEDIMENT _____

SURFACE WATER/STREAM _____ AIR _____

SOIL _____ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL n/a MEASUREMENT METHOD n/a

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS:

COLOR gray brown pH 7.15 ODOR slight petroleum

TEMPERATURE (°F) 59.6 SPECIFIC CONDUCTANCE (umhos/cm) 1.37 mS/cm

OTHER (OVA, Methane meter, etc.) _____

CONSTITUENTS SAMPLED:

	TCLP30	filtered metals	

REMARKS: _____

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

Surface Water Sediment Sampling

ICM Laboratories
1152 Route 10, Randolph, NJ 07869
201-584-0330 Fax: 201-584-0515

Chain of Custody

NJ Certification #14116

Client: Dvirka & Bartilucci
Address: PO Box 56, 5879 Fisher Rd, E. Syracuse, NY 13057
Phone #: 315 437-1142
Project: Tappan Terminal
Project Mgr: Gerry Gould
Invoice to: Gerry Gould
Report to: Gerry Gould
 # Copies: 2 Bound/(Unbound)

Deliverables:
___ NJ Reduced (Non CLP)
___ NJ Regulatory
___ Reduced (CLP) ___ Full (CLP)
___ NPDES
___ PA: ___ Std. ___ Reduced I
✓ NY: ___ ASPA ✓ ASPB ___ CLP
___ State Specific: _____
___ Results Only

SRP Diskette: Yes ✓ No ___
SRP #: _____

Turnaround Required:
Fax Preliminary: _____
Hard Copy: _____

Additional Information:
___ State Forms Required
___ NJ Cleanup Levels Required
___ NJ Groundwater Quality Stds. Required
___ State Specific Levels Required: _____

Expected Sample Concentration:
High ___ Medium ___ Low ___
Known Hazard: _____

Lab #	Sample Identification	Sample Date/Time	Composite	Grab	Soil	Aqueous	Other	# Bottles	Analysis/Method/Pollutant List: VOCs	SVOCs, PAHs, PCBs	Preservation: H_2SO_4	HNO_3	HCl	NaOH	Other
	SD-1	11/5/98 11:41		✓				2	✓	✓					
	SD-2	11:47		✓											
	SD-3	11:52		✓											
	SD-4	11:58		✓											
	SD-5/MS/MSD	12:02		✓				6							
	SD-6	12:07		✓											
	SD-7	12:14		✓											
	SD-8	12:45		✓											
	SD-9	13:00		✓											
	SD-10	13:05		✓				↓	↓	↓					

Samples have been collected, preserved & handled in accordance with NJAC 7:18

Sampled by: _____ Date/Time: 11/5/98 13:40
Relinquished by: _____ Date/Time: 11/5/98 16:00
Received by: FED EX Date/Time: 11/5/98
Relinquished by: _____ Date/Time: _____
Received by: _____ Date/Time: _____
Relinquished by: _____ Date/Time: _____
Received by: _____ Date/Time: _____

Comments: _____

If analysis is for informational purposes only, please sign the following:
"Analysis is for informational purposes, not to be used for compliance or regulatory purposes." _____

Cooler Temp: _____ Condition: Intact/Broken/Leaking
Custody Seals: ___ Present ___ Absent Seal #: _____

ICM Laboratories
1152 Route 10, Randolph, NJ 07869
201-584-0330 Fax: 201-584-0515

Chain of Custody

NJ Certification #14116

Client: D&B
Address: 5879 Fifth Rd
Phone #: 315 437-1142
Project:
Project Mgr: G. Gould
Invoice to:
Report to:
 # Copies: _____ Bound/Unbound

Deliverables:
___ NJ Reduced (Non CLP)
___ NJ Regulatory
___ Reduced (CLP) ___ Full (CLP)
___ NPDES
___ PA: ___ Std. ___ Reduced I
___ NY: ___ ASPA ___ ASPB ___ CLP
___ State Specific: _____
___ Results Only

SRP Diskette: Yes___ No___
SRP #: _____

Turnaround Required:
Fax Preliminary: _____
Hard Copy: _____

Additional Information:
___ State Forms Required
___ NJ Cleanup Levels Required
___ NJ Groundwater Quality Stds. Required
___ State Specific Levels Required: _____

Expected Sample Concentration:
High ___ Medium ___ Low ___
Known Hazard: _____

Lab #	Sample Identification	Sample Date/Time	Composite	Grab	Soil	Aqueous	Other	# Bottles	Analysis/Method/Pollutant List: VOCs	SVOCs P/ABs	Preservation: H_2SO_4	HNO_3	HCl	NaOH	Other
	SD-11	11/5/98 13:19		✓				2	✓	✓					
	SD-12	13:30		✓				2	✓	✓					
	Trip Blank gg 11/6/98								✓						

Samples have been collected, preserved & handled in accordance with NJAC 7:18

Sampled by: G. Gould Date/Time: 11/5/98 13:40
Relinquished by: G. Gould Date/Time: 11/5/98 16:00
Received by: FEDEX Date/Time: 11/5/98
Relinquished by: _____ Date/Time: _____
Received by: _____ Date/Time: _____
Relinquished by: _____ Date/Time: _____
Received by: _____ Date/Time: _____

Comments:

If analysis is for informational purposes only, please sign the following:
"Analysis is for informational purposes, not to be used for compliance or regulatory purposes." _____

Cooler Temp: _____ **Condition:** Intact/Broken/Leaking
Custody Seals: ___ Present ___ Absent **Seal #:** _____

FedEx USA Airbill FedEx Tracking Number 801182370175

0200 Form I.D. No.

SLA11

Sender's Copy

1 From (please print and press hard)

Date 11/5/98 Sender's FedEx Account Number 1245-6133-7

Sender's Name Gerry Gould Phone (315) 437-1142

Company DVIRKA AND BARTILUCCI

Address 5879 FISHER RD Dept./Floor/Suite/Room

City EAST SYRACUSE State NY ZIP 13057

2 Your Internal Billing Reference Information (Optional) (First 24 characters will appear on invoice) 1570 - Sediment Samples

3 To (please print and press hard)

Recipient's Name Sample Control Phone (201) 584-0330

Company ICM Laboratories

Address 1152 Route 10 Dept./Floor/Suite/Room
(To "HOLD" at FedEx location, print FedEx address here) (We Cannot Deliver to P.O. Boxes or P.O. ZIP Codes)

City Randolph State NJ ZIP 07869

☐ Check here if residence (Extra charge applies for FedEx Express Saver)

For HOLD at FedEx Location check here
☐ Hold Weekday (Not available with FedEx First Overnight) ☐ Hold Saturday (Not available at all locations) (Available for FedEx Priority Overnight and FedEx 2Day only)

For Saturday Delivery check here
☐ (Extra Charge. Not available to all locations) (Available for FedEx Priority Overnight and FedEx 2Day only)

4a Express Package Service *Packages under 150 lbs.* Delivery commitment may be later in some areas.

☑ FedEx Priority Overnight (Next business morning) ☐ FedEx Standard Overnight (Next business afternoon) ☐ FedEx 2Day* (Second business day) ☐ FedEx Express Saver* (Third business day)

☐ FedEx First Overnight (Earliest next business morning delivery to select locations) (Higher rates apply)

*FedEx Letter Rate not available. Minimum charge. One pound rate.

4b Express Freight Service *Packages over 150 lbs.* Delivery commitment may be later in some areas.

☐ FedEx Overnight Freight (Next business day) ☐ FedEx 2Day Freight (Second business day) ☐ FedEx Express Saver Freight (Up to 3 business days)

(Call for delivery schedule. See back for detailed descriptions of freight services.)

5 Packaging ☐ FedEx Letter ☐ FedEx Pak (Declared value limit $500) ☐ FedEx Box ☐ FedEx Tube ☑ Other Pkg.

6 Special Handling

Does this shipment contain dangerous goods? ☐ Yes (As per attached Shipper's Declaration) ☐ Yes (Shipper's Declaration not required)

☐ Dry Ice Dry Ice, 9, UN 1845 lb. _____ x _____ kg. 904 (Dangerous Goods Shipper's Declaration not required)

CA ☐ Cargo Aircraft Only

7 Payment

Bill to: ☑ Sender (Account no. in section 1 will be billed) ☐ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check (Enter FedEx account no. or Credit Card no. below)

FedEx Account No. _____ Exp. Date _____

Credit Card No. _____

Total Packages	Total Weight	Total Declared Value*	Total Charges
1	52	$ .00	$

*When declaring a value higher than $100 per shipment, you pay an additional charge. See SERVICE CONDITIONS, DECLARED VALUE, AND LIMIT OF LIABILITY section for further information

8 Release Signature *Sign to authorize delivery without obtaining signature*

Your signature authorizes Federal Express to deliver this shipment without obtaining a signature and agrees to indemnify and hold harmless Federal Express from any resulting claims.

287

WCSL 0897
Rev. Date 5/97
Part #150JE4
©1994-97 FedEx
PRINTED IN U.S.A.

Service Conditions, Declared Value, and Limit of Liability – By using this Airbill, you agree to the service conditions in our current Service Guide or U.S. Government Service Guide. Both are available on request. SEE BACK OF SENDER'S COPY OF THIS AIRBILL FOR INFORMATION AND ADDITIONAL TERMS. We will not be responsible for any claim in excess of $100 per package whether the result of loss, damage, or delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, and document your actual loss in a timely manner. Your right to recover from us for any loss includes intrinsic value of the package, loss of sales, interest, profit, attorney's fees, costs, and other forms of damage, whether direct, incidental, consequential, or special, and is limited to the greater of $100 or the declared value but cannot exceed actual documented loss. The maximum declared value for any FedEx Letter and FedEx Pak is $500. Federal Express may, upon your request, and with some limitations, refund all transportation charges paid. See the FedEx Service Guide for further details.

Questions?
Call 1·800·Go·FedEx (800)463-3339

The World On Time

003253734 7

Tappan Terminal Sediment Samples

RETAIN THIS COPY FOR YOUR RECORDS

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G-Gould

SAMPLE LOCATION/WELL NO. SD - 1

FIELD SAMPLE I.D. NUMBER SD - 1 DATE 11/5/98

TIME 11:41 WEATHER Sunny TEMPERATURE 50°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT ✓

SURFACE WATER/STREAM _____ AIR _____

SOIL _____ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL n/a MEASUREMENT METHOD n/a

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS:

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) PID = 0.0 ppm

CONSTITUENTS SAMPLED: VOCs SVOCs PI/PCBs

REMARKS: 5.8' deep
soft gray & black silt

WELL CASING VOLUMES				
GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Taffan Terminal SAMPLE CREW G. Gould

SAMPLE LOCATION/WELLNO. SD - 2

FIELD SAMPLE I.D. NUMBER SD - 2 DATE 11/5/98

TIME 11:47 WEATHER Sunny TEMPERATURE 50°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT ✓

SURFACE WATER/STREAM _____ AIR _____

SOIL _____ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER n/a MEASUREMENT METHOD n/a

DEPTH OF WELL n/a MEASUREMENT METHOD n/a

VOLUME REMOVED n/a REMOVAL METHOD n/a

FIELD TEST RESULTS:

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) PID = ppm

CONSTITUENTS SAMPLED: VOCs SVOCs PI PCBs

REMARKS: 6.6' feet deep
soft gray & black silt

WELL CASING VOLUMES				
GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould

SAMPLE LOCATION/WELL NO. SD - 3

FIELD SAMPLE I.D. NUMBER SD - 3 DATE 11/5/98

TIME 1152 WEATHER Sunny TEMPERATURE 50° F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT ✓

SURFACE WATER/STREAM _____ AIR _____

SOIL _____ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL n/a MEASUREMENT METHOD n/a

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS:

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) PID = 0.0 ppm

CONSTITUENTS SAMPLED: VOCs SVOCs PI PCBs

REMARKS: depth: 190' ≈ 15.8' deep
soft gray & black silt

WELL CASING VOLUMES				
GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Jaffan Terminal SAMPLE CREW G-Gould

SAMPLE LOCATION/WELLNO. SD - 4

FIELD SAMPLE I.D. NUMBER SD - 4 DATE 11/5/98

TIME 11:58 WEATHER Sunny TEMPERATURE 50°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT ✓

SURFACE WATER/STREAM _____ AIR _____

SOIL _____ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER n/a MEASUREMENT METHOD n/a

DEPTH OF WELL n/a MEASUREMENT METHOD n/a

VOLUME REMOVED n/a REMOVAL METHOD n/a

FIELD TEST RESULTS:

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) PID = 0.0 ppm

CONSTITUENTS SAMPLED: VOCs SVOCs P/PCBs

REMARKS: 148" = 12.3' deep
soft gray & black silt

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould

SAMPLE LOCATION/WELL NO. SD - 5

FIELD SAMPLE I.D. NUMBER SD - 5 DATE 11/5/98

TIME 12:02 WEATHER Sunny TEMPERATURE 50°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT ✓

SURFACE WATER/STREAM _____ AIR _____

SOIL _____ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL n/a MEASUREMENT METHOD n/a

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS:

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) PID = 0.0 ppm

CONSTITUENTS SAMPLED: VOCs SVOCs P/PCBs

REMARKS: 23½" ≈ 19.7' deep
MS/MSD collected here
soft gray & black silt

WELL CASING VOLUMES				
GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Jaffan Terminal SAMPLE CREW G-Gould

SAMPLE LOCATION/WELLNO. SD - 6

FIELD SAMPLE I.D. NUMBER SD - 6 DATE 11/5/98

TIME 12:07 WEATHER Sunny TEMPERATURE 50°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT ✓

SURFACE WATER/STREAM _____ AIR _____

SOIL _____ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER n/a MEASUREMENT METHOD n/a

DEPTH OF WELL n/a MEASUREMENT METHOD n/a

VOLUME REMOVED n/a REMOVAL METHOD n/a

FIELD TEST RESULTS:

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) PID = 0.0 ppm

CONSTITUENTS SAMPLED: VOCs SVOCs P/PCBs

REMARKS: depth - 420" ≈ 35' deep
GPS point 7 - 75' west of sea island
GPS point 6 adjacent to sea island - no recovery, gray & black silt at SD-6

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G-Gould

SAMPLE LOCATION/WELL NO. SD - 7

FIELD SAMPLE I.D. NUMBER SD - 7 DATE 11/5/98

TIME 12:14 WEATHER sunny TEMPERATURE 50°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT ✓

SURFACE WATER/STREAM _____ AIR _____

SOIL _____ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER n/a MEASUREMENT METHOD n/a

DEPTH OF WELL n/a MEASUREMENT METHOD n/a

VOLUME REMOVED n/a REMOVAL METHOD n/a

FIELD TEST RESULTS:

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) PID = 0.0 ppm

CONSTITUENTS SAMPLED: VOCs SVOCs P/PCBs

REMARKS: 3&4" x 32' deep GPS point 8

~~GPS point 7 is next to sea wall - no recovery~~

GPS point 9 at stilling well

gray & black silt

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Taffan Terminal SAMPLE CREW G-Gould

SAMPLE LOCATION/WELLNO. SD - 8

FIELD SAMPLE I.D. NUMBER SD - 8 DATE 11/5/98

TIME 12:45 WEATHER Sunny TEMPERATURE 50° F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT ✓

SURFACE WATER/STREAM _____ AIR _____

SOIL _____ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER n/a MEASUREMENT METHOD n/a

DEPTH OF WELL n/a MEASUREMENT METHOD n/a

VOLUME REMOVED n/a REMOVAL METHOD n/a

FIELD TEST RESULTS:

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) DID = 0.0 ppm

CONSTITUENTS SAMPLED: VOCs SVOCs P/PCBs

REMARKS: GPS point 10 depth = 211" ≈ 17.6'
crab in sample 1" long
shells and brown sand and gravel
lost sonar dredge here

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Jaffon Terminal SAMPLE CREW G. Gould

SAMPLE LOCATION/WELLNO. SD - 9

FIELD SAMPLE I.D. NUMBER SD - 9 DATE 11/5/98

TIME 13:00 WEATHER Sunny TEMPERATURE 50°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT ✓

SURFACE WATER/STREAM _____ AIR _____

SOIL _____ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER n/a MEASUREMENT METHOD n/a

DEPTH OF WELL n/a MEASUREMENT METHOD n/a

VOLUME REMOVED n/a REMOVAL METHOD n/a

FIELD TEST RESULTS:

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) PID = 0.0 ppm

CONSTITUENTS SAMPLED: VOCs SVOCs P/PCBs

REMARKS: GPS point 11 depth 197" ≈ 16.4'
soft gray & black silt

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould

SAMPLE LOCATION/WELL NO. SD - 10

FIELD SAMPLE I.D. NUMBER SD - 10 DATE 11/5/98

TIME 1305 WEATHER Sunny TEMPERATURE 50° F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT ✓

SURFACE WATER/STREAM _____ AIR _____

SOIL _____ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER n/a MEASUREMENT METHOD _____

DEPTH OF WELL n/a MEASUREMENT METHOD n/a

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS:

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) DID = 0.0 ppm

CONSTITUENTS SAMPLED: VOCs SVOCs P/PCBs

REMARKS: GIS point 12 depth: 26" ≈ 18"
soft gray & black silt

WELL CASING VOLUMES

GAL/FT	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould

SAMPLE LOCATION/WELL NO. SD - 11

FIELD SAMPLE I.D. NUMBER SD-11 DATE 11/5/98

TIME 13:19 WEATHER Sunny TEMPERATURE 50°F

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT ✓

SURFACE WATER/STREAM _____ AIR _____

SOIL _____ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL n/a MEASUREMENT METHOD n/a

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS:

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) PID = 0.0 ppm

CONSTITUENTS SAMPLED:

	VOCs	SVOCs	PI PCBs

REMARKS: GPR Point 13 depth: 44" ≈ 3.7'

upgradient sample

N of Tower Road Ext, soft gray & black silt

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

DVIRKA AND BARTILUCCI

SAMPLE INFORMATION RECORD

SITE Tappan Terminal SAMPLE CREW G. Gould

SAMPLE LOCATION/WELL NO. SD - 12

FIELD SAMPLE I.D. NUMBER SD - 12 DATE 11/5/98

TIME 13:30 WEATHER Sunny TEMPERATURE 50° F.

SAMPLE TYPE:

GROUNDWATER _____ SEDIMENT ✓

SURFACE WATER/STREAM _____ AIR _____

SOIL _____ OTHER (Describe, i.e., septage, leachate) _____

WELL INFORMATION (fill out for groundwater samples):

DEPTH TO WATER _____ MEASUREMENT METHOD _____

DEPTH OF WELL n/a MEASUREMENT METHOD n/a

VOLUME REMOVED _____ REMOVAL METHOD _____

FIELD TEST RESULTS:

COLOR _____ pH _____ ODOR _____

TEMPERATURE (°F) _____ SPECIFIC CONDUCTANCE (umhos/cm) _____

OTHER (OVA, Methane meter, etc.) PID = 0.0 ppm

CONSTITUENTS SAMPLED: VOCs SVOCs PI PCBs

REMARKS: GPS Point 14 depth = 56" = 4.6'
up gradient sample - south of Dobbs Ferry train station
soft gray + black silt

WELL CASING VOLUMES

GAL/FT				
	1-1/4" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.10	2-1/2" = 0.24	3-1/2" = 0.50	6" = 1.46

SIR

APPENDIX C

Boring Logs

Driller: Parratt-Wolff D. Richmond / M. Marshall

Inspector: **G. Gould**

Rig Type: I R A-200

Drilling Method: Direct Push - hammer

Dvirka and Bartilucci Boring Log

Project Name: Tappan Terminal

Project #: 1570

Boring Depth: 12.0'

Boring ID : SB-1 (6 w-1)

Sheet ____ of ____

Location: ____

Groundwater Observations			
Date			
Time			
DTW	--		
Casing/Total Depth			

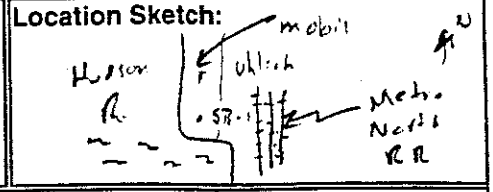
Start (Date & Time): 10/6/98 9:20

Finish (Date & Time): 10/6/98 9:50

Weather: Sunny, 55° F

Elevation of Ground Surface: ____

Location Sketch:



Sample Interval	Sample No.	Blows	pid ppm	Field Description	Well Schematic	Comments
0-2	SS-1		0.5	dry black/white, tan cinders, f-c sand, tr. gravel (fill)		
Rec:	2.0					
2-4	SS-2		0.2	moist brown silt and wood fragments (fill)		9:39 collect soil sample from 2-6' SB-1 - TCL + 30 + TAL
Rec:	1.0					
4-6	SS-3		0.1	moist brown silt, ash, cinders wood fragments (fill)		
Rec:	1.0					
				wet at 5.0'		
6-8	SS-4		0.4	wet brown + black gravel and silt angular (fill)		
Rec:	1.5					
8-10	SS-5		0.4	wet gray/black f-c sand and f-m gravel (angular) (fill)		slight odor of decayed organic material - (wood muck smell)
Rec:	1.5					
10-12	SS-6		0.5	wet black m. gravel (angular - subangular) brick fragments little m. sand		slight petroleum odor
Rec:	1.5'		0			
				bottom of boring 12.0'		install 1" dia. temp well 10' 20 slot screen
						- 12:50 gw sample collected w/ MS/MSD after purging 2½ gallons
						- PVC removed backfilled w/ bentonite chips, topped with gravel

Soil Stratigraphy Summary ____

Driller: T-W / D. Richmond, M. Marshall

Inspector: D. Stahl

Rig Type: IR

Drilling Method: direct push

Dvirka and Bartlucci Boring Log

Project Name: Tappan Terminal

Project #: 1570

Boring Depth: 5.0'

Boring ID: SB-4

Sheet 1 of 1

Location:

Groundwater Observations			
Date			
Time			
DTW			
Casing Total Depth	--		

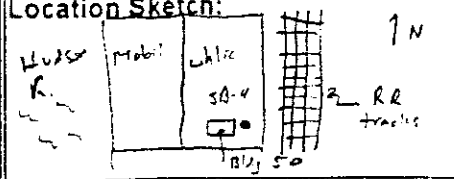
Start (Date & Time): 10-6-98 / 07:40

Finish (Date & Time): 10-6-98 / 07:55

Weather: Sunny 55°F

Elevation of Ground Surface:

Location Sketch:



Sample Interval	Sample No.	~~Blows~~	PID ppm	Field Description	Well Schematic	Comments
0-2.0'	SS-1		0.4	Asphalt (0.3'). over Dry grey f gravel. (0.3') over Moist, grey + black c-f sand, trace gravel w/ cinders		3" asphalt Sample SS-1 SB-4 at 07:51 for SS-1 thru SS-3, only lower portion of SS-1.
Rec:	1.4'					
2-4.0'	SS-2		0.2	Moist, concrete (0.2') over Moist brown sawdust (0.2') over Grey + Black coal, cinders, glass, slag		
Rec:	0.8'					
4-5.0'	SS-3		0.5	Moist, black, brown + grey cinders, slag, glass (0.2') over Moist brown fine sand, trace c-m sand, trace f gravel		
Rec:	0.4'				B.O.B = 5.0'	- back filled with bentonite chips

Soil Stratigraphy Summary

Driller: Parratt-Wolff D. Richmond / M Marshall
Inspector: G. Gould
Rig Type: JR A-200
Drilling Method: direct push

Dvirka and Bartilucci Boring Log

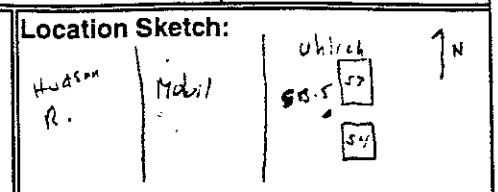
Project Name: Tappan Terminal
Project #: 1570
Boring Depth: 8.0

Boring ID: SB-5
Sheet 1 of 1
Location: W of NW cne Bldg 54

Groundwater Observations			
Date			
Time			
DTW	--		
Casing/Total Depth			

Start (Date & Time): 10-6-98/08:39
Finish (Date & Time): 10-6-98/9:15
Weather: Sunny, 55°F
Elevation of Ground Surface:

Location Sketch:



Sample Interval	Sample No.	Blows	PID ppm	Field Description	Well Schematic	Comments
0-2.0'	SS-1		8.0	dry black f-c sand, some silt wood ash and cinders, red brick fragments (fill)		
Rec:	2.0					
2-4.0'	SS-2		0.8	moist black fc sand, little silt black ash and cinders (fill) light brown f sand (fill)		9:04 am 2-5' collect subsurface sample TCL 30 & TOC
Rec:	2.0					
4-6.0'	SS-3		0.5	moist white/black ash		
Rec:	1.0					
6-8	SS-4		1.2	Wet black f-c sand slag		- backfill with bentonite chips top with black top patch
Rec:	1.0					
				bottom of boring 8.0'		

Soil Stratigraphy Summary

file d&blog.xls revised 8/26/96 by GG

Driller: T-W, L. Richards

Inspector: D. Stahl

Rig Type: IR

Drilling Method: direct push

Dvirka and Bartlucci Boring Log

Project Name: Tappan Terminal

Project #: 1590

Boring Depth: 8.0

Boring ID: SB-6

Sheet 1 of 1

Location:

Groundwater Observations			
Date			
Time			
DTW			
Casing Total Depth	--		

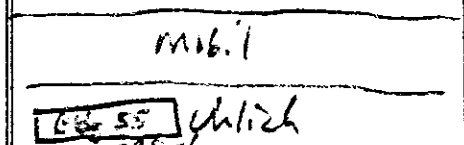
Start (Date & Time): 10-5-98/15:15

Finish (Date & Time): 10-5-98/15:45

Weather: sunny 70°F

Elevation of Ground Surface:

Location Sketch:



Sample Interval	Sample No	~~Blows~~	PID ppm	Field Description	Well Schematic	Comments
0-2.0'	SS-1		0.2	Moist, brown silt, some f sand, trace gravel, Fill.		
Rec=	1.4					
2-4.0	SS-2		0.2	Moist, brown silt, little f sand, trace(-) f gravel w/ Bk partings near tip and white silt (0.2') near center of recovery		∇ = 5'
Rec=	1.6					
4-6.0	SS-3		0.3	Moist, brown silt, trace fr sand,		
Rec=				∇ = 5'		
6-8.0'	SS-4		0.1	Wet, brown & dk brown silt w/ weathered bistite containing rock (0.3') in tip.		Collect SB-6 in fill 2-4', at 15:35.
Rec=						
				B.o.B. = 8.0		

Soil Stratigraphy Summary

Driller: E-W/K. Fleming, M. Marshall

Inspector: D. Stahl

Rig Type: IR

Drilling Method: direct push

Dvirka and Bartlucci Boring Log

Project Name: Tappan Terminal

Project #: 1570

Boring Depth: 8.0'

Boring ID: SB-7

Sheet 1 of 1

Location: SE of LMS-2

Groundwater Observations			
Date			
Time			
DTW			
Casing Total Depth	--		

Start (Date & Time): 10-6-98/08:12

Finish (Date & Time): 10-6-98/08:30

Weather: Sunny 55°F

Elevation of Ground Surface:

Location Sketch:

Sample Interval	Sample No	~~Blows~~	PID ppm	Field Description	Well Schematic	Comments
0-2.0'	SS-1		2.2	0.3 asphalt over Moist Bk and grey f gravel and c-f sand w/ cinders + slag.		
Rec =	1.5					
2-4.0'	SS-2		0.7	Moist, black, grey or brown f gravel and c-f sand w/ a wet (0.2') black-purple portion near center of recovery w/ slag + cinders		▼ = 5'
Rec =	1.1					
4-6.0'	SS-3		0.2	Moist, grey c-f sand, some silt, trace f gravel w/ light grey silt layer		08:27, sample soil from SS-2 and upper SS-3
Rec =	1.4'					
6-8.0'	SS-4		1.8	Wet, grey f gravel, trace c-f sand w/ slag, bricks, glass, shell fragments		
Rec =	0.8					
				B.O.B = 8.0'		

Soil Stratigraphy Summary

Driller: [illegible] Richmond, Mr.

Inspector: D. Stahl

Rig Type: ER

Drilling Method: direct push

Dvirka and Bartilucci Boring Log

Project Name: Tappan Terminal

Project #: 1570

Boring Depth: 8.0'

Boring ID: [illegible]

Sheet 1 of 1

Location: W of NW cne tennis court

Groundwater Observations			
Date			
Time			
DTW			
Casing Total Depth	--		

Start (Date & Time): 10-6-98/07:05

Finish (Date & Time): 10-6-98/07:30

Weather: Sun, 50°F

Elevation of Ground Surface:

Location Sketch: Mobil

SB-8 • COURT Vehicle

Sample Interval	Sample No.	~~Blows~~	PID ppm	Field Description	Well Schematic	Comments
0-2.0'	SS-1		2.3	Dry, m-f gravel, little c-f sand w/ cinders, coal, grey or black throughout. concrete		4" asphalt
Rec=	2.0'					
2-4.0'	SS-2		3.1	Moist, grey m-f gravel, little silt, trace c-f sand, w/shells + coal. brownish upper third.		Sample soil SB-8 at 07:25 from SS-2 and SS-3
Rec=	1.9'					
4-6.0'	SS-3		0.3	Moist grey silt, trace c-f sand, w/ white silt, wood, shells. Wet in tip.		∇ = 6.0'
Rec=	0.5'					
6-8.0'	SS-4		0.5	Wet, brown silt, trace c-f sand w/ wood peat, brick, cinders, shells.		
Rec=	1.2'					
				B.O.B. = 8.0'		

Soil Stratigraphy Summary

-2-

Driller: Parratt-Wolff Dave Richmond / M. Marshal
Inspector: **G. Gould**
Rig Type: IR A-200
Drilling Method: Direct Push

Dvirka and Bartilucci Boring Log

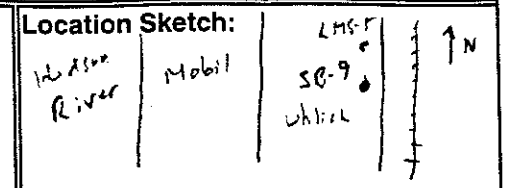
Project Name: Tappan Terminal
Project #: 1570
Boring Depth: 8.0

Boring ID : SB-9
Sheet 1 of 1
Location:

Groundwater Observations			
Date			
Time			
DTW	--		
Casing/Total Depth			

Start (Date & Time): 10/5/98 14:40
Finish (Date & Time): 10/5/98 15:10
Weather: Sunny / 70°F
Elevation of Ground Surface:

Location Sketch:



Sample Interval	Sample No.	Blows	PID ppm	Field Description	Well Schematic	Comments
0-2	SB-1		0.2	moist black and brown f-c sand (fill)		14:57 collect sample SB-9 1'-4' mix brown & black fill
Rec:	2.0					
2-4	SB-2		0.3	moist black, soft f-c sand tr. silt tr gravel (fill)		
Rec:	1.8'			moist light brown med. sand tr. gravel (fill)		
4-6	SB-3		0.3	moist f-m brown sand		backfill boring with cuttings and bentonite chips
Rec:	1.5'			wet brown silt & clay		
6-8	SB-4		0.3	wet brown & white med. sand (fill)		
Rec:	1.5'					
				bottom of boring 8.0'		

Soil Stratigraphy Summary

Driller: Parratt-Wolff D. Richmond, M. Marshal
Inspector: G. Gould
Rig Type: IR A-200
Drilling Method: Direct Push

Dvirka and Bartilucci Boring Log

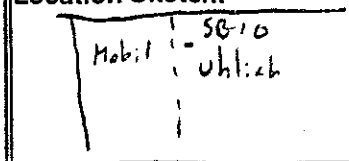
Project Name: Tappan Terminal
Project #: 1570
Boring Depth: _____

Boring ID : SB-10
Sheet 1 of _____
Location: _____

	Groundwater Observations		
Date			
Time			
DTW			
Casing/Total Depth			

Start (Date & Time): 10/6/98 14:57
Finish (Date & Time): 10/6/98 15:15
Weather: Sunny 60°F
Elevation of Ground Surface: _____

Location Sketch:



Sample Interval	Sample No.	~~Blows~~	PID ppm	Field Description	Well Schematic	Comments
0-2	SS-1		9.0	dry red, white, black brown m. sand, silt. red brick, glass, slag (fill)		
Rec =	1.5					
2-4	SS-2		0.5	dry brown, black silt, f-m sand tr. brick, glass		15:09 collected soil sample from 2'-4'
Rec =	1.5					
4-6	SS-3		0.1	wet white quartzite fragments		
Rec =	0.4					
6-8	SS-4		0.1	wet white quartzite frags		
Rec =	0.5					
				refusal at 7.0'		

Soil Stratigraphy Summary _____

Driller: Parratt-Wolff D. Richmond, M Marshall
Inspector: **G. Gould**
Rig Type: IR A-200
Drilling Method: Direct Push 3" sleeves/geoprobe tools

Dvirka and Bartilucci Boring Log

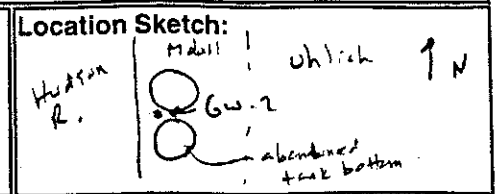
Project Name: _Tappan Terminal
Project #: 1570
Boring Depth: _____

Boring ID : GW-2
Sheet 1 of 2
Location: _____

Groundwater Observations			
Date			
Time			
DTW	-		
Casing/Total Depth			

Start (Date & Time): 10/6/98 10:45
Finish (Date & Time): 10/6/98 16:00
Weather: Sunny
Elevation of Ground Surface: _____

Location Sketch:



Sample Interval	Sample No.	Blows		Field Description	Well Schematic	Comments
0-2	SS-1		1.1	dry brown m. sand, tr. glass (fill)		slight fuel oil odor
Rec=	0.9'					
2-4	SS-2		6.0	moist brown m. sand, f gravel glass (fill)		
Rec=	0.7'					
4-6	SS-3		5.6	wet black f-c sand green glass (fill)		
Rec=	0.5'					
6-8	SS-4			no recovery		
Rec=	0.0					
8-10	SS-5		1.1	wet black f-m sand, silt (fill)		slight fuel odor
Rec=	0.5'					
10-12	SS-6		0.5	wet black m-c sand green glass fragment wood frag, ash and cinders - white (fill)		
Rec=	0.2'					
12-14	SS-7		0.4	wet black f-m sand wood fragments, glass fragments white ash (fill)		glass - bottle neck in spoon
Rec=	1.0					
14-16	Tube 1		-			14' switch over to geoprobe tools - 2' sleeves
Rec=	0.0					
16-18	Tube 2		0.8	wet gray/black silt, tr wood tr. roots mottled (marine silt)		
Rec=	1.5'					
18-20	Tube 3		1.0	wet gray/black silt, shells, wood, tr. sand (marine silt)		
Rec=	2.0					

Soil Stratigraphy Summary _____

Driller: Parratt-Wolff

Inspector: **G. Gould**

Rig Type:

Drilling Method:

Dvirka and Bartilucci Boring Log

Project Name: Tappan Terminal

Project #: 1570

Boring Depth:

Boring ID : G-2.2

Sheet 2 of 2

Location:

	Groundwater Observations		
Date			
Time			
DTW			
Casing/Total Depth			

Start (Date & Time):

Finish (Date & Time):

Weather:

Elevation of Ground Surface:

Location Sketch:

Sample Interval	Sample No.	Blows	PID ppm	Field Description	Well Schematic	Comments
20-22	Tube 4		0.8	wet dk gray silt, tr. f. sand tr. white shells 1-2mm (marine silt)		
Rec =	1.5'					
22-24	Tube 5		0.5	wet dk gray silt, tr f. sand tr. white shells 1-2mm (marine silt)		
Rec =	2.0					
				bottom of boring 24'		13:50 collect gw sample from 16' in boring 1' N of logged hole

Soil Stratigraphy Summary

Driller: P-W/ DiKilhanes — Inspector: D. Stahl — Rig Type: FR — Drilling Method: direct push

Dvirka and Bartilucci Boring Log

Project Name: Tappan Terminal Site
Project #: 1570
Boring Depth: 12.0'

Boring ID: GW-3
Sheet 1 of 1
Location: SE corner Bldg. 55

Groundwater Observations			
Date			
Time			
DTW			
Casing Total Depth	--		

Start (Date & Time): 10-5-98/15:55
Finish (Date & Time): 10-5-98/16:10
Weather: sunny 70°F
Elevation of Ground Surface:

Location Sketch: Mobil — •GW-3 [Bldg. 55] — Uhlich

Sample Interval	Sample No.	~~Blows~~	PID ppm	Field Description	Well Schematic	Comments
0-2' Rec= 1.5'	SS-1		0.1	0.3' asphalt over Dry dark brown-black c-f sand, little silt, w/ cinders.	1" I.D. PVC Screen .020" slot 12.2'	
2-4.0' Rec= 0.9'	SS-2		0.6	Moist, brown-black c-f sand, l-silt trace f gravel w/ cinders.		
4-6.0' Rec= 0.8'	SS-3		2.6	Moist, brown-black c-f sand, little silt, trace f gravel w/ cinders (0.5') over wet, Gy silt (0.3'). 5.5'		
6-8.0' Rec= 0.8'	SS-4		0.7	Wet, brown-black silt and c-f sand, trace gravel w/ wood & cinders (0.4') over wet, white silt.		
8-10.0' Rec= 1.0'	SS-5		2.7	Wet, grey m-f gravel, some silt, little c-f sand w/ oyster shell fragments.		10/6/98 15:50 gw sample collected from temp. well
10-12.0' Rec= 1.6'	SS-6		0.7	Wet, grey silt, some m-f gravel w/ shell fragments.		
				B.O.B. = 12.0'		

Soil Stratigraphy Summary ______

Driller: [illegible]
Inspector: D. Stahl
Rig Type: IR
Drilling Method: direct push

Dvirka and Bartilucci Boring Log

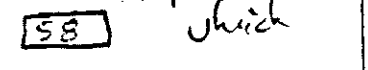
Project Name: Tappan Terminal Site
Project #: 1570
Boring Depth: ____

Boring ID: [illegible]
Sheet 1 of 1
Location: W of NW cnr Bldg-58

Groundwater Observations			
Date			
Time			
DTW			
Casing Total Depth	--		

Start (Date & Time): 10-5-98/16:15
Finish (Date & Time): 10-5-98/
Weather: Sunny 70°F
Elevation of Ground Surface: ____

Location Sketch: Mob.



Sample Interval	Sample No.	~~Blows~~	PID ppm	Field Description	Well Schematic	Comments
0-2.0'	SS-1		0.5	0.3 asphalt over Dry brown c-f. sand, some silt w/grey portion (1.4') over Moist brown silt (0.3').		
Rec=	2.0'					
2-4.0'	SS-2		0.3	Moist dark brown c-f sand, little f gravel, little silt w/cinders.		rapid advancement 2-12'.
Rec=	1.9'					
4-6.0'	SS-3		0.7	Moist, brown f sand, some silt.		
Rec=	0.5'					
6-8.0'	SS-4		—	No recovery		
Rec=	0.0'					
8-10.0'	SS-5		—	No recovery in soft material as in SS-4.		10/7/98 17:45 collect gw sample from temp well
Rec=	0.0'					
10-12.0'	SS-6		0.2	Wet, gy-brown f sand and silt, trace v-c sand.		- Well removed and boring backfilled with bentonite chips and topped with black top patch
Rec=	1.8'					
				B.O.B. = 12.0'	—	

Soil Stratigraphy Summary ____

Driller: F-W/ D.Richmond

Inspector: D. Stahl

Rig Type:

Drilling Method:

Dvirka and Bartilucci Boring Log

Project Name: Tappan Terminal Site

Project #: 1570

Boring Depth:

Boring ID:

Sheet 1 of 1

Location: NE corner of Uhlich property

Groundwater Observations			
Date			
Time			
DTW			
Casing Total Depth	--		

Start (Date & Time): 10-5-98 / 13:35

Finish (Date & Time): 10-5-98 / 14:10

Weather: Sunny, 70°F

Elevation of Ground Surface:

Location Sketch: MOBIL; Uhlich; B1&G-66

Sample Interval	Sample No	~~Blows~~	PID ppm	Field Description	Well Schematic	Comments
0-2 Rec = 2.0'	SS-1		0.0	dry brown/black f-c sand, some silt, asphalt, cinders (fill)		
2-4 Rec = 1.0	SS-2		4.0	moist brown f-m sand tr gravel (fill)	2.0'	slight fuel odor at 3' in spoon
4-6 Rec = 1.5	SS-3		4.4	moist gray & brown f-m sand wet gray f-m sand (fill) little silt - clay		
6-8 Rec = 2.0	SS-4		1.2	wet brown med. sand, tr. c. gravel (fill)	1" ID PVC Screen 10.0' slot	
8-10 Rec = 2.0	SS-5		0.6	wet light brown med. sand tr. gravel (fill)		14:01 background breathing zone PID = 0.6 ppm
10-12 Rec = 1.5	SS-6		0.5	wet grey med. sand 2" clay layer tr. c. gravel (fill)		12.0'
				bottom of boring 12.0'		- drive temp 2" OD casing and drive point to install 1" PVC - temp. well in place 14:17 - 10/5/98 14:45 collect sample of gw from temp. well - well removed and boring filled with bentonite chips

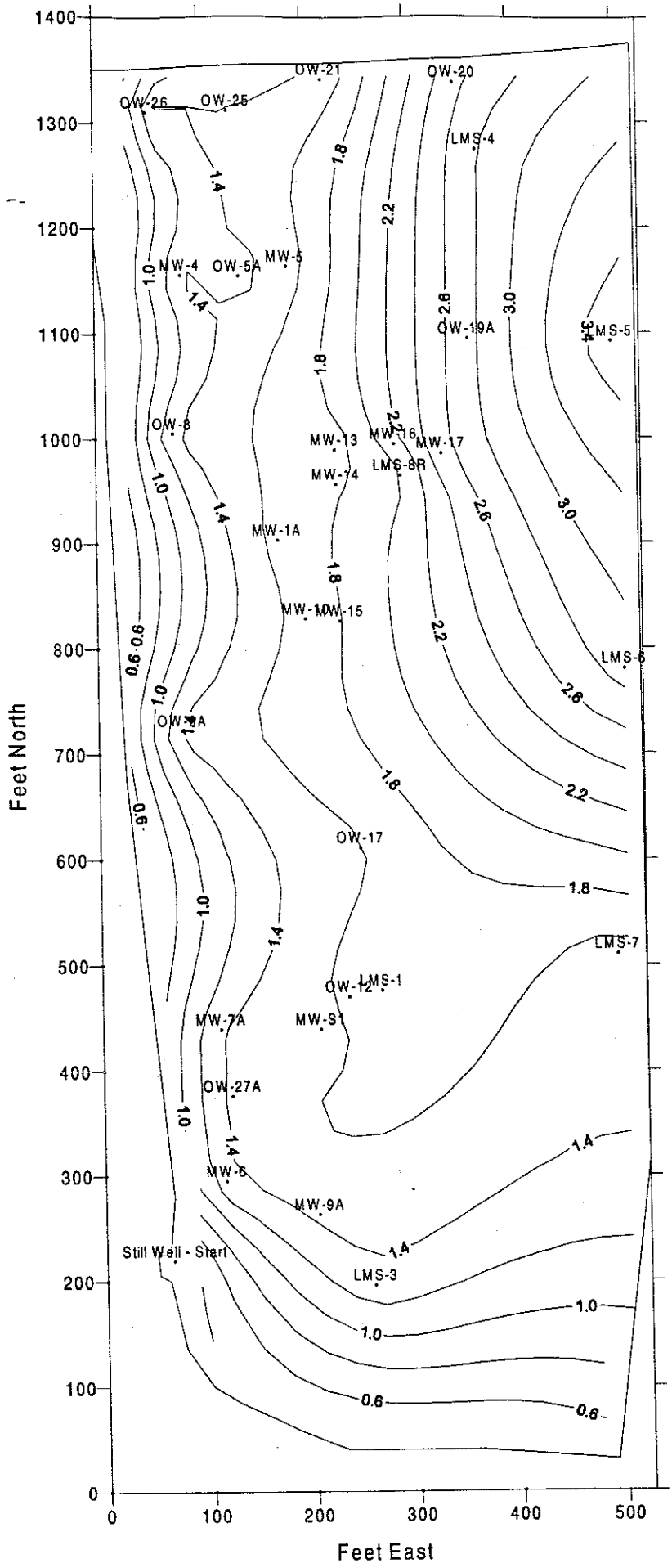
Soil Stratigraphy Summary

APPENDIX D

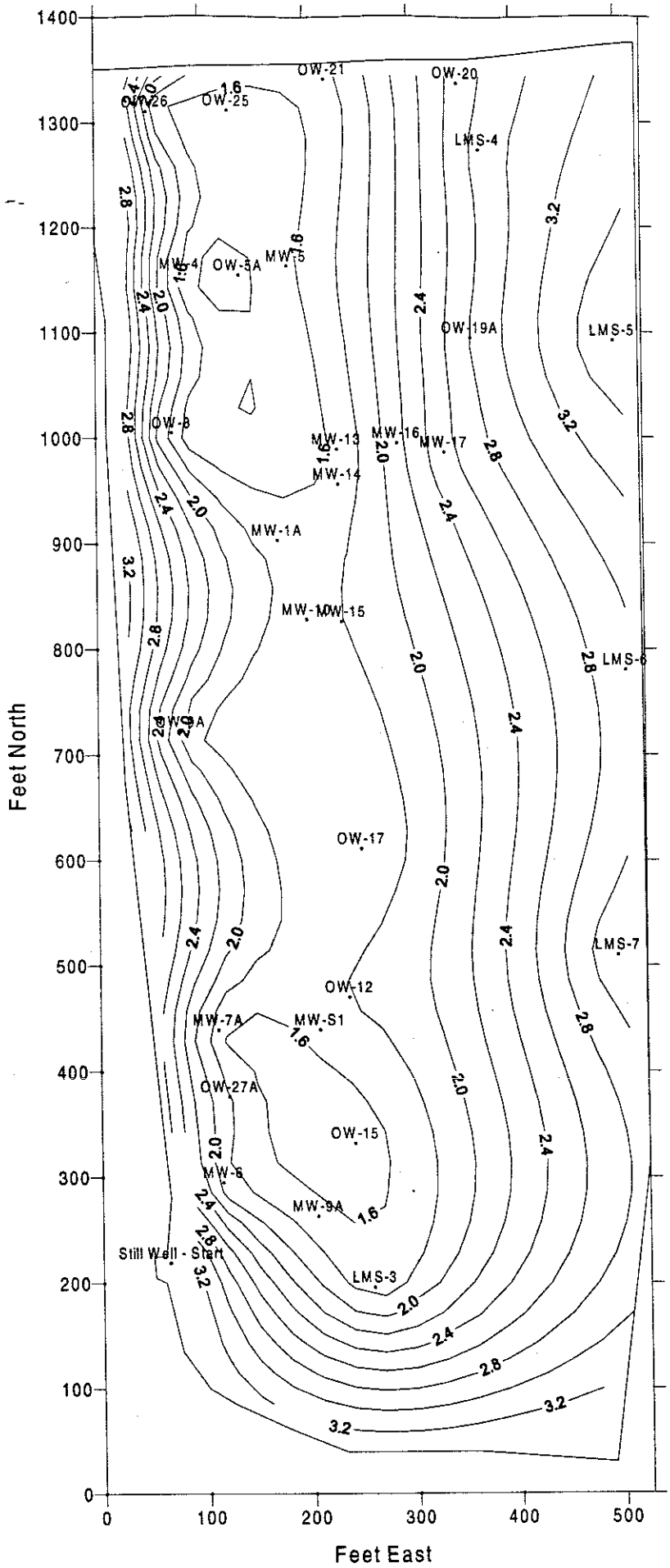
Groundwater Elevation Data

Tappan Terminal Site
Water Table Map
December 4, 1998

15



Tappan Terminal Site
Water Table Map
November 4, 1998



high tide

Groundwater Level Measurements
Tappan Terminal Site
December 15, 1998

Well ID	Depth to Groundwater (feet)	Groundwater Elevation (feet amsl)	Depth Below Ground Surface (feet)	
MW-S1	6.38	1.50	4.99	
MW-D1	4.73	3.08	3.73	
MW-1A	4.54	1.68	2.29	
MW-4	4.60	1.47	2.60	
OW-5A	5.59	1.33	2.86	
MW-5	3.91	1.48	3.21	
MW-6	5.97	1.37	3.87	
MW-7A	6.54	1.41	4.42	
OW-8	4.94	1.42	2.84	
OW-9A	6.55	1.48	3.51	
MW-9A	7.10	1.44	4.75	
MW-10	4.71	1.66	2.96	
OW-12	8.08	1.66	6.88	
MW-13	6.00	1.70	3.60	
MW-14	4.20	1.79	2.50	
OW-15	NR	NR	NR	
MW-15	5.34	1.79	2.88	
MW-16	8.34	2.15	5.30	
OW-17	7.68	1.57	5.58	
MW-17	8.08	2.55	5.03	
OW-19A	3.47	2.74	3.87	
OW-20	6.68	2.55	4.28	
OW-21	5.35	1.43	3.65	
OW-25	4.33	1.40	2.53	
OW-26	3.80	1.43	3.80	
OW-27A	4.41	1.46	4.95	
Still Well - Start	3.89	0.17	-0.17	Tide drop
Still Well - Finish	4.93	-0.87	0.87	1.04
LMS-1	6.73	1.74	6.99	
LMS-2	NR	NR	NR	
LMS-3	7.22	1.34	5.26	
LMS-4	3.83	2.81	4.02	
LMS-5	3.89	3.52	4.28	
LMS-6	5.42	2.90	5.75	
LMS-7	9.61	1.50	6.73	
LMS-8R	4.20	1.93	4.57	

NR - not recorded

dropping

Time Started:	11:31	High Tide*	7:37
Time Finished:	12:50	Low Tide*	13:55
Precip (in.)	-		

* Times provided via WWW Tide and Current Predictor at http://tbone.biol.sc.edu/tide

Groundwater Level Measurements
Tappan Terminal Site
November 4, 1998

Well ID	Depth to Groundwater (feet)	Groundwater Elevation (feet amsl)	Depth Below Ground Surface (feet)	
MW-S1	6.21	1.67	4.82	
MW-D1	3.90	3.91	2.90	
MW-1A	4.49	1.73	2.24	
MW-4	4.70	1.37	2.70	
OW-5A	5.56	1.36	2.83	
MW-5	3.81	1.58	3.11	
MW-6	5.52	1.82	3.42	
MW-7A	6.39	1.56	4.27	
OW-8	4.84	1.52	2.74	
OW-9A	6.19	1.84	3.15	
MW-9A	6.87	1.67	4.52	
MW-10	4.66	1.71	2.91	
OW-12	7.92	1.82	6.72	
MW-13	6.08	1.62	3.68	
MW-14	4.32	1.67	2.62	
OW-15	7.20	1.50	4.98	
MW-15	5.33	1.80	2.87	
MW-16	8.35	2.14	5.31	
OW-17	7.65	1.60	5.55	
MW-17	8.07	2.56	5.02	
OW-19A	3.39	2.82	3.79	
OW-20	6.54	2.69	4.14	
OW-21	5.08	1.70	3.38	
OW-25	4.26	1.47	2.46	
OW-26	3.60	1.63	3.60	
OW-27A	4.06	1.81	4.60	
Still Well - Start	0.35	3.71	-3.71	Tide drop
Still Well - Finish	1.13	2.93	-2.93	0.78
LMS-1	NR	NR	NR	
LMS-2	NR	NR	NR	
LMS-3	6.92	1.64	4.96	
LMS-4	3.75	2.89	3.94	
LMS-5	3.83	3.58	4.22	
LMS-6	5.38	2.94	5.71	
LMS-7	7.92	3.19	5.04	
LMS-8R	NR	NR	NR	

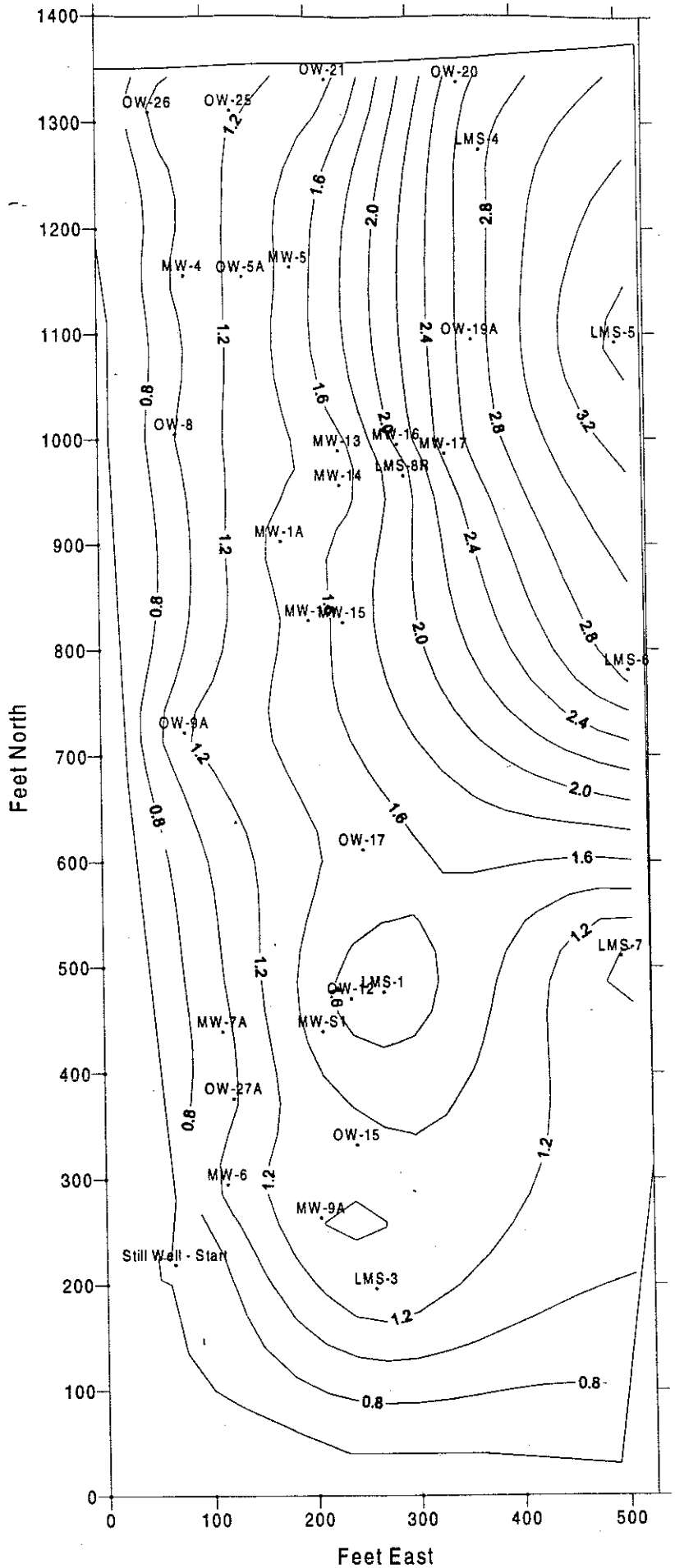
NR - not recorded

Time Started:	8:26	Low Tide*	3:38
Time Finished:	10:53	High Tide*	9:30
Precip (in.)	0.00		

* Times provided via WWW Tide and Current Predictor at http://tbone.biol.sc.edu/tide

High Tide

Tappan Terminal Site
Water Table Map
October 7, 1998



Rising tide

Groundwater Level Measurements
Tappan Terminal Site
October 7, 1998

Well ID	Depth to Groundwater (feet)	Groundwater Elevation (feet amsl)	Depth Below Ground Surface (feet)	
MW-S1	6.38	1.50	4.99	
MW-D1	4.89	2.92	3.89	
MW-1A	4.72	1.50	2.47	
MW-4	4.94	1.13	2.94	
OW-5A	5.69	1.23	2.96	
MW-5	3.92	1.47	3.22	
MW-6	6.26	1.08	4.16	
MW-7A	7.01	0.94	4.89	
OW-8	5.32	1.04	3.22	
OW-9A	6.81	1.22	3.77	
MW-9A	7.13	1.41	4.78	
MW-10	4.89	1.48	3.14	
OW-12	8.04	1.70	6.84	
MW-13	6.19	1.51	3.79	
MW-14	4.49	1.50	2.79	
OW-15	7.37	1.33	5.15	
MW-15	5.46	1.67	3.00	
MW-16	8.43	2.06	5.39	
OW-17	7.80	1.45	5.70	
MW-17	8.16	2.47	5.11	
OW-19A	3.51	2.70	3.91	
OW-20	6.69	2.54	4.29	
OW-21	5.49	1.29	3.79	
OW-25	4.55	1.18	2.75	
OW-26	4.13	1.10	4.13	
OW-27A	4.90	0.97	5.44	
Still Well - Start	3.62	0.44	-0.44	Tide drop
Still Well - Finish	2.20	1.86	-1.86	-1.42
LMS-1	6.69	1.78	6.95	
LMS-2	NR	NR	NR	
LMS-3	7.18	1.38	5.22	
LMS-4	3.86	2.78	4.05	
LMS-5	3.94	3.47	4.33	
LMS-6	5.44	2.88	5.77	
LMS-7	10.19	0.92	7.31	
LMS-8R	4.23	1.90	4.60	

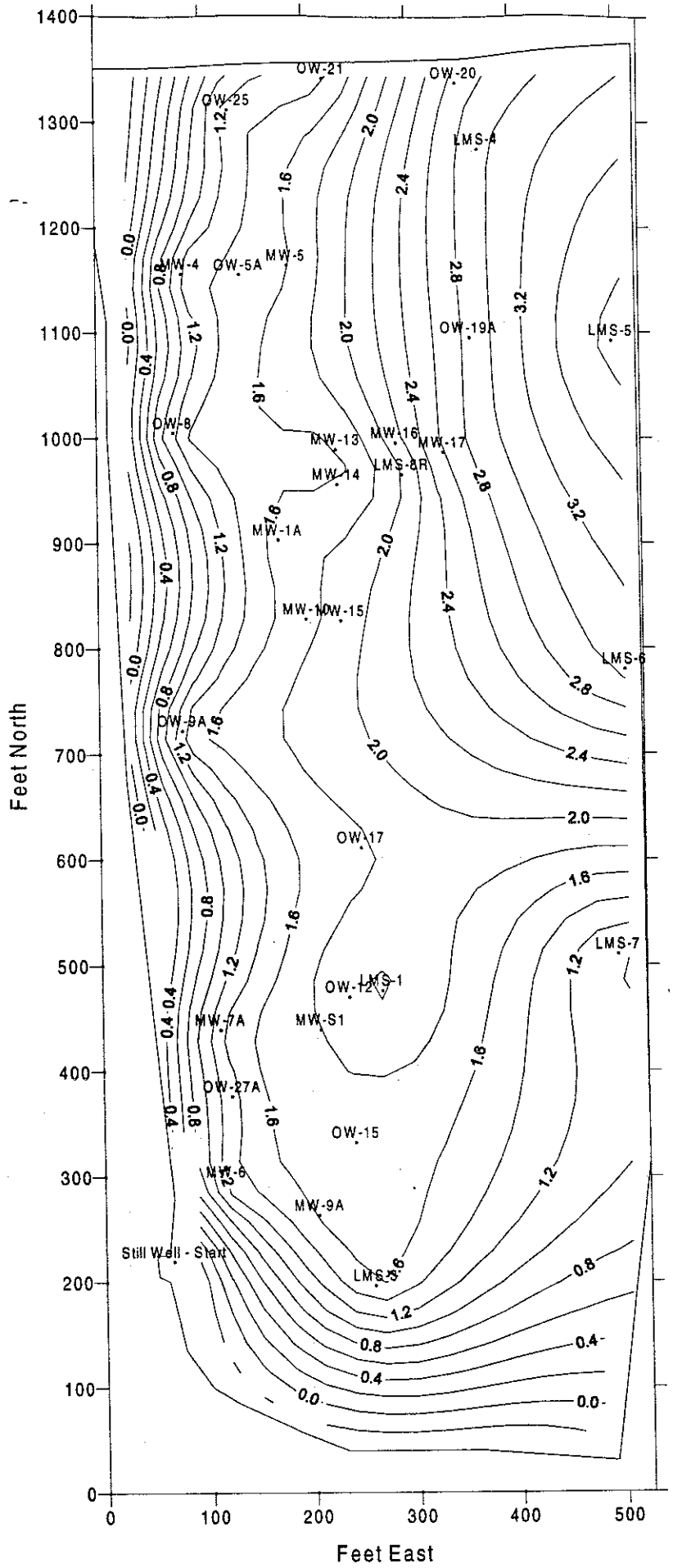
NR - not recorded

Time Started:	7:10	Low Tide*	5:51
Time Finished:	8:40	High Tide*	11:39
Precip (in.)	0.00		

* Times provided via WWW Tide and Current Predictor at http://tbone.biol.sc.edu/tide

mid-tide rising

Tappan Terminal Site
Water Table Map
September 25, 1998



Low Tide

Groundwater Level Measurements
Tappan Terminal Site
September 25, 1998

Well ID	Depth to Groundwater (feet)	Groundwater Elevation (feet amsl)	Depth Below Ground Surface (feet)
MW-S1	6.10	1.78	4.71
MW-D1	4.76	3.05	3.76
MW-1A	4.49	1.73	2.24
MW-4	4.69	1.38	2.69
OW-5A	5.50	1.42	2.77
MW-5	3.83	1.56	3.13
MW-6	6.00	1.34	3.90
MW-7A	6.51	1.44	4.39
OW-8	4.99	1.37	2.89
OW-9A	6.47	1.56	3.43
MW-9A	6.91	1.63	4.56
MW-10	4.64	1.73	2.89
OW-12	7.78	1.96	6.58
MW-13	6.17	1.53	3.77
MW-14	4.42	1.57	2.72
OW-15	7.07	1.63	4.85
MW-15	5.24	1.89	2.78
MW-16	8.36	2.13	5.32
OW-17	7.50	1.75	5.40
MW-17	7.98	2.65	4.93
OW-19A	3.36	2.85	3.76
OW-20	6.53	2.70	4.13
OW-21	5.47	1.31	3.77
OW-25	4.39	1.34	2.59
OW-27A	4.52	1.35	5.06
Still Well - Start	4.84	-0.78	0.78
Still Well - Finish	4.29	-0.23	0.23
LMS-1	6.42	2.05	6.68
LMS-2	NR	NR	NR
LMS-3	6.91	1.65	4.95
LMS-4	3.68	2.96	3.87
LMS-5	3.73	3.68	4.12
LMS-6	5.25	3.07	5.58
LMS-7	10.17	0.94	7.29
LMS-8R	4.19	1.94	4.56

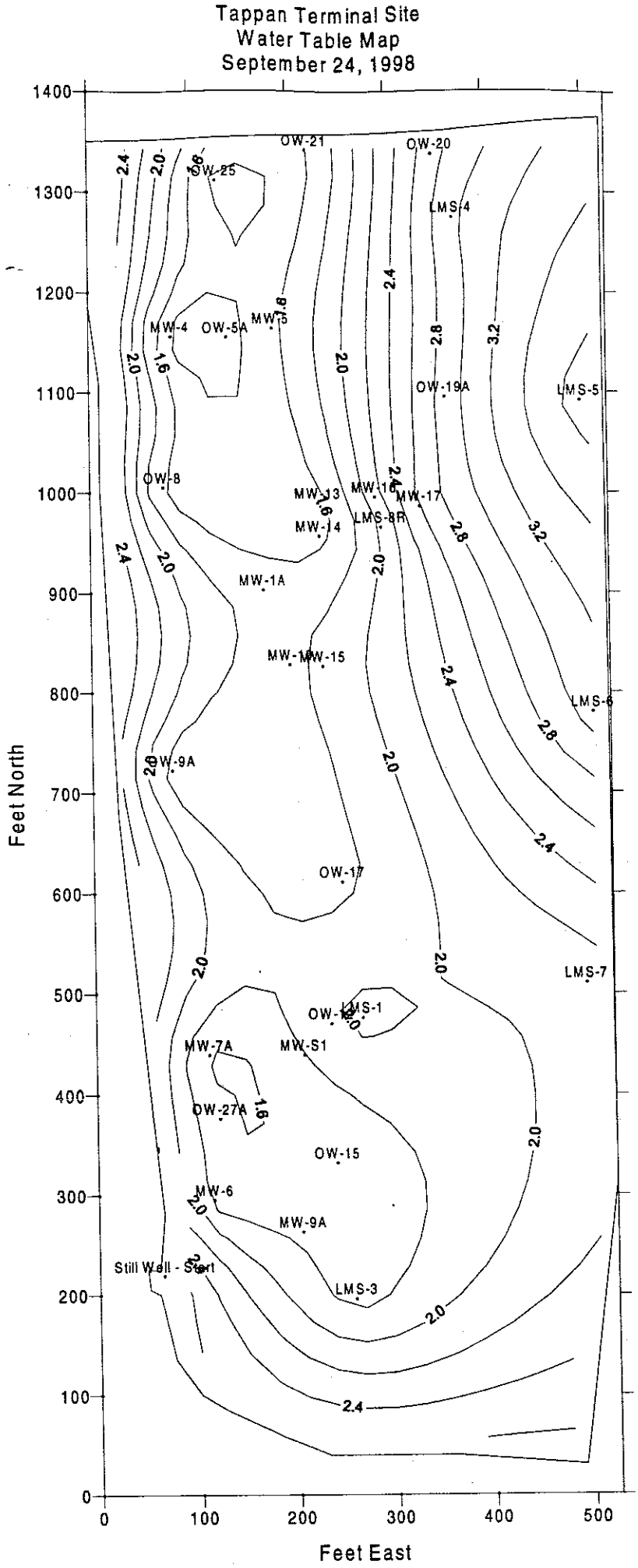
Tide drop
-0.55

NR - not recorded

Low Tide

Time Started:	7:01	Low Tide*	7:39
Time Finished:	8:24	High Tide*	13:43
Precip (in.)	none		

* Times provided via WWW Tide and Current Predictor at http://tbone.biol.sc.edu/tide


Tappan Terminal Site
Water Table Map
September 24, 1998
Feet North
Feet East
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
OW-21
OW-20
OW-25
LMS-4
MW-4
OW-5A
MW-5
OW-19A
LMS-5
OW-8
MW-13
MW-16
MW-17
MW-14
LMS-8R
MW-1A
MW-18
MW-15
LMS-6
OW-9A
OW-17
LMS-7
LMS-1
MW-7A
MW-S1
OW-27A
OW-15
MW-6
MW-9A
Still Well - Start
LMS-3
2.4
2.0
1.6
2.8
3.2

high tide

Groundwater Level Measurements
Tappan Terminal Site
September 24, 1998

Well ID	Depth to Groundwater (feet)	Groundwater Elevation (feet amsl)	Depth Below Ground Surface (feet)	
MW-S1	6.08	1.80	4.69	
MW-D1	4.04	3.77	3.04	
MW-1A	4.48	1.74	2.23	
MW-4	4.78	1.29	2.78	
OW-5A	5.59	1.33	2.86	
MW-5	3.82	1.57	3.12	
MW-6	5.63	1.71	3.53	
MW-7A	6.41	1.54	4.29	
OW-8	4.85	1.51	2.75	
OW-9A	6.41	1.62	3.37	
MW-9A	6.77	1.77	4.42	
MW-10	4.64	1.73	2.89	
OW-12	7.76	1.98	6.56	
MW-13	6.18	1.52	3.78	
MW-14	4.46	1.53	2.76	
OW-15	7.04	1.66	4.82	
MW-15	5.26	1.87	2.80	
MW-16	8.35	2.14	5.31	
OW-17	7.50	1.75	5.40	
MW-17	7.97	2.66	4.92	
OW-19A	3.32	2.89	3.72	
OW-20	6.50	2.73	4.10	
OW-21	5.24	1.54	3.54	
OW-25	4.43	1.30	2.63	
OW-27A	4.23	1.64	4.77	
Still Well - Start	1.23	2.83	-2.83	Tide drop
Still Well - Finish	0.99	3.07	-3.07	-0.24
LMS-1	6.41	2.06	6.67	
LMS-2	NR	NR	NR	
LMS-3	6.85	1.71	4.89	
LMS-4	3.65	2.99	3.84	
LMS-5	3.71	3.70	4.10	
LMS-6	5.22	3.10	5.55	
LMS-7	9.04	2.07	6.16	
LMS-8R	4.15	1.98	4.52	

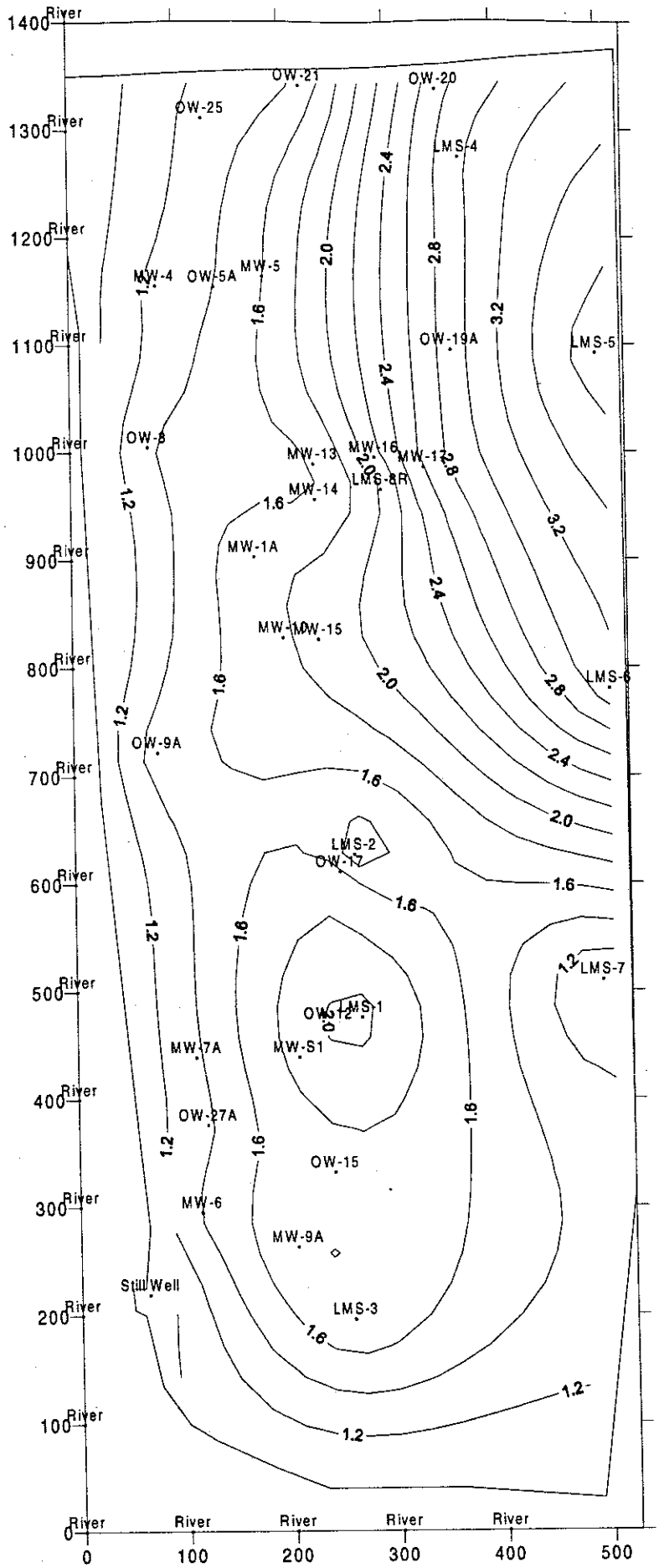
NR- not recorded

high tide

Time Started:	11:33	Low Tide*	7:09
Time Finished:	13:01	High Tide*	13:07
Precip (in.)	none		

* Times provided via WWW Tide and Current Predictor at http://tbone.biol.sc.edu/tide

Tappan Terminal Site
Water Table Elevation
September 23, 1998



mid tide
rising

Groundwater Level Measurements
Tappan Terminal Site
September 23, 1998

Well ID	Depth to Groundwater (feet)	Groundwater Elevation (feet amsl)	Depth Below Ground Surface (feet)
MW-S1	6.01	1.87	4.62
MW-D1	4.54	3.27	3.54
MW-1A	4.45	1.77	2.20
MW-4	4.79	1.28	2.79
OW-5A	5.54	1.38	2.81
MW-5	3.80	1.59	3.10
MW-6	5.91	1.43	3.81
MW-7A	6.58	1.37	4.46
OW-8	4.95	1.41	2.85
OW-9A	6.48	1.55	3.44
MW-9A	6.75	1.79	4.40
MW-10	4.60	1.77	2.85
OW-12	7.71	2.03	6.51
MW-13	6.14	1.56	3.74
MW-14	4.40	1.59	2.70
OW-15	6.97	1.73	4.75
MW-15	5.24	1.89	2.78
MW-16	8.35	2.14	5.31
OW-17	7.50	1.75	5.40
MW-17	7.97	2.66	4.92
OW-19A	3.31	2.90	3.71
OW-20	6.49	2.74	4.09
OW-21	5.37	1.41	3.67
OW-25	4.44	1.29	2.64
OW-27A	4.51	1.36	5.05
Still Well	3.23	0.83	-0.83
OW-26	NR	NR	NR
LMS-1	6.39	2.08	6.65
LMS-2	8.29	1.20	6.13
LMS-3	6.77	1.79	4.81
LMS-4	3.65	2.99	3.84
LMS-5	3.69	3.72	4.08
LMS-6	5.18	3.14	5.51
LMS-7	10.14	0.97	7.26
LMS-8R	4.18	1.95	4.55

NR- not recorded

Time Started:	8:10	Low Tide*	6:35
Time Finished:	9:55	High Tide*	12:31
Precip (in.)	not available		

* Times provided via WWW Tide and Current Pr
http://tbone.biol.sc.edu/tide

mid tide rising

APPENDIX E

Survey Data

JOB: 98025
Crew: FD,HS,TD
Material: FIELD DATA
Notes:
YEC/TAPPAN TERMINAL,HASTINGS-ON-HUDSON
DATE BEGUN: 12-16-98 08:15:06
DATE ENDED: 12-28-98 12:26:42

UNIT:
Distance unit: FEET
Angle unit: D.M.S.
Azimuth system: NORTH
Angle direction: RIGHT
Vertical system: ZENITH

ACTIVITY	POINT	HEIGHT	HORIZONTAL	VERTICAL	DISTANCE	CREATED TIME/DESC
OCC. STA.	1	5.26				12-16-98 08:16:43 PK(D11)
REF. DIR.: Occupy station: 1 Backsight: 6 Azimuth: 197.00000						
~~BACKSIGHT~~	~~2~~		~~0.00000~~	~~90.00300~~	~~999.9600~~	~~<RECORD DELETED>~~
BACKSIGHT	6		0.00000	90.00300	999.9600	PK(D1)
~~SIDESHOT~~	~~3~~	~~4.71~~	~~87.57500~~	~~89.22400~~	~~162.7151~~	~~<RECORD DELETED>~~
~~SIDESHOT~~	~~6~~	~~4.71~~	~~87.57500~~	~~89.22400~~	~~162.7151~~	~~<RECORD DELETED>~~
SIDESHOT	2	4.71	87.57500	89.22400	162.7151	PIN W/CAP
~~SIDESHOT~~	~~3~~	~~4.71~~	~~267.57500~~	~~270.37050~~	~~162.7200~~	~~<RECORD DELETED>~~
~~SIDESHOT~~	~~6~~	~~4.71~~	~~267.57500~~	~~270.37050~~	~~162.7200~~	~~<RECORD DELETED>~~
SIDESHOT	2	4.71	267.57500	270.37050	162.7200	PIN W/CAP
~~BACKSIGHT~~	~~2~~		~~180.00000~~	~~269.59350~~	~~999.9651~~	~~<RECORD DELETED>~~
BACKSIGHT	6		180.00000	269.59350	999.9651	PK(D1)
NOTE: B/S HGT=5.19---------PIN W/CAP="LABERGE BASELINE"						
SIDESHOT	21	5.16	215.34550	89.42006	197.6300	COR CLF
NOTE: @ BEG W'LY FACE 1'WIDE CRW(CRW=CONC RET WALL)						
SIDESHOT	22	5.16	211.50500	89.50400	152.9400	GW-5
SIDESHOT	23	5.16	232.53400	89.26300	79.2551	BLDG COR(66)
NOTE: (66)=BLDG NUMBER						
SIDESHOT	24	10.35	319.42500	86.23300	98.2998	BLDG COR(66)
SIDESHOT	25	5.16	199.46450	89.49050	171.5400	CLF
SIDESHOT	26	5.16	173.56500	90.10500	163.4300	INT CLF
SIDESHOT	27	5.16	170.23050	90.21300	110.0700	CLF
SIDESHOT	28	5.16	170.49200	90.23400	71.1200	LMS-4
SIDESHOT	29	5.16	165.39300	90.42400	72.6399	CLF
SIDESHOT	30	5.16	125.26150	91.54331	22.5199	CLF
SIDESHOT	31	5.16	20.18500	90.38550	53.9351	CLF
SIDESHOT	32	5.16	322.33250	89.35500	25.1100	SB-10

ACTIVITY	POINT	HEIGHT	HORIZONTAL	VERTICAL	DISTANCE	CREATED TIME/DESC
OCC. STA.	1	5.26				12-16-98 08:52:31 PK(D11)
BACKSIGHT	~~26~~		0.00000	90.00300	999.9651	PIN W/CAP
SIDESHOT	9	5.21	179.56200	90.18250	100.1100	POL'X'(D-12)
SIDESHOT	9	5.21	359.56250	269.41300	100.1051	POL'X'(D-12)
BACKSIGHT	~~26~~		180.00000	269.59250	999.9751	PIN W/CAP
SIDESHOT	10	5.16	0.05150	90.07100	100.4700	PK POL(D-10)
SIDESHOT	11	5.16	0.01250	90.12550	200.4700	PK POL(D-9)
SIDESHOT	12	5.16	0.00450	90.08250	300.3451	PK POL(D-8)
SIDESHOT	13	5.16	0.00250	90.04150	400.2400	PK POL(D-7)
SIDESHOT	14	5.16	0.00500	90.00000	500.1751	PK POL(D-6)
SIDESHOT	15	5.16	0.00400	89.55550	600.1200	PK POL(D-5)
SIDESHOT	16	5.16	0.00150	89.55200	700.1100	PK POL(D-4)
SIDESHOT	17	5.16	0.00050	89.57300	800.0351	PK POL(D-3)
SIDESHOT	18	5.16	0.00200	89.58550	899.9900	PK POL(D-2)
OCC. STA.	9	5.30				12-16-98 09:23:00 POL'X'(D-12)
BACKSIGHT	1		0.00000	89.48100	100.1051	PK(D11)
NOTE: B/S HGT=5.16						
SIDESHOT	33	5.16	243.31400	90.07550	128.6900	INV DRAIN
NOTE: 2.5'WIDE BOX CULV						
SIDESHOT	34	5.16	242.50250	86.00270	133.1794	COR CRW
NOTE: CORNERS TO NORTH						
SIDESHOT	35	5.16	252.10550	89.02350	121.3600	NW COR BEG CRW
NOTE: CRW=6"WIDE CONC RET WALL						
SIDESHOT	36	5.16	252.18050	88.07160	122.6299	CLF
SIDESHOT	37	5.16	281.19450	88.55350	119.2351	W'LY FACE CRW
SIDESHOT	38	5.16	280.56000	87.50050	119.9500	CLF
SIDESHOT	39	11.85	294.48200	86.15000	124.9751	BLDG COR(66)
SIDESHOT	40	11.85	293.36250	86.13000	129.3451	W'LY FACE CRW
SIDESHOT	41	11.85	293.25300	85.15300	129.6100	CLF
OCC. STA.	10	5.29				12-16-98 09:49:53 PK POL(D-10)
BACKSIGHT	1		0.00050	90.00350	100.4500	PK(D11)
NOTE: B/S HGT=5.16						
SIDESHOT	42	11.65	78.24200	86.32500	116.3249	BLDG COR(66)
NOTE: @ SE COR 2.5'SQ CHIMNEY						
SIDESHOT	43	5.16	86.02300	89.45000	117.8051	W'LY FACE CRW
SIDESHOT	44	5.16	86.06550	88.45250	119.8000	CLF
SIDESHOT	45	5.16	96.33550	89.24150	118.1351	SW COR END CRW
SIDESHOT	46	8.25	105.47550	88.01550	119.2850	COR TRAILER
SIDESHOT	47	5.16	91.39300	89.41300	103.9351	LMS-5
SIDESHOT	48	8.25	105.26100	88.02000	121.3100	NW COR BEG CRW

ACTIVITY	POINT	HEIGHT	HORIZONTAL	VERTICAL	DISTANCE	CREATED TIME/DESC
NOTE:						
CRW=6"WIDE CONC RET WALL						
SIDESHOT	49	5.16	107.22050	89.37150	109.5500	COR TRAILER
SIDESHOT	50	15.60	149.10350	86.30200	173.5848	EDGE TNK
SIDESHOT	51	5.16	328.48050	90.43300	36.3551	CLF/GATE
SIDESHOT	52	5.16	299.01400	91.19415	21.5600	CLF/GATE
SIDESHOT	53	5.16	209.32250	90.48100	38.1251	CLF/EMAC
SIDESHOT	54	5.16	193.11150	90.34500	84.1151	CLF/EMAC
SIDESHOT	55	5.16	189.28000	90.18300	117.6700	COR CLF
SIDESHOT	56	5.16	207.50450	90.25500	130.9500	COR CLF
SIDESHOT	57	5.16	209.03400	89.58200	128.0800	END CLF
NOTE:						
@ CRW						
SIDESHOT	58	4.30	209.06550	90.25300	126.8900	BEG CRW(NE COR)
NOTE:						
CRW=8"CONC RET WALL						
SIDESHOT	59	5.16	218.34400	90.17000	153.4600	LMS-8R
SIDESHOT	60	5.16	270.37050	93.05200	9.0351	CL REMS RR TRX
NOTE:						
INSIDE RAIL TO INSIDE RAIL=4.78						
SIDESHOT	61	5.16	231.24550	88.32000	176.4800	<RECORD DELETED>
SIDESHOT	62	5.16	188.18400	90.42350	63.9800	CL REMS RR TRX
SIDESHOT	61	12.00	231.27050	88.33350	176.4651	COR CRW(8")
SIDESHOT	63	5.16	104.31000	89.25550	118.0251	UP
OCC. STA.	11	5.29				12-16-98 11:06:46
						PK POL(D-9)
BACKSIGHT	1		0.00000	89.51150	200.4400	PK(D11)
SIDESHOT	64	8.25	252.46250	89.27050	147.2351	EDGE CRW(8")
SIDESHOT	65	8.25	238.17150	89.36450	163.6800	COR CRW(8")
NOTE:						
@ BEG CLF						
SIDESHOT	66	5.16	215.47300	90.22450	107.6100	SE COR END CRW(8")
SIDESHOT	67	6.25	83.50150	88.49550	105.0200	SB-9
SIDESHOT	68	8.25	74.48000	87.47300	119.7451	COR TRAILER
SIDESHOT	69	8.25	73.32400	87.40450	110.0451	COR TRAILER
SIDESHOT	70	8.25	85.38350	87.42100	117.3651	W'LY FACE CRW(6")
SIDESHOT	71	8.25	85.49450	87.24318	117.9749	CLF
SIDESHOT	72	8.25	92.46100	88.14200	116.5331	COR BLDG
SIDESHOT	73	8.25	93.01000	87.41300	106.1051	COR BLDG
NOTE:						
PREVIOUS TWO SHOTS ROD=7.6(NOT 8.25)						
SIDESHOT	74	13.20	100.30450	85.07550	107.6900	COR BLDG
SIDESHOT	75	11.85	67.56000	85.18200	135.0700	NW COR SHW
NOTE:						
SHW=STONE & CONC HEADWALL						
SIDESHOT	76	11.85	73.44450	85.10200	130.6700	SW COR SHW
SIDESHOT	77	11.85	71.09400	85.58400	127.4451	COR CRW
NOTE:						
CRW=8"CONC RET WALL						

ACTIVITY	POINT	HEIGHT	HORIZONTAL	VERTICAL	DISTANCE	CREATED TIME/DESC
SIDESHOT	78	11.85	69.17500	86.03000	128.7151	COR CRW
SIDESHOT	79	11.85	71.00100	85.59350	132.3700	<RECORD DELETED>
SIDESHOT	80	15.60	70.32550	85.39250	129.5000	INV
SIDESHOT	79	15.60	70.54450	86.01150	132.4451	INV(HW)
SIDESHOT	81--	5.16	117.09000	89.23200	85.3651	EDGE TNK
SIDESHOT	82	5.16	132.07050	89.11446	62.7351	EDGE TNK
SIDESHOT	83	5.16	155.06350	89.40100	86.8699	EDGE TNK
SIDESHOT	84	5.16	106.50200	89.33100	120.2151	UP
SIDESHOT	85	5.16	111.45200	89.28000	125.3651	W'LY FACE CRW(6")
SIDESHOT	86	5.16	111.08550	88.20045	126.3750	CLF
OCC. STA.	12	5.33				12-16-98 12:06:32
						PK POL(D-8)
BACKSIGHT	1		0.00000	89.54450	300.3951	PK(D11)
SIDESHOT	87	5.16	85.03200	88.43400	10.9251	UP
SIDESHOT	88	5.16	88.29350	89.47450	113.1500	SS-23
SIDESHOT	89	5.16	92.08500	88.02400	30.7799	BLDG COR(63)
SIDESHOT	90	5.16	95.13200	85.37400	12.9151	BLDG COR(63)
SIDESHOT	91	5.16	135.48350	87.01350	18.4751	BLDG COR(63)
SIDESHOT	92	5.16	86.49065	89.37151	64.4732	EDGE TNK
SIDESHOT	93	5.16	150.33400	88.45455	22.9800	BLDG COR(60)
SIDESHOT	94	5.16	173.35200	89.45050	100.6300	BLDG COR(60)
SIDESHOT	95	5.16	348.32350	90.31400	48.4600	CL REMS RR TRX
SIDESHOT	96	5.16	189.32300	89.58300	106.4400	UP
SIDESHOT	97	5.16	196.45550	90.32550	35.0951	CL REMS RR TRX
SIDESHOT	98	5.16	239.12300	90.29100	133.1350	BLDG COR(59)
SIDESHOT	99	5.16	184.32050	89.53500	131.4151	CL END REMS RR TRX
SIDESHOT	100	5.16	205.39500	87.31194	75.7699	<RECORD DELETED>
SIDESHOT	101	8.25	198.03350	88.11050	105.9000	BLDG COR(59)
SIDESHOT	100	8.25	205.39300	87.30444	75.7999	BLDG COR(59)
SIDESHOT	102	5.16	304.53100	87.56000	23.2551	UT
NOTE:						
UT=UTILITY TOWER ON 3.0'X 2.085'CONC BASE						
SIDESHOT	103	5.16	3.44450	88.48000	157.3551	<RECORD DELETED>
NOTE:						<RECORD DELETED>
157.3551						
SIDESHOT	104	8.25	0.00000	0.00000	164.6600	<RECORD DELETED>
SIDESHOT	103	8.25	3.38500	88.50350	164.6651	END UT
NOTE:						
NO CONC BASE						
SIDESHOT	104	8.25	3.47350	88.46350	157.3751	END UT
NOTE:						
ON 2.0'X 1.25'CONC BASE						
SIDESHOT	105	8.25	263.17550	91.01400	133.4700	<RECORD DELETED>
SIDESHOT	106	5.16	263.17550	91.01300	133.5851	SS-4
SIDESHOT	105	5.16	242.42000	90.20550	155.8951	CLF
OCC. STA. -	13	5.28				12-16-98 12:42:23
						PK POL(D-7)
BACKSIGHT	1		0.00000	89.57450	400.2251	PK(D11)
SIDESHOT	107	5.16	102.10250	89.06300	105.3751	LMS-6

ACTIVITY	POINT	HEIGHT	HORIZONTAL	VERTICAL	DISTANCE	CREATED TIME/DESC
SIDESHOT	108	5.16	94.03550	89.20550	84.9351	CL TANK
NOTE:						
5.5'DIA						
SIDESHOT	109	5.16	99.42350	89.06050	114.6551	UP
NOTE:						
@ CL 6"TRW(TRW=TIE RET WALL)						
SIDESHOT	110	5.16	100.07250	88.03150	118.5651	CLF
SIDESHOT	111	5.16	104.32350	88.28200	116.9300	BLDG COR(61)
SIDESHOT	112	5.16	108.12150	89.12325	89.3251	BLDG COR(61)
SIDESHOT	113	8.25	135.38250	87.48100	117.6900	BLDG COR(61)
SIDESHOT	114	5.16	237.47550	89.32450	116.9551	BLDG COR(62)
SIDESHOT	115	8.25	195.37550	86.54100	65.1400	BLDG COR(62)
NOTE:						
@ BEG CLF						
SIDESHOT	116	5.16	249.05400	89.39550	144.5200	UP
SIDESHOT	117	5.16	255.24350	89.45500	139.5251	UP
SIDESHOT	118	5.16	251.46150	89.45150	142.6551	EL.TRANS
NOTE:						
5.5'(N-S)X 4.0'(E-W)						
SIDESHOT	119	5.16	256.46000	90.19068	17.6500	COR CLF
SIDESHOT	120	5.16	262.59400	89.45580	33.2050	COR CLF
NOTE:						
TO SE COR BLDG 59						
SIDESHOT	121	5.16	241.58400	89.55200	160.0900	CLF
SIDESHOT	122	5.16	186.11400	89.37450	165.0450	BLDG COR(62)
SIDESHOT	123	5.16	166.00150	89.42200	84.6800	SB-8
OCC. STA.	14	5.48				12-16-98 13:12:07
						PK POL(D-6)
BACKSIGHT	1		0.00000	90.02550	500.1751	PK(D11)
SIDESHOT	124	7.35	48.50200	88.10300	151.4251	BLDG COR(60)
NOTE:						
@ BEG 6"TRW						
SIDESHOT	125	5.16	82.34350	88.40050	111.6600	BLDG COR(61)
SIDESHOT	126	7.35	48.51450	88.31150	154.8000	SW COR END CRW
SIDESHOT	127	5.16	102.01450	87.55377	115.6199	CLF
SIDESHOT	128	5.16	112.03300	89.27450	113.4151	UP
SIDESHOT	129	5.00	82.01350	89.30200	100.2651	COR CLF
NOTE:						
CLF AROUND VOLLEY BALL COURT						
SIDESHOT	130	8.25	134.40350	88.12100	144.0103	BLDG COR(58)
NOTE:						
@ BEG CLF						
SIDESHOT	131	8.25	135.23400	88.16050	140.4400	COR CLF
NOTE:						
CLF @ VOLLEY BALL CRT						
SIDESHOT	132	5.16	132.46200	88.33400	149.5351	INT CLF
SIDESHOT	133	6.70	133.57100	88.45404	147.3298	SS-22
SIDESHOT	134	5.16	158.16050	89.22200	107.5600	COR CLF(V-BALL)
SIDESHOT	135	5.85	154.10250	89.03100	91.4151	COR UGC

ACTIVITY	POINT	HEIGHT	HORIZONTAL	VERTICAL	DISTANCE	CREATED TIME/DESC
NOTE:						
UGC=UNDERGROUND CHAMBER						
SIDESHOT	136	5.85	150.48400	88.56050	81.7951	COR UGC
SIDESHOT	137	5.85	159.35500	89.11050	76.1451	COR UGC
SIDESHOT	138	5.16	162.12100	89.43350	85.9700	COR UGC
SIDESHOT	139	7.10	149.43450	87.54450	79.3800	INT CLF
NOTE:						
V-BALL & OTHER						
SIDESHOT	140	0.00	167.05000	91.20000	77.8751	CL UG TANK
NOTE:						
12'DIA						
SIDESHOT	141	5.16	168.47500	89.03200	90.4800	CL UG TANK
NOTE:						
7.1'DIA						
SIDESHOT	142	5.16	170.42450	89.53107	68.4351	COR CLF
SIDESHOT	143	5.16	173.57150	89.41208	101.3751	BLDG COR(58)
NOTE:						
@ END "OTHER"CLF						
SIDESHOT	144	5.16	190.56200	89.35200	94.3400	BLDG COR(57N)
SIDESHOT	145	5.16	191.59350	89.31200	91.5851	UT
NOTE:						
ON 1.8'X 0.9'CONC BASE						
SIDESHOT	146	5.85	70.51200	88.13381	42.2199	COR CLF(V-BALL)
SIDESHOT	147	5.16	181.55400	89.42000	104.6300	GW-4
UNIT:						
Distance unit: FEET						
Angle unit: D.M.S.						
Azimuth system: NORTH						
Angle direction: RIGHT						
Vertical system: VERT DIST						
UNIT:						
Distance unit: FEET						
Angle unit: D.M.S.						
Azimuth system: NORTH						
Angle direction: RIGHT						
Vertical system: ZENITH						
OCC. STA.	16	5.27				12-17-98 11:30:34
						PK POL(D-4)
BACKSIGHT	1		0.00000	90.06100	700.1000	PK(D11)
NOTE:						
B/S HGT=5.12						
SIDESHOT	148	5.16	28.11000	89.26250	21.9850	BLDG COR(58)
SIDESHOT	149	5.16	79.21350	89.38450	103.7900	BLDG COR(58)
SIDESHOT	150	5.16	79.48050	89.00150	105.5100	CLF
SIDESHOT	151	5.16	82.36104	90.07399	90.2705	LMS-7
SIDESHOT	152	10.85	97.37250	86.15000	78.0652	BLDG COR(55)
SIDESHOT	153	10.85	97.26450	86.39200	97.4800	UP
SIDESHOT	154	5.16	134.57300	90.27160	14.7300	BLDG COR(55)
SIDESHOT	155	5.16	121.46050	90.31200	13.4700	UT

ACTIVITY	POINT	HEIGHT	HORIZONTAL	VERTICAL	DISTANCE	CREATED TIME/DESC
NOTE:						
UT=METAL UTILITY TOWER/0.35'X 1.35'						
SIDESHOT	156	5.16	206.47100	90.24300	22.7500	MH
SIDESHOT	157	5.16	353.45450	90.16000	126.0151	MH
SIDESHOT	158	5.16	354.10450	90.14500	111.8400	MH
OCC. STA.	17	5.30				12-17-98 11:45:51
						PK POL(D-3)
BACKSIGHT	1		0.00000	90.03500	800.0251	PK(D11)
NOTE:						
B/S HGT=5.12						
SIDESHOT	159	5.16	357.39150	90.08100	344.2551	MH
SIDESHOT	160	5.16	315.47300	90.10131	26.7000	BLDG COR(57S)
SIDESHOT	161	5.16	280.59500	89.57050	100.5900	BLDG COR(57S)
SIDESHOT	162	5.16	266.10550	90.17450	81.0951	BLDG COR(54)
SIDESHOT	163	5.16	253.40000	89.42093	19.6251	BLDG COR(54)
SIDESHOT	164	5.16	269.27500	90.32000	104.7200	SB-5
SIDESHOT	165	5.16	270.20300	90.24300	90.3051	MH
SIDESHOT	166	5.16	260.03550	89.58100	23.1051	UT
NOTE:						
ON 2.5'(N-S)X 3.1'(E-W)CONC BASE						
SIDESHOT	167	8.25	201.19250	86.12050	52.3000	BLDG COR(54)
SIDESHOT	168	10.65	196.47250	85.08350	65.5200	BLDG COR(52)
OCC. STA.	6	5.33				12-17-98 12:09:11
						PK(D1)
BACKSIGHT	1		0.00000	90.00350	999.9751	PK(D11)
TRAVERSE	7	5.34	132.58500	83.56300	269.9851	MAG PK
SIDESHOT	5	5.55	273.21150	90.13350	173.8651	MAG PK
SIDESHOT	5	5.55	93.21300	269.46250	173.8700	MAG PK
TRAVERSE	7	5.55	312.58550	276.03200	269.9900	MAG PK
BACKSIGHT	1		180.00050	269.59200	999.9751	PK(D11)
NOTE:						
B/S HGT=5.12						
SIDESHOT	169	5.16	7.32150	89.37550	75.0451	BLDG COR(55)
SIDESHOT	170	5.16	55.33550	89.50167	26.7900	BLDG COR(55)
SIDESHOT	171	5.16	76.34250	89.59400	63.7251	BLDG COR(55)
SIDESHOT	172	5.16	113.27050	90.37500	18.0451	GW-3
SIDESHOT	173	5.16	150.22050	89.46250	117.1800	SB-4
SIDESHOT	174	5.16	301.01000	90.20250	11.9951	MH
SIDESHOT	175	5.16	149.19200	89.32550	130.4351	BLDG COR(51)
SIDESHOT	176	5.16	150.28500	89.41050	126.6851	UP
SIDESHOT	177	5.16	153.46150	89.43506	123.5351	BLDG COR(51)
SIDESHOT	178	5.16	156.49500	89.45100	135.0000	BLDG COR(51)
SIDESHOT	179	5.16	161.25450	89.50200	170.4851	CL BEG REMS RR TRX
SIDESHOT	180	5.16	160.14200	89.50000	136.9100	CL REMS RR TRX
NOTE:						
@ CL CLF/GATE						
SIDESHOT	181	14.85	153.16150	85.24484	146.8996	COR CLF
SIDESHOT	182	5.16	146.18100	90.13300	43.5100	CL END REMS RR TRX
SIDESHOT	183	5.16	154.28150	89.51350	120.6500	CL BEG SEWER

ACTIVITY	POINT	HEIGHT	HORIZONTAL	VERTICAL	DISTANCE	CREATED TIME/DESC
SIDESHOT	184	5.16	158.04150	89.47250	135.1700	CL < SEWER
SIDESHOT	185	5.16	158.09400	89.43550	139.0600	CL END SEWER
NOTE:						
PAINTED SEWER MARKS ON PAV'T						
SIDESHOT	186	5.16	147.53350	89.31350	126.0251	SS-20
SIDESHOT	187	5.16	162.38300	89.46550	93.2450	BLDG COR(50)
SIDESHOT	188	5.16	176.32350	89.37100	70.6100	BLDG COR(50)
SIDESHOT	189	5.16	206.45500	90.02050	69.2851	BLDG COR(50)
SIDESHOT	190	5.16	214.03150	90.02550	74.4351	MH
SIDESHOT	191	5.16	244.29000	90.20050	126.9500	BLDG COR(50)
SIDESHOT	192	5.16	246.01450	90.20100	130.1751	CLF/GATE
SIDESHOT	193	5.16	253.34500	90.32400	121.6750	CLF/GATE
SIDESHOT	194	5.16	254.25300	90.35350	107.3500	COR GAURD SHACK
SIDESHOT	195	6.55	260.38550	89.37500	103.2200	COR GUARD SHACK
SIDESHOT	196	5.16	262.09350	90.24050	113.0300	COR GUARD SHACK
SIDESHOT	197	5.16	263.16350	90.33500	115.5051	END CLF
SIDESHOT	198	5.16	308.38400	88.51283	24.7151	BLDG COR(52)
SIDESHOT	199	5.16	281.07450	89.43400	80.8750	BLDG COR(52)
SIDESHOT	200	5.16	278.26350	89.47005	104.1451	BLDG COR(53)
SIDESHOT	201	5.16	100.34300	89.53500	67.5951	COR SHED
SIDESHOT	202	5.16	95.01250	90.00599	67.4451	COR SHED
SIDESHOT	203	5.16	95.16422	89.42450	75.5362	COR SHED
SIDESHOT	204	5.16	90.05500	88.54400	82.0351	CLF
OCC. STA.	7	5.42				12-17-98 13:20:24
						MAG PK
BACKSIGHT	6		0.00000	96.07250	270.0300	PK(D1)
SIDESHOT	8	5.46	51.47100	92.56150	382.4351	MAG PK
SIDESHOT	8	5.46	231.47100	267.03500	382.4351	MAG PK
BACKSIGHT	6		180.00000	263.52250	270.0351	PK(D1)
NOTE:						
B/S HGT=5.10						
SIDESHOT	205	5.16	346.23300	92.12050	29.7651	CL RD@BEG BR
NOTE:						
BR=20'IN WIDTH						
SIDESHOT	206	5.16	0.28350	91.53000	35.1251	BEG/PC BC
SIDESHOT	207	5.16	6.34050	91.53050	32.2951	POC BC
SIDESHOT	208	5.16	14.15050	91.51350	33.9651	PT BC
SIDESHOT	209	5.16	330.20550	92.16350	128.5151	CL RD@ CL BR
SIDESHOT	210	5.16	38.00350	93.04500	80.3400	BC
SIDESHOT	211	5.16	43.16000	93.20500	120.4651	BC
SIDESHOT	212	5.16	327.51200	93.42100	287.7551	CL RD@END BR
SIDESHOT	213	5.16	44.34350	93.24300	138.1700	BC
SIDESHOT	214	5.16	48.39300	93.26100	136.4000	CL RD
SIDESHOT	215	5.16	328.16500	94.00000	340.7751	CL RD
SIDESHOT	216	5.16	52.56250	93.32300	136.0151	< BC
SIDESHOT	217	5.16	63.07450	92.45150	82.7851	BC
SIDESHOT	218	5.16	77.23100	91.11400	55.4100	< BC
SIDESHOT	219	5.16	102.10350	89.42000	28.4000	END(+/-)BC
SIDESHOT	220	15.60	332.16300	93.00150	321.1251	BLDG COR(50)

ACTIVITY	POINT	HEIGHT	HORIZONTAL	VERTICAL	DISTANCE	CREATED TIME/DESC
SIDESHOT	221	15.60	332.21450	93.11250	304.0551	BLDG COR(50)
SIDESHOT	222	15.60	334.39400	93.10000	244.7600	BLDG COR(50)
NOTE: @ OVERHANG/NO ELEV.						
SIDESHOT	223	15.60	338.48150	93.36500	187.6900	BLDG COR(50)
NOTE: @ OVERHANG/NO ELEV.						
SIDESHOT	224	5.16	264.13050	94.12400	4.3000	END JB
NOTE: JB=JERSEY BARRIER						
SIDESHOT	225	5.16	329.28100	92.57300	12.5951	< JB
SIDESHOT	226	5.16	327.45100	92.12400	28.9300	BEG JB
SIDESHOT	227	5.16	51.22100	93.36200	297.4800	CL RD
NOTE: STA#8 IS @ CL RD						
OCC. STA.	8	5.52				12-18-98 07:40:50 MAG PK
BACKSIGHT	7		0.00000	87.08550	382.4900	MAG PK
NOTE: B/S HGT=4.98						
SIDESHOT	228	5.16	299.54550	72.56300	86.0751	T.CL 24"CMP
NOTE: EXPOSED						
SIDESHOT	229	8.25	53.11400	92.03150	173.7251	SS-21
SIDESHOT	230	5.16	323.12550	74.06100	41.3100	DMH
SIDESHOT	231	8.25	55.09400	91.57200	169.8951	UP
SIDESHOT	232	8.25	61.50100	91.59500	157.8951	CL BEG W.CHAMBER
NOTE: 5.2'WIDE						
SIDESHOT	233	11.85	65.49150	90.38250	153.5000	CL END W.CHAMBER
SIDESHOT	234	5.16	286.15200	90.11550	16.9600	END BC/CBCP
NOTE: 2'X 4'(TYP)						
SIDESHOT	235	5.16	79.49050	90.30500	14.7151	END BC/CBCP
SIDESHOT	236	5.60	89.23400	93.20336	151.3799	< BLDG(55)
SIDESHOT	237	5.60	95.53150	93.17150	151.5451	SB-6
SIDESHOT	238	5.16	68.37250	93.18450	141.8051	CLF
SIDESHOT	239	5.16	179.28050	90.30350	79.7300	CL RD
NOTE: 24'PAV'T(TYP)						
SIDESHOT	240	5.16	178.05150	90.40500	162.0851	CL RD
SIDESHOT	241	5.16	177.00100	90.53050	244.3751	CL RD
SIDESHOT	242	5.16	176.32300	90.53050	323.7051	CL RD
SIDESHOT	243	9.00	161.53100	90.31200	495.2652	BLDG COR(60)
SIDESHOT	244	6.35	179.23050	90.48000	278.8951	CL CBFI
NOTE: 1.85'X 4.1'						
SIDESHOT	245	5.16	176.36150	90.51200	354.2351	CL RD
SIDESHOT	246	8.25	178.37150	90.23050	357.1751	CL CBFI

ACTIVITY	POINT	HEIGHT	HORIZONTAL	VERTICAL	DISTANCE	CREATED TIME/DESC
NOTE:						
2.15'SQ						
SIDESHOT	247	5.16	176.36350	90.44400	436.0851	CL RD
SIDESHOT	248	8.25	178.00250	90.22450	425.1351	CL CBFI
NOTE:						
2.0'X 4.1'						
SIDESHOT	249	5.16	176.25200	90.39150	505.7800	CL RD
SIDESHOT	250	5.16	178.02550	90.40050	501.8751	CBCP
SIDESHOT	251	5.16	176.07400	90.34150	591.7500	CL RD
SIDESHOT	252	5.16	176.16000	90.28050	672.0900	CL RD
SIDESHOT	253	5.16	177.34400	90.31100	655.4251	CBCP
SIDESHOT	254	5.16	173.55450	90.22050	662.1251	BEG NE COR SHW
SIDESHOT	255	5.16	173.55050	90.21300	646.3551	END SE COR SHW
NOTE:						
SHW=STONE & CONC HEADWALL/BURIED IN LAWN LITTER(LEAVES,SHRUBS,ETC)						
SIDESHOT	256	8.25	173.57100	90.20500	652.2000	INV@CL(+/-)HW
OCC. STA.	5	5.37				12-21-98 09:54:50
						MAG PK
BACKSIGHT	6		0.00000	89.48050	173.8751	PK(D1)
SIDESHOT	4	5.33	252.40550	90.16150	482.3751	PIN W/CAP
SIDESHOT	4	5.33	72.41000	269.43550	482.3700	PIN W/CAP
BACKSIGHT	6		180.00050	270.11350	173.8751	PK(D1)
NOTE:						
B/S HGT=5.07						
TRAVERSE	19	5.16	252.40550	90.05400	180.9951	POL-MAG PK
SIDESHOT	257	5.16	28.45350	90.00450	70.8700	BLDG COR
NOTE:						
GUARD SHACK						
SIDESHOT	258	5.16	17.53500	89.35450	14.2451	LMS-3
SIDESHOT	259	5.16	7.11550	89.36100	10.9200	END CLF
SIDESHOT	260	5.16	58.44150	88.56100	109.4451	BLDG COR(50)
SIDESHOT	261	5.16	63.14500	88.29500	110.6100	UP
NOTE:						
@ CL CLF						
SIDESHOT	262	5.16	45.42550	89.56050	83.7651	END CLF/GATE
SIDESHOT	263	8.25	59.42100	87.02400	129.8898	UP
SIDESHOT	264	5.16	63.42000	88.19100	113.8199	COR CLF
SIDESHOT	265	5.16	58.56350	88.41200	128.5951	CLF
SIDESHOT	266	5.16	82.19050	88.19100	133.7399	UP
SIDESHOT	267	5.16	83.48300	88.27050	133.6451	UP
SIDESHOT	268	5.16	295.58000	91.01550	20.8551	BEG CLF
NOTE:						
@ BLDG(53) LINE(+/-)						
SIDESHOT	269	5.16	257.14550	90.12500	16.3650	CLF/GATE
SIDESHOT	270	5.16	206.10500	90.12450	25.7600	CLF/GATE
SIDESHOT	271	5.16	202.18300	90.28400	27.3200	INT CLF
SIDESHOT	272	8.25	109.51550	87.24450	67.6651	CLF/GATE
SIDESHOT	273	8.25	104.32100	87.32300	86.8000	CLF/GATE
SIDESHOT	274	5.16	102.00300	89.17500	101.5500	COR CLF

ACTIVITY	POINT	HEIGHT	HORIZONTAL	VERTICAL	DISTANCE	CREATED TIME/DESC
SIDESHOT	275	9.35	121.08550	87.25050	107.2400	PC CLF
SIDESHOT	276	11.85	133.13300	86.27200	113.7300	POL CLF
SIDESHOT	277	9.35	154.30100	88.19150	123.3551	PT CLF
SIDESHOT	278	15.60	182.29400	86.08350	128.7051	INT CLF
OCC. STA.	19	5.15				12-21-98 10:46:47
						POL-MAG PK
BACKSIGHT	5		0.00000	90.00500	181.0051	MAG PK
NOTE:						
B/S HGT=5.13						
SIDESHOT	279	8.25	52.01550	89.41500	204.2700	END CLF
SIDESHOT	280	8.25	325.14400	89.28370	73.1800	<RECORD DELETED>
SIDESHOT	281	11.00	306.53492	86.30355	125.2908	BLDG COR(53)
SIDESHOT	280	5.16	325.15000	89.27471	73.1800	BLDG COR(53)
SIDESHOT	282	8.25	55.50550	89.46400	189.7400	COR STLWL
NOTE:						
STLWL=CONC"STILLING WELL"						
SIDESHOT	283	8.25	59.47150	89.50500	204.5651	COR STLWL
SIDESHOT	284	8.25	55.47200	89.46500	218.0751	COR STLWL
SIDESHOT	285	10.15	51.48300	89.11400	204.2500	COR STLWL
SIDESHOT	286	11.00	309.33200	85.39200	95.0451	UP
SIDESHOT	287	11.00	306.48500	85.19400	82.6900	UP
SIDESHOT	288	8.25	56.20100	89.45450	205.9200	CL 2.8'SQ"WELL"
SIDESHOT	289	11.00	311.42350	85.15050	85.6700	ELEC TRANS
NOTE:						
4.6'X 2.6'						
SIDESHOT	290	8.25	53.55300	89.45050	153.2000	CBFI
NOTE:						
CBFI=2'DIA(TYP)						
SIDESHOT	291	8.25	62.40250	89.19300	129.9351	BL A-2
SIDESHOT	292	8.25	57.27250	89.02100	114.2151	MW-6
SIDESHOT	293	11.85	298.07250	86.32400	140.7100	BLDG COR(54)
SIDESHOT	294	11.85	303.14550	86.34550	146.7200	BLDG COR(52)
SIDESHOT	295	8.25	69.19400	89.13200	119.2500	CBFI
SIDESHOT	296	6.90	226.52250	88.17000	102.8651	COR SHED
NOTE:						
ROD=5.9(NOT 6.9)/METAL/1 STY						
SIDESHOT	297	5.90	231.01150	88.04560	91.7800	COR SHED
SIDESHOT	298	5.90	235.48100	88.08350	97.6551	COR SHED
SIDESHOT	299	8.25	100.36500	87.37450	73.4751	OW-27A
SIDESHOT	300	11.85	234.13450	85.44398	119.1786	LMS-1
SIDESHOT	301	8.25	112.14400	88.49250	98.7351	BL A-3
SIDESHOT	302	11.85	238.58450	86.25250	143.4851	COR MSU
NOTE:						
MSU=METAL STORAGE UNIT						
SIDESHOT	303	11.85	243.19000	86.38350	155.1951	COR MSU
SIDESHOT	304	8.25	122.54400	88.57150	101.3051	CBFI
SIDESHOT	305	8.25	120.40050	88.44050	93.6651	SB-2
SIDESHOT	306	8.25	139.39500	88.34300	102.3751	MW-7A
SIDESHOT	307	15.60	229.47450	86.00200	174.7900	COR MSU

ACTIVITY	POINT	HEIGHT	HORIZONTAL	VERTICAL	DISTANCE	CREATED TIME/DESC
SIDESHOT	308	15.60	221.16200	85.46300	160.5551	COR MSU
SIDESHOT	309	15.60	221.10250	85.46300	160.4600	CLF
SIDESHOT	310	5.16	145.29150	89.38150	87.8251	COR CONC PAD
SIDESHOT	311	15.60	229.37300	84.22450	126.3051	COR MSU
SIDESHOT	312	15.60	229.28100	84.23400	126.0400	CLF
SIDESHOT	313	5.16	180.19000	89.23300	59.8551	COR CONC PAD
SIDESHOT	314	15.60	232.22200	84.37150	130.6651	COR MSU
SIDESHOT	315	15.60	234.02550	83.36500	112.8900	COR CLF
SIDESHOT	316	5.16	26.36550	89.34200	58.8751	COR CONC PAD
SIDESHOT	317	5.16	62.26450	89.36450	86.2400	COR CONC PAD
SIDESHOT	318	5.16	39.57050	89.29000	85.8299	COR CONC PAD
SIDESHOT	319	5.16	341.30000	89.51300	84.7600	MH-1
SIDESHOT	320	6.05	30.24000	89.29200	126.5800	COR CONC PAD
SIDESHOT	321	8.25	20.33350	88.23450	123.2351	COR CONC PAD
SIDESHOT	322	5.16	350.25300	90.01000	115.9900	BLDG COR(53)
SIDESHOT	323	5.16	346.23100	89.59250	100.2800	BLDG COR(53)
SIDESHOT	324	5.16	21.25150	89.18100	78.0400	COR CONC PAD
SIDESHOT	325	5.16	345.24350	89.57550	97.2700	UP
SIDESHOT	326	5.16	330.19250	89.21400	69.4451	OW-15
SIDESHOT	327	8.25	18.35150	88.40350	144.8600	COR CONC PAD
SIDESHOT	328	8.25	17.38450	88.30339	168.7691	COR CONC PAD
NOTE: @ CLF						
SIDESHOT	329	7.00	9.51000	88.53032	121.9174	MW-9A
SIDESHOT	330	8.25	26.02100	88.51443	171.3999	COR CONC PAD
SIDESHOT	331	8.25	27.06000	88.53300	141.6251	COR CONC PAD
SIDESHOT	332	5.16	339.51450	91.48250	15.7700	CBFI
SIDESHOT	333	8.25	15.10300	88.43000	165.1200	UP
SIDESHOT	334	5.16	278.55150	89.22400	52.5400	CLF
NOTE: @ CL GATE/20'WIDE						
SIDESHOT	335	8.25	16.13500	89.02550	156.1700	ANCHOR
SIDESHOT	336	6.50	225.53000	87.51500	102.4251	COR CLF
SIDESHOT	337	8.25	143.46100	88.53150	142.8351	UP
SIDESHOT	338	8.25	141.29200	89.26450	145.7771	ANCHOR
SIDESHOT	339	11.85	219.24400	86.53000	136.8200	UP
SIDESHOT	340	8.00	219.26050	87.15450	89.2400	UP
SIDESHOT	341	5.16	203.50550	89.47000	58.8900	MH
SIDESHOT	342	5.16	221.26550	88.51450	103.8151	OW-12
SIDESHOT	343	5.16	207.49150	89.58450	67.1500	MW-S1
SIDESHOT	344	5.16	207.39500	89.47500	71.6751	MW-SD
SIDESHOT	345	5.16	208.41050	89.48150	96.1400	SS-2
SIDESHOT	346	5.16	208.22000	89.37150	105.0300	B/O PIPES
NOTE: B/O=CL BLOW-OFF CLUSTER OF 5-3"PIPES						
SIDESHOT	347	5.16	193.38300	89.32350	93.7151	COR CONC PAD
SIDESHOT	348	5.16	193.30300	89.33000	74.9351	COR CONC PAD
SIDESHOT	349	8.25	215.42250	87.28150	84.9200	COR CONC PAD
SIDESHOT	350	8.25	212.49050	87.35050	93.3400	COR(+/-)CONC PAD

ACTIVITY	POINT	HEIGHT	HORIZONTAL	VERTICAL	DISTANCE	CREATED TIME/DESC
NOTE:						
EDGE CONC BROKEN						
SIDESHOT	351	5.16	202.31100	89.39300	89.2200	COR(+/-)CONC PAD
SIDESHOT	352	5.16	201.30400	89.25400	93.9900	COR(+/-)CONC PAD
TRAVERSE	4	5.16	0.00000	0.00000	0.0000	PIN W/CAP
OCC. STA.	4	5.39				12-21-98 12:27:02
						PIN W/CAP
BACKSIGHT	5		0.00000	89.46200	482.3751	MAG PK
SIDESHOT	3	5.34	202.13450	90.00550	391.0100	PIN W/CAP
SIDESHOT	3	5.34	22.13500	269.59150	391.0100	PIN W/CAP
BACKSIGHT	5		180.00050	270.13300	482.3700	MAG PK
NOTE:						
B/S HGT=5.13						
SIDESHOT	353	10.50	353.47250	88.48550	349.3615	SS-1
SIDESHOT	354	5.16	0.29350	89.23100	229.4151	CBFI
SIDESHOT	355	5.16	6.13250	89.51400	158.0251	TNKPD1
NOTE:						
TNKPD=TANK PAD/OUTSIDE EDGE 2.1'WIDE CONC RING						
SIDESHOT	356	5.16	346.47250	89.52000	156.4951	TNKPD1
SIDESHOT	357	5.16	324.22450	89.47000	125.7100	TNKPD1
SIDESHOT	358	5.16	308.43100	89.42000	81.5900	TNKPD1
SIDESHOT	359	5.16	337.14500	88.39500	19.3551	TNKPD1
SIDESHOT	360	5.16	50.49000	89.36250	55.0800	TNKPD1
SIDESHOT	361	5.16	331.18150	91.45350	17.6800	GW-2
SIDESHOT	362	5.16	42.35000	89.46350	96.7600	TNKPD1
SIDESHOT	363	5.16	26.05350	89.52100	135.5551	TNKPD1
SIDESHOT	364	0.20	31.36000	93.12450	82.2151	BL A5
SIDESHOT	365	5.16	3.56100	90.20550	115.4651	SS-3
SIDESHOT	366	5.16	78.21400	88.29250	56.1651	COR CP
NOTE:						
CP=CONC PAD						
SIDESHOT	367	5.16	64.53200	87.52050	39.5851	COR CP
SIDESHOT	368	5.16	103.41500	87.06000	30.3351	COR CP
SIDESHOT	369	5.16	104.11550	88.16400	50.1200	COR CP
SIDESHOT	370	5.16	145.09000	89.14300	33.0451	BL A6
SIDESHOT	371	5.16	143.32000	89.25250	33.1800	TNKPD2
SIDESHOT	372	5.16	162.06250	90.01400	84.1100	TNKPD2
SIDESHOT	373	5.16	154.22400	89.37550	78.1751	OW-9A
SIDESHOT	374	5.16	182.57150	89.54000	122.5500	TNKPD2
SIDESHOT	375	5.16	182.27200	89.53150	124.2600	HUB A7
SIDESHOT	376	5.16	200.01200	89.52450	140.4000	TNKPD2
SIDESHOT	377	5.16	220.35150	89.48550	144.9600	TNKPD2
SIDESHOT	378	5.16	249.59450	89.45450	118.0300	TNKPD2
SIDESHOT	379	5.16	272.40000	89.37100	73.4251	TNKPD2
SIDESHOT	380	5.16	287.50150	88.55200	21.9300	TNKPD2
SIDESHOT	381	8.25	322.58000	87.34500	158.5751	UP
SIDESHOT	382	5.16	318.47350	88.21400	156.4700	PIPE
SIDESHOT	383	5.16	307.25550	87.51250	154.8651	<RECORD DELETED>
SIDESHOT	384	8.25	312.31400	87.53400	166.5651	CLF

ACTIVITY	POINT	HEIGHT	HORIZONTAL	VERTICAL	DISTANCE	CREATED TIME/DESC
SIDESHOT	383	8.25	307.27100	87.51350	154.8751	OW-17
SIDESHOT	385	7.05	304.11400	88.20350	204.9849	BLDG COR(57)
SIDESHOT	386	5.16	294.58000	89.08000	140.2451	SS-12
SIDESHOT	387	7.05	301.45100	88.28000	192.4100	SB-7
SIDESHOT	388	5.16	295.06250	88.12350	131.4900	PIPE
SIDESHOT	389	5.16	296.28050	88.29550	195.4851	BLDG COR(62)
NOTE:						
ROD=7.05(NOT 5.16)						
SIDESHOT	390	7.05	297.14050	88.18450	166.3951	CL POC CONC WALL
SIDESHOT	391	8.25	288.23250	87.58350	136.2151	UP
SIDESHOT	392	7.30	299.27050	88.17300	160.9600	LMS-2
SIDESHOT	393	8.10	300.45150	88.06400	159.8700	CBFI
NOTE:						
2.6'SQ						
SIDESHOT	394	5.16	296.20400	88.52450	172.9000	POC CONC WALL
SIDESHOT	395	5.16	291.31200	88.49550	177.7251	PT CONC WALL
SIDESHOT	396	5.16	279.06300	88.47100	177.1251	PC CONC WALL
SIDESHOT	397	5.16	276.23400	88.43350	173.5900	POC CONC WALL
SIDESHOT	398	8.25	274.47450	87.32450	164.9851	POC CONC WALL
SIDESHOT	399	8.25	275.36200	87.23500	156.2000	POC CONC WALL
SIDESHOT	400	8.25	278.45050	87.19300	150.8400	PT CONC WALL
SIDESHOT	401	5.16	293.52450	88.36100	152.4100	PC CONC WALL
SIDESHOT	402	5.16	294.02550	88.40100	150.9600	CLF
SIDESHOT	403	6.40	273.01050	88.34200	136.4951	UP
SIDESHOT	404	5.16	289.44050	89.39000	102.1300	CL BEG CP/2.85'W
SIDESHOT	405	5.16	286.32450	89.34350	101.6651	CL END CP/2.85'W
SIDESHOT	406	5.16	258.34100	88.51200	144.8251	PIPE
SIDESHOT	407	5.16	260.18150	89.02450	157.4251	MH-2
SIDESHOT	408	5.16	245.37200	88.59250	184.4851	MH-7
SIDESHOT	409	11.85	237.25100	87.52050	205.0098	UP
SIDESHOT	410	11.85	233.49150	88.00400	193.1957	MW-15
SIDESHOT	411	11.85	226.17050	87.54250	184.1600	MW-10

UNIT:
Distance unit: FEET
Angle unit: D.M.S.
Azimuth system: NORTH
Angle direction: RIGHT
Vertical system: VERT DIST

UNIT:
Distance unit: FEET
Angle unit: D.M.S.
Azimuth system: NORTH
Angle direction: RIGHT
Vertical system: ZENITH

OCC. STA.	4	5.33				12-28-98 07:47:42
						PIN W/CAP
BACKSIGHT	5		0.00000	89.44500	482.3800	MAG PK

NOTE:
B/S HGT=5.30

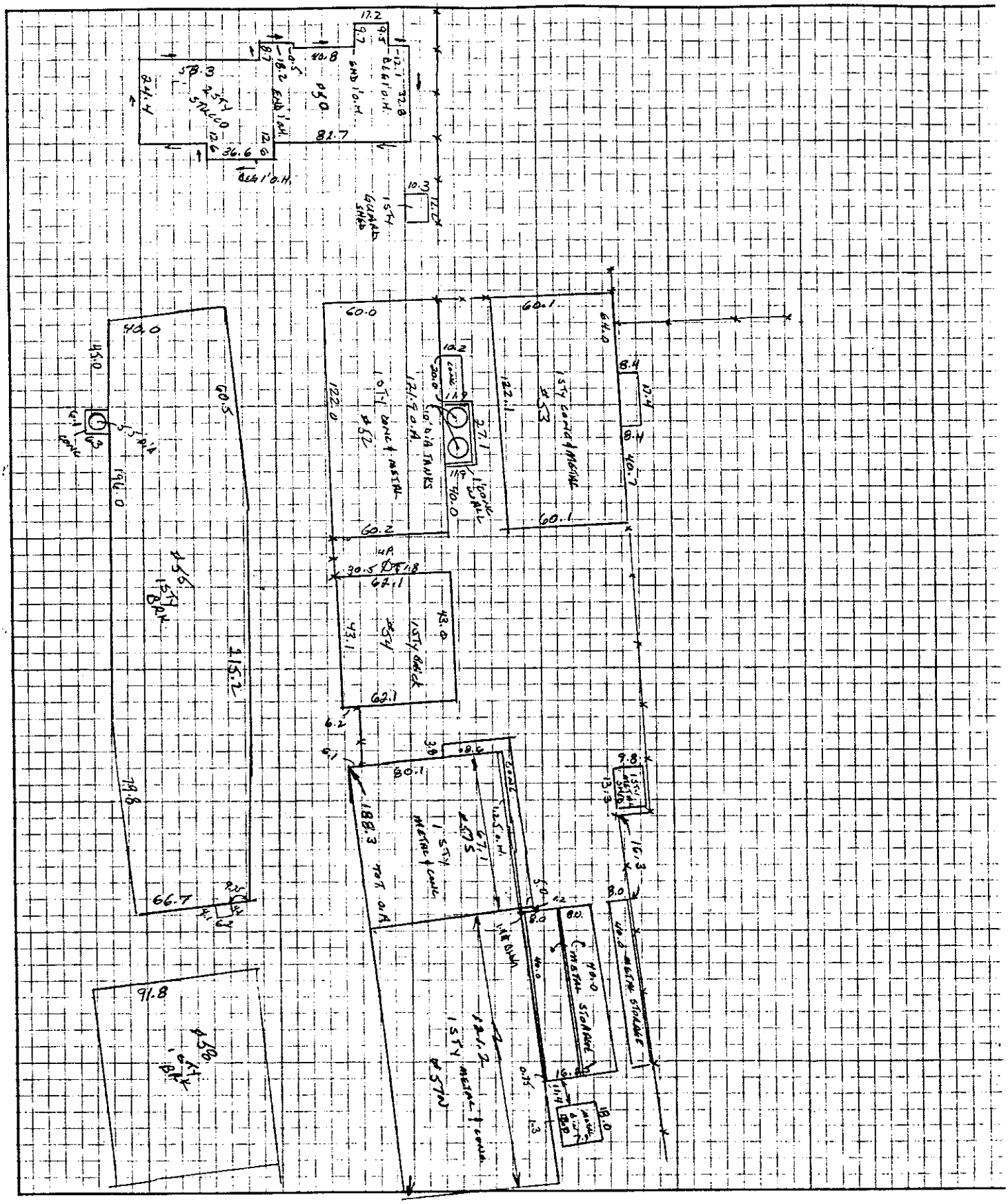
ACTIVITY	POINT	HEIGHT	HORIZONTAL	VERTICAL	DISTANCE	CREATED TIME/DESC
SIDESHOT	412	5.16	212.49300	90.05396	244.2851	MW-1A
SIDESHOT	413	5.16	198.37400	89.49000	253.1351	LIGHT TOWER
SIDESHOT	414	8.25	213.05250	89.24350	304.6400	SS-5
SIDESHOT	415	8.25	218.31250	89.26462	310.4051	MW-14
SIDESHOT	416	8.25	216.20250	89.17200	339.9200	MW-13
SIDESHOT	417	8.25	219.20250	89.11100	341.2900	SMH-3
OCC. STA.	3	5.19				12-28-98 08:31:56
						PIN W/CAP
BACKSIGHT	4		0.00000	90.00350	391.0000	PIN W/CAP
SIDESHOT	2	5.06	200.41000	87.56000	147.4700	PIN W/CAP
SIDESHOT	2	5.06	20.41000	272.03550	147.4700	PIN W/CAP
BACKSIGHT	4		180.00000	269.59300	391.0051	PIN W/CAP
NOTE:						
B/S HGT=5.13						
SIDESHOT	418	5.16	52.44400	89.57547	88.5000	OW-8
SIDESHOT	419	5.16	211.28550	90.24000	41.4200	SB-3
SIDESHOT	420	5.16	100.24450	91.12550	24.3100	SS-13
SIDESHOT	421	11.85	248.12100	86.00050	131.3551	SS-6
SIDESHOT	422	11.85	246.02150	85.27550	116.8700	SMH-5
SIDESHOT	423	11.85	248.23450	82.56400	78.7600	SMH-4
SIDESHOT	424	15.60	245.19150	84.15550	86.1051	CB"A"
NOTE:						
@CL CB/@ INV 12"CLAY PIPE						
SIDESHOT	425	5.16	223.29150	88.29450	97.5900	UP
SIDESHOT	426	5.16	231.52100	88.14300	79.1700	BSP
NOTE:						
BSP=BOT SOIL PILE						
SIDESHOT	427	5.16	235.24250	88.35150	64.4900	BSP
SIDESHOT	428	5.16	257.51550	89.29150	54.3551	BSP
SIDESHOT	429	11.85	283.37200	82.53400	60.1300	BSP
SIDESHOT	430	15.60	296.18100	80.55350	82.7951	BSP
SIDESHOT	431	11.85	295.02200	81.36050	79.8900	TSP
NOTE:						
TSP=TOP SOIL PILE						
SIDESHOT	432	15.60	269.59100	81.39200	76.6300	BSP
SIDESHOT	433	8.25	248.32450	86.27500	75.9900	BSP
SIDESHOT	434	5.16	236.48100	85.25500	75.5000	TSP
NOTE:						
@ TOP CL 3.5'(N-S) X 1.0'(E-W)CONC PAD						
OCC. STA.	2	5.28				12-28-98 09:29:07
						PIN W/CAP
BACKSIGHT	3		0.00000	92.16300	147.4951	PIN W/CAP
SIDESHOT	1	5.24	239.01250	90.51050	162.7300	PK(D11)
SIDESHOT	1	5.24	59.01250	269.08500	162.7300	PK(D11)
BACKSIGHT	3		180.00000	267.42000	147.5051	PIN W/CAP
NOTE:						
B/S HGT=4.88						
SIDESHOT	435	5.16	264.44150	91.21400	130.0200	SS-14
SIDESHOT	436	5.16	281.52150	91.02400	170.2800	OW-19A

ACTIVITY	POINT	HEIGHT	HORIZONTAL	VERTICAL	DISTANCE	CREATED TIME/DESC
SIDESHOT	437	15.60	302.16200	87.53450	221.3598	MW-17
SIDESHOT	438	11.85	310.23300	88.41450	195.9300	MW-16
SIDESHOT	439	5.16	30.05200	98.00100	37.0600	MW-5
SIDESHOT	440	5.16	42.48400	93.37016	88.5405	OW-5A
SIDESHOT	441	11.85	50.32350	89.41029	137.9651	MW-4
SIDESHOT	442	5.16	64.39250	90.26450	189.9750	UP
SIDESHOT	443	8.25	100.39000	90.59200	205.5951	OW-26
SIDESHOT	444	11.85	98.00550	89.47300	222.6400	UP
SIDESHOT	445	5.16	101.28450	91.44250	165.6451	EDGE TP#3
NOTE: TP=TANK PAD						
SIDESHOT	446	5.16	99.54200	92.12250	128.1300	EDGE TP#3
SIDESHOT	447	11.85	82.51450	89.13150	128.5151	EDGE TP#3
SIDESHOT	448	8.25	80.09500	90.39500	158.4900	EDGE TP#3
SIDESHOT	449	11.25	88.29400	89.27050	181.6200	EDGE TP#3
SIDESHOT	450	11.25	98.33200	89.27500	175.2300	EDGE TP#3
SIDESHOT	451	8.25	118.05500	91.03237	151.6251	OW-25
SIDESHOT	452	8.25	120.33000	90.15300	161.0551	UP
SIDESHOT	453	11.60	127.29550	89.40200	178.9700	SS-8
SIDESHOT	454	11.85	133.36100	89.13200	166.5151	SMH-6
SIDESHOT	455	5.16	147.47400	90.24450	132.4651	UP
SIDESHOT	456	8.25	155.12500	90.29567	151.7800	OW-21
SIDESHOT	457	8.25	159.02150	90.27050	172.6151	CLF/GATE
NOTE: @ EP						
SIDESHOT	458	11.15	150.56350	89.24550	170.6451	CLF/GATE
NOTE: @ EP						
SIDESHOT	459	11.15	131.07500	89.22100	182.3500	CLF
SIDESHOT	460	11.15	111.55500	88.33300	224.4851	CLF
NOTE: ROD=15.6(NOT 11.15)						
SIDESHOT	461	15.60	100.42350	88.49500	275.3600	END CLF
SIDESHOT	462	5.16	160.51400	91.41200	154.1951	EP
SIDESHOT	463	5.16	176.24250	92.04050	106.5751	EP
SIDESHOT	464	5.16	209.57400	92.32400	80.1500	EP
SIDESHOT	465	5.16	246.35450	92.07100	91.2351	EP
SIDESHOT	466	5.16	268.08050	91.30100	126.0000	EP
SIDESHOT	467	5.16	280.21150	90.59250	173.6551	EP
SIDESHOT	468	5.16	287.51500	91.03450	176.5551	EP
SIDESHOT	469	5.16	279.27550	91.30050	126.5951	EP
SIDESHOT	470	5.16	259.26500	92.26250	80.6600	EP
SIDESHOT	471	5.16	216.41250	93.20200	59.9151	EP
SIDESHOT	472	5.16	174.10000	92.42150	83.8500	EP
SIDESHOT	473	5.16	159.48550	92.00250	118.4151	EP
SIDESHOT	474	5.16	131.15000	93.49500	74.4451	EDGE TP#4
SIDESHOT	475	5.16	106.33150	94.15500	65.3600	EDGE TP#4
SIDESHOT	476	11.85	95.39100	88.58300	95.4800	EDGE TP#4
SIDESHOT	477	11.85	103.50050	89.10500	118.2751	EDGE TP#4

ACTIVITY	POINT	HEIGHT	HORIZONTAL	VERTICAL	DISTANCE	CREATED TIME/DESC
SIDESHOT	478	5.16	119.43450	92.17550	123.3351	EDGE TP#4
SIDESHOT	479	5.16	128.22250	92.28200	112.9051	EDGE TP#4
SIDESHOT	480	5.16	192.00500	90.49550	199.1200	OW-20
OCC. STA.	2	5.28				12-28-98 11:57:35
						PIN W/CAP
BACKSIGHT	3		0.00000	0.00000	0.0000	PIN W/CAP
SIDESHOT	481	8.25	217.31500	90.07350	140.1000	SS-9
SIDESHOT	482	5.16	191.37550	90.52200	193.2600	BSP
SIDESHOT	483	8.25	186.55100	89.57550	187.8200	BSP
SIDESHOT	484	8.25	179.59150	89.55500	182.1200	BSP
SIDESHOT	485	8.25	172.32050	90.01500	164.3200	BSP
SIDESHOT	486	5.16	166.57300	90.50400	165.4800	BSP
SIDESHOT	487	5.16	165.34050	91.24350	153.0000	BSP
SIDESHOT	488	5.16	170.07100	91.24300	151.2400	BSP
SIDESHOT	489	5.16	176.08100	91.32400	134.2000	BSP
SIDESHOT	490	5.16	187.55050	91.17350	135.2400	BSP
SIDESHOT	491	5.16	192.29050	91.17400	152.5000	BSP
SIDESHOT	492	5.16	190.26350	91.12350	177.6200	BSP
SIDESHOT	493	5.16	190.35450	90.59550	185.8200	BSP
SIDESHOT	494	5.16	193.16050	91.15250	167.4400	BSP
SIDESHOT	495	5.16	197.58200	91.00550	171.5000	BSP
SIDESHOT	496	5.16	194.54100	89.40300	175.3800	TSP
SIDESHOT	497	5.16	190.36250	90.16300	189.9400	TSP
SIDESHOT	498	5.16	181.02300	90.08100	178.0400	TSP
SIDESHOT	499	5.16	168.45000	90.11400	160.1200	TSP
SIDESHOT	500	5.16	174.34000	89.43300	149.8000	TSP
SIDESHOT	501	5.16	205.29100	91.23000	123.8600	BSP
SIDESHOT	502	5.16	205.37150	92.02550	93.4600	BSP
SIDESHOT	503	5.16	225.24150	92.05200	88.7800	BSP
SIDESHOT	504	5.16	239.11300	91.42450	110.2000	BSP
SIDESHOT	505	5.16	244.30000	91.34100	136.0600	BSP
SIDESHOT	506	8.25	236.20300	90.06300	140.8200	BSP
SIDESHOT	507	8.25	231.52350	90.01400	130.5600	BSP
SIDESHOT	508	8.25	222.14500	89.57350	136.3600	BSP
SIDESHOT	509	8.25	212.14400	90.01450	136.4200	BSP
SIDESHOT	510	8.25	213.16150	87.38350	127.2800	TSP
SIDESHOT	511	5.16	210.42000	89.12250	103.6400	TSP
SIDESHOT	512	5.16	228.15550	89.48450	108.6200	TSP
SIDESHOT	513	5.16	229.47150	89.37400	124.2400	TSP
SIDESHOT	514	5.16	235.33550	88.55450	119.7600	TSP
SIDESHOT	515	5.16	239.00350	89.33150	134.8200	TSP

PROJ. NAME & LOC. JAPAN TERMINAL PROJ. NO. 98025

SUBJECT BUILDING MEAS. 12/20/98 FD, HS, TD



98025 YEC/TAPPAN TERMINAL 12/28/98
ELEV TIE TO NGS DATUM FD, HS

+	H.I.	−	ELEV	REMARKS
			9.72	NGS RIVET FND IN ABANDONED CONC BASE POWERLINE RV44
3.94	13.66			
		6.47	7.19	STA"6 PK D-1
6.89	14.08			
		4.36	9.72	NGS RIVET IN CONC (C/A BEG)

(1)

98025 YEC/TAPPAN TERMINAL 12/24/98
WELL ELEV'S HS, FD, GD,

+	H.I.	−	ELEV	REMARKS
			7.19 ~~9.72~~	STA"6 PK D-1
4.15	11.34			
		4.78	6.56	GRD @ LAS 3
		2.78	8.56	T.PVC "
		2.27	9.07	T.CASING "
		5.28	6.06	STA"5 MAG PK.
5.52	11.58			
		5.36	6.22	GRD @ MW-9A
		3.04	8.54	T.PVC "
		2.81	8.77	T.CASING "
		4.89	6.69	GRD @ OW-15
		2.88	8.70	T.PVC " *
* UNABLE TO unlock w/KEYS GIVEN				
		5.07	6.51	GRD @ MW-1
		3.70	7.88	T.CASING (NO PVC)
		4.82	6.76	GRD @ MW-1
		3.77	7.81	T.PVC "
		3.58	8.00	T.CASING
		2.98	8.60	GRD @ OW-2
		1.84	9.74	T.PVC "
		2.82	8.76	T.CASING LAS-1 (FM)*
		3.11	8.47	T. PVC
* FM = FLUSH Mount				
		5.27	6.31	POL #19 MAG PK

(1)

98025 YEC / TAPPAN TERMINAL 12/24/98
WELL ELEV'S FD, HS, GDD

+	H.I.	—	ELEV	REMARKS
5.63	11.94			
		6.62	5.32	GRD @ MW-6
		4.60	7.34	T. PVC " (NO CASING)
		5.52	6.69	T. CASING OW-21A(FM
		6.07	5.87	T. PVC "
		6.10	5.84	GRD @ MW21A
		3.69	8.25	T. CASING "
		3.99	7.95	T. PVC "
		7.85	4.09	PAINTED LOC STILLING WELL
7.71	11.80			
		7.57	4.23	STA #4 RIM W/CAP
8.31	12.54			
		7.60	4.94	GRD @ OW-9A
		4.51	8.03	T. PVC "
		4.21	8.33	T. CASING "
		5.31	7.23	GRD @ OW-17
		3.29	9.25	T. PVC (NO CASING)
		5.34	7.20	GRD @ LMS-2
		2.74	9.80	T. CASING "
		3.05	9.49	T. PVC "
		4.84	7.70	SMH #7 RIM
1.99	9.69			
		4.95	4.74	GRD @ MW-10
		3.32	6.37	T. PVC " (NO CASING)

(2)

98025 YEC / Tappan Terminal 12/24/98
FD, HS, GDD

+	H.I.	—	ELEV.	REMARKS
		5.04	4.65	GRD @ MW-15
		0.34	7.35	T. CASING "
		2.56	7.13	T. PVC "
		5.58	4.11	GRD @ MW-1A
		3.10	6.59	T. CASING "
		3.47	6.22	T. PVC "
		5.40	4.29	GRD @ OW-8
		3.33	6.36	T. PVC "
		5.52	4.17	STA'S RIM W/CAP
5.25	9.42			
		4.66	4.76	GRD @ MW-5
		4.03	5.39	T. PVC " (NO CASING)
		5.15	4.27	GRD @ OW-5A
		2.32	7.10	T. CASING "
		2.50	6.92	T. PVC "
		5.26	4.16	GRD @ MW-4
		3.35	6.07	T. PVC " (NO CASING)
3.80	9.87			
		6.62	3.25	GRD @ OW-26
		4.64	5.23	T. PVC " (NO CASING)
		5.89	3.98	GRD @ OW-25
		4.14	5.73	T. PVC " (NO CASING)
7.05	12.78			
		7.26	5.52	GRD @ OW-01

(3)

98025 YEC/Tappan Terminal 12/24/98
FD, HS, GDD

+	H.I.	−	ELEV	REMARKS
		6.00	6.78	T. PVC OW-7 (NO CASING)
4.56	11.34			
		4.50	6.84	GRD @ OW-20
		2.11	9.23	T. PVC " (NO CASING)
		4.70	6.64	T. CASING OW19-A (EM)
		5.13	6.21	T. PVC "
		4.71	6.63	T.P.
5.58	12.21			
		4.75	7.46	GRD @ MW-16
		1.72	10.49	T. PVC "
		1.39	10.82	T. CASING "
		1.42	10.79	" MW-17
		1.58	10.63	T. PVC "
		4.54	7.67	GRD @ "
		4.40	7.81	T. CASING LMS-5
		4.77	7.44	T. PVC "
		7.88	4.33	GRD @ MW-14
		6.22	5.99	AC @ " (NO CASING)
		6.74	5.47	GRD @ MW-13
		4.51	7.70	T. PVC " (NO CASING)
		5.68	6.53	GRD @ LMS-4 (EM)
		5.57	6.64	T. PVC "
		5.38	6.83	T. CASING
5.17	11.95			

(4)

98025 YEC/Tappan Terminal 12/24/98
FD, HS, GDD

+	H.I.	−	ELEV	REMARKS
		4.70	7.25	STA #1 / AK D-11
4.85	12.08		~~30.00~~	(7.23)
		5.61	6.47	T. PVC LMS-8R (EM)
		5.95	6.13	T. CASING "
		3.47	8.61	" LMS-6
		3.76	8.32	T. PVC "
		4.00	8.08	T.P. ALG (D-5 AK)
5.49	13.57			
		2.09	11.48	T. CASING LMS-7
		2.46	11.11	T. PVC "
		5.31	8.26	GRD @ "
		6.38	7.19	STA #6 AK D-1
			~~29.92~~ 7.19	(S/A 0.06)

(5)

APPENDIX F

Fish and Wildlife Data

Table F-1 Vegetative Species Observed on the Tappan Terminal Site

Common Name	Scientific Name
Herbaceous Plants	
Yarrow	Achillea millefolium
Common ragweed	Ambrosia artemisiifolia
Pearly everlasting	Anaphalis margaritacea
Little blue stem grass	Andropogon scoparius
Dogbane	Apocynum androsaemifolium
Bearberry	Arctostaphylos uva-ursi
Aster	Aster spectabilis
Aster	Aster undulatus
Common lambsquarters	Chenopodium album
Spotted wintergreen	Chimaphila maculata
Daisy	Chrysanthemum sp.
Chickory	Cichorium intybus
Bull thistle	Cirsium vulgare
Crown vetch	Coronilla varia
Lady's slipper	Cypripedium acaule
Poverty grass	Danthonia spicata
Queen Anne's lace	Daucus carota
Tick-trefoil	Desmodium sp.
Crabgrass	Digitaria sp.
Strawberry	Fragaria virginiana
Narrow-leafed bush clover	Lespedeza augustifolia
Bush clover	Lespedeza virginiana
Butter and eggs	Linaria vulgaris
Evening primrose	Oenothera biennis
Yellow woodsorrel	Oxalis stricta
Witchgrass	Panicuum capillare
Fall panicum	Panicum dichotomiflorum
Common reed grass	Phragmites communis
Ground cherry	Physalis heterophylla
Pokeweed	Phytolacca americana
Broadleaf plantain	Plantago major
Dock	Rumex acetosella
Nightshade	Solanum dulcamara
Lance-leaved goldenrod	Solidago graminifolia
Common goldenrod	Solidago juncea
Early flowering goldenrod	Solidago nemoralis
Stiff goldenrod	Solidago rigida
Common mullein	Verbascum thapsus

Vetch	Vicia sp.

Shrubs and Vines

Alder	Alnus rugosa
Barberry	Berberis thunbergii
Leatherleaf	Chamaedaphne calyculata
Forsythia	Forsythia sp.
Japanese honeysuckle	Lonicera japonica
Virginia creeper	Parthenocissus quinquefolia
Poison ivy	Rhus radicans
Multiflora rose	Rosa multiflora
Catbrier	Smilax

Trees

Red maple	Acer rubrum
Gray birch	Betula populifolia
Flowering dogwood	Cornus florida
Black gum	Nyassa sylvatica
Red pine	Pinus resinosa
White pine	Pinus strobus
Large-toothed aspen	Populus grandidentata
Quaking aspen	Populus tremuloides
Black cherry	Prunus serotina
White oak	Quercus alba
Black oak	Quercus velutina
Black locust	Robinia pseudoacacia

Table F-2 Mammals Likely to Inhabit the Tappan Terminal Site

Common Name	Scientific Name
Eastern chipmūnk	Tamias striatus
Gray Squirrel	Sciurus carolinensis
Cottontail rabbit	Sylvilagus floridanus
White-footed mouse	Peromyscus leucopus
Meadow vole	Microtus pennsylvanicus
House mouse	Mus musculus
Norway rat	Rattus norvegicus
Raccoon	Procyon lotor

Table F-3 Avifauna Likely to Inhabit the Tappan Terminal Site

Common Name	Scientific Name
Double-crested cormorant	Phalacrocorax auritus
Great blue heron	Ardea herodias
Black-crowned night heron	Nycticorax nycticorax
Canada goose	Branta canadensis
Mallard	Anas platyrhynchos
Black duck	Anas rubripes
Green-winged teal	Anas carolinensis
Blue-winged teal	Anas discors
Bufflehead	Bucephala albeola
Hooded merganser	Lophodytes cucullatus
Red-breasted merganser	Mergus serrator
Sharp-shinned hawk	Accipiter striatus
Broad-winged hawk	Buteo platypterus
Red-tailed hawk	Buteo jamaicensis
Kestrel	Falco sparverius
Ring-necked pheasant	Phasianus colchicus
Killdeer	Charadrius vociferus
Herring gull	Larus argentatus
Great black-backed gull	Larus marinus
Common tern	Sterna hirundo
Least tern	Sterna albifrons
Mourning dove	Zenaida macroura
Yellow-bellied sapsucker	Sphyrapicus varius
Red-bellied woodpecker	Melanerpes carolinus
Downy woodpecker	Picoides pubescens
Hairy woodpecker	Picoides villosus
Eastern kingbird	Tyrannus tyrannus
American crow	Corvus brachyrhynchos
Blue jay	Cyanocitta cristata
Black-capped chickadee	Parus atricapillus
Tufted titmouse	Parus bicolor
White-breasted nuthatch	Sitta carolinensis
Red-breasted nuthatch	Sitta canadensis
Brown creeper	Certhia americana
House wren	Troglodytes aedon
Winter wren	Troglodytes troglodytes
Carolina wren	Thryothorus ludovicianus
Gray catbird	Dumetella carolinensis
Northern mockingbird	Mimus polyglottos
Eastern bluebird	Stalia sialis

American robin	Turdus migratorius
Wood thrush	Hyocichla mustelina
Cedar waxwing	Bonbycilla cedrorum
Solitary vireo	Vireo solitarius
Yellow warbler	Dendroica petechia
Yellow-rumped warbler	Dendroica coronata
Bay-breasted warbler	Dendroica castanea
Blackpoll warbler	Dendroica striata
Pine warbler	Dendroica pinus
Ovenbird	Seirus aurocapillus
Common yellowthroat	Geothlypis trichas
Eastern meadowlark	Sturnella magna
Common grackle	Quiscalus quiscula
European starling	Sturnus vulgaris
House sparrow	Passer domesticus
Northern cardinal	Cardinalis cardinalis
Indigo bunting	Passerina cyanea
Brown-headed cowbird	Molothrus ater
Scarlet tanager	Piranga olivacea
House finch	Carpodacus mexicanus
Purple finch	Carpodacus purpureus
American goldfinch	Carduelis tristis
Northern junco	Junco hyemalis
Rufous-sided towhee	Pipilo erythrophthalmus
Chipping sparrow	Spizella passerina
Field sparrow	Spizella pusilla
Song sparrow	Melospiza melodia
White-throated sparrow	Zonotrichia albicollis

Table F-4 Finfish Likely to Seasonally Inhabit the Tappan Terminal Site

Common Name	Scientific Name
American eel	Anguilla rostrata
Blueback herring	Alosa aestivalis
Atlantic menhaden	Brevoortia tyrannus
Bay anchovy	Anchoa mitchilli
Oyster toadfish	Opsanus tao
Atlantic tomcod	Microgadus tomcod

Table F-4 Finfish Likely to Seasonally Inhabit the Tappan Terminal Site (Continued)

Common Name	Scientific Name
Atlantic needlefish	Strongylura marina
Mummichog	Fundulus heteroclitus
Striped killifish	Fundulus majalis
Atlantic silverside	Menidia menidia
Tidewater silverside	Menidia beryllina
Northern pipefish	Syngnathus fuscus
Striped bass	Morone saxatilis
White Perch	Morone americana
Bluefish	Pomatomus saltatrix
Scup	Stenotomus chrysops
Weakfish	Cynoscion regalis
Northern kingfish	Menticirrhus saxatilis
Cunner	Tautogolabrus adspersus
Tautog	Tautoga onitis
American sand lance	Ammodytes americanus
Northern searobin	Prionotus carolinus
Striped searobin	Prionotus evolans
Sea raven	Hemitripterus americanus
Winter flounder	Pseudopleronectes americanus
Hogchoker	Trinectes maculatus
Summer flounder	Paralichthys oblongus
Windowpane	Lophopsetta maculata
Smallmouth flounder	Etropus microstomus
Northern puffer	Sphoeroides maculatus
Striped burrfish	Chilomycterus schoepfi

Table F-5 Reptiles and Amphibians Likely to Inhabit the Tappan Terminal Site

Common Name	Scientific Name
Box turtle	Terrapene carolina
Eastern garter snake	Thamnophis sirtalis
Eastern ribbon snake	Thamnophis sauritis
Northern black racer	Coluber constrictor
Northern spring peeper	Hyla crucifer
Fowler's toad	Bufo woodhousei fowleri

Table F-6 Federally Listed or Proposed Threatened or Endangered Species in New York State

Common Name	Scientific Name	Status	Distribution
Fishes			
Sturgeon, shortnose	Asipenser brevirostrum	E	Hudson River and other Atlantic coastal rivers
Reptiles			
Turtle, bog	Clemmys muhlenbergii	PT	Albany, Columbia, Dutchess, Genesee, Orange, Oswego, Putnam, Seneca, Ulster, Wayne, and Westchester Counties
Turtle, green	Chelonia mydas	T	Oceanic summer visitor coastal waters
Turtle, hawksbill	Eretmochelys imbricata	E	Oceanic summer visitor coastal waters
Turtle, leatherback	Dermochelys coriacea	E	Oceanic summer visitor coastal waters
Turtle, loggerhead	Caretta caretta	T	Oceanic summer visitor coastal waters
Turtle, Atlantic ridley	Lepidochelys kempii	E	Oceanic summer visitor coastal waters
Birds			
Eagle, bald	Haliaeetus leucocephalus	T	Entire state
Falcon, peregrine	Falco peregrinus	E	Entire state - re-establishment to former breeding range in progress
Plover, piping	Charadrius melodus	E T	Great Lakes Watershed Remainder of coastal New York

Tern, roseate	Sterna dougallii dougallii	E	Southeastern coastal portions of state
Mammals			
Bat, Indiana	Myotis sodalis	E	Entire state
Cougar, eastern	Felis concolor cougar	E	Entire state - probably extinct
Whale, blue	Balaenoptera musculus	E	Oceanic
Whale, finback	Balaenoptera physalus	E	Oceanic
Whale, humpback	Megaptera novaeangliae	E	Oceanic
Whale, right	Eubalaena glacialis	E	Oceanic
Whale, sei	Balaenoptera borealis	E	Oceanic
Whale, sperm	Physeter catodon	E	Oceanic
Mollusks			
Snail, Chittenango ovate amber	Succinea chittenangoensis	T	Madison County
Mussel, dwarf wedge	Alasmidonta heterodon	E	Orange County - lower Neversink River
Butterflies			
Butterfly, Karner blue	Lycaeides melissa samuelis	E	Albany, Saratoga, Warren, and Schenectady Counties
Plants			
Monkshood, northern wild	Aconitum noveboracense	T	Ulster, Sullivan, and Delaware Counties
Pogonia, small whorled	Isotria medeoloides	T	Entire state
Swamp pink	Helonias bullata	T	Staten Island - presumed extirpated
Gerardia, sandplain	Agalinis acuta	E	Nassau and Suffolk Counties

Fern, American hart's-tongue	Asplenium scolopendrium var. Americana	T	Onondaga and Madison Counties
Orchid, estern prairie fringed	Platanthera leucophea	T	Not relocated in New York
Bulrush, northeastern	Scirpus ancistrochaetus	E	Not relocated in New York
Roseroot, Leedy's	Sedum integrifolium ssp. Leedyi	T	West shore of Seneca Lake
Amaranth, seabeach	Amaranthus pumilus	T	Atlantic coastal plain beaches
Goldenrod, Houghton's	Solidago houghtonii	T	Genesee County

Table F-7 Floral and Faunal Associations Observed Within 2.5 Miles of the Tappan Terminal Site

Species	Grassland/ Field	Forested/ Grassland/ Field	Estuarine/ Open Water	Developed/ Paved	Forested
Plants					
Common ragweed	X	X			
Daisy	X	X			
Crown vetch	X	X			
Fescue					
Goldenrod	X	X			
Virginia creeper		X			X
Multiflora rose	X	X			
Red maple					X
Flowering Dogwood		X			X
Black locust		X			X
Animals					
Striped bass			X		
Gray Squirrel		X			X
Mice/voles/shrews	X	X			X
Black Duck			X		
Hawks	X	X	X	X	
Finches		X			X
Sparrows	X	X			X
Eastern garter snake	X	X			X

Table F-8 Qualitative Habitat Value Analysis Within the Captain's Cove Site

Evaluation Factor	Grassland/ Field	Forested/ Grassland/ Field	Estuarine/ Open Water	Developed/ Paved	Forested
Food Chain Production	2	2	3	1	2
Primary Productivity	2	2	2	1	2
Nutrient Transport	1	1	3	1	2
Food Chain Support	2	2	3	1	2
Hydroperiod	1	1	3	1	1
Elevational Location	2	2	2	2	2
Cultural Location	1	1	2	1	2
Recreation	1	2	3	2	2
Socio-Economic	1	1	2	2	2
Aesthetics	2	2	3	1	3
Water Purification Factor	2	2	1	1	2
Totals	*17*	*18*	*27*	*14*	*22*

APPENDIX G

Analytical Results

TABLE G-1a.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
SURFACE SOIL SAMPLE RESULTS - FALL 1998
VOLATILE ORGANIC COMPOUNDS

Sample Identification	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8	SS-9	SS-10	SS-11	SS-12	Contract Required Detection Limit	NYSDEC Recommended Soil Clean-Up Objective
Sample Depth	0-3"	0-3"	0-3"	0-3"	0-3"	0-3"	0-3"	0-3"	0-3"	6"-9" **	0-3"	0-3"		
Date of Collection	09/24/98	09/24/98	09/24/98	09/24/98	09/24/98	09/24/98	09/24/98	09/24/98	09/24/98	09/23/98	09/24/98	09/24/98		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Percent Moisture	7.72	6.94	6.8	19.08	9.05	6.29	1.02	17.73	9.92	8.5	5.51	26.95		
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Chloromethane	U	U	U	U	U	U	U	U	U	U	U	U	10	----
Bromomethane	U	U	U	U	U	U	U	U	U	U	U	U	10	----
Vinyl Chloride	U	U	U	U	U	U	U	U	U	U	U	U	10	200
Chloroethane	U	U	U	U	U	U	U	U	U	U	U	U	10	1900
Methylene Chloride	10 J	U*	U*	U*	9 J	8 J	7 J	8 J	U*	11 J	U*	U*	10	100
Acetone	U	U	U	U	U	U	U	U	120	15	170	250	10	200
Carbon Disulfide	U	U	U	U	U	U	U	U	U	U	U	U	10	2700
1,1-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	10	400
1,1-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	10	200
1,2-Dichloroethene (total)	U	U	U	U	U	U	U	U	U	U	U	U	10	300
Chloroform	U	U	U	U	U	U	1 J	U	U	U	U	28	10	300
1,2-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	10	100
2-Butanone	U	U	U	U	U	U	U	U	U	U	U	U	10	300
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	10	800
Carbon Tetrachloride	U	U	U	U	U	U	U	U	U	U	U	U	10	600
Bromodichloromethane	U	U	U	U	U	U	U	U	U	U	U	U	10	----
1,2-Dichloropropane	U	U	U	U	U	U	U	U	U	U	U	U	10	----
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	10	----
Trichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	10	700
Dibromochloromethane	U	U	U	U	U	U	U	U	U	U	U	U	10	----
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	10	----
Benzene	U	U	U	U	U	U	U	U	U	U	U	U	10	60
Trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	10	----
Bromoform	U	U	U	U	U	U	U	U	U	U	U	U	10	----
4-Methyl-2-Pentanone	U	U	U	U	U	U	U	U	U	U	U	U	10	1000
2-Hexanone	U	U	U	U	U	U	U	U	U	U	U	U	10	----
Tetrachloroethene	U	U	U	U	U	U	U	U	U	U	U	U	10	1400
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	U	U	U	U	10	600
Toluene	U	U	U	U	U	U	U	U	U	1 J	U	U	10	1500
Chlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	10	1700
Ethylbenzene	U	U	U	U	U	U	5 J	U	U	18	U	U	10	5500
Styrene	U	U	U	U	U	U	U	U	U	U	U	U	10	----
Total Xylenes	4.1 J	2 J	U	U	U	U	32	6.2 J	U	19	U	U	10	1200
Total VOCs	14.1	2	0	0	9	8	45	14.2	120	64	170	278		10000
Total VOC TICs	0	0	0	0	0	0	46	0	0	1,129	0	0		

QUALIFIERS:

U: Compound analyzed for but not detected

B: Compound found in the blank as well as the sample

J: Compound found at a concentration below the CRDL, value estimated

U*: Result qualified as non-detect based on validation criteria.

NOTES:

----: not established

** Sample collected beneath asphalt surface

Indicates value exceeds recommended soil clean-up objective.

TABLE G-1a

TAPPAN TERMINAL SITE

REMEDIAL INVESTIGATION AND FEASIBILITY STUDY

SURFACE SOIL SAMPLE RESULTS - FALL 1998

VOLATILE ORGANIC COMPOUNDS

Sample Identification	SS-13	SS-14	SS-15	SS-16	SS-17	SS-18	SS-19	SS-20	SS-21	SS-22	SS-23	SS-24	Contract Required Detection Limit	NYSDEC Recommended Soil Clean-Up Objective
Sample Depth	0-3"	0-3"	3"-6" **	8"-11" **	6"-9" **	8"-11" **	6"-9" **	0-3"	0-3"	0-3"	0-3"	0-3"		
Date of Collection	09/24/98	09/24/98	09/23/98	09/23/98	09/23/98	09/23/98	09/23/98	09/24/98	09/24/98	09/24/98	09/24/98	09/24/98		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Percent Moisture	9.5	2.54	7.51	10.06	10.31	5.12	7.35	6.73	6.34	26.23	4.2	18.29		
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Chloromethane	U	U	U	U	U	U	U	U	U	U	U	U	10	----
Bromomethane	U	U	U	U	U	U	U	U	U	U	U	U	10	----
Vinyl Chloride	U	U	U	U	U	U	U	U	U	U	U	U	10	200
Chloroethane	U	U	U	U	U	U	U	U	U	U	U	U	10	1900
Methylene Chloride	8 J	7 J	8 J	8 J	7 J	U*	U*	3 J	7 J	15	U*	18	10	100
Acetone	U	U	U	U	42	U	U	U	U	U	U	U	10	200
Carbon Disulfide	U	U	U	U	U	U	U	U	U	U	U	U	10	2700
1,1-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	10	400
1,1-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	10	200
1,2-Dichloroethene (total)	U	U	U	U	U	U	U	U	U	U	U	U	10	300
Chloroform	U	U	67	11 J	51	U	4 J	U	U	U	U	U	10	300
1,2-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	10	100
2-Butanone	U	U	U	U	U	U	U	U	U	U	U	U	10	300
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	10	800
Carbon Tetrachloride	U	U	U	U	U	U	U	U	U	U	U	U	10	600
Bromodichloromethane	U	U	U	U	U	U	U	U	U	U	U	U	10	----
1,2-Dichloropropane	U	U	U	U	U	U	U	U	U	U	U	U	10	----
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	10	----
Trichloroethene	U	U	U	6 J	U	U	U	U	U	U	U	U	10	700
Dibromochloromethane	U	U	U	U	U	U	U	U	U	U	U	U	10	----
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	10	----
Benzene	U	U	U	U	U	U	U	U	U	U	U	U	10	60
Trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	10	----
Bromoform	U	U	U	U	U	U	U	U	U	U	U	U	10	----
4-Methyl-2-Pentanone	U	U	U	U	U	U	U	U	U	U	U	U	10	1000
2-Hexanone	U	U	U	U	U	U	U	U	U	U	U	U	10	----
Tetrachloroethene	U	U	U	10 J	5 J	U	U	U	U	U	U	U	10	1400
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	U	U	U	U	10	600
Toluene	U	U	U	U	U	U	U	U	U	U	U	U	10	1500
Chlorobenzene	U	U	U	8 J	U	U	U	U	U	U	U	U	10	1700
Ethylbenzene	U	U	U	U	U	U	U	U	U	U	U	U	10	5500
Styrene	U	U	U	U	U	U	U	U	U	U	U	U	10	----
Total Xylenes	8 J	U	4.4 J	U	U	2 J	U	4 J	2 J	U	U	5.7 J	10	1200
Total VOCs	16	7	79.4	43	105	2	4	7	9	15	0	23.7		10000
Total VOC TICs	0	0	0	0	0	0	0	0	0	0	0	0		

QUALIFIERS:

U: Compound analyzed for but not detected

B: Compound found in the blank as well as the sample

J: Compound found at a concentration below the CRDL, value estimated

U*: Result qualifed as non-detect based on validation criteria.

NOTES:

----: not established

** Sample collected beneath asphalt surface

[ ] Indicates value exceeds recommended soil clean-up objective.

TABLE G-1b.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
SURFACE SOIL SAMPLE RESULTS - FALL 1998
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8	SS-9	SS-10	SS-11	SS-12	Contract	NYSDEC
Sample Depth	0-3"	0-3"	0-3"	0-3"	0-3"	0-3"	0-3"	0-3"	0-3"	6"-9" **	0-3"	0-3"	Required	Recommended
Date of Collection	9/24/98	9/24/98	9/24/98	9/24/98	9/24/98	9/24/98	9/24/98	9/24/98	9/24/98	9/23/98	9/24/98	9/24/98	Detection	Soil Clean-Up
Dilution Factor	1.0	1.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	2.0	1.0	2.0	Limit	Objective
Percent Moisture	7.72	6.94	6.80	19.08	9.05	6.29	1.02	17.73	9.92	8.50	5.51	26.95	(ug/kg)	(ug/kg)
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)		
Phenol	U	U	U	U	U	U	U	U	U	U	U	U	330	30 OR MDL
bis (2-Chloroethyl) ether	U	U	U	U	U	U	U	U	U	U	U	U	330	----
2-Chlorophenol	U	U	U	U	U	U	U	U	U	U	U	U	330	800
1,3-Dichlorobenzene	U	U	U	U	U	83 J	U	U	U	U	U	U	330	1,600
1,4-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	330	8,500
1,2-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	330	7,900
2-Methylphenol	U	U	U	U	U	U	U	U	U	U	U	U	330	100 OR MDL
2,2'-Oxybis (1-Chloropropane)	U	U	U	U	U	U	U	U	U	U	U	U	330	----
4-Methylphenol	U	U	U	U	U	U	U	U	U	U	U	U	330	900
N-Nitroso-di-n-propylamine	U	U	U	U	U	U	U	U	U	U	U	U	330	----
Hexachloroethane	U	U	U	U	U	U	U	U	U	U	U	U	330	----
Nitrobenzene	U	U	U	U	U	U	U	U	U	U	U	U	330	200 OR MDL
Isophorone	U	U	U	U	U	U	U	U	U	U	U	U	330	4,400
2-Nitrophenol	U	U	U	U	U	U	U	U	U	U	U	U	330	330 OR MDL
2,4-Dimethylphenol	U	U	U	U	U	U	U	U	U	U	U	U	330	----
bis (2-Chloroethoxy) methane	U	U	U	U	U	U	U	U	U	U	U	U	330	----
2,4-Dichlorophenol	U	U	U	U	U	U	U	U	U	U	U	U	330	400
1,2,4-Trichlorobenzene	U	U	U	U	160 J	950	U	U	U	U	U	57 J	330	3,400
Naphthalene	U	U	U	54 J	U	61 J	U	36 J	44 J	U	21 J	U	330	13,000
4-Chloroaniline	U	U	U	U	U	U	U	U	U	U	U	110 J	330	220 OR MDL
Hexachlorobutadiene	U	U	U	U	U	U	U	U	U	U	U	U	330	----
4-Chloro-3-methylphenol	U	U	U	U	U	U	U	U	U	U	U	U	330	240 OR MDL
2-Methylnaphthalene	22 J	U	U	150 J	U	59 J	U	59 J	58 J	2,100	U	U	330	36,400
Hexachlorocyclopentadiene	U	U	U	U	U	U	U	U	U	U	U	U	330	----
2,4,6-Trichlorophenol	U	U	U	U	U	U	U	U	U	U	U	U	330	----
2,4,5-Trichlorophenol	U	U	U	U	U	U	U	U	U	U	U	U	800	100
2-Chloronaphthalene	U	U	U	U	U	U	U	U	U	U	U	U	330	----
2-Nitroaniline	U	U	U	U	U	U	U	U	U	U	U	U	800	430 OR MDL
Dimethylphthalate	U	U	U	U	U	U	U	U	U	U	U	84 J	330	2,000
Acenaphthylene	23 J	27 J	U	34 J	U	53 J	U	170 J	46 J	U	33 J	U	330	41,000
2,6-Dinitrotoluene	U	U	U	U	U	U	U	U	U	U	U	U	330	1
3-Nitroaniline	U	U	U	U	U	U	U	U	U	U	U	U	800	500 OR MDL
Acenaphthene	22 J	U	U	82 J	U	45 J	U	46 J	70 J	830	U	130 J	330	50,000
2,4-Dinitrophenol	U	U	U	U	U	U	U	U	U	U	U	U	800	200 OR MDL
4-Nitrophenol	U	U	U	U	U	U	U	U	U	U	U	U	800	100 OR MDL

TABLE G-1b. (CONTINUED)
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
SURFACE SOIL SAMPLE RESULTS - FALL 1998
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8	SS-9	SS-10	SS-11	SS-12	Contract Required Detection Limit	NYSDEC Recommended Soil Clean-Up Objective
Sample Depth	0-3"	0-3"	0-3"	0-3"	0-3"	0-3"	0-3"	0-3"	0-3"	6"-9" **	0-3"	0-3"		
Date of Collection	09/24/98	09/24/98	09/24/98	09/24/98	09/24/98	09/24/98	09/24/98	09/24/98	09/24/98	09/23/98	09/24/98	09/24/98		
Dilution Factor	1.0	1.0	1.0	1.0	2.0	2.0	1.0	1.0	1.0	2.0	1.0	2.0		
Percent Moisture	7.72	6.94	6.80	19.08	9.05	6.29	1.02	17.73	9.92	8.50	5.51	26.95		
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Dibenzofuran	U	U	U	41 J	U	U	U	36 J	40 J	540 J	U	56 J	330	6,200
2,4-Dinitrotoluene	U	U	U	U	U	U	U	U	U	U	U	U	330	----
Diethylphthalate	U	U	U	U	U	U	U	U	U	U	U	U	330	7,100
4-Chlorophenyl-phenylether	U	U	U	U	U	U	U	U	U	U	U	U	330	----
Fluorene	26 J	U	U	70 J	41 J	54 J	U	64 J	70 J	1,400	U	130 J	330	50,000
4-Nitroaniline	U	U	U	U	U	U	U	U	U	U	U	U	330	----
4,6-Dinitro-2-methylphenol	U	U	U	U	U	U	U	U	U	U	U	U	330	----
N-Nitrosodiphenylamine	U	75 J	U	U	130 J	280 J	U	U	U	1,900	U	77 J	330	----
4-Bromophenyl-phenylether	U	U	U	U	U	U	U	U	U	U	U	U	330	----
Hexachlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	330	410
Pentachlorophenol	U	U	U	U	U	U	U	U	U	U	U	U	330	100 OR MDL
Phenanthrene	480	170 J	40 J	750	440 J	570 J	U	660	510	2,200	56 J	1,100	330	50,000
Anthracene	84 J	44 J	U	190 J	120 J	150 J	U	220 J	150 J	490 J	23 J	290 J	330	50,000
Carbazole	47 J	20 J	U	120 J	68 J	120 J	U	120 J	88 J	U	U	150 J	330	----
Di-n-butylphthalate	39 J	64 J	56 J	49 J	52 J	75 J	20 J	85 J	50 J	63 J	49 J	150 J	330	8,100
Fluoranthene	960	290 J	38 J	960	600 J	880	25 J	1,300	710	1,200	210 J	1,400	330	50,000
Pyrene	900	290 J	52 J	1,900	960	1,800	44 J	1,800	890	1,400	210 J	2,300	330	50,000
Butylbenzylphthalate	U	36 J	U	U	U	U	U	U	U	U	U	U	330	----
3,3'-Dichlorobenzidine	U	U	U	U	U	U	U	U	U	U	U	U	330	224 OR MDL
Benzo (a) anthracene	510	190 J	27 J	680	330 J	660 J	U	1,100	500	630 J	160 J	790 J	330	400
Chrysene	600	240 J	30 J	820	370 J	680 J	30 J	1,200	550	680 J	210 J	930	330	50,000
bis (2-Ethylhexyl) phthalate	170 J	230 J	58 J	200 J	320 J	1,000	35 J	370 J	93 J	250 J	120 J	2,600	330	
Di-n-octylphthalate	U	U	U	U	U	36 J	U	U	U	U	36 J	640 J	330	1,100
Benzo (b) fluoranthene	700	230 J	21 J	1,300	470 J	980	26 J	1,900	730	790	200 J	900 J	330	1,100
Benzo (k) fluoranthene	590	230 J	25 J	970	430 J	770	19 J	1,100	590	730 J	220 J	1,200	330	61 OR MDL
Benzo (a) pyrene	590	200 J	33 J	1,000	410 J	890	27 J	1,100	550	420 J	180 J	790 J	330	3,200
Indeno (1,2,3-cd) pyrene	280 J	94 J	20 J	410	210 J	360 J	20 J	500	260 J	200 J	120 J	320 J	330	14 OR MDL
Dibenzo (a,h) anthracene	160 J	20 J	U	240 J	U	370 J	U	280 J	180 J	160 J	68 J	80 J	330	50,000
Benzo (g,h,i) perylene	270 J	79 J	46 J	570	180 J	410 J	36 J	110 J	63 J	U	140 J	290 J	330	----
Total PAHs	6,195	2,104	332	10,030	4,561	8,733	227	11,586	5,913	11,130	1,851	10,650		10,000
Total Carcinogen PAHs	3,430	1,204	156	5,420	2,220	4,710	122	7,180	3,360	3,610	1,158	5,010		500,000
Total SVOCs	6,473	2,529	446	10,590	5,291	11,336	282	12,256	6,242	15,983	2,056	14,574		----
Total SVOC TICs	4,726	11,789	1,592	4,318	48,800	58,460	0	6,532	3,267	73,770	1,783	46,450		

QUALIFIERS:
J: Compound found at a concentration below the detection limit
U: Compound analyzed for but not detected
B: Compound found in the method blank as well as the sample

NOTES:
MDL - Method Detection Limit
----: not established
Indicates value exceeds NYSDEC soil clean-up objective.
** Sample collected beneath asphalt surface

TABLE G-1b.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
SURFACE SOIL SAMPLE RESULTS - FALL 1998
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	SS-13	SS-14	SS-15	SS-16	SS-17	SS-18	SS-19	SS-20	SS-21	SS-22	SS-23	SS-24	Contract Required Detection Limit	NYSDEC Recommended Soil Clean-Up Objective
Sample Depth	0-3"	0-3"	3"-6" **	8"-11" **	6"-9" **	8"-11" **	6"-9" **	0-3"	0-3"	0-3"	0-3"	0-3"		
Date of Collection	9/24/98	9/24/98	9/23/98	9/23/98	9/23/98	9/23/98	9/23/98	9/24/98	9/24/98	9/24/98	9/24/98	9/24/98		
Dilution Factor	1.0	1.0	1.0	5.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Percent Moisture	9.50	2.54	7.51	10.06	10.31	5.12	7.35	6.73	6.34	26.23	4.20	18.29		
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Phenol	U	U	U	U	U	U	U	U	U	U	U	U	330	30 OR MDL
bis (2-Chloroethyl) ether	U	U	U	U	U	U	U	U	U	U	U	U	330	----
2-Chlorophenol	U	U	U	U	U	U	U	U	U	U	U	U	330	800
1,3-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	330	1,600
1,4-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	330	8,500
1,2-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	330	7,900
2-Methylphenol	U	U	U	U	U	U	U	U	U	U	U	U	330	100 OR MDL
2,2'-Oxybis (1-Chloropropane)	U	U	U	U	U	U	U	U	U	U	U	U	330	----
4-Methylphenol	U	U	U	U	U	U	U	U	U	U	U	U	330	900
N-Nitroso-di-n-propylamine	U	U	U	U	U	U	U	U	U	U	U	U	330	----
Hexachloroethane	U	U	U	U	U	U	U	U	U	U	U	U	330	----
Nitrobenzene	U	U	U	U	U	U	U	U	U	U	U	U	330	200 OR MDL
Isophorone	U	U	U	U	U	U	U	U	U	U	U	U	330	4,400
2-Nitrophenol	U	U	U	U	U	U	U	U	U	U	U	U	330	330 OR MDL
2,4-Dimethylphenol	U	U	U	U	U	U	U	U	U	U	U	U	330	----
bis (2-Chloroethoxy) methane	U	U	U	U	U	U	U	U	U	U	U	U	330	----
2,4-Dichlorophenol	U	U	U	U	U	U	U	U	U	U	U	U	330	400
1,2,4-Trichlorobenzene	U	U	35 J	U	U	U	U	U	U	U	U	U	330	3,400
Naphthalene	U	23 J	56 J	U	U	U	56 J	U	55 J	42 J	54 J	220 J	330	13,000
4-Chloroaniline	U	U	U	U	U	U	U	U	42 J	U	34 J	U	330	220 OR MDL
Hexachlorobutadiene	U	U	U	U	U	U	U	U	U	U	U	U	330	----
4-Chloro-3-methylphenol	U	U	U	U	U	U	U	U	U	U	U	U	330	240 OR MDL
2-Methylnaphthalene	U	42 J	130 J	U	U	U	U	U	51 J	37 J	57 J	290 J	330	36,400
Hexachlorocyclopentadiene	U	U	U	U	U	U	U	U	U	U	U	U	330	----
2,4,6-Trichlorophenol	U	U	U	U	U	U	U	U	U	U	U	U	330	----
2,4,5-Trichlorophenol	U	U	U	U	U	U	U	U	U	U	U	U	800	100
2-Chloronaphthalene	U	U	U	U	U	U	U	U	U	U	U	U	330	----
2-Nitroaniline	U	U	U	U	U	U	U	U	U	U	U	U	800	430 OR MDL
Dimethylphthalate	U	U	U	U	U	U	U	U	U	U	U	U	330	2,000
Acenaphthylene	33 J	61 J	63 J	U	U	U	32 J	630 J	66 J	730	72 J	110 J	330	41,000
2,6-Dinitrotoluene	U	U	U	U	U	U	U	U	U	U	U	U	330	1
3-Nitroaniline	U	U	U	U	U	U	U	U	U	U	U	U	800	500 OR MDL
Acenaphthene	U	26 J	20 J	U	U	890 J	19 J	U	270 J	90 J	280 J	500	330	50,000
2,4-Dinitrophenol	U	U	U	U	U	U	U	U	U	U	U	U	800	200 OR MDL
4-Nitrophenol	U	U	U	U	U	U	U	U	U	U	U	U	800	100 OR MDL

TABLE _b. (CONTINUED)
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
SURFACE SOIL SAMPLE RESULTS - FALL 1998
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	SS-13	SS-14	SS-15	SS-16	SS-17	SS-18	SS-19	SS-20	SS-21	SS-22	SS-23	SS-24	Contract Required Detection Limit	NYSDEC Recommended Soil Clean-Up Objective
Sample Depth	0-3"	0-3"	3"-6" **	8"-11" **	6"-9" **	8"-11" **	6"-9" **	0-3"	0-3"	0-3"	0-3"	0-3"		
Date of Collection	09/24/98	09/24/98	09/23/98	09/23/98	09/23/98	09/23/98	09/23/98	09/24/98	09/24/98	09/24/98	09/24/98	09/24/98		
Dilution Factor	1.0	1.0	1.0	5*	10*	1.0*	1.0	1.0*	1.0	1.0	1.0	1.0		
Percent Moisture	9.50	2.54	7.51	10.06	10.31	5.12	7.35	6.73	6.34	26.23	4.20	18.29		
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Dibenzofuran	U	20 J	27 J	U	U	U	U	U	170 J	69 J	170 J	250 J	330	6,200
2,4-Dinitrotoluene	U	U	U	U	U	U	U	U	U	U	U	U	330	----
Diethylphthalate	U	U	U	U	U	U	U	U	U	U	U	U	330	7,100
4-Chlorophenyl-phenylether	U	U	U	U	U	U	U	U	U	U	U	U	330	----
Fluorene	U	29 J	35 J	U	U	610 J	26 J	U	240 J	110 J	310 J	420	330	50,000
4-Nitroaniline	U	U	62 J	U	U	U	U	U	U	U	U	U	330	----
4,6-Dinitro-2-methylphenol	U	U	U	U	U	U	U	U	U	U	U	U	330	----
N-Nitrosodiphenylamine	U	U	25 J	U	U	U	U	U	U	U	58 J	U	330	----
4-Bromophenyl-phenylether	U	U	U	U	U	U	U	U	U	U	U	U	330	----
Hexachlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	330	410
Pentachlorophenol	U	U	U	U	U	U	U	U	U	U	U	U	330	100 OR MDL
Phenanthrene	54 J	350	280 J	24,000 J	U	7,700 J	290 J	4,500 J	2,100	1,300	2,100	6,600 D	330	50,000
Anthracene	25 J	110 J	72 J	6,300 J	U	1,700 J	74 J	790 J	480	630	650	890	330	50,000
Carbazole	U	56 J	36 J	3,200 J	U	1,500 J	35 J	630 J	390	270 J	300 J	780	330	
Di-n-butylphthalate	46 J	69 J	72 J	2,900 J	U	U	40 J	1,200 J	U	50 J	33 J	22 J	330	8,100
Fluoranthene	U	800	480	42,000 J	U	11,000	540	9,200 J	2,300	3,400	2,200	11,000 D	330	50,000
Pyrene	350 J	970	910	40,000 J	U	9,200 J	620	7,700 J	2,300	7,200 D	4,600 D	9,900 D	330	50,000
Butylbenzylphthalate	U	U	U	U	U	U	U	530 J	23 J	120 J	70 J	U	330	50,000
3,3'-Dichlorobenzidine	U	U	U	U	U	U	U	U	U	U	U	U	330	----
Benzo (a) anthracene	150 J	630	340 J	23,000 J	U	5,500 J	320 J	3,800 J	1,500	3,100	1,800	5,400 D	330	224 OR MDL
Chrysene	160 J	650	450	25,000 J	U	5,400 J	360	5,000 J	1,600	3,100	1,900	6,200 D	330	400
bis (2-Ethylhexyl) phthalate	100 J	250 J	70 J	16,000 J	10,000 J	1,700 J	120 J	2,200 J	170 J	390 J	210 J	240 J	330	50,000
Di-n-octylphthalate	46 J	U	27 J	U	U	U	U	U	U	U	U	U	330	
Benzo (b) fluoranthene	260 J	880	550	23,000 J	U	6,100 J	410	5,700 J	2,100	3,900 D	2,500	7,100 D	330	1,100
Benzo (k) fluoranthene	210 J	850	520	25,000 J	U	5,100 J	330 J	4,000 J	1,000	2,000	1,600	5,200 D	330	1,100
Benzo (a) pyrene	200 J	790	490	25,000 J	U	5,100 J	360 J	3,900 J	1,500	2,900	1,900	6,500 D	330	61 OR MDL
Indeno (1,2,3-cd) pyrene	85 J	340 J	220 J	12,000 J	U	2,600 J	150 J	2,400 J	590	970	780	2,200	330	3,200
Dibenzo (a,h) anthracene	U	200 J	120 J	7,900 J	U	1,600 J	77 J	1,300 J	330 J	550	410	U	330	14 OR MDL
Benzo (g,h,i) perylene	110 J	220 J	220 J	11,000 J	U	2,300 J	150 J	4,200 J	520	880	610	1,800	330	50,000
Total PAHs	1,637	6,929	4,826	264,200	0	64,800	3,814	53,120	16,951	30,902	21,766	64,040		----
Total Carcinogen PAHs	1,065	4,340	2,690	140,900	0	31,400	2,007	26,100	8,620	16,520	10,890	32,600		10,000
Total SVOCs	1,829	7,366	5,310	286,300	10,000	68,000	4,009	57,680	17,797	31,838	22,698	65,622		500,000
Total SVOC TICs	634	5,404	9,860	1,326,000	8,711,000	59,300	5,051	31,100	11,081	19,460	8,214	8,171		----

Qualifiers:
J: Compound found at a concentration below the detection limit
U: Compound analyzed for but not detected
B: Compound found in the method blank as well as the sample
D: Value is a result of analysis with a dilution factor of 10.0
*: Sample run at medium level with the listed dilution.

NOTES:
MDL - Method Detection Limit
----: not established
[ ] Indicates value exceeds NYSDEC soil clean-up objective.
** Sample collected beneath asphalt surface

TABLE G-1c.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
SURFACE SOIL SAMPLE RESULTS - FALL 1998
PESTICIDE/PCBs

Sample Identification	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8	SS-9	SS-10	SS-11	SS-12	Contract Required Detection Limit	NYSDEC Recommended Soil Clean-Up Objective
Sample Depth	0-3"	0-3"	0-3"	0-3"	0-3"	0-3"	0-3"	0-3"	0-3"	6"-9" **	0-3"	0-3"		
Date of Collection	09/24/98	09/24/98	09/24/98	09/24/98	09/24/98	09/24/98	09/24/98	09/24/98	09/24/98	09/23/98	09/24/98	09/24/98		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Percent Moisture	7.72	6.94	6.8	19.08	9.05	6.29	1.02	17.73	9.92	8.5	5.51	26.95		
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
alpha-BHC	U	U	U	U	U	U	U	U	U	U	U	U	0.05	110
beta-BHC	U	U	U	U	U	U	U	U	U	U	U	U	0.05	200
delta-BHC	U	U	U	U	U	U	U	U	U	U	U	U	0.05	300
gamma-BHC (Lindane)	U	U	U	U	U	U	U	U	U	U	U	U	0.05	540
Heptachlor	U	U	U	U	U	U	U	U	U	U	U	U	0.05	100
Aldrin	U	U	U	U	U	U	U	U	U	U	U	U	0.05	41
Heptachlor Epoxide	U	U	U	U	U	U	U	U	U	U	U	U	0.05	20
Endosulfan I	U	U	U	U	U	U	U	U	U	U	U	U	0.05	900
Dieldrin	U	U	U	U	U	U	U	17	U	U	U	U	0.10	44
4,4'-DDE	U	U	U	U	U	U	U	U	U	U	U	U	0.10	2100
Endrin	U	U	U	U	U	U	U	U	U	U	U	16 P	0.10	100
Endosulfan II	12 P	U	U	U	U	U	U	U	U	U	U	U	0.10	900
4,4'-DDD	U	U	U	U	17 P	140 D	U	U	U	U	U	U	0.10	2900
Endosulfan Sulfate	U	U	U	U	6.1 P	U	U	U	U	U	U	U	0.10	1000
4,4'-DDT	U	U	U	U	U	U	U	U	U	U	U	U	0.10	2100
Methoxychlor	U	U	U	U	U	160 P	U	U	U	U	U	U	0.50	***
Endrin Ketone	U	U	U	U	5.0 P	21 P	U	U	U	U	U	U	0.10	----
Endrin Aldehyde	U	U	U	U	U	U	U	U	U	U	U	U	0.10	----
alpha-Chlordane	U	3.4 P	U	3.8 P	U	4.6 P	U	U	14 P	U	U	4.2 P	0.05	540
gamma-Chlordane	U	U	U	U	U	U	U	8.4 P	14 P	U	U	U	0.05	540
Toxaphene	U	U	U	U	U	U	U	U	U	U	U	U	5.0	----
Aroclor-1016	U	U	U	U	U	U	U	U	U	U	U	U	1.0	1000*
Aroclor-1221	U	U	U	U	U	U	U	U	U	U	U	U	2.0	1000*
Aroclor-1232	U	U	U	U	U	U	U	U	U	U	U	U	1.0	1000*
Aroclor-1242	U	U	U	U	U	U	U	U	U	U	U	U	1.0	1000*
Aroclor-1248	U	U	U	U	U	U	U	U	U	U	U	U	1.0	1000*
Aroclor-1254	U	U	U	U	U	U	U	U	U	U	U	U	1.0	1000*
Aroclor-1260	480 P	U	U	U	U	U	U	2,500 D	1,200	U	U	U	1.0	1000*
Total PCBs	480	0	0	0	0	0	0	2,500	1,200	0	0	0		1000*

QUALIFIERS:
U: Compound analyzed for but not detected
J: Compound found at a concentration below the CRDL, value estimated
P: Greater than 25% difference for detected concentrations between the two GC columns
D: Value is a result of analysis with a dilution factor of 5.0

NOTES:
----: not established
***: Total pesticides not to exceed 10,000 ug/kg
*: Value refers to the sum of these compounds

Indicates value exceeds NYSDEC recommended soil clean-up objective

** Sample collected beneath asphalt surface

TABLE 3-1c.

TAPPAN TE NAL SITE

REMEDIAL INVESTIGATION AND FEASIBILITY STUDY

SURFACE SOIL SAMPLE RESULTS - FALL 1998

PESTICIDE/PCBs

Sample Identification	SS-13	SS-14	SS-15	SS-16	SS-17	SS-18	SS-19	SS-20	SS-21	SS-22	SS-23	SS-24	Contract Required Detection Limit (ug/kg)	NYSDEC Recommended Soil Clean-Up Objective (ug/kg)
Sample Depth	0-3"	0-3"	3"-6" **	8"-11" **	6"-9" **	8"-11" **	6"-9" **	0-3"	0-3"	0-3"	0-3"	0-3"		
Date of Collection	09/24/98	09/24/98	09/23/98	09/23/98	09/23/98	09/23/98	09/23/98	09/24/98	09/24/98	09/24/98	09/24/98	09/24/98		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Percent Moisture	9.5	2.54	7.51	10.06	10.31	5.12	7.35	6.73	6.34	26.23	4.2	18.29		
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)		
alpha-BHC	U	U	U	U	U	U	U	U	U	U	U	U	0.05	110
beta-BHC	U	U	U	U	U	U	U	U	U	U	U	U	0.05	200
delta-BHC	U	U	U	U	U	U	U	U	U	U	U	U	0.05	300
gamma-BHC (Lindane)	U	U	U	U	U	U	U	U	U	U	U	U	0.05	540
Heptachlor	U	U	U	U	U	U	U	U	U	U	U	U	0.05	100
Aldrin	U	U	U	U	U	U	U	U	U	U	U	U	0.05	41
Heptachlor Epoxide	U	U	U	U	U	U	U	U	U	U	2.7 P	U	0.05	20
Endosulfan I	U	U	U	U	U	U	U	U	U	U	U	U	0.05	900
Dieldrin	12	U	U	U	U	U	U	U	U	U	U	U	0.10	44
4,4'-DDE	U	U	U	17 P	U	U	U	3.4 JP	U	U	11	U	0.10	2100
Endrin	U	U	U	U	U	U	U	U	U	U	U	U	0.10	100
Endosulfan II	40 P	27 P	55 P	U	U	U	U	U	U	U	U	U	0.10	900
4,4'-DDD	U	U	U	260 D	U	U	U	U	6.0 P	U	17 P	U	0.10	2900
Endosulfan Sulfate	U	U	U	U	U	U	U	U	U	11 P	U	U	0.10	1000
4,4'-DDT	U	U	U	9.4	U	U	U	40	U	19 P	60 DP	U	0.10	2100
Methoxychlor	U	U	U	U	120 P	U	U	U	U	U	U	U	0.50	***
Endrin Ketone	U	9.3 P	U	U	U	12	U	U	U	U	12	U	0.10	----
Endrin Aldehyde	U	U	U	U	U	U	U	U	U	U	U	U	0.10	----
alpha-Chlordane	U	U	U	U	U	5.0 P	U	U	U	U	56 DP	2.5 P	0.05	540
gamma-Chlordane	U	4.7 P	U	U	U	7.9	U	U	U	U	63 DP	2.5 P	0.05	540
Toxaphene	U	U	U	U	U	U	U	U	U	U	U	U	5.0	----
Aroclor-1016	U	U	U	U	U	U	U	U	U	U	U	U	1.0	1000*
Aroclor-1221	U	U	U	U	U	U	U	U	U	U	U	U	2.0	1000*
Aroclor-1232	U	U	U	U	U	U	U	U	U	U	U	U	1.0	1000*
Aroclor-1242	U	U	U	U	U	U	U	U	U	U	U	U	1.0	1000*
Aroclor-1248	U	U	U	U	U	U	U	U	U	U	U	U	1.0	1000*
Aroclor-1254	U	U	U	U	U	U	U	U	U	U	U	U	1.0	1000*
Aroclor-1260	U	940	4,400	U	U	U	U	330	U	U	U	U	1.0	1000*
Total PCBs	0	940	**4,400**	0	0	0	0	330	0	0	0	0		

QUALIFIERS:

U: Compound analyzed for but not detected

J: Compound found at a concentration below the CRDL, value estimated

P: Greater than 25% difference for detected concentrations between the two GC columns

DP/BDP: Value is a result of analysis with a dilution factor of 5.0

NOTES:

----: not established ***: Total pesticides not to exceed 10,000 ug/kg

*: Value refers to the sum of these compounds

SS-14 DL analyses with a dilution factor of 5.0, yielded an Aroclor 1260 result of 1700 DP ug/kg.

SS-15 DL analyses with a dilution factor of 10.0, yielded an Aroclor 1260 result of 8300 DP ug/kg.

SS-16 DL analyses with a dilution factor of 10.0, yielded a 4,4'-DDD result of 260 DP ug/kg.

Indicates value exceeds NYSDEC recommended soil clean-up objective

** Sample collected beneath asphalt surface

TABLE G-1d.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
SURFACE SOIL SAMPLE RESULTS - FALL 1998
INORGANIC PARAMETERS

Sample Identification	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8	SS-9	SS-10	SS-11	SS-12	Instrument Detection Limit (ug/l)	NYSDEC Recommended Soil Clean-Up Objective (mg/kg)
Sample Depth	0-3"	0-3"	0-3"	0-3"	0-3"	0-3"	0-3"	0-3"	0-3"	6"-9" **	0-3"	0-3"		
Date of Collection	09/24/98	09/24/98	09/24/98	09/24/98	09/24/98	09/24/98	09/24/98	09/24/98	09/24/98	09/23/1998	09/24/98	09/24/98		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Percent Solids	92.3	93.1	93.2	80.9	91.0	93.7	99.0	82.3	90.1	91.5	94.5	73.1		
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		
Aluminum	4,150	6,210	1,740	6,740	6,020	6,010	1,140	13,600	8,780	9,400	5,530	2,010	13	SB
Antimony	4.9 B	23.2	U	2.2 B	3.6 B	4.2 B	U	10.4 B	0.89 B	0.96 B	2.0 B	0.99 B	8	SB
Arsenic	**17.7**	**89.6**	1.2 B	**9.6**	**12.0**	**12.9**	1.7 B	**26.6**	6.3	**19.8**	6.4	2.6 B	3	7.5 or SB
Barium	**676**	**572**	10.0 B	300	**729**	**698**	17.8 B	**1,510**	235	129	112	**8,120**	1	300 or SB
Beryllium	**0.44 B**	**0.46 B**	0.07 B	**0.57 B**	**0.47 B**	**0.45 B**	**0.53 B**	**0.86 B**	**0.53 B**	**0.22 B**	**0.47 B**	**0.19 B**	1	0.16 or SB
Cadmium	2.5	3.4	U	1.3	3.3	3.6	0.18 B	2.4	2.6	U	2.3	0.49 B	1	10*
Calcium	17,600	3,280	504 B	11,700	5,650	3,510	404 B	3,250	16,300	16,100	11,200	4,130	8	SB
Chromium	15.3	33.3	6.3	17.5	34.5	33.5	14.6	**60.4**	39.7	9.1	17.1	12.8	1	50*
Cobalt	5.3 B	7.5 B	1.9 B	6.8 B	6.6 B	7.3 B	2.1 B	14.6	5.6 B	10.9 B	6.6 B	0.83 B	2	30 or SB
Copper	**320**	**544**	9.7	**149**	**791**	**952**	**37.6**	**1,110**	**194**	**127**	**278**	**86.7**	1	25 or SB
Iron	**29,100**	**31,700**	**5,130**	**17,500**	**24,000**	**21,800**	**12,400**	**32,600**	**18,000**	**22,600**	**26,400**	**6,790**	20	2,000 or SB
Lead	394	1,320	13.8	201	657	819	51.1	725	322	96.8	235	597	2	400
Magnesium	6,800	2,190	1,450	7,970	3,620	2,870	415 B	6,350	8,880	7,050	6,100	2,580	8	SB
Manganese	295	570	48.2	261	560	189	92.9	1,020	277	251	211	77.3	4	SB
Mercury	**0.69**	**2.0**	U	**0.52**	**1.4**	**1.8**	U	**2.8**	**0.65**	**0.19**	**0.13**	**0.63**	0.2	0.1
Nickel	**20.5**	**31.1**	**14.8**	**20.9**	**35.0**	**43.5**	9.4	**63.9**	**26.4**	12.6	**18.4**	11.0	2	13 or SB
Potassium	566 B	1,280	450 B	1,300	879 B	794 B	283 B	1,580	1,020 B	1,200	2,090	405 B	20	SB
Selenium	1.6	1.5	U	1.1 B	**2.1**	1.9	U	1.8	1.4	1.3	0.99 B	1.1 B	4	2 or SB
Silver	U	0.98 B	U	U	0.82 B	0.59 B	U	0.98 B	0.40 B	U	U	0.45 B	1	SB
Sodium	202 B	106 B	332 B	355 B	233 B	144 B	61.6 B	920 B	384 B	944 B	146 B	398 B	9	SB
Thallium	1.4 B	1.3 B	U	U	U	1.0 B	U	1.4 B	U	U	U	U	5	SB
Vanadium	27.7	85.5	7.2 B	42.8	143	**262**	6.9 B	100	45.8	64.3	22.3	14.2 B	1	150 or SB
Zinc	**319**	**902**	**23.5**	**414**	**884**	**1,220**	**120**	**776**	**330**	**84.0**	**314**	**125**	1	20 or SB
Cyanide	0.98	7.9	U	U	4.0	3.3	U	U	U	U	U	1.8	10	----

QUALIFIERS:
U: Compound analyzed for but not detected
B: Compound concentration is less than the CRDL but greater than the IDL.

NOTES:
To determine the detection limit for each sample, use the following equation: (CRDL)*(DF)*(100/%S) where CRDL = contract required detection limit, DF = dilution factor and %S = percent solids.
SB: Site backround
----: not established
*: as per proposed 4/95 NYSDEC TAGM

Indicates value exceeds the NYSDEC recommended soil clean-up objective

** Sample collected beneath asphalt surface

TABLE G-1d.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
SURFACE SOIL SAMPLE RESULTS - FALL 1998
INORGANIC PARAMETERS

Sample Identification	SS-13	SS-14	SS-15	SS-16	SS-17	SS-18	SS-19	SS-20	SS-21	SS-22	SS-23	SS-24	Instrument Detection Limit (ug/l)	NYSDEC Recommended Soil Clean-Up Objective (mg/kg)
Sample Depth	0-3"	0-3"	3"-6" **	8"-11" **	6"-9" **	8"-11" **	6"-9" **	0-3"	0-3"	0-3"	0-3"	0-3"		
Date of Collection	9/24/98	9/24/98	9/23/98	9/23/98	9/23/98	9/23/98	9/23/98	9/24/98	9/24/98	09/24/98	09/24/98	09/24/98		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Percent Solids	90.5	97.5	92.5	89.9	89.7	94.9	92.7	93.3	93.7	73.8	95.8	83.4		
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		
Aluminum	6,470	6,040	4,940	4,670	3,320	11,900	5,080	4,350	4,360	9,230	4,540	7,410	13	SB
Antimony	U	1.3 B	1.3 B	1.8 B	2.7 B	0.69 B	1.8 B	8.7 B	1.7 B	3.1 B	1.9 B	2.2 B	8	SB
Arsenic	5.3	10.3	9.4	6.5	6.5	2.4	7.1	8.9	47.4	15.6	3.8	10.7	3	7.5 or SB
Barium	296	247	199	469	319	136	954	242	672	177	117	296	1	300 or SB
Beryllium	0.95 B	0.48 B	0.36 B	0.35 B	0.39 B	0.37 B	0.39 B	8.1	0.62 B	0.47 B	0.28 B	0.53 B	1	0.16 or SB
Cadmium	1.2	1.3	1.7	4.1	5.9	U	2.0	2.4	3.2	0.69 B	0.87 B	0.89 B	1	10*
Calcium	10,600	26,300	10,100	30,100	40,100	22,200	33,000	14,200	4,200	3,740	11,000	16,800	8	SB
Chromium	34.6	87.9	11.8	29.5	25.4	30.0	15.2	96.6	11.9	32.1	18.7	20.4	1	50*
Cobalt	5.3 B	9.8 B	5.9 B	6.0 B	4.4 B	8.8 B	5.6 B	17.5	4.3 B	11.5 B	4.0 B	7.0 B	2	30 or SB
Copper	301	284	428	250	220	71.2	211	648	509	231	83.5	203	1	25 or SB
Iron	19,400	26,600	19,100	20,000	21,600	22,000	17,200	33,600	13,400	32,900	10,700	20,000	20	2,000 or SB
Lead	583	434	135	403	349	59.6	195	972	159	342	142	297	2	400
Magnesium	3,050	8,500	5,450	14,800	22,000	18,900	19,600	5,460	1,510	5,870	7,050	11,200	8	SB
Manganese	405	584	2,190	178	215	245	254	302	129	489	181	273	4	SB
Mercury	2.8	2.7	0.33	1.3	2.0	0.06 B	0.18	0.73	0.13	0.24	0.21	0.68	0.2	0.1
Nickel	31.3	54.0	22.4	35.9	21.1	19.5	14.7	119	16.7	31.8	10.3	22.5	2	13 or SB
Potassium	926 B	867 B	499 B	994 B	503 B	6,360 B	1,040 B	745 B	541 B	1,280 B	935 B	1,460	20	SB
Selenium	U	1.2	1.1	1.3	1.9	1.4	0.85 B	1.3	1.9	2.5	0.91 B	0.94 B	4	2 or SB
Silver	38.8	0.32 B	U	U	0.31 B	U	U	2.9	U	U	0.22 B	U	1	SB
Sodium	1,310	345 B	680 B	733 B	446 B	265 B	729 B	172 B	94.0 B	43.3 B	97.1 B	168 B	9	SB
Thallium	U	1.3 B	U	1.3 B	U	0.93 B	U	1.4 B	1.1 B	U	U	U	5	SB
Vanadium	2,190	353	32.3	32.3	27.4	44.9	23.1	53.6	25.1	61.4	21.9	53.4	1	150 or SB
Zinc	290	570	519	573	1,620	135	450	3,200	579	1,850	198	395	1	20 or SB
Cyanide	7.2	U	U	U	U	U	U	0.09	U	U	U	U	10	----

QUALIFIERS:
U: Compound analyzed for but not detected
B: Compound concentration is less than the CRDL but greater than the IDL.

NOTES:
To determine the detection limit for each sample, use the following equation: (CRDL)*(DF)*(100/%S) where CRDL = contract required detection limit, DF = dilution factor and %S = percent solids.
SB: Site backround
----: not established
*: as per proposed 4/95 NYSDEC TAGM

Indicates value exceeds the NYSDEC recommended soil clean-up objective

** Sample collected beneath asphalt surface

TABLE G-2a.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
SUBSURFACE SOIL SAMPLE RESULTS - FALL 1998
VOLATILE ORGANIC COMPOUNDS

Sample Identification	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8	SB-9	SB-10	Contract Required Detection Limit	NYSDEC Recommended Soil Clean-Up Objective
Sample Depth	2-4'	2-4'	1-5'	2-5'	2-4'	2-6'	2-6'	1-4'	2-4'		
Date of Collection	10/06/98	10/06/98	10/06/98	10/06/98	10/05/98	10/06/98	10/06/98	10/05/98	10/06/98		
Dilution Factor	1.0	1.0	1.0	125.0	1.0	125.0	125.0	1.0	1.0		
Percent Moisture	20	24	11	29	19	29	20	13	10		
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Chloromethane	U	U	U	U	U	U	U	U	U	10	----
Bromomethane	U	U	U	U	U	U	U	U	U	10	----
Vinyl Chloride	U	U	U	U	U	U	1,800	U	U	10	200
Chloroethane	U	U	U	U	U	U	U	U	U	10	1,900
Methylene Chloride	70	54	U*	U*	68	U*	U*	U*	U*	10	100
Acetone	78	U	U	U	U	U	U	15	U	10	200
Carbon Disulfide	4 J	U	U	U	U	U	U	U	U	10	2,700
1,1-Dichloroethene	U	U	U	U	U	U	U	U	U	10	400
1,1-Dichloroethane	U	U	U	U	U	U	23,000	U	U	10	200
1,2-Dichloroethene (total)	U	U	U	U	U	830 J	U	U	U	10	300
Chloroform	U	U	U	U	U	U	U	U	U	10	300
1,2-Dichloroethane	U	U	U	U	U	U	U	U	U	10	100
2-Butanone	16	U	U	U	U	U	U	U	U	10	300
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	U	10	800
Carbon Tetrachloride	U	U	U	U	U	U	U	U	U	10	600
Bromodichloromethane	U	U	U	U	U	U	U	U	U	10	----
1,2-Dichloropropane	U	U	U	U	U	U	U	U	U	10	----
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	10	----
Trichloroethene	U	U	U	2,400	U	180 J	15,000	U	U	10	700
Dibromochloromethane	U	U	U	U	U	U	U	U	U	10	----
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	U	10	----
Benzene	U	22	U	U	U	U	U	U	U	10	60
Trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	10	----
Bromoform	U	U	U	U	U	U	U	U	U	10	----
4-Methyl-2-Pentanone	U	U	U	U	U	U	U	U	U	10	1,000
2-Hexanone	U	U	U	U	U	U	U	U	U	10	----
Tetrachloroethene	U	U	U	42,000 D	U	2,100	50,000 D	U	U	10	1,400
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	U	10	600
Toluene	2 J	1 J	U	U	U	230 J	U	U	U	10	1,500
Chlorobenzene	U	2 J	U	5,200	U	31,000	U	U	U	10	1,700
Ethylbenzene	U	U	U	U	U	U	U	U	U	10	5,500
Styrene	U	U	U	U	U	U	U	U	U	10	----
Total Xylenes	12 J	6 J	U	230 J	4 J	550 J	260 J	1 J	1 J	10	1,200
Total VOCs	182	85	0	49,830	72	34,890	90,060	16	1		10,000
Total VOC TICs	7	0	0	0	0	0	0	0	0		

QUALIFIERS:
U: Compound analyzed for but not detected
J: Compound found at aconcentration below the CRDL, value estimated
D: Result taken from reanalysis at a 1:250 dilution
U*: Result qualified as non-detect based on validation criteria
---: Not established

NOTES:
To determine the detection limit for each sample, use following equation: (CRDL)*(DF) where CRDL = contract required detection limit, DF = dilution factor and %S = percent solids..

Indicates value exceeds the NYSDEC recommended soil clean up objective.

TABLE G-2b.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
SUBSURFACE SOIL SAMPLE RESULTS - FALL 1998
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8	SB-9	SB-10	Contract Required Detection Limit	NYSDEC Recommended Soil Clean-Up Objective
Sample Depth	2-6'	2-4'	2-4'	1-5'	2-5'	2-4'	2-6'	2-6'	1-4'	2-4'		
Date of Collection	10/06/98	10/06/98	10/06/98	10/06/98	10/06/98	10/05/98	10/06/98	10/06/98	10/05/98	10/06/98		
Dilution Factor	1.0	2.0	2.0	1.0	1.0	1.0	2.0	2.0	1.0	1.0		
Percent Moisture	41.16	19.62	24.21	10.92	28.57	18.51	29.02	19.98	13.48	9.81		
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Phenol	U	U	U	U	U	U	U	U	U	U	330	30 OR MDL
bis(2-Chloroethyl)ether	U	U	U	U	U	U	U	U	U	U	330	----
2-Chlorophenol	U	U	U	U	U	U	U	U	U	U	330	800
1,3-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	330	1,600
1,4-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	330	8,500
1,2-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	330	7,900
2-Methylphenol	U	U	U	U	U	U	U	U	U	U	330	100 OR MDL
2,2-Oxybis (1-Chloropropane)	U	U	U	U	U	U	U	U	U	U	330	----
4-Methylphenol	U	U	U	U	U	U	U	U	U	U	330	900
N-Nitroso-di-n-propylamine	U	U	U	U	U	U	U	U	U	U	330	----
Hexachloroethane	U	U	U	U	U	U	U	U	U	U	330	----
Nitrobenzene	650	U	U	U	U	U	U	U	U	U	330	200 OR MDL
Isophorone	U	U	U	U	U	U	U	U	U	U	330	4,400
2-Nitrophenol	U	U	U	U	U	U	U	U	U	U	330	330 OR MDL
2,4-Dimethylphenol	U	U	U	U	U	U	U	U	U	U	330	----
bis(2-Chloroethoxy)methane	U	U	U	U	U	U	U	U	U	U	330	----
2,4-Dichlorophenol	U	U	U	U	U	U	U	U	U	U	330	400
1,2,4-Trichlorobenzene	U	U	U	U	U	U	U	U	U	U	330	3,400
Naphthalene	470 J	U	U	U	U	94 J	U	90 J	U	370 J	330	13,000
4-Chloroaniline	58 J	U	U	U	U	U	U	U	U	U	330	220 OR MDL
Hexachlorobutadiene	U	U	U	U	U	U	U	U	U	U	330	----
4-Chloro-3-methylphenol	U	U	U	U	U	U	U	U	U	U	330	240 OR MDL
2-Methylnaphthalene	430 J	U	350 J	52 J	U	53 J	U	U	U	960	330	36,400
Hexachlorocyclopentadiene	U	U	U	U	U	U	U	U	U	U	330	----
2,4,6-Trichlorophenol	U	U	U	U	U	U	U	U	U	U	330	----
2,4,5-Trichlorophenol	U	U	U	U	U	U	U	U	U	U	800	100
2-Chloronaphthalene	U	U	U	U	U	U	U	U	U	U	330	----
2-Nitroaniline	U	U	U	U	U	U	U	U	U	U	800	430 OR MDL
Dimethylphthalate	U	U	U	U	U	U	U	U	U	U	330	2,000
Acenaphthylene	U	U	U	U	U	47 J	U	U	U	U	330	41,000
2,6-Dinitrotoluene	U	U	U	U	U	U	U	U	U	U	330	1
3-Nitroaniline	U	U	U	U	U	U	U	U	U	U	800	500 OR MDL
Acenaphthene	1,700	U	U	U	U	320 J	U	300 J	73 J	U	330	50,000
2,4-Dinitrophenol	U	U	U	U	U	U	U	U	U	U	800	200 OR MDL
4-Nitrophenol	U	U	U	U	U	U	U	U	U	U	800	100 OR MDL
Dibenzofuran	1,100	U	U	U	U	260 J	U	130 J	52 J	U	330	6,200

TABLE G-2b. (CONTINUED)
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
SUBSURFACE SOIL SAMPLE RESULTS - FALL 1998
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8	SB-9	SB-10	Contract Required Detection Limit	NYSDEC Recommended Soil Clean-Up Objective
Sample Depth	2-6'	2-4'	2-4'	1-5'	2-5'	2-4'	2-6'	2-6'	1-4'	2-4'		
Date of Collection	10/06/98	10/06/98	10/06/98	10/06/98	10/06/98	10/05/98	10/06/98	10/06/98	10/05/98	10/06/98		
Dilution Factor	1.0	2.0	2.0	1.0	1.0	1.0	2.0	2.0	1.0	1.0		
Percent Moisture	41.16	19.62	24.21	10.92	28.57	18.51	29.02	19.98	13.48	9.81		
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
2,4-Dinitrotoluene	U	U	U	U	U	U	U	U	U	U	330	----
Diethylphthalate	U	U	U	U	U	U	U	U	U	U	330	7,100
4-Chlorophenyl-phenylether	U	U	U	U	U	U	U	U	U	U	330	----
Fluorene	1,200	U	U	U	U	290 J	U	260 J	62 J	99 J	330	50,000
4-Nitroaniline	620 J	U	U	U	U	U	U	U	U	U	330	----
4,6-Dinitro-2-methylphenol	U	U	U	U	U	U	U	U	U	U	330	----
N-Nitrosodiphenylamine	U	U	U	U	U	U	U	U	U	U	330	----
4-Bromophenyl-phenylether	U	U	U	U	U	U	U	U	U	U	330	410
Hexachlorobenzene	U	U	U	U	U	U	U	U	U	U	330	100 OR MDL
Pentachlorophenol	7,000 D	320 J	U	52 J	U	3,000	160 J	1,900	580	270 J	330	50,000
Phenanthrene	1,900	U	U	U	U	550	U	530 J	170 J	51 J	330	50,000
Anthracene	780	U	U	U	U	530	U	340 J	58 J	U	330	
Carbazole	U	U	U	U	U	U	U	U	U	U	330	8,100
Di-n-butylphthalate	5,700 D	520 J	U	77 J	U	3,200 D	490 J	2,300	650	250 J	330	50,000
Fluoranthene	6,800 D	540 J	U	110 J	U	2,700	530 J	3,400	660	270 J	330	50,000
Pyrene	U	U	U	U	U	U	U	47 J	U	U	330	50,000
Butylbenzylphthalate	U	U	U	U	U	U	U	U	U	U	330	----
3,3'-Dichlorobenzidine	2,400	180 J	U	64 J	U	1,500	320 J	1,300	350 J	140 J	330	224 OR MDL
Benzo (a) anthracene	2,400	210 J	U	110 J	U	1,700	360 J	1,300	380 J	150 J	330	400
Chrysene	1,700	150 J	430 J	340 J	310 J	1,700	120 J	3,600	390	730	330	50,000
bis(2-Ethylhexyl)phthalate	U	U	180 J	U	U	U	U	U	U	U	330	50,000
Di-octylphthalate	2,800	200 J	U	120 J	U	1,900	360 J	1,700	300 J	160 J	330	1,100
Benzo(b)fluoranthene	1,900	220 J	U	110 J	U	1,200	330 J	1,300	350 J	150 J	330	1,100
Benzo(k)fluoranthene	1,700	160 J	U	60 J	U	1,600	340 J	1,300	310 J	140 J	330	61 OR MDL
Benzo(a)pyrene	1,300	U	U	57 J	U	700	140 J	450 J	130 J	49 J	330	3,200
Indeno(1,2,3-cd)pyrene	270 J	U	U	U	U	330 J	U	260 J	69 J	U	330	14 OR MDL
Dibenzo(a,h)anthracene	1,300	U	U	57 J	U	630	130 J	430 J	130 J	46 J	330	50,000
Benzo(g,h,i)perylene	38,840	2,350	0	817	0	19,761	3,160	16,820	4,214	2,145		----
Total PAHs	12,770	970	0	521	0	8,930	1,850	7,610	1,889	789		10,000
Total Carcinogen PAHs	44,178	2,500	960	1,209	310	22,304	3,280	20,937	4,714	3,835		500,000
Total SVOCs	18,400	8,550	23,070	4,430	3,388	8,777	11,240	9,770	5,893	5,520		
Total SVOC TICs												

QUALIFIERS:
J: Compound found at a concentration below the detection limit
U: Compound analyzed for but not detected
B: Compound found in the method blank as well as the sample
D: Value is a result of analysis with a dilution factor of 2.0

NOTES: To determine the detection limit for each sample, use the following equation: (CRDL)*(DF)*(100/%S), where CRDL = contract required detection limit, DF = dilution factor and %S = percent solids.
--: not established

Indicates value exceeds recommended NYSDEC Soil Clean-Up Objective

TABLE G-2c.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
SUBSURFACE SOIL SAMPLE RESULTS - FALL 1998
PESTICIDE/PCBs

Sample Identification	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8	SB-9	SB-10	Contract Required Detection Limit	NYSDEC Recommended Soil Clean Up Objective
Sample Depth	2-6'	2-4'	2-4'	1-5'	2-5'	2-4'	2-6'	2-6'	1-4'	2-4'		
Date of Collection	10/06/98	10/06/98	10/06/98	10/06/98	10/06/98	10/05/98	10/06/98	10/06/98	10/05/98	10/06/98		
Dilution Factor	1.0	1.0	2.0	1.0	1.0	1.0	2.0	2.0	1.0	1.0		
Percent Moisture	41.16	19.62	24.21	10.92	28.57	18.51	29.02	19.98	13.48	9.81		
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
alpha-BHC	U	U	U	U	U	U	U	U	U	U	0.05	110
beta-BHC	U	U	U	U	U	U	U	U	U	U	0.05	200
delta-BHC	U	U	U	U	U	U	U	U	U	U	0.05	300
gamma-BHC (Lindane)	U	U	U	U	U	U	U	U	U	U	0.05	540
Heptachlor	U	U	U	U	U	U	U	U	U	U	0.05	100
Aldrin	U	U	U	U	U	U	U	U	U	U	0.05	41
Heptachlor Epoxide	U	U	U	U	U	U	U	U	U	U	0.05	20
Endosulfan I	U	U	U	U	U	U	U	U	U	U	0.05	900
Dieldrin	U	U	U	U	U	U	U	U	U	U	0.10	44
4,4'-DDE	U	U	U	U	U	U	U	U	U	U	0.10	2100
Endrin	U	U	U	U	U	U	U	U	U	U	0.10	100
Endosulfan II	U	U	220 P	U	U	U	U	U	U	U	0.10	900
4,4'-DDD	U	9.7 P	13 P	U	U	U	16	U	U	U	0.10	2900
Endosulfan Sulfate	U	U	U	U	U	U	U	U	U	U	0.10	1000
4,4'-DDT	U	5.9 P	U	6.7 P	U	U	U	U	U	U	0.10	2100
Methoxychlor	U	U	U	U	U	U	U	U	U	U	0.50	**
Endrin Ketone	U	U	8.5 P	5.3 P	U	U	U	8.9 P	U	U	0.10	----
Endrin Aldehyde	U	U	62	U	U	U	U	U	U	U	0.10	----
alpha-Chlordane	U	U	U	U	U	U	U	U	U	U	0.05	540
gamma-Chlordane	U	U	U	U	U	U	U	4.2 P	U	U	0.05	540
Toxaphene	U	U	U	U	U	U	U	U	U	U	5.0	----
Aroclor-1016	U	U	U	U	U	U	U	U	U	U	1.0	1000*
Aroclor-1221	U	U	U	U	U	U	U	U	U	U	2.0	1000*
Aroclor-1232	U	U	U	U	U	U	U	U	U	U	1.0	1000*
Aroclor-1242	U	U	U	U	U	U	U	U	U	U	1.0	1000*
Aroclor-1248	U	U	U	U	U	U	U	U	U	U	1.0	1000*
Aroclor-1254	U	U	U	U	U	U	U	U	U	U	1.0	1000*
Aroclor-1260	U	U	U	U	U	U	U	U	U	U	1	1000*
Total PCBs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		

QUALIFIERS:
U: Compound analyzed for but not detected
J: Compound found at a concentration below the CRDL, value estimated
P: Greater than 25% difference for detected concentrations between the two GC columns

NOTES:
*: Value applies to the sum of these substances
**: Total Pesticides < 10,000 ug/kg

TABLE G-2d.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
SUBSURFACE SOIL SAMPLE RESULTS - FALL 1998
INORGANIC PARAMETERS

Sample Identification	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8	SB-9	SB-10	Contract Required Detection Limit	NYSDEC Recommended Soil Clean-Up Objective
Sample Depth	2-6'	2-4'	2-4'	1-5'	2-5'	2-4'	2-6'	2-6'	1-4'	2-4'		
Date of Collection	10/06/98	10/06/98	10/06/98	10/06/98	10/06/98	10/05/98	10/06/98	10/06/98	10/05/98	10/06/98		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Percent Solids	58.8	80.4	75.8	89.1	71.4	81.5	71.0	80.0	86.5	90.2		
Units	(mg/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Aluminum	5,060	4,900	3,020	3,870	2,950	6,170	2,370	5,480	4,140	3,320	13	SB
Antimony	4.7 B	2.5 B	1.7 B	7.5 B	1.4 B	2.7 B	1.3 B	2.4 B	U	U	8	SB
Arsenic	5.0	**7.9**	7.0	**10.2**	**10.4**	4.4	3.1	**9.8**	**14.6**	3.6	3	7.5 or SB
Barium	83.8	214	121	145	**330**	**3650**	123	**525**	**1230**	52.2	1	300 or SB
Beryllium	**0.23 B**	**0.29 B**	**0.22 B**	**0.24 B**	**0.26 B**	**0.24 B**	U	**0.29 B**	**0.18 B**	U	1	0.16 or SB
Cadmium	0.48 B	1.9	0.87 B	**122**	1.5	0.33 B	U	4.6	0.92 B	U	1	10*
Calcium	18,900	15,900	1,870	7,040	4,410	4,690	3,310	22,000	18,000	39,200	8	SB
Chromium	14.5	18.4	22.7	**120**	8.9	14.8	5.6	15.6	27.6	6.4	1	50*
Cobalt	4.0 B	6.5 B	3.0	8.3 B	4.1 B	5.8 B	3.0 B	5.6 B	2.2 B	2.8 B	2	30 or SB
Copper	**149**	**162**	**166**	**28,700**	**571**	**74.4**	**68.8**	**253**	**246**	14.4	1	25 or SB
Iron	**17,000**	**17,400**	**16,400**	**14,600**	**14,200**	**16,300**	**8,280**	**15,700**	**9,630**	**7,030**	20	2000 or SB
Lead	178	687	149	**3,090**	114	154	94.0	236	173	133	2	400
Magnesium	5,840	3,300	969 B	1,710	2,230	3,820	272 B	7,910	8,460	4,090	8	SB
Manganese	142	657	199	327	82.9	381	52.0	202	109	307	4	SB
Mercury	**0.24**	**1.1**	**0.61**	**0.13**	**0.17**	**0.23**	**0.26**	**0.54**	**0.16**	0.05 B	0.2	0.1
Nickel	10.3 B	**15.8**	**17.2**	**1,120**	12.4	**16.6**	8.2 B	**238**	8.6 B	6.9 B	2	13 or SB
Potassium	2,080	607 B	417 B	327 B	435 B	1,390	227 B	902 B	628 B	423 B	20	SB
Selenium	U	**2.3**	**2.1**	**2.7**	1.9	U	U	2.0	U	U	4	2 or SB
Silver	U	0.28 B	0.68 B	0.92 B	U	U	U	0.80 B	U	U	1	SB
Sodium	1,530 B	451 B	524 B	1,380	612 B	169 B	398 B	307 B	589 B	285 B	9	SB
Thallium	1.9 B	0.89 B	1.3 B	U	2.0 B	U	U	1.3 B	U	1.0 B	5	SB
Vanadium	19.7 B	21.9 B	83.4	13.7 B	16.7 B	23.5 B	7.9 B	32.8	10.9 B	17.2 B	1	150 or SB
Zinc	**257**	**857**	**182**	**43,500**	**186**	**89.9**	**49.9**	**376**	**768**	**49.7**	1	20 or SB

QUALIFIERS:
U: Compound analyzed for but not detected
B: Compound concentration is less than the CRDL but greater than the IDL

NOTES:
To determine the detection limit for each sample, use the following equation: (CRDL)*(DF)* (100/%S), where CRDL = contract required detection limit, DF = dilution factor and %S = percent solids.
SB: Site backround
---: Not established
* : as per proposed 4/95 NYSDEC TAGM

Indicates value exceeds NYSDEC recommended Soil Clean-Up Objective

TABLE 3a.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
GROUNDWATER SAMPLE RESULTS - FALL 1998
VOLATILE ORGANIC COMPOUNDS

Sample Identification	MW-S1	MW-D1	MW-1A	MW-4	MW-5	OW-5A	MW-6	MW-7A	OW-8	MW-9A	OW-9A	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	09/28/98	09/28/98	09/29/98	09/30/98	09/29/98	09/30/98	09/28/98	09/28/98	09/29/98	09/28/98	09/29/98		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	10.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Chloromethane	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Bromomethane	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Vinyl Chloride	U	U	U	U	U	U	U	U	U	U	U	10	2 ST
Chloroethane	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Methylene Chloride	U*	U*	U*	U*	3 J	8 J	U*	U*	U*	U*	U*	10	5 ST
Acetone	U*	U*	U*	U*	U*	U	U*	U*	U	U*	U*	10	50GV
Carbon Disulfide	U	U	U	U	U	U	U	U	U	U	U	10	----
1,1-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
1,1-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
1,2-Dichloroethene (total)	3 J	U	U	U	U	U	U	U	U	U	U	10	5 ST *
Chloroform	U	U	U	U	U	U	U	U	U	U	U	10	7 ST
1,2-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	10	0.6 ST
2-Butanone	U	U	U	U	U	U	U	U	U	U	U	10	50GV
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Carbon Tetrachloride	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Bromodichloromethane	U	U	U	U	U	U	U	U	U	U	U	10	50GV
1,2-Dichloropropane	U	U	U	U	U	U	U	U	U	U	U	10	1 ST
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	10	0.4 ST **
Trichloroethene	1 J	U	U	U	U	U	U	U	U	U	U	10	5 ST
Dibromochloromethane	U	U	U	U	U	U	U	U	U	U	U	10	50GV
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	10	1 ST
Benzene	5 J	U	10 J	U	U	U	U	U	U	U	U	10	1 ST
Trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	10	0.4 ST **
Bromoform	U	U	U	U	U	U	U	U	U	U	U	10	50GV
4-Methyl-2-Pentanone	U	U	U	U	U	U	U	U	U	U*	U	10	----
2-Hexanone	U	U	U	U	U	U	U	U	U	U	U	10	50GV
Tetrachloroethene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	U	15 J	U	10	5 ST
Toluene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Chlorobenzene	1900 D	U	770 D*	U	U	2 J	17	10	17	1,500	U	10	5 ST
Ethylbenzene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Styrene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Total Xylenes	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Total VOCs	1909	0	780	0	3	10	17	10	17	1,515	0		----
Total VOC TICs	0	0	66	750	27	13	0	0	1,480	0	0		----

QUALIFIERS:
U: Compound analyzed for but not detected
B: Compound found in the blank as well as the sample
J: Compound found at a concentration below the CRDL, value estimated
D: Value is a result of analysis with a dilution factor of 10.0
D*: Value is a result of analysis with a dilution factor of 5.0
U*: Result qualified as non-detect based upon validation criteria

NOTES:
*: Value pertains to cis-1,2 Dichloroethene and trans-1,2 Dichloroethene individually
**: Value pertains to the sum of the isomers
GV: Guidance Value
ST: Standard
----: Not established
Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value.

TABLE 3a.

TAPPAN TEI. .NAL SITE

REMEDIAL INVESTIGATION AND FEASIBILITY STUDY

GROUNDWATER SAMPLE RESULTS - FALL 1998

VOLATILE ORGANIC COMPOUNDS

Sample Identification	MW-10	OW-12	MW-13	MW-14	MW-15	OW-15	MW-16	MW-17	OW-17	OW-19A	OW-20	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	09/29/98	09/29/98	10/01/98	10/01/98	09/29/98	09/28/98	10/01/98	09/30/98	09/29/98	09/30/98	09/30/98		
Dilution Factor	1.0	100.0	20.0	50.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Chloromethane	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Bromomethane	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Vinyl Chloride	U	U	U	U	U	U	U	U	U	U	U	10	2 ST
Chloroethane	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Methylene Chloride	U*	350 J	U	99 J	U*	U*	2 J	2 J	U*	2 J	2 J	10	5 ST
Acetone	U*	U	U	920	U*	U*	U	U*	U*	U	U*	10	50GV
Carbon Disulfide	U	U	U	U	U	U	U	U	1 J	U	U	10	----
1,1-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
1,1-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
1,2-Dichloroethene (total)	3 J	U	U	U	U	7 J	U	U	U	U	U	10	5 ST *
Chloroform	U	U	U	U	U	U	U	U	U	U	U	10	7 ST
1,2-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	10	0.6 ST
2-Butanone	U	U	U	U	U	U	U	U	U	U	U	10	50GV
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Carbon Tetrachloride	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Bromodichloromethane	U	U	U	U	U	U	U	U	U	U	U	10	50GV
1,2-Dichloropropane	U	U	U	U	U	U	U	U	U	U	U	10	1 ST
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	10	0.4 ST **
Trichloroethene	U	U	U	U	U	1 J	U	U	U	U	U	10	5 ST
Dibromochloromethane	U	U	U	U	U	U	U	U	U	U	U	10	50GV
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	10	1 ST
Benzene	130	U	U	U	170	3 J	U	U	18	U	U	10	1 ST
Trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	10	0.4 ST **
Bromoform	U	U	U	U	U	U	U	U	U	U	U	10	50GV
4-Methyl-2-Pentanone	U	U*	U	U	U	U	U	U	U	U	U	10	----
2-Hexanone	U	U	U	U	U	U	U	U	U	U	U	10	50GV
Tetrachloroethene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Toluene	1 J	U	U	U	2 J	U	U	U	10 J	U	U	10	5 ST
Chlorobenzene	6,000 D	11,000	3,300	7,600	8,100 D	1400 D	U	U	5,600 D	1 J	1 J	10	5 ST
Ethylbenzene	U	U	U	U	5 J	U	U	U	1 J	U	U	10	5 ST
Styrene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Total Xylenes	U	U	U	U	3 J	U	U	U	6 J	U	U	10	5 ST
Total VOCs	6,134	11,350	3,300	8,619	8,280	1,411	2	2	5,636	2	3		----
Total VOC TICs	53	0	0	0	312	0	0	6	0	332	0		----

QUALIFIERS:

U: Compound analyzed for but not detected

B: Compound found in the blank as well as the sample

J: Compound found at aconcentration below the CRDL, value estimated

D: Value is a result of analysis with a dilution factor of 50.0

U*: Result qualified as non-detect based upon validation criteria

NOTES:

*: Value pertains to cis-1,2 Dichloroethene and trans-1,2 Dichloroethene individually

**: Value pertains to the sum of the isomers

GV: Guidance Value

ST: Standard

----: Not established

[ ] Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value.

TABLE 3a.

TAPPAN TERMINAL SITE

REMEDIAL INVESTIGATION AND FEASIBILITY STUDY

GROUNDWATER SAMPLE RESULTS - FALL 1998

VOLATILE ORGANIC COMPOUNDS

Sample Identification	OW-25	OW-26	OW-27A	LMS-1	LMS-2	LMS-3	LMS-4	LMS-5	LMS-6	LMS-7	LMS-8R	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	09/30/98	10/01/98	09/29/98	10/02/98	10/02/98	10/02/98	10/01/98	10/01/98	10/02/98	10/02/98	10/01/98		
Dilution Factor	1.0	1.0	1.0	50.0	50.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Chloromethane	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Bromomethane	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Vinyl Chloride	U	U	U	U	U	U	U	U	U	U	U	10	2 ST
Chloroethane	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Methylene Chloride	3 J	2 J	U*	160 J	180 J	3 J	2 J	U	4 J	4 J	U	10	5 ST
Acetone	U	8 J	U*	U	U	U	U	23	U	U	U	10	50GV
Carbon Disulfide	U	U	U	U	U	U	U	U	U	U	U	10	----
1,1-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
1,1-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
1,2-Dichloroethene (total)	U	U	U	U	U	U	U	U	U	U	U	10	5 ST *
Chloroform	U	U	U	U	U	U	U	U	U	U	U	10	7 ST
1,2-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	10	0.6 ST
2-Butanone	U	U	U	U	U	U	U	U	U	U	U	10	50GV
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Carbon Tetrachloride	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Bromodichloromethane	U	U	U	U	U	U	U	U	U	U	U	10	50GV
1,2-Dichloropropane	U	U	U	U	U	U	U	U	U	U	U	10	1 ST
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	10	0.4 ST **
Trichloroethene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Dibromochloromethane	U	U	U	U	U	U	U	U	U	U	U	10	50GV
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	10	1 ST
Benzene	U	U	2 J	U	U	U	U	U	U	U	U	10	1 ST
Trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	10	0.4 ST **
Bromoform	U	U	U	U	U	U	U	U	U	U	U	10	50GV
4-Methyl-2-Pentanone	U	U	U	U	U	U	U	U	U	U	U	10	----
2-Hexanone	U	U	U	U	U	U	U	U	U	U	U	10	50GV
Tetrachloroethene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Toluene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Chlorobenzene	U	U	960 D	2,900	3,100	39	U	U	U	U	U	10	5 ST
Ethylbenzene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Styrene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Total Xylenes	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Total VOCs	3	10	962	3,060	3,280	42	2	23	4	4	0		----
Total VOC TICs	246	770	0	0	0	0	0	0	0	0	0		----

QUALIFIERS:

U: Compound analyzed for but not detected

B: Compound found in the blank as well as the sample

J: Compound found at aconcentration below the CRDL, value estimated

D: Value is a result of analysis with a dilution factor of 10.0

U*: Result qualified as non-detect based upon validation criteria

NOTES:

*: Value pertains to cis-1,2 Dichloroethene and trans-1,2 Dichloroethene individually

**: Value pertains to the sum of the isomers

GV: Guidance Value

ST: Standard

----: Not established

[ ] Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value.

TABLE G-3b.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
GROUNDWATER SAMPLE RESULTS - FALL 1998
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	MW-S1	MW-D1	MW-1A	MW-4	MW-5	OW-5A	MW-6	MW-7A	OW-8	MW-9A	OW-9A	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	09/28/98	09/28/98	09/29/98	09/30/98	09/29/98	09/30/98	09/28/98	09/28/98	09/29/98	09/28/98	09/29/98		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Phenol	U	U	U	U	U	U	U	U	U	U	U	10	1 ST *
bis (2-Chloroethyl) ether	U	U	U	U	U	U	U	U	U	U	U	10	1 ST
2-Chlorophenol	U	U	U	U	U	U	U	U	U	U	U	10	1 ST *
1,3-Dichlorobenzene	U	U	4 J	U	U	U	U	U	U	U	U	10	3 ST
1,4-Dichlorobenzene	U	U	8 J	U	U	U	U	U	U	U	U	10	3 ST
1,2-Dichlorobenzene	U	U	1 J	U	U	U	U	U	U	U	U	10	3 ST
2-Methylphenol	U	U	U	U	U	U	U	U	U	U	U	10	----
2,2'-Oxybis (1-Chloropropane)	U	U	U	U	U	U	U	U	U	U	U	10	----
4-Methylphenol	U	U	U	U	U	U	U	U	U	U	U	10	----
N-Nitroso-di-n-propylamine	U	U	U	U	U	U	U	U	U	U	U	10	----
Hexachloroethane	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Nitrobenzene	U	U	U	U	U	U	U	U	U	U	U	10	0.4 ST
Isophorone	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
2-Nitrophenol	U	U	U	U	U	U	U	U	U	U	U	10	----
2,4-Dimethylphenol	U	U	U	U	U	U	U	U	U	U	U	10	1 ST *
bis (2-Chloroethoxy) methane	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
2,4-Dichlorophenol	U	U	U	U	U	U	U	U	U	U	U	10	1 ST *
1,2,4-Trichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Naphthalene	6 J	U	10 J	U	U	U	U	U	U	U	U	10	10 GV
4-Chloroaniline	U	U	5 J	U	U	U	U	U	5 J	25	U	10	5 ST
Hexachlorobutadiene	U	U	U	U	U	U	U	U	U	U	U	10	0.5 ST
4-Chloro-3-methylphenol	U	U	U	U	U	U	U	U	U	U	U	10	----
2-Methylnaphthalene	U	U	U	U	U	U	U	U	U	U	U	10	----
Hexachlorocyclopentadiene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
2,4,6-Trichlorophenol	U	U	U	U	U	U	U	U	U	U	U	10	----
2,4,5-Trichlorophenol	U	U	U	U	U	U	U	U	U	U	U	10	----
2-Chloronaphthalene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
2-Nitroaniline	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Dimethylphthalate	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
Acenaphthylene	U	U	U	U	U	U	U	U	U	U	U	10	----
2,6-Dinitrotoluene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
3-Nitroaniline	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Acenaphthene	4 J	U	U	2 J	U	U	U	U	U	U	U	10	20 GV
2,4-Dinitrophenol	U	U	U	U	U	U	U	U	U	U	U	10	1 ST *
4-Nitrophenol	U	U	U	U	U	U	U	U	U	U	U	10	----
Dibenzofuran	U	U	U	U	U	U	U	U	U	U	U	10	----
2,4-Dinitrotoluene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST

TABLE G-3b. (CONTINUED)
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
GROUNDWATER SAMPLE RESULTS - FALL 1998
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	MW-S1	MW-D1	MW-1A	MW-4	MW-5	OW-5A	MW-6	MW-7A	OW-8	MW-9A	OW-9A	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	09/28/98	09/28/98	09/29/98	09/30/98	09/29/98	09/30/98	09/28/98	09/28/98	09/29/98	09/28/98	09/29/98		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Diethylphthalate	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
4-Chlorophenyl-phenylether	U	U	U	U	U	U	U	U	U	U	U	10	----
Fluorene	U	U	U	2 J	U	U	U	U	U	U	U	10	50 GV
4-Nitroaniline	U	U	U	U	U	U	U	U	U	2 J	U	10	5 ST
4,6-Dinitro-2-methylphenol	U	U	U	U	U	U	U	U	U	U	U	10	----
N-Nitrosodiphenylamine	1 J	U	U	U	U	U	U	U	U	U	U	10	50 GV
4-Bromophenyl-phenylether	U	U	U	U	U	U	U	U	U	U	U	10	----
Hexachlorobenzene	U	U	U	U	U	U	U	U	U	U	U	10	0.04 ST
Pentachlorophenol	U	U	U	U	U	U	U	U	U	U	U	10	1 ST *
Phenanthrene	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
Anthracene	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
Carbazole	U	U	U	U	U	U	U	U	U	U	U	10	----
Di-n-butylphthalate	U	U	U	U	U	U	U	U	U	U	U	10	50 ST
Fluoranthene	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
Pyrene	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
Butylbenzylphthalate	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
3,3'-Dichlorobenzidine	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Benzo (a) anthracene	U	U	U	U	U	U	U	U	U	U	U	10	0.002 GV
Chrysene	U	U	U	U	U	U	U	U	U	U	U	10	0.002 GV
bis (2-Ethylhexyl) phthalate	2 J	U	U	U	U	U	U	U	1 J	U	U	10	5 ST
Di-n-octylphthalate	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
Benzo (b) fluoranthene	U	U	U	U	U	U	U	U	U	U	U	10	0.002 GV
Benzo (k) fluoranthene	U	U	U	U	U	U	U	U	U	U	U	10	0.002 GV
Benzo (a) pyrene	U	U	U	U	U	U	U	U	U	U	U	10	ND ST
Indeno (1,2,3-cd) pyrene	U	U	U	U	U	U	U	U	U	U	U	10	0.002 GV
Dibenzo (a,h) anthracene	U	U	U	U	U	U	U	U	U	U	U	10	----
Benzo (g,h,i) perylene	U	U	U	U	U	U	U	U	U	U	U	10	----
Total PAHs	10	0	10	4	0	0	0	0	0	0	0		----
Total Carcinogen PAHs	0	0	0	0	0	0	0	0	0	0	0		----
Total SVOCs	13	0	28	4	0	0	0	0	6	27	0		----
Total SVOC TICs	79	19	439	39	8	288	4	0	0	171	11		----

QUALIFIERS:
J: Compound found at a concentration below the detection limit
U: Compound analyzed for but not detected
B: Compound found in the method blank as well as the sample
D: Value is a result of analysis with a dilution factor of 5.0

NOTES:
GV: Guidance value
ST: Standard
----: Not established
NA: Not analyzed
*: Value pertains to total phenols
[ ] Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value.

TABLE G-3b.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
GROUNDWATER SAMPLE RESULTS - FALL 1998
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	MW-10	OW-12	MW-13	MW-14	MW-15	OW-15	MW-16	MW-17	OW-17	OW-19A	OW-20	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	09/29/98	09/29/98	10/01/98	10/01/98	09/29/98	09/28/98	10/01/98	09/30/98	09/29/98	09/30/98	09/30/98		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Phenol	U	U	U	U	4 J	U	U	U	U	U	U	10	1 ST *
bis (2-Chloroethyl) ether	U	U	U	U	U	U	U	U	U	U	U	10	1 ST
2-Chlorophenol	14	48	U	33	32	U	U	U	21	U	U	10	1 ST *
1,3-Dichlorobenzene	9 J	U	U	U	38	U	U	U	U	U	U	10	3 ST
1,4-Dichlorobenzene	19	U	U	13	170 D	U	U	U	9 J	U	U	10	3 ST
1,2-Dichlorobenzene	18	U	U	7 J	14	U	U	U	U	U	U	10	3 ST
2-Methylphenol	U	U	U	2 J	U	U	U	U	U	U	U	10	----
2,2'-Oxybis (1-Chloropropane)	U	U	U	U	U	U	U	U	U	U	U	10	----
4-Methylphenol	U	U	U	U	U	U	U	U	U	U	U	10	----
N-Nitroso-di-n-propylamine	U	U	U	U	U	U	U	U	U	U	U	10	----
Hexachloroethane	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Nitrobenzene	U	U	U	U	U	U	U	U	U	U	U	10	0.4 ST
Isophorone	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
2-Nitrophenol	U	U	U	U	U	U	U	U	U	U	U	10	----
2,4-Dimethylphenol	U	U	U	42	U	U	U	U	U	U	U	10	1 ST *
bis (2-Chloroethoxy) methane	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
2,4-Dichlorophenol	U	1 J	U	4 J	U	U	U	U	U	U	U	10	1 ST *
1,2,4-Trichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Naphthalene	14	27	70	7 J	6 J	8 J	U	U	4 J	U	U	10	10 GV
4-Chloroaniline	U	U	U	U	U	U	U	U	2 J	U	U	10	5 ST
Hexachlorobutadiene	U	U	U	U	U	U	U	U	U	U	U	10	0.5 ST
4-Chloro-3-methylphenol	U	U	U	U	U	U	U	U	U	U	U	10	----
2-Methylnaphthalene	U	U	U	2 J	U	U	U	U	4 J	U	U	10	----
Hexachlorocyclopentadiene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
2,4,6-Trichlorophenol	U	U	U	3 J	U	U	U	U	U	U	U	10	----
2,4,5-Trichlorophenol	U	U	U	U	U	U	U	U	U	U	U	10	----
2-Chloronaphthalene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
2-Nitroaniline	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Dimethylphthalate	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
Acenaphthylene	U	U	U	U	U	U	U	U	U	U	U	10	----
2,6-Dinitrotoluene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
3-Nitroaniline	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Acenaphthene	U	U	U	U	2 J	U	U	U	U	U	U	10	20 GV
2,4-Dinitrophenol	U	U	U	U	U	U	U	U	U	U	U	10	1 ST *
4-Nitrophenol	U	U	U	U	U	U	U	U	U	U	U	10	----
Dibenzofuran	U	U	U	U	U	U	U	U	U	U	U	10	----
2,4-Dinitrotoluene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST

TABLE G-3b. (CONTINUED)
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
GROUNDWATER SAMPLE RESULTS - FALL 1998
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	MW-10	OW-12	MW-13	MW-14	MW-15	OW-15	MW-16	MW-17	OW-17	OW-19A	OW-20	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	09/29/98	09/29/98	10/01/98	10/01/98	09/29/98	09/28/98	10/01/98	09/30/98	09/29/98	09/30/98	09/30/98		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Diethylphthalate	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
4-Chlorophenyl-phenylether	U	U	U	U	U	U	U	U	U	U	U	10	----
Fluorene	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
4-Nitroaniline	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
4,6-Dinitro-2-methylphenol	U	U	U	U	U	U	U	U	U	U	U	10	----
N-Nitrosodiphenylamine	9 J	14	3 J	20	1 J	U	U	U	1 J	U	U	10	50 GV
4-Bromophenyl-phenylether	U	U	U	U	U	U	U	U	U	U	U	10	----
Hexachlorobenzene	U	U	U	U	U	U	U	U	U	U	U	10	0.04 ST
Pentachlorophenol	U	U	U	U	U	U	U	U	U	U	U	10	1 ST *
Phenanthrene	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
Anthracene	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
Carbazole	U	U	U	U	2 J	U	U	U	U	U	U	10	----
Di-n-butylphthalate	U	U	U	U	U	U	U	U	U	U	U	10	50 ST
Fluoranthene	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
Pyrene	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
Butylbenzylphthalate	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
3,3'-Dichlorobenzidine	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Benzo (a) anthracene	U	U	U	U	U	U	U	U	U	U	U	10	0.002 GV
Chrysene	U	U	U	U	U	U	U	U	U	U	U	10	0.002 GV
bis (2-Ethylhexyl) phthalate	U	2 J	U	U	U	12	U	U	U	1 J	U	10	5 ST
Di-n-octylphthalate	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
Benzo (b) fluoranthene	U	U	U	U	U	U	U	U	U	U	U	10	0.002 GV
Benzo (k) fluoranthene	U	U	U	U	U	U	U	U	U	U	U	10	0.002 GV
Benzo (a) pyrene	U	U	U	U	U	U	U	U	U	U	U	10	ND ST
Indeno (1,2,3-cd) pyrene	U	U	U	U	U	U	U	U	U	U	U	10	0.002 GV
Dibenzo (a,h) anthracene	U	U	U	U	U	U	U	U	U	U	U	10	----
Benzo (g,h,i) perylene	U	U	U	U	U	U	U	U	U	U	U	10	----
Total PAHs	14	27	70	7	8	8	0	0	4	0	0		----
Total Carcinogen PAHs	0	0	0	0	0	0	0	0	0	0	0		----
Total SVOCs	83	92	73	133	269	20	0	0	41	1	0		----
Total SVOC TICs	160	194	1,193	2,638	140	33	0	5	406	21	8		----

QUALIFIERS:
J: Compound found at a concentration below the detection limit
U: Compound analyzed for but not detected
B: Compound found in the method blank as well as the sample
D: Value is a result of analysis with a dilution factor of 5.0

NOTES:
GV: Guidance value
ST: Standard
----: Not established
NA: Not analyzed
*: Value pertains to total phenols
[ ] Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value.

TABLE G-3b.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
GROUNDWATER SAMPLE RESULTS - FALL 1998
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	OW-25	OW-26	OW-27A	LMS-1	LMS-2	LMS-3	LMS-4	LMS-5	LMS-6	LMS-7	LMS-8R	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	09/30/98	10/01/98	09/29/98	10/02/98	10/02/98	10/02/98	10/01/98	10/07/98	10/02/98	10/02/98	10/01/98		
Dilution Factor	1.0	1.0	1.0	1.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Phenol	U	U	U	U	U	U	U	U	U	U	U	10	1 ST *
bis (2-Chloroethyl) ether	U	U	U	U	U	U	U	U	U	U	U	10	1 ST
2-Chlorophenol	U	U	U	U	61 J	U	U	U	U	U	U	10	1 ST *
1,3-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	10	3 ST
1,4-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	10	3 ST
1,2-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	10	3 ST
2-Methylphenol	U	U	U	U	U	U	U	U	U	U	U	10	----
2,2'-Oxybis (1-Chloropropane)	U	U	U	U	U	U	U	U	U	U	U	10	----
4-Methylphenol	U	U	U	U	U	U	U	U	U	U	U	10	----
N-Nitroso-di-n-propylamine	U	U	U	U	U	U	U	U	U	U	U	10	----
Hexachloroethane	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Nitrobenzene	U	U	U	U	U	U	U	U	U	U	U	10	0.4 ST
Isophorone	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
2-Nitrophenol	U	U	U	U	U	U	U	U	U	U	U	10	----
2,4-Dimethylphenol	U	U	U	U	U	U	U	U	U	U	U	10	1 ST *
bis (2-Chloroethoxy) methane	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
2,4-Dichlorophenol	U	U	U	U	U	U	U	U	U	U	U	10	1 ST *
1,2,4-Trichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Naphthalene	U	U	U	6 J	23 J	U	U	U	U	U	U	10	10 GV
4-Chloroaniline	U	U	12	U	U	18	U	U	U	U	U	10	5 ST
Hexachlorobutadiene	U	U	U	U	U	U	U	U	U	U	U	10	0.5 ST
4-Chloro-3-methylphenol	U	U	U	U	U	U	U	U	U	U	U	10	----
2-Methylnaphthalene	U	U	U	U	71 J	U	U	U	U	U	U	10	----
Hexachlorocyclopentadiene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
2,4,6-Trichlorophenol	U	U	U	U	U	U	U	U	U	U	U	10	----
2,4,5-Trichlorophenol	U	U	U	U	U	U	U	U	U	U	U	10	----
2-Chloronaphthalene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
2-Nitroaniline	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Dimethylphthalate	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
Acenaphthylene	U	U	U	U	U	U	U	U	U	U	U	10	----
2,6-Dinitrotoluene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
3-Nitroaniline	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Acenaphthene	U	U	U	U	U	U	U	U	U	U	U	10	20 GV
2,4-Dinitrophenol	U	U	U	U	U	U	U	U	U	U	U	10	1 ST *
4-Nitrophenol	U	U	U	U	U	U	U	U	U	U	U	10	----
Dibenzofuran	U	U	U	U	U	U	U	U	U	U	U	10	----
2,4-Dinitrotoluene	U	U	U	U	U	U	U	U	U	U	U	10	5 ST

TABLE G-3b. (CONTINUED)
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
GROUNDWATER SAMPLE RESULTS - FALL 1998
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	OW-25	OW-26	OW-27A	LMS-1	LMS-2	LMS-3	LMS-4	LMS-5	LMS-6	LMS-7	LMS-8R	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	09/30/98	10/01/98	09/29/98	10/02/98	10/02/98	10/02/98	10/01/98	10/07/98	10/02/98	10/02/98	10/01/98		
Dilution Factor	1.0	1.0	1.0	1.0	10.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Diethylphthalate	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
4-Chlorophenyl-phenylether	U	U	U	U	U	U	U	U	U	U	U	10	----
Fluorene	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
4-Nitroaniline	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
4,6-Dinitro-2-methylphenol	U	U	U	U	U	U	U	U	U	U	U	10	----
N-Nitrosodiphenylamine	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
4-Bromophenyl-phenylether	U	U	U	U	U	U	U	U	U	U	U	10	----
Hexachlorobenzene	U	U	U	U	U	U	U	U	U	U	U	10	0.04 ST
Pentachlorophenol	U	U	U	U	U	U	U	U	U	U	U	10	1 ST *
Phenanthrene	U	U	U	U	32 J	U	U	U	U	U	U	10	50 GV
Anthracene	U	2 J	U	U	U	U	U	U	U	U	U	10	50 GV
Carbazole	U	U	U	U	U	U	U	U	U	U	U	10	----
Di-n-butylphthalate	U	U	U	U	U	U	U	U	U	U	U	10	50 ST
Fluoranthene	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
Pyrene	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
Butylbenzylphthalate	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
3,3'-Dichlorobenzidine	U	U	U	U	U	U	U	U	U	U	U	10	5 ST
Benzo (a) anthracene	U	U	U	U	U	U	U	U	U	U	U	10	0.002 GV
Chrysene	U	U	U	U	U	U	U	U	U	U	U	10	0.002 GV
bis (2-Ethylhexyl) phthalate	U	U	U	U	41 J	U	U	U	U	U	U	10	5 ST
Di-n-octylphthalate	U	U	U	U	U	U	U	U	U	U	U	10	50 GV
Benzo (b) fluoranthene	U	U	U	U	U	U	U	U	U	U	U	10	0.002 GV
Benzo (k) fluoranthene	U	U	U	U	U	U	U	U	U	U	U	10	0.002 GV
Benzo (a) pyrene	U	U	U	U	U	U	U	U	U	U	U	10	ND ST
Indeno (1,2,3-cd) pyrene	U	U	U	U	U	U	U	U	U	U	U	10	0.002 GV
Dibenzo (a,h) anthracene	U	U	U	U	U	U	U	U	U	U	U	10	----
Benzo (g,h,i) perylene	U	U	U	U	U	U	U	U	U	U	U	10	----
Total PAHs	0	2	0	6	55	0	0	0	0	0	0		----
Total Carcinogen PAHs	0	0	0	0	0	0	0	0	0	0	0		----
Total SVOCs	0	2	12	6	228	18	0	0	0	0	0		----
Total SVOC TICs	0	14	79	9	2,903	530	4	2	3	3	13		----

QUALIFIERS:
J: Compound found at a concentration below the detection limit
U: Compound analyzed for but not detected
B: Compound found in the method blank as well as the sample
D: Value is a result of analysis with a dilution factor of 5.0

NOTES:
GV: Guidance value
ST: Standard
---: Not established
NA: Not analyzed
*: Value pertains to total phenols
[ ] Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value.

TABLE G-3c.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
GROUNDWATER SAMPLE RESULTS - FALL 1998
PESTICIDE/PCBs

Sample Identification	MW-S1	MW-D1	MW-1A	MW-4	MW-5	OW-5A	MW-6	MW-7A	OW-8	MW-9A	OW-9A	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	09/28/98	09/28/98	09/29/98	09/30/98	09/29/98	09/30/98	09/28/98	09/28/98	09/29/98	09/28/98	09/29/98		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
alpha-BHC	U	U	U	U	U	U	U	U	U	U	U	0.05	0.01 ST
beta-BHC	U	U	U	U	U	U	U	U	U	0.17 P	U	0.05	0.04 ST
delta-BHC	U	U	U	U	U	U	U	U	U	U	U	0.05	0.04 ST
gamma-BHC (Lindane)	U	U	U	U	U	U	U	U	U	U	U	0.05	0.05 ST
Heptachlor	U	U	U	U	U	U	U	U	U	U	U	0.05	0.04 ST
Aldrin	U	U	U	U	U	U	U	U	U	U	U	0.05	ND ST
Heptachlor Epoxide	U	U	U	U	U	U	U	U	U	U	U	0.05	0.03 ST
Endosulfan I	U	U	U	U	U	U	U	U	U	U	U	0.05	----
Dieldrin	U	U	U	U	U	U	U	U	U	U	U	0.10	0.004 ST
4,4'-DDE	U	U	U	U	U	U	U	U	U	U	U	0.10	0.2 ST
Endrin	U	U	U	U	U	U	U	U	U	U	U	0.10	ND ST
Endosulfan II	U	U	U	U	U	U	U	U	U	U	U	0.10	----
4,4'-DDD	U	U	U	U	0.13 P	U	U	U	U	U	U	0.10	0.3 ST
Endosulfan Sulfate	U	U	U	U	U	U	U	U	U	U	U	0.10	----
4,4'-DDT	U	U	U	U	U	U	U	U	U	U	U	0.10	0.2 ST
Methoxychlor	U	U	U	U	U	U	U	U	U	U	U	0.50	35 ST
Endrin Ketone	U	U	U	U	U	U	U	U	U	U	U	0.10	5 ST
Endrin Aldehyde	U	U	U	U	U	U	U	U	U	U	U	0.10	5 ST
alpha-Chlordane	U	U	U	U	U	U	U	U	U	U	U	0.05	0.05 ST
gamma-Chlordane	U	U	U	U	U	U	U	U	U	U	U	0.05	0.05 ST
Toxaphene	U	U	U	U	U	U	U	U	U	U	U	5.0	0.06 ST
Aroclor-1016	U	U	U	U	U	U	U	U	U	U	U	1.0	0.09 ST *
Aroclor-1221	U	U	U	U	U	U	U	U	U	U	U	2.0	0.09 ST *
Aroclor-1232	U	U	U	U	U	U	U	U	U	U	U	1.0	0.09 ST *
Aroclor-1242	U	U	U	U	U	U	U	U	U	U	U	1.0	0.09 ST *
Aroclor-1248	U	U	U	U	U	U	U	U	U	U	U	1.0	0.09 ST *
Aroclor-1254	U	U	U	U	U	U	U	U	U	U	U	1.0	0.09 ST *
Aroclor-1260	U	U	U	U	U	U	U	U	U	U	U	1.0	0.09 ST *
Total PCBs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		

QUALIFIERS:
U: Compound analyzed for but not detected
J: Compound found at a concentration below the CRDL, value estimated
P: Greater than 25% difference for detected concentrations between the two GC columns
NA: Not analyzed

NOTES:
*: Value applies to the sum of these substances
GV: Guidance Value
ST: Standard
----: not established
[ ] Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value

TABLE G-3c.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
GROUNDWATER SAMPLE RESULTS - FALL 1998
PESTICIDE/PCBs

Sample Identification	MW-10	OW-12	MW-13	MW-14	MW-15	OW-15	MW-16	MW-17	OW-17	OW-19A	OW-20	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	09/29/98	09/29/98	10/01/98	10/01/98	09/29/98	09/28/98	10/01/98	09/30/98	09/29/98	09/30/98	09/30/98		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
alpha-BHC	U	U	U	U	U	U	U	U	U	U	U	0.05	0.01 ST
beta-BHC	U	U	0.79	U	U	U	U	U	U	U	U	0.05	0.04 ST
delta-BHC	U	U	U	U	U	U	U	U	U	U	U	0.05	0.04 ST
gamma-BHC (Lindane)	U	U	U	U	U	U	U	U	U	U	U	0.05	0.05 ST
Heptachlor	U	U	U	U	U	U	U	U	U	U	U	0.05	0.04 ST
Aldrin	U	U	U	U	U	U	U	U	U	U	U	0.05	ND ST
Heptachlor Epoxide	U	U	U	U	U	U	U	U	U	U	U	0.05	0.03 ST
Endosulfan I	U	U	U	U	U	U	U	U	U	U	U	0.05	----
Dieldrin	U	U	U	U	U	U	U	U	U	U	U	0.10	0.004 ST
4,4'-DDE	U	U	U	U	U	U	U	U	U	U	U	0.10	0.2 ST
Endrin	U	U	U	U	U	U	U	U	U	U	U	0.10	ND ST
Endosulfan II	U	U	U	U	U	U	U	U	U	U	U	0.10	----
4,4'-DDD	U	U	0.41 P	1.3 P	U	U	U	U	0.27 P	U	U	0.10	0.3 ST
Endosulfan Sulfate	U	U	U	U	U	U	U	U	U	U	U	0.10	----
4,4'-DDT	U	U	U	U	U	U	U	U	U	U	U	0.10	0.2 ST
Methoxychlor	U	U	U	U	U	U	U	U	U	U	U	0.50	35 ST
Endrin Ketone	U	U	U	U	U	U	U	U	U	U	U	0.10	5 ST
Endrin Aldehyde	U	U	U	U	U	U	U	U	U	U	U	0.10	5 ST
alpha-Chlordane	U	U	U	U	U	U	U	U	U	U	U	0.05	0.05 ST
gamma-Chlordane	U	U	U	U	U	U	U	U	U	U	U	0.05	0.05 ST
Toxaphene	U	U	U	U	U	U	U	U	U	U	U	5.0	0.06 ST
Aroclor-1016	U	U	U	U	U	U	U	U	U	U	U	1.0	0.09 ST *
Aroclor-1221	U	U	U	U	U	U	U	U	U	U	U	2.0	0.09 ST *
Aroclor-1232	U	U	U	U	U	U	U	U	U	U	U	1.0	0.09 ST *
Aroclor-1242	U	U	U	U	U	U	U	U	U	U	U	1.0	0.09 ST *
Aroclor-1248	U	U	U	U	U	U	U	U	U	U	U	1.0	0.09 ST *
Aroclor-1254	U	U	U	U	U	U	U	U	U	U	U	1.0	0.09 ST *
Aroclor-1260	U	U	U	U	U	U	U	U	U	U	U	1.0	0.09 ST *
Total PCBs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		

QUALIFIERS:
U: Compound analyzed for but not detected
J: Compound found at a concentration below the CRDL, value estimated
P: Greater than 25% difference for detected concentrations between the two GC columns
NA: Not analyzed

NOTES:
*: Value applies to the sum of these substances
GV: Guidance Value
ST: Standard
----: not established
[ ] Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value

TABLE G-3c.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
GROUNDWATER SAMPLE RESULTS - FALL 1998
PESTICIDE/PCBs

Sample Identification	OW-25	OW-26	OW-27A	LMS-1	LMS-2	LMS-3	LMS-4	LMS-5	LMS-6	LMS-7	LMS-8R	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	09/30/98	10/01/98	09/29/98	10/02/98	10/02/98	10/02/98	10/01/98	10/01/98	10/02/98	10/02/98	10/01/98		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
alpha-BHC	U	U	U	U	U	U	U	U	U	U	U	0.05	0.01 ST
beta-BHC	U	U	U	U	U	U	U	U	U	U	U	0.05	0.04 ST
delta-BHC	U	U	U	U	U	U	U	U	U	U	U	0.05	0.04 ST
gamma-BHC (Lindane)	U	U	U	U	U	U	U	U	U	U	U	0.05	0.05 ST
Heptachlor	U	U	U	U	U	U	U	U	U	U	U	0.05	0.04 ST
Aldrin	U	U	U	U	U	U	U	U	U	U	U	0.05	ND ST
Heptachlor Epoxide	U	U	U	U	U	U	U	U	U	U	U	0.05	0.03 ST
Endosulfan I	U	U	U	U	U	U	U	U	U	U	U	0.05	----
Dieldrin	U	U	U	U	U	U	U	U	U	U	U	0.10	0.004 ST
4,4'-DDE	U	U	U	U	U	U	U	U	U	U	U	0.10	0.2 ST
Endrin	U	U	U	U	U	U	U	U	U	U	U	0.10	ND ST
Endosulfan II	U	U	U	U	U	U	U	U	U	U	U	0.10	----
4,4'-DDD	U	U	U	U	1.5 DP	U	U	U	U	U	U	0.10	0.3 ST
Endosulfan Sulfate	U	U	U	U	U	U	U	U	U	U	U	0.10	----
4,4'-DDT	U	U	U	U	U	U	U	U	U	U	U	0.10	0.2 ST
Methoxychlor	U	U	U	U	U	U	U	U	U	U	U	0.50	35 ST
Endrin Ketone	U	U	U	U	U	U	U	U	U	U	U	0.10	5 ST
Endrin Aldehyde	U	U	U	U	U	U	U	U	U	U	U	0.10	5 ST
alpha-Chlordane	U	U	U	U	U	U	U	U	U	U	U	0.05	0.05 ST
gamma-Chlordane	U	U	U	U	U	U	U	U	U	U	U	0.05	0.05 ST
Toxaphene	U	U	U	U	U	U	U	U	U	U	U	5.0	0.06 ST
Aroclor-1016	U	U	U	U	U	U	U	U	U	U	U	1.0	0.09 ST *
Aroclor-1221	U	U	U	U	U	U	U	U	U	U	U	2.0	0.09 ST *
Aroclor-1232	U	U	U	U	U	U	U	U	U	U	U	1.0	0.09 ST *
Aroclor-1242	U	U	U	U	U	U	U	U	U	U	U	1.0	0.09 ST *
Aroclor-1248	U	U	U	U	U	U	U	U	U	U	U	1.0	0.09 ST *
Aroclor-1254	U	U	U	U	U	U	U	U	U	U	U	1.0	0.09 ST *
Aroclor-1260	U	U	U	U	U	U	U	U	U	U	U	1.0	0.09 ST *
Total PCBs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		

QUALIFIERS:
U: Compound analyzed for but not detected
J: Compound found at a concentration below the CRDL, value estimated
P: Greater than 25% difference for detected concentrations between the two GC columns
NA: Not analyzed
D: Value is a result of analysis with a dilution factor of 10.0

NOTES:
*: Value applies to the sum of these substances
GV: Guidance Value
ST: Standard
----: not established
[ ] Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value

TABLE G-3d.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
GROUNDWATER SAMPLE RESULTS - FALL 1998
INORGANIC PARAMETERS - UNFILTERED

Sample Identification	MW-S1	MW-D1	MW-1A	MW-4	MW-5	OW-5A	MW-6	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	09/28/98	09/28/98	09/29/98	09/30/98	09/29/98	09/30/98	09/28/98		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum	35.2 B	74.7 B	398	177 B	736	50.5 B	696	13	----
Antimony	10.1 B	U	U	U	10.0 B	6.8 B	3.5 B	8	3 ST
Arsenic	U	38.1	U	U	U	U	U	3	25 ST
Barium	288	375	727	1,180	216	594	334	1	1,000 ST
Beryllium	0.65 B	U	0.67 B	0.53 B	0.60 B	0.62 B	U	1	3 GV
Cadmium	1.9 B	2.5 B	U	U	4.4 B	U	U	1	5 ST
Calcium	131,000	19,600	89,300	141,000	113,000	64,400	93,300	8	----
Chromium	1.2 B	2.1 B	6.2 B	U	6.4 B	1.1 B	2.9 B	1	50 ST
Cobalt	U	0.92 B	0.77 B	1.3 B	2.0 B	3.9 B	1.0 B	2	----
Copper	54.4	7.6 B	13.0 B	15.3 B	247	20.4 B	129	1	200 ST
Iron	4,700	1,090	15,000	39,600	5,710	2,540	7,070	20	300 ST ^
Lead	4.5	4.6	145	13.0	81.6	11.9	199	2	25 ST
Magnesium	22,700	27,700	18,900	66,600	37,300	32,100	16,200	8	35,000 GV
Manganese	429	137	567	712	835	608	456	4	300 ST ^
Mercury	0.15 B	U	0.31	0.09 B	0.15	0.11	0.27	0.2	0.7 ST
Nickel	17.1 B	U	3.1 B	U	11.2 B	29.6 B	5.8 B	2	100 ST
Potassium	11,200	40,000 B	9,100	25,800	14,400	31,100	7,980	20	----
Selenium	U	U	U	U	4.6 B	U	U	4	10 ST
Silver	U	U	U	U	1.4 B	U	U	1	50 ST
Sodium	158,000	125,000	133,000	485,000	326,000	421,000	124,000	9	20,000 ST
Thallium	U	U	U	U	U	U	U	5	0.5 GV
Vanadium	11.7 B	U	5.2 B	U	23.8 B	U	7.0 B	1	----
Zinc	373	37.3	57.2	52.4	781	270	387.0	1	2000 GV
Cyanide	U	25.2	6.9	U	U	U	U	10	200 ST

QUALIFIERS:
U: Compound analyzed for but not detected
B: Compound concentration is less than the CRDL but greater than the IDL.

NOTES:
NA: Not analyzed
SB: Site background
^: The combined standard for iron and manganese is 500 ug/l
Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value

TABLE G-3c.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
GROUNDWATER SAMPLE RESULTS - FALL 1998
PESTICIDE/PCBs

Sample Identification	OW-25	OW-26	OW-27A	LMS-1	LMS-2	LMS-3	LMS-4	LMS-5	LMS-6	LMS-7	LMS-8R	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	09/30/98	10/01/98	09/29/98	10/02/98	10/02/98	10/02/98	10/01/98	10/01/98	10/02/98	10/02/98	10/01/98		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
alpha-BHC	U	U	U	U	U	U	U	U	U	U	U	0.05	0.01 ST
beta-BHC	U	U	U	U	U	U	U	U	U	U	U	0.05	0.04 ST
delta-BHC	U	U	U	U	U	U	U	U	U	U	U	0.05	0.04 ST
gamma-BHC (Lindane)	U	U	U	U	U	U	U	U	U	U	U	0.05	0.05 ST
Heptachlor	U	U	U	U	U	U	U	U	U	U	U	0.05	0.04 ST
Aldrin	U	U	U	U	U	U	U	U	U	U	U	0.05	ND ST
Heptachlor Epoxide	U	U	U	U	U	U	U	U	U	U	U	0.05	0.03 ST
Endosulfan I	U	U	U	U	U	U	U	U	U	U	U	0.05	----
Dieldrin	U	U	U	U	U	U	U	U	U	U	U	0.10	0.004 ST
4,4'-DDE	U	U	U	U	U	U	U	U	U	U	U	0.10	0.2 ST
Endrin	U	U	U	U	U	U	U	U	U	U	U	0.10	ND ST
Endosulfan II	U	U	U	U	U	U	U	U	U	U	U	0.10	----
4,4'-DDD	U	U	U	U	1.5 DP	U	U	U	U	U	U	0.10	0.3 ST
Endosulfan Sulfate	U	U	U	U	U	U	U	U	U	U	U	0.10	----
4,4'-DDT	U	U	U	U	U	U	U	U	U	U	U	0.10	0.2 ST
Methoxychlor	U	U	U	U	U	U	U	U	U	U	U	0.50	35 ST
Endrin Ketone	U	U	U	U	U	U	U	U	U	U	U	0.10	5 ST
Endrin Aldehyde	U	U	U	U	U	U	U	U	U	U	U	0.10	5 ST
alpha-Chlordane	U	U	U	U	U	U	U	U	U	U	U	0.05	0.05 ST
gamma-Chlordane	U	U	U	U	U	U	U	U	U	U	U	0.05	0.05 ST
Toxaphene	U	U	U	U	U	U	U	U	U	U	U	5.0	0.06 ST
Aroclor-1016	U	U	U	U	U	U	U	U	U	U	U	1.0	0.09 ST *
Aroclor-1221	U	U	U	U	U	U	U	U	U	U	U	2.0	0.09 ST *
Aroclor-1232	U	U	U	U	U	U	U	U	U	U	U	1.0	0.09 ST *
Aroclor-1242	U	U	U	U	U	U	U	U	U	U	U	1.0	0.09 ST *
Aroclor-1248	U	U	U	U	U	U	U	U	U	U	U	1.0	0.09 ST *
Aroclor-1254	U	U	U	U	U	U	U	U	U	U	U	1.0	0.09 ST *
Aroclor-1260	U	U	U	U	U	U	U	U	U	U	U	1.0	0.09 ST *
Total PCBs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		

QUALIFIERS:
U: Compound analyzed for but not detected
J: Compound found at a concentration below the CRDL, value estimated
P: Greater than 25% difference for detected concentrations between the two GC columns
NA: Not analyzed
D: Value is a result of analysis with a dilution factor of 10.0

NOTES:
*: Value applies to the sum of these substances
GV: Guidance Value
ST: Standard
----: not established
Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value

TABLE G-3d.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
GROUNDWATER SAMPLE RESULTS - FALL 1998
INORGANIC PARAMETERS - UNFILTERED

Sample Identification	MW-14	MW-15	OW-15	MW-16	MW-17	OW-17	OW-19A	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	10/01/98	09/29/98	09/28/98	10/01/98	09/30/98	09/29/98	09/30/98		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum	338	937	238	58.0 B	1,290	166 B	2,730	13	----
Antimony	**14.2 B**	**3.4 B**	**28.8 B**	U	**7.0 B**	U	U	8	3 ST
Arsenic	6.5 B	4.4 B	17.5	5.1 B	8.4 B	U	10.6	3	25 ST
Barium	682	**1,440**	253	393	653	**1,120**	373	1	1,000 ST
Beryllium	U	U	U	0.51 B	1.1 B	0.60 B	0.71 B	1	3 GV
Cadmium	U	3.4 B	1.9 B	U	0.85 B	U	1.1 B	1	5 ST
Calcium	87,000	92,300	61,500	192,000	167,000	219,000	146,000	8	----
Chromium	2.7 B	7.0 B	3.1 B	1.9 B	9.7 B	1.6 B	45.7	1	50 ST
Cobalt	1.4 B	1.3 B	U	0.78 B	3.1 B	U	4.0 B	2	----
Copper	130	**1,850**	**1,430**	10.9 B	23.0 B	6.0 B	55.8	1	200 ST
Iron	**1,290**	**12,400**	**3,190**	**5,220**	**4,150**	**18,600**	**16,900**	20	300 ST ^
Lead	**46.2**	**680**	8.5	6.7	**62.6**	5.1	**302**	2	25 ST
Magnesium	12,900	16,900	10,600	33,500	34,300	**47,900**	**58,800**	8	35,000 GV
Manganese	**1,240**	**675**	108	**582**	**719**	**2,600**	**1,570**	4	300 ST ^
Mercury	0.22	0.15	**0.71**	U	0.27	0.08 B	0.66	0.2	0.7 ST
Nickel	7.4 B	14.0 B	7.9 B	14.8 B	6.3 B	1.7 B	7.7 B	2	100 ST
Potassium	9,980	7,820	10,500	17,700	21,000	18,800	18,400	20	----
Selenium	U	U	4.8 B	4.3 B	8.8	5.1	U	4	10 ST
Silver	U	U	U	U	U	U	U	1	50 ST
Sodium	**127,000**	**87,500**	**264,000**	**649,000**	**864,000**	**367,000**	**598,000**	9	20,000 ST
Thallium	U	U	U	**4.5 B**	U	U	U	5	0.5 GV
Vanadium	31.5 B	7.6 B	17.9 B	81.7 B	212	1.9 B	10.4 B	1	----
Zinc	90.9	1050	638	179	104	25.3	522	1	2000 GV
Cyanide	U	U	U	17.6	50.6	U	3.5 B	10	200 ST

QUALIFIERS
U: Compound analyzed for but not detected
B: Compound concentration is less than the CRDL but greater than the IDL.

NOTES:
NA: Not analyzed
SB: Site background
^: The combined standard for iron and manganese is 500 ug/l
Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value

TABLE G-3d.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
GROUNDWATER SAMPLE RESULTS - FALL 1998
INORGANIC PARAMETERS - UNFILTERED

Sample Identification	OW-20	OW-25	OW-26	OW-27A	LMS-1	LMS-2	LMS-3	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	09/30/98	09/30/98	10/01/98	09/29/98	10/02/98	10/02/98	10/02/98		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum	1,090	56.0 B	217	77.2 B	76.8 B	21,500	362	13	----
Antimony	8.6 B	U	8.0 B	5.0 B	U	U	4.0 B	8	3 ST
Arsenic	25.0	U	U	U	U	7.6 B	U	3	25 ST
Barium	758	549	1,150	953	137 B	89.0 B	575	1	1,000 ST
Beryllium	0.52 B	0.71 B	0.77 B	0.91 B	U	2.5 B	U	1	3 GV
Cadmium	U	U	U	U	U	U	1.2 B	1	5 ST
Calcium	93,800	122,000	121,000	148,000	135,000	313,000	40,700	8	----
Chromium	2.9 B	1.9 B	2.8 B	1.1 B	5.6 B	31.6	3.6 B	1	50 ST
Cobalt	0.97 B	U	U	0.72 B	U	U	0.78 B	2	----
Copper	30.5	14.6 B	36.6	7.5 B	91.0	791	282	1	200 ST
Iron	1,660	2,940	21,700	8,860	197	239,000	3,700	20	300 ST ^
Lead	18.8	5.3	57.6	9.2	10.0	87.0	18.4	2	25 ST
Magnesium	34,600	67,100	131,000	83,300	30,100	90,800	7,640	8	35,000 GV
Manganese	450	1,090	1,400	479	206	7,470	75.9	4	300 ST ^
Mercury	0.11	0.09 B	U	0.07 B	U	0.13 B	U	0.2	0.7 ST
Nickel	3.7 B	U	3.1 B	U	3.9 B	3.8 B	8.8 B	2	100 ST
Potassium	7,400	34,700	50,700	38,400	21,200	35,500 B	4,400 B	20	----
Selenium	U	U	5.5	4.4 B	U	U	U	4	10 ST
Silver	U	U	U	U	U	U	U	1	50 ST
Sodium	98,100	678,000	1,140,000	775,000	418,000	375,000	124,000	9	20,000 ST
Thallium	U	U	5.4 B	3.6 B	U	12.1	U	5	0.5 GV
Vanadium	12.4 B	6.2 B	1.9 B	4.3 B	4.0 B	14.3 B	6.3 B	1	----
Zinc	66.4	25.8	465	42.1	31.1	910	644	1	2000 GV
Cyanide	U	39.8	0.79 B	2.4 B	U	U	U	10	200 ST

QUALIFIERS
U: Compound analyzed for but not detected
B: Compound concentration is less than the CRDL but greater than the IDL.

NOTES:
NA: Not analyzed
SB: Site background
^: The combined standard for iron and manganese is 500 ug/l
Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value

TABLE G-3d.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
GROUNDWATER SAMPLE RESULTS - FALL 1998
INORGANIC PARAMETERS - UNFILTERED

Sample Identification	LMS-4	LMS-5	LMS-6	LMS-7	LMS-8R	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	10/01/98	10/01/98	10/02/98	10/02/98	10/01/98		
Dilution Factor	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum	61.8 B	1,160	682	323	3,920	13	----
Antimony	U	U	19.4 B	U	5.2 B	8	3 ST
Arsenic	4.7 B	U	4.4 B	U	31.2	3	25 ST
Barium	350	238	88.3 B	270	812	1	1,000 ST
Beryllium	U	U	U	U	0.82 B	1	3 GV
Cadmium	U	U	U	U	1.5 B	1	5 ST
Calcium	100,000	86,400	120,000	132,000	196,000	8	----
Chromium	U	1.8 B	1.8 B	3.3 B	15.4	1	50 ST
Cobalt	1.2 B	0.70 B	0.92 B	U	4.8 B	2	----
Copper	12.3 B	9.4 B	30.2	19.1 B	135	1	200 ST
Iron	1,620	3,370	3,440	1,090	23,600	20	300 ST ^
Lead	8.0	7.0	29.0	9.2	722	2	25 ST
Magnesium	39,500	25,600	34,300	170,000	48,400	8	35,000 GV
Manganese	601	597	311	656	1,720	4	300 ST ^
Mercury	U	U	U	U	2.6	0.2	0.7 ST
Nickel	2.8 B	U	2.3 B	2.0 B	10.4 B	2	100 ST
Potassium	8,900	15,800	7,180	68,100	23,100	20	----
Selenium	U	U	3.9 B	U	7.0	4	10 ST
Silver	U	U	U	U	1.5 B	1	50 ST
Sodium	160,000	1,370,000	136,000	1,300,000	599,000	9	20,000 ST
Thallium	U	U	4.7 B	U	U	5	0.5 GV
Vanadium	U	3.2 B	3.0 B	1.5 B	18.9 B	1	----
Zinc	46.7	37.7	85.5	30.3	584.0	1	2000 GV
Cyanide	U	U	U	U	U	10	200 ST

QUALIFIERS:
U: Compound analyzed for but not detected
B: Compound concentration is less than the CRDL but greater than the IDL.

NOTES:
NA: Not analyzed
SB: Site background
^: The combined standard for iron and manganese is 500 ug/l
Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value

TABLE G-3e.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
GROUNDWATER SAMPLE RESULTS - FALL 1998
INORGANIC PARAMETERS - FILTERED

Sample Identification	MW-S1	MW-D1	MW-1A	MW-4	MW-5	OW-5A	MW-6	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	09/28/98	09/28/98	09/29/98	09/30/98	09/29/98	09/30/98	09/28/98		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum	33.8 B	U	U	U	U	U	U	13	----
Antimony	U	U	U	U	6.5 B	8.5 B	U	8	3 ST
Arsenic	U	40.3	U	U	U	U	U	3	25 ST
Barium	285	353	795	1,230	204	880	285	1	1,000 ST
Beryllium	0.59 B	U	0.52 B	0.87 B	0.58 B	0.80 B	U	1	3 GV
Cadmium	U	U	U	U	U	U	U	1	5 ST
Calcium	138,000	20,600	101,000	150,000	114,000	72,600	101,000	8	----
Chromium	U	U	3.7 B	U	U	U	U	1	50 ST
Cobalt	U	U	1.1 B	1.3 B	U	4.3 B	U	2	----
Copper	U	U	U	U	U	4.6 B	2.0 B	1	200 ST
Iron	3,710	155	9,690	37,500	2,280	3,030	4,520	20	300 ST ^
Lead	U	U	3.3	4.9	U	U	U	2	25 ST
Magnesium	24,200	29,700	22,700	71,900	37,600	35,000	17,000	8	35,000 GV
Manganese	462	101	658	766	805	816	366	4	300 ST ^
Mercury	U	U	0.10 B	U	U	U	U	0.2	0.7 ST
Nickel	14.1 B	U	U	U	2.4 B	26.5 B	3.4 B	2	100 ST
Potassium	13,300	42,300 B	11,800	32,000	16,800	30,700	9,380	20	----
Selenium	12.6	8.6	12.4	10.2	6.2	7.9	6.0	4	10 ST
Silver	U	U	U	U	U	U	U	1	50 ST
Sodium	181,000	129,000	141,000	477,000	333,000	441,000	121,000	9	20,000 ST
Thallium	U	U	U	U	U	U	U	5	0.5 GV
Vanadium	12.4 B	U	4.1 B	U	8.7 B	1.4 B	2.7 B	1	----
Zinc	14.1 B	20.5	17.1 B	18.6 B	17.5 B	197	192	1	2000 GV

QUALIFIERS:
U: Compound analyzed for but not detected
B: Compound concentration is less than the CRDL but greater than the IDL.

NOTES:
NA: Not analyzed
SB: Site background
^: The combined standard for iron and manganese is 500 ug/l
Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value

TABLE G-3e.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
GROUNDWATER SAMPLE RESULTS - FALL 1998
INORGANIC PARAMETERS - FILTERED

Sample Identification	MW-7A	OW-8	MW-9A	OW-9A	MW-10	OW-12	MW-13	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	09/28/98	09/29/98	09/28/98	09/29/98	09/29/98	09/29/98	10/01/98		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum	29.0 B	U	27.4 B	U	22.7 B	22.8 B	337	13	----
Antimony	U	U	U	U	U	U	5.2 B	8	3 ST
Arsenic	U	U	5.4 B	U	U	U	U	3	25 ST
Barium	826	735	520	1,420	2,180	33.9 B	1,500	1	1,000 ST
Beryllium	0.75 B	U	U	0.82 B	0.70 B	0.71 B	0.77 B	1	3 GV
Cadmium	U	U	U	U	U	U	U	1	5 ST
Calcium	207,000	87,800	96,600	105,000	124,000	137,000	108,000	8	----
Chromium	U	U	1.4 B	U	4.6 B	2.4 B	4.6 B	1	50 ST
Cobalt	0.82 B	U	U	U	1.0 B	U	2.6 B	2	----
Copper	U	U	U	U	U	1.7 B	15.3 B	1	200 ST
Iron	898	23,400	1,100	6,700	2,810	220	2,680	20	300 ST ^
Lead	U	4.7	U	5.5	U	3.8	5.4	2	25 ST
Magnesium	117,000	56,800	16,300	155,000	26,600	33,200	16,400	8	35,000 GV
Manganese	620	786	138	346	628	164	1,800	4	300 ST ^
Mercury	U	0.10 B	U	0.13 B	U	U	0.10 B	0.2	0.7 ST
Nickel	5.8 B	U	U	U	2.6 B	2.2 B	12.7 B	2	100 ST
Potassium	60,500	33,100	17,200	73,500	14,500	14,200	37,800	20	----
Selenium	10.0	12.2	11.7	10.9	15.0	16.6	4.3 B	4	10 ST
Silver	U	U	U	U	U	U	U	1	50 ST
Sodium	1,080,000	462,000	285,000	1,520,000	144,000	257,000	127,000	9	20,000 ST
Thallium	U	U	U	U	U	U	3.5 B	5	0.5 GV
Vanadium	1.5 B	U	6.8 B	U	4.4 B	35.1 B	41.9 B	1	----
Zinc	11.8 B	22.2	8.5 B	12.8 B	8.1 B	22.7	60.3	1	2000 GV

QUALIFIERS:
U: Compound analyzed for but not detected
B: Compound concentration is less than the CRDL but greater than the IDL.

NOTES:
NA: Not analyzed
SB: Site background
^: The combined standard for iron and manganese is 500 ug/l
Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value

TABLE G-3e.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
GROUNDWATER SAMPLE RESULTS - FALL 1998
INORGANIC PARAMETERS - FILTERED

Sample Identification	MW-14	MW-15	OW-15	MW-16	MW-17	OW-17	OW-19A	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	10/01/98	09/29/98	09/28/98	10/01/98	09/30/98	09/29/98	09/30/98		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum	18.9 B	U	34.8 B	U	U	1,320	U	13	----
Antimony	47.2 B	U	9.0 B	4.3 B	U	13.8 B	U	8	3 ST
Arsenic	8.0 B	U	7.8 B	4.4 B	U	4.0 B	U	3	25 ST
Barium	592	1,300	233	505	752	1,450	291	1	1,000 ST
Beryllium	U	U	U	0.85 B	0.62 B	0.96 B	0.54 B	1	3 GV
Cadmium	U	U	U	U	U	3.5 B	U	1	5 ST
Calcium	86,400	95,300	68,900	191,000	165,000	199,000	149,000	8	----
Chromium	U	U	U	U	U	9.3 B	U	1	50 ST
Cobalt	0.73 B	U	U	1.1 B	U	1.8 B	0.71 B	2	----
Copper	4.2 B	U	2.2 B	U	1.8 B	506	U	1	200 ST
Iron	380	7,300	2,160	3,860	1,230	19,300	3,280	20	300 ST ^
Lead	3.2	3.7	U	3.2	U	261	U	2	25 ST
Magnesium	12,000	16,800	11,400	37,400	39,700	44,000	61,700	8	35,000 GV
Manganese	1,020	689	118	685	692	2,260	1,420	4	300 ST ^
Mercury	U	U	U	U	U	0.63	U	0.2	0.7 ST
Nickel	4.8 B	U	5.6 B	12.6 B	U	9.6 B	U	2	100 ST
Potassium	10,200	9,250	12,700	22,600	23,900	18,000	21,400	20	----
Selenium	8.8	6.9	9.5	7.2	7.2	U	8.1	4	10 ST
Silver	U	U	U	U	1.4 B	U	U	1	50 ST
Sodium	119,000	88,300	311,000	892,000	1,050,000	334,000	673,000	9	20,000 ST
Thallium	U	U	U	7.9 B	U	U	U	5	0.5 GV
Vanadium	78.2 B	2.0 B	16.2 B	56.2 B	104	6.8 B	U	1	----
Zinc	12.0 B	99.4	17.4 B	159	14.9 B	549	12.5 B	1	2000 GV

QUALIFIERS:
U: Compound analyzed for but not detected
B: Compound concentration is less than the CRDL but greater than the IDL.

NOTES:
NA: Not analyzed
SB: Site background
^: The combined standard for iron and manganese is 500 ug/l
Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value

TABLE G-3e.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
GROUNDWATER SAMPLE RESULTS - FALL 1998
INORGANIC PARAMETERS - FILTERED

Sample Identification	OW-20	OW-25	OW-26	OW-27A	LMS-1	LMS-2	LMS-3	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	09/30/98	09/30/98	10/01/98	09/29/98	10/02/98	10/02/98	10/02/98		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum	U	U	U	U	25.6 B	26,100	16.8 B	13	----
Antimony	5.9 B	U	U	4.0 B	U	U	U	8	3 ST
Arsenic	21.1	U	U	U	U	U	U	3	25 ST
Barium	400	523	1,160	1,070	135 B	47.3 B	433	1	1,000 ST
Beryllium	U	U	0.62 B	0.86 B	U	3.0 B	U	1	3 GV
Cadmium	U	U	U	U	U	U	U	1	5 ST
Calcium	98,700	115,000	126,000	146,000	138,000	312,000	35,600	8	----
Chromium	U	U	U	U	1.5 B	36.8	1.2 B	1	50 ST
Cobalt	U	U	U	0.70 B	U	U	U	2	----
Copper	U	U	U	U	1.6 B	U	U	1	200 ST
Iron	97.3 B	3,000	19,000	4,300	76.6 B	261,000	4,060	20	300 ST ^
Lead	U	U	4.3	U	U	22.0	U	2	25 ST
Magnesium	36,100	64,500	134,000	86,800	30,100	94,500	6,850	8	35,000 GV
Manganese	441	983	1,430	451	211	8,140	75.0	4	300 ST ^
Mercury	0.10 B	0.10 B	U	0.11 B	U	0.10 B	U	0.2	0.7 ST
Nickel	U	U	U	U	U	U	5.3 B	2	100 ST
Potassium	8,600	36,000	50,500	39,300	23,600	35,700	4,750 B	20	----
Selenium	7.0	8.2	6.8	13.4	9.0	16.7	10.5	4	10 ST
Silver	U	U	U	U	U	U	U	1	50 ST
Sodium	98,400	672,000	1,170,000	841,000	384,000	323,000	110,000	9	20,000 ST
Thallium	U	U	U	3.8 B	U	U	U	5	0.5 GV
Vanadium	7.4 B	6.0 B	U	5.6 B	3.8 B	12.9 B	4.8 B	1	----
Zinc	10.2 B	9.5 B	19.7 B	8.5 B	16.4 B	31.3	7.6 B	1	2000 GV

QUALIFIERS:
U: Compound analyzed for but not detected
B: Compound concentration is less than the CRDL but greater than the IDL.

NOTES:
NA: Not analyzed
SB: Site background
^: The combined standard for iron and manganese is 500 ug/l
Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value

TABLE G-3e.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
GROUNDWATER SAMPLE RESULTS - FALL 1998
INORGANIC PARAMETERS - FILTERED

Sample Identification	LMS-4	LMS-5	LMS-6	LMS-7	LMS-8R	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	10/01/98	10/01/98	10/02/98	10/02/98	10/01/98		
Dilution Factor	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum	U	U	23.1 B	25.3 B	U	13	----
Antimony	U	U	U	U	U	8	3 ST
Arsenic	U	U	U	U	7.8 B	3	25 ST
Barium	351	243	81.2 B	221	592	1	1,000 ST
Beryllium	U	U	U	U	U	1	3 GV
Cadmium	U	U	U	U	U	1	5 ST
Calcium	103,000	89,500	129,000	144,000	214,000	8	----
Chromium	U	U	U	U	U	1	50 ST
Cobalt	U	U	U	U	U	2	----
Copper	U	U	1.4 B	U	U	1	200 ST
Iron	1,320	1,620	1,660	408	9,540	20	300 ST ^
Lead	3.2	U	U	U	3.8	2	25 ST
Magnesium	42,300	27,100	36,700	194,000	53,600	8	35,000 GV
Manganese	622	633	348	542	1,770	4	300 ST ^
Mercury	U	U	U	U	U	0	0.7 ST
Nickel	U	U	U	U	U	2	100 ST
Potassium	10,300	18,200	8,380	68,400	27,500	20	----
Selenium	7.6	4.8 B	4.5 B	6.2	8.9	4	10 ST
Silver	U	U	U	U	U	1	50 ST
Sodium	167,000	1,490,000	148,000	1,480,000	732,000	9	20,000 ST
Thallium	U	U	U	U	U	5	0.5 GV
Vanadium	U	U	U	U	2.1 B	1	----
Zinc	26.1	11.8 B	37.0	7.9 B	10.6 B	1	2000 GV

QUALIFIERS:
U: Compound analyzed for but not detected
B: Compound concentration is less than the CRDL but greater than the IDL.

NOTES:
NA: Not analyzed
SB: Site background
^: The combined standard for iron and manganese is 500 ug/l
Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value

TABLE G-4a.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
DIRECT PUSH GROUNDWATER SAMPLE RESULTS - FALL 1998
VOLATILE ORGANIC COMPOUNDS

Sample Identification	GW-1	GW-2	GW-3	GW-4	GW-5	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	10/06/98	10/06/98	10/06/98	10/06/98	10/06/98		
Dilution Factor	1	1	1	1	1		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Chloromethane	U	U	U	U	U	10	5 ST
Bromomethane	U	U	U	U	U	10	5 ST
Vinyl Chloride	U	U	U	9 J	U	10	2 ST
Chloroethane	U	U	U	U	U	10	5 ST
Methylene Chloride	U	3 J	3 J	2 J	3 J	10	5 ST
Acetone	U	U	U	9 J	U	10	50GV
Carbon Disulfide	U	U	U	U	U	10	----
1,1-Dichloroethene	U	U	U	U	U	10	5 ST
1,1-Dichloroethane	U	U	U	U	U	10	5 ST
1,2-Dichloroethene (total)	U	U	U	U	U	10	5 ST *
Chloroform	U	U	U	U	U	10	7 ST
1,2-Dichloroethane	U	U	U	U	U	10	0.6 ST
2-Butanone	U	U	U	U	U	10	50GV
1,1,1-Trichloroethane	U	U	U	U	U	10	5 ST
Carbon Tetrachloride	U	U	U	U	U	10	5 ST
Bromodichloromethane	U	U	U	U	U	10	50GV
1,2-Dichloropropane	U	U	U	U	U	10	1 ST
cis-1,3-Dichloropropene	U	U	U	U	U	10	0.4 ST **
Trichloroethene	U	U	U	U	U	10	5 ST
Dibromochloromethane	U	U	U	U	U	10	50GV
1,1,2-Trichloroethane	U	U	U	U	U	10	1 ST
Benzene	U	U	U	U	U	10	1 ST
Trans-1,3-Dichloropropene	U	U	U	U	U	10	0.4 ST **
Bromoform	U	U	U	U	U	10	50GV
4-Methyl-2-Pentanone	U	U	U	U	U	10	----
2-Hexanone	U	U	U	U	U	10	50GV
Tetrachloroethene	U	U	U	U	U	10	5 ST
1,1,2,2-Tetrachloroethane	U	U	U	U	U	10	5 ST
Toluene	U	U	U	U	U	10	5 ST
Chlorobenzene	U	370 D	U	2 J	9 J	10	5 ST
Ethylbenzene	U	U	U	U	U	10	5 ST
Styrene	U	U	U	U	U	10	5 ST
Total Xylenes	U	2 J	U	U	U	10	5 ST
Total VOCs	0	375	3	22	12		10,000
Total VOC TICs	0	0	0	0	22		----

QUALIFIERS:

U: Compound analyzed for but not detected

B: Compound found in the blank as well as the sample

J: Compound found at a concentration below the CRDL, value estimated

D: Value is a result of analysis with a dilution factor of 2.0

NOTES:

*: Value pertains to cis-1,2 Dichloroethene and trans-1,2 Dichloroethene individually

**: Value pertains to the sum of the isomers

GV: Guidance Value

ST: Standard

----: Not established

Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value

TABLE G-4b.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
DIRECT PUSH GROUNDWATER SAMPLE RESULTS - FALL 1998
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	GW-1	GW-2	GW-3	GW-4	GW-5	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	10/06/98	10/06/98	10/06/98	10/06/98	10/06/98		
Dilution Factor	1	1	1	1	1		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Phenol	U	U	U	U	U	10	1 ST *
bis (2-Chloroethyl) ether	U	U	U	U	U	10	1 ST
2-Chlorophenol	U	U	U	U	U	10	1 ST *
1,3-Dichlorobenzene	U	U	U	U	U	10	3 ST
1,4-Dichlorobenzene	U	U	U	U	U	10	3 ST
1,2-Dichlorobenzene	U	U	U	U	U	10	3 ST
2-Methylphenol	U	U	U	U	U	10	----
2,2'-Oxybis (1-Chloropropane)	U	U	U	U	U	10	----
4-Methylphenol	U	U	U	U	U	10	----
N-Nitroso-di-n-propylamine	U	U	U	U	U	10	----
Hexachloroethane	U	U	U	U	U	10	5 ST
Nitrobenzene	U	U	U	U	U	10	0.4 ST
Isophorone	U	U	U	U	U	10	50 GV
2-Nitrophenol	U	U	U	U	U	10	----
2,4-Dimethylphenol	U	U	U	U	U	10	1 ST *
bis (2-Chloroethoxy) methane	U	U	U	U	U	10	5 ST
2,4-Dichlorophenol	U	U	U	U	U	10	1 ST *
1,2,4-Trichlorobenzene	U	U	U	U	U	10	5 ST
Naphthalene	U	1 J	U	1 J	U	10	10 GV
4-Chloroaniline	U	9 J	U	U	U	10	5 ST
Hexachlorobutadiene	U	U	U	U	U	10	0.5 ST
4-Chloro-3-methylphenol	U	U	U	U	U	10	----
2-Methylnaphthalene	U	U	U	U	U	10	----
Hexachlorocyclopentadiene	U	U	U	U	U	10	5 ST
2,4,6-Trichlorophenol	U	U	U	U	U	10	----
2,4,5-Trichlorophenol	U	U	U	U	U	10	----
2-Chloronaphthalene	U	U	U	U	U	10	5 ST
2-Nitroaniline	U	U	U	U	U	10	5 ST
Dimethylphthalate	U	U	U	U	U	10	50 GV
Acenaphthylene	U	U	U	U	U	10	----
2,6-Dinitrotoluene	U	U	U	U	U	10	5 ST
3-Nitroaniline	U	U	U	U	U	10	5 ST
Acenaphthene	U	2 J	U	2 J	2 J	10	20 GV
2,4-Dinitrophenol	U	U	U	U	U	10	1 ST *
4-Nitrophenol	U	U	U	U	U	10	----
Dibenzofuran	U	U	U	U	U	10	----
2,4-Dinitrotoluene	U	U	U	U	U	10	5 ST

TABLE G-4b. (CONTINUED)
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
DIRECT PUSH GROUNDWATER SAMPLE RESULTS - FALL 1998
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	GW-1	GW-2	GW-3	GW-4	GW-5	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	10/06/98	10/06/98	10/06/98	10/06/98	10/06/98		
Dilution Factor	1	1	1	1	1		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Diethylphthalate	U	U	U	U	U	10	50 GV
4-Chlorophenyl-phenylether	U	U	U	U	U	10	----
Fluorene	U	U	U	U	U	10	50 GV
4-Nitroaniline	U	U	U	U	U	10	5 ST
4,6-Dinitro-2-methylphenol	U	U	U	U	U	10	----
N-Nitrosodiphenylamine	U	1 J	U	U	U	10	50 GV
4-Bromophenyl-phenylether	U	U	U	U	U	10	----
Hexachlorobenzene	U	U	U	U	U	10	0.04 ST
Pentachlorophenol	U	U	U	U	U	10	1 ST *
Phenanthrene	U	U	U	U	U	10	50 GV
Anthracene	U	U	U	U	U	10	50 GV
Carbazole	U	U	U	1 J	1 J	10	----
Di-n-butylphthalate	U	U	U	U	U	10	50 ST
Fluoranthene	U	U	U	1 J	U	10	50 GV
Pyrene	U	U	U	U	U	10	50 GV
Butylbenzylphthalate	U	U	U	U	U	10	50 GV
3,3'-Dichlorobenzidine	U	U	U	U	U	10	5 ST
Benzo (a) anthracene	U	U	U	U	U	10	0.002 GV
Chrysene	U	U	U	U	U	10	0.002 GV
bis (2-Ethylhexyl) phthalate	U	U	3 J	U	U	10	5 ST
Di-n-octylphthalate	U	U	U	U	U	10	50 GV
Benzo (b) fluoranthene	U	U	U	U	U	10	0.002 GV
Benzo (k) fluoranthene	U	U	U	U	U	10	0.002 GV
Benzo (a) pyrene	U	U	U	U	U	10	ND ST
Indeno (1,2,3-cd) pyrene	U	U	U	U	U	10	0.002 GV
Dibenzo (a,h) anthracene	U	U	U	U	U	10	----
Benzo (g,h,i) perylene	U	U	U	U	U	10	----
Total PAHs	0	3	0	4	2		----
Total Carcinogen PAHs	0	0	0	0	0		10000
Total SVOCs	0	13	3	5	3		500000
Total SVOC TICs	9	47	9	10	10		----

QUALIFIERS:
J: Compound found at a concentration below the detection limit
U: Compound analyzed for but not detected
B: Compound found in the method blank as well as the sample

NOTES:
GV: Guidance value
ST: Standard
----: Not established
ND: Non-detect
*: Value pertains to total phenols

Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value.

TABLE G-4c.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
DIRECT PUSH GROUNDWATER SAMPLE RESULTS - FALL 1998
PESTICIDE/PCBs

Sample Identification	GW-1	GW-2	GW-3	GW-4	GW-5	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	10/06/98	10/06/98	10/06/98	10/06/98	10/06/98		
Dilution Factor	1	1	1	1	1		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
alpha-BHC	U	U	U	U	U	0.05	0.01 ST
beta-BHC	U	U	U	U	U	0.05	0.04 ST
delta-BHC	U	U	U	U	U	0.05	0.04 ST
gamma-BHC (Lindane)	U	U	U	U	U	0.05	0.05 ST
Heptachlor	U	U	U	U	U	0.05	0.04 ST
Aldrin	U	U	U	U	U	0.05	ND ST
Heptachlor Epoxide	U	U	U	U	U	0.05	0.03 ST
Endosulfan I	U	U	U	U	U	0.05	----
Dieldrin	U	U	U	U	U	0.10	0.004 ST
4,4'-DDE	U	U	U	U	U	0.10	0.2 ST
Endrin	U	U	U	U	U	0.10	ND ST
Endosulfan II	U	U	U	U	U	0.10	----
4,4'-DDD	U	U	U	U	U	0.10	0.3 ST
Endosulfan Sulfate	U	U	U	U	U	0.10	----
4,4'-DDT	U	U	U	U	U	0.10	0.2 ST
Methoxychlor	U	U	U	U	U	0.50	35 ST
Endrin Ketone	U	U	U	U	U	0.10	5 ST
Endrin Aldehyde	U	U	U	U	U	0.10	5 ST
alpha-Chlordane	U	U	U	U	U	0.05	0.05 ST
gamma-Chlordane	U	U	U	U	U	0.05	0.05 ST
Toxaphene	U	U	U	U	U	5.0	0.06 ST
Aroclor-1016	U	U	U	U	U	1.0	0.09 ST *
Aroclor-1221	U	U	U	U	U	2.0	0.09 ST *
Aroclor-1232	U	U	U	U	U	1.0	0.09 ST *
Aroclor-1242	U	U	U	U	U	1.0	0.09 ST *
Aroclor-1248	U	U	U	U	U	1.0	0.09 ST*
Aroclor-1254	U	U	U	U	U	1.0	0.09 ST *
Aroclor-1260	U	U	U	U	U	1.0	0.09 ST *
Total PCBs	0.0	0.0	0.0	0.0	0.0		

QUALIFIERS:
U: Compound analyzed for but not detected
J: Compound found at a concentration below the CRDL, value estimated
P: Greater than 25% difference for detected concentrations between the two GC columns
NA: Not analyzed

NOTES:
*: Value applies to the sum of these substances
GV: Guidance Value
ST: Standard
----: not established

Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value

TABLE G-4d.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
DIRECT PUSH GROUNDWATER SAMPLE RESULTS - FALL 1998
INORGANIC PARAMETERS - UNFILTERED

Sample Identification	GW-1	GW-2	GW-3	GW-4	GW-5	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	10/06/98	10/06/98	10/06/98	10/06/98	10/06/98		
Dilution Factor	1	1	1	1	1		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum	344	622	958	33,200	2,930	13	----
Antimony	11.8 B	3.4 B	4.7 B	5.0 B	U	8	3 ST
Arsenic	U	4.5 B	U	22.8	11.2	3	25 ST
Barium	68.5 B	1,160	541	1,140	2,330	1	1,000 ST
Beryllium	2.8 B	1.8 B	2.0 B	4.2 B	1.9 B	1	3 GV
Cadmium	1.1 B	U	U	U	U	1	5 ST
Calcium	131,000	132,000	212,000	499,000	111,000	8	----
Chromium	2.8 B	9.0 B	3.8 B	58.0	6.5 B	1	50 ST
Cobalt	U	1.8 B	0.86 B	29.7 B	3.1 B	2	----
Copper	22.0 B	52.6	23.3 B	208	23.8 B	1	200 ST
Iron	994	2,850	2,150	73,700	7,050	20	300 ST ^
Lead	9.3	58.6	22.7	202	43.3	2	25 ST
Magnesium	345,000	37,700	66,000	51,200	54,300	8	35,000 GV
Manganese	10.4 B	1,120	156	6,550	825	4	300 ST ^
Mercury	0.10 B	0.26	1.7	0.35	0.14 B	0.2	0.7 ST
Nickel	2.7 B	6.3 B	2.8 B	68.1	15.0 B	2	100 ST
Potassium	114,000	16,000	30,600	25,600	10,000	20	----
Selenium	U	U	U	5.5	U	4	10 ST
Silver	U	U	U	U	U	1	50 ST
Sodium	2,720,000	209,000	753,000	569,000	151,000	9	20,000 ST
Thallium	U	U	U	U	U	5	0.5 GV
Vanadium	2.4 B	9.1 B	5.2 B	75.3 B	8.2 B	1	----
Zinc	75.8	487	126	368	116	1	2000 GV
Cyanide	U	U	7.6	U	U	10	200 ST

QUALIFIERS:
U: Compound analyzed for but not detected
B: Compound concentration is less than the CRDL but greater than the IDL.

NOTES:
NA: Not analyzed
SB: Site background
^: The combined standard for iron and manganese is 500 ug/l

Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value

TABLE G-4e.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
DIRECT PUSH GROUNDWATER SAMPLE RESULTS - FALL 1998
INORGANIC PARAMETERS - FILTERED

Sample Identification	GW-1	GW-2	GW-3	GW-4	GW-5	Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	10/06/98	10/06/98	10/06/98	10/06/98	10/06/98		
Dilution Factor	1	1	1	1	1		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum	61.2 B	52.7 B	78.2 B	84.2 B	61.2 B	13	----
Antimony	**6.5 B**	U	U	U	U	8	3 ST
Arsenic	U	U	U	U	U	3	25 ST
Barium	68.3 B	**1,130**	503	**1,030**	945	1	1,000 ST
Beryllium	2.2 B	2.0 B	2.0 B	2.7 B	2.0 B	1	3 GV
Cadmium	U	U	U	U	U	1	5 ST
Calcium	128,000	131,000	237,000	681,000	94,300	8	----
Chromium	U	3.0 B	U	U	U	1	50 ST
Cobalt	0.70 B	U	1.0 B	2.0 B	0.99 B	2	----
Copper	2.3 B	U	U	U	U	1	200 ST
Iron	U	**892**	49.9 B	**20,200**	**2,190**	20	300 ST ^
Lead	U	U	U	U	U	2	25 ST
Magnesium	**340,000**	**37,200**	**73,900**	**45,100**	**47,800**	8	35,000 GV
Manganese	4.4 B	**1,100**	**141**	**6,700**	**670**	4	300 ST ^
Mercury	0.12 B	U	U	0.10 B	0.10 B	0.2	0.7 ST
Nickel	2.4 B	U	1.6 B	3.4 B	U	2	100 ST
Potassium	126,000	17,400	37,400	27,400	10,800	20	----
Selenium	U	**16.0**	**15.6**	**11.1**	8.6	4	10 ST
Silver	U	U	U	U	U	1	50 ST
Sodium	**3,050,000**	**223,000**	**817,000**	**673,000**	**154,000**	9	20,000 ST
Thallium	U	U	U	U	U	5	0.5 GV
Vanadium	U	5.2 B	2.5 B	U	U	1	----
Zinc	36.6	8.9 B	6.8 B	70.2	11.4 B	1	2000 GV

QUALIFIERS:
U: Compound analyzed for but not detected
B: Compound concentration is less than the CRDL but greater than the IDL.

NOTES:
NA: Not analyzed
SB: Site background
^: The combined standard for iron and manganese is 500 ug/l

Indicates value exceeds NYSDEC Class GA groundwater standard or guidance value

TABLE G-5a.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
SEDIMENT SAMPLE RESULTS - FALL 1998
VOLATILE ORGANIC COMPOUNDS

Sample Identification	SD-1	SD-2	SD-3	SD-4	SD-5	SD-6	SD-7	SD-8	SD-9	SD-10	SD-11	SD-12	Contract	Toxicity
Date of Collection	11/05/98	11/05/98	11/05/98	11/05/98	11/05/98	11/05/98	11/05/98	11/05/98	11/05/98	11/05/98	11/05/98	11/05/98	Required	Screening
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	Detection	Level *
Percent Moisture	57	56	48	30	55	48	60	39	52	51	55	55	Limit	
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)[1]	(ug/kg)
Chloromethane	U	U	U	U	U	U	U	U	U	U	U	U	10	---
Bromomethane	U	U	U	U	U	U	U	U	U	U	U	U	10	---
Vinyl Chloride	U	U	U	U	U	U	U	U	U	U	U	U	10	0.105 [1]
Chloroethane	U	U	U	U	U	U	U	U	U	U	U	U	10	---
Methylene Chloride	U	11 J	10 J	9 J	8 J	7 J	U	U	10 J	7 J	8 J	10 J	10	---
Acetone	U	48	U	U	28	29	33	U	U	20	20 J	22 J	10	---
Carbon Disulfide	U	U	U	U	U	U	U	U	U	U	5 J	U	10	---
1,1-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	10	0.03 [1]
1,1-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	10	---
1,2-Dichloroethene (total)	U	U	U	U	U	U	U	U	U	U	U	U	10	---
Chloroform	U	U	U	U	U	U	U	U	U	U	U	U	10	---
1,2-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	10	1.05 [1]
2-Butanone	16 J	U	U	U	17 J	21	30	U	U	U	U	U	10	---
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	10	---
Carbon Tetrachloride	U	U	U	U	U	U	U	U	U	U	U	U	10	0.9 [1]
Bromodichloromethane	U	U	U	U	U	U	U	U	U	U	U	U	10	---
1,2-Dichloropropane	U	U	U	U	U	U	U	U	U	U	U	U	10	---
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	10	---
Trichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	10	3 [1]
Dibromochloromethane	U	U	U	U	U	U	U	U	U	U	U	U	10	---
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	10	0.9 [1]
Benzene	U	U	U	U	U	U	U	U	U	U	U	U	10	0.9 [1]
Trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	10	---
Bromoform	U	U	U	U	U	U	U	U	U	U	U	U	10	---
4-Methyl-2-Pentanone	U	U	U	U	U	16 J	10 J	U	U	U	U	U	10	---
2-Hexanone	U	U	U	U	U	14 J	13 J	U	U	U	U	U	10	---
Tetrachloroethene	U	U	U	U	U	U	U	U	U	U	U	U	10	1.2 [1]
1,1,2,2-Tetrachloroethane	U	U	U	U	U	5 J	U	U	U	U	U	U	10	0.45 [1]
Toluene	U	U	U	U	U	U	U	U	U	U	U	U	10	---
Chlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	10	---
Ethylbenzene	U	U	U	U	U	U	U	U	U	U	U	U	10	---
Styrene	U	U	U	U	U	U	U	U	U	U	U	U	10	---
Total Xylenes	U	U	U	U	U	U	U	U	U	U	U	U	10	---
Total VOCs	16	59	10	9	53	92	86	0	10	27	33	32		
Total VOC TICs	0	0	0	0	0	59	52	0	0	22	0	0		

QUALIFIERS:

U: Compound analyzed for but not detected

B: Compound found in the blank as well as the sample

J: Compound found at a concentration below the CRDL, value estimated

NOTES:

--- : No criterion available for compound

* : Screening levels determined by most protective value of Human Health, Aquatic Chronic, ERL guidelines, Aquatic Acute, and Wildlife Toxicity Levels as listed in NYSDEC Technicalc Guidance for Screening Contaminated Sediment, Nov. 22, 1993

[1] : Human Health Toxicity Level

[2] : Aquatic Chronic Toxicity Level

[3] : Effects Range-Low (ERL) guidance values from Long et al. (1995)

[4] : Aquatic Acute Toxicity Level

[5] : Wildlife Toxicity Level

: Indicates value exceeds Toxicity Screening Level

TABLE 5b.
TAPPAN TERMINAL SITE
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
SEDIMENT SAMPLE RESULTS - FALL 1998
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	SD-1	SD-2	SD-3	SD-4	SD-5	SD-6	SD-7	SD-8	SD-9	SD-10	SD-11	SD-12	Contract Required Detection Limit	Toxicity Screening Level *
Date of Collection	11/5/98	11/5/98	11/5/98	11/5/98	11/5/98	11/5/98	11/5/98	11/5/98	11/5/98	11/5/98	11/5/98	11/5/98		
Dilution Factor	1	1	1	1	1	1	1	1	1	1	1	1		
Percent Moisture	57	56	48	30	55	48	60	39	52	51	55	55		
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Phenol	U	U	U	U	U	U	U	U	U	U	U	U	330	0.9 [2]
bis (2-Chloroethyl) ether	U	U	U	U	U	U	U	U	U	U	U	U	330	0.045 [1]
2-Chlorophenol	U	U	U	U	U	U	U	U	U	U	U	U	330	---
1,3-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	330	18 [2]
1,4-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	330	18 [2]
1,2-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	330	18 [2]
2-Methylphenol	U	U	U	U	U	U	U	U	U	U	U	U	330	---
2,2'-Oxybis (1-Chloropropane)	U	U	U	U	U	U	U	U	U	U	U	U	330	---
4-Methylphenol	U	U	U	U	U	U	U	U	U	U	U	U	330	---
N-Nitroso-di-n-propylamine	U	U	U	U	U	U	U	U	U	U	U	U	330	---
Hexachloroethane	U	U	U	U	U	U	U	U	U	U	U	U	330	---
Nitrobenzene	U	U	U	U	U	U	U	U	U	U	U	U	330	---
Isophorone	U	U	U	U	U	U	U	U	U	U	U	U	330	---
2-Nitrophenol	U	U	U	U	U	U	U	U	U	U	U	U	330	---
2,4-Dimethylphenol	U	U	U	U	U	U	U	U	U	U	U	U	330	---
bis (2-Chloroethoxy) methane	U	U	U	U	U	U	U	U	U	U	U	U	330	---
2,4-Dichlorophenol	U	U	U	U	U	U	U	U	U	U	U	U	330	75 [4]
1,2,4-Trichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	330	160 [3]
Naphthalene	U	U	U	U	U	U	U	U	U	U	U	U	330	---
4-Chloroaniline	U	U	U	U	U	U	U	U	U	U	U	U	330	---
Hexachlorobutadiene	U	U	U	U	U	U	U	U	U	U	U	U	330	---
4-Chloro-3-methylphenol	U	U	U	U	U	U	U	U	U	U	U	U	330	70 [3]
2-Methylnaphthalene	U	U	U	U	U	U	U	U	U	U	U	U	330	6.6 [2]
Hexachlorocyclopentadiene	U	U	U	U	U	U	U	U	U	U	U	U	330	---
2,4,6-Trichlorophenol	U	U	U	U	U	U	U	U	U	U	U	U	800	---
2,4,5-Trichlorophenol	U	U	U	U	U	U	U	U	U	U	U	U	330	---
2-Chloronaphthalene	U	U	U	U	U	U	U	U	U	U	U	U	800	---
2-Nitroaniline	U	U	U	U	U	U	U	U	U	U	U	U	330	---
Dimethylphthalate	U	U	U	U	U	U	U	U	U	U	U	U	330	16 [3]
Acenaphthylene	U	U	34 J	U	U	U	U	U	U	U	U	U	330	---
2,6-Dinitrotoluene	U	U	U	U	U	U	U	U	U	U	U	U	800	---
3-Nitroaniline	U	U	U	U	U	U	U	U	U	U	U	U	330	16 [3]
Acenaphthene	U	U	U	U	U	U	U	U	U	U	U	U	800	---
2,4-Dinitrophenol	U	U	U	U	U	U	U	U	U	U	U	U	800	---
4-Nitrophenol	U	U	U	U	U	U	U	U	U	U	U	U	800	---

TABLE G-5b. (CONT'D)
TAPPAN TERMINAL
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
SEDIMENT SAMPLE RESULTS - FALL 1998
SEMIVOLATILE ORGANIC COMPOUNDS

Sample Identification	SD-1	SD-2	SD-3	SD-4	SD-5	SD-6	SD-7	SD-8	SD-9	SD-10	SD-11	SD-12	Contract Required Detection Limit	Toxicity Screening Level *
Date of Collection	11/05/1998	11/05/1998	11/05/1998	11/05/1998	11/05/1998	11/05/1998	11/05/1998	11/05/1998	11/05/1998	11/05/1998	11/05/1998	11/05/1998		
Dilution Factor	1	1	1	1	1	1	1	1	1	1	1	1		
Percent Moisture	57	56	48	30	55	48	60	39	52	51	55	55		
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
Dibenzofuran	U	U	U	U	U	U	U	U	U	U	U	U	330	---
2,4-Dinitrotoluene	U	U	U	U	U	U	U	U	U	U	U	U	330	---
Diethylphthalate	U	U	U	U	U	U	U	U	U	U	U	U	330	---
4-Chlorophenyl-phenylether	U	U	U	U	U	U	U	U	U	U	U	U	330	---
Fluorene	U	U	U	U	U	U	U	U	U	U	U	U	330	19 [3]
4-Nitroaniline	U	U	U	U	U	U	U	U	U	U	U	U	330	---
4,6-Dinitro-2-methylphenol	U	U	U	U	U	U	U	U	U	U	U	U	330	---
N-Nitrosodiphenylamine	U	U	U	U	U	U	U	U	U	U	U	U	330	---
4-Bromophenyl-phenylether	U	U	U	U	U	U	U	U	U	U	U	U	330	---
Hexachlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	330	0.225 [1]
Pentachlorophenol	U	U	U	U	U	U	U	U	U	U	U	U	330	60 [2]
Phenanthrene	170 J	U	81 J	U	160 J	U	U	130 J	U	110 J	U	U	330	180 [2]
Anthracene	U	U	U	U	U	U	U	U	U	U	U	U	330	85.3 [3]
Carbazole	U	U	U	U	U	U	U	U	U	U	U	U	330	---
Di-n-butylphthalate	U	U	U	U	U	U	U	U	U	U	U	U	330	---
Fluoranthene	320 J	140 J	190 J	84 J	300 J	120 J	85 J	300 J	110 J	250 J	160 J	130 J	330	600 [3]
Pyrene	260 J	130 J	180 J	71 J	250 J	110 J	88 J	250 J	96 J	200 J	150 J	120 J	330	665 [3]
Butylbenzylphthalate	U	U	U	U	U	U	U	U	U	U	U	U	330	---
3,3'-Dichlorobenzidine	U	U	U	U	U	U	U	U	U	U	U	U	330	---
Benzo (a) anthracene	140 J	U	100 J	U	150 J	U	U	140 J	U	120 J	89 J	83 J	330	1.95 [1]
Chrysene	170 J	91 J	120 J	48 J	160 J	69 J	U	150 J	76 J	130 J	97 J	110 J	330	1.95 [1]
bis (2-Ethylhexyl) phthalate	140 J	84 J	160 J	65 J	130 J	140 J	U	63 J	74 J	130 J	150 J	U	330	299.25 [4]
Di-n-octylphthalate	U	U	U	U	U	U	U	U	U	U	U	U	330	---
Benzo (b) fluoranthene	180 J	79 J	140 J	52 J	150 J	67 J	U	140 J	U	120 J	79 J	85 J	330	1.95 [1]
Benzo (k) fluoranthene	140 J	89 J	100 J	U	140 J	U	U	110 J	U	120 J	100 J	74 J	330	1.95 [1]
Benzo (a) pyrene	120 J	100 J	150 J	51 J	170 J	72 J	U	140 J	79 J	140 J	110 J	93 J	330	1.95 [1]
Indeno (1,2,3-cd) pyrene	95 J	U	72 J	U	78 J	U	U	62 J	U	U	U	U	330	63.4 [3]
Dibenzo (a,h) anthracene	U	U	U	U	U	U	U	U	U	U	U	U	330	---
Benzo (g,h,i) perylene	95 J	U	89 J	U	81 J	U	U	62 J	U	U	U	U	330	---
Total PAHs	1,690	629	1,256	306	1,639	438	173	1,484	361	1,190	785	695		4022 [3]
Total Carcinogen PAHs	845	359	682	151	848	208	0	742	155	630	475	445		
Total SVOCs	1,830	713	1,416	371	1,769	578	173	1,547	435	1,320	935	695		
Total SVOC TICs	3,670	3,320	4,370	3,760	3,390	2,710	4,530	4,820	2,730	2,070	3,090	1,840		

QUALIFIERS:

J: Compound found at a concentration below the detection limit

U: Compound analyzed for but not detected

B: Compound found in the method blank as well as the sample

NOTES:

--- : No criterion available for compound

* : Screening levels determined by most protective value of Human Health, Aquatic Chronic, ERL guidelines, Aquatic Acute, and Wildlife Toxicity Levels as listed in NYSDEC Technical Guidance for Screening Contaminated Sediment, Nov. 22, 1993

[1] : Human Health Toxicity Level

[2] : Aquatic Chronic Toxicity Level

[3] : Effects Range-Low (ERL) guidance values from Long et al. (1995)

[4] : Aquatic Acute Toxicity Level

° : Wildlife Toxicity Level

: Indicates value exceeds Toxicity Screening Level

TABLE 5c.

TAPPAN TE AL SITE

REMEDIAL INVESTIGATION AND FEASIBILITY STUDY

SEDIMENT SAMPLE RESULTS - FALL 1998

PESTICIDE/PCBs

Sample Identification	SD-1	SD-2	SD-3	SD-4	SD-5	SD-6	SD-7	SD-8	SD-9	SD-10	SD-11	SD-12	Contract Required Detection Limit	Toxicity Screening Level *
Date of Collection	11/5/98	11/5/98	11/5/98	11/5/98	11/5/98	11/5/98	11/5/98	11/5/98	11/5/98	11/5/98	11/5/98	11/5/98		
Dilution Factor	1	1	1	1	1	1	1	1	1	1	1	1		
Percent Moisture	57	56	48	30	55	48	60	39	52	51	55	55		
Units	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
alpha-BHC	U	U	U	U	U	U	U	U	U	U	U	U	0.05	---
beta-BHC	U	U	U	U	U	U	U	U	U	U	U	U	0.05	---
delta-BHC	U	U	U	U	U	U	U	U	U	U	U	U	0.05	---
gamma-BHC (Lindane)	U	U	U	U	U	U	U	U	U	U	U	U	0.05	---
Heptachlor	U	U	U	U	U	U	U	U	U	U	U	U	0.05	0.0012 [1]
Aldrin	U	U	U	U	U	U	U	U	U	U	U	U	0.05	0.15 [1]
Heptachlor Epoxide	U	U	U	U	U	U	U	U	U	U	U	U	0.05	0.0012 [1]
Endosulfan I	U	U	U	U	U	U	U	U	U	U	U	U	0.05	0.045 [2]
Dieldrin	U	U	U	U	U	U	U	U	U	U	U	U	0.10	0.15 [1]
4,4'-DDE	U	U	U	U	U	U	U	U	U	U	U	U	0.10	0.02 [1]
Endrin	U	U	U	U	U	U	U	U	U	U	U	U	0.10	0.0798 [1]
Endosulfan II	U	U	U	U	U	U	U	U	U	U	U	U	0.10	0.045 [2]
4,4'-DDD	U	U	U	U	30	U	U	U	U	U	U	U	0.10	0.02 [1]
Endosulfan Sulfate	U	U	U	U	U	U	U	U	U	U	U	U	0.10	---
4,4'-DDT	U	U	U	U	U	U	U	U	U	U	U	U	0.10	0.02 [1]
Methoxychlor	U	U	U	U	U	U	U	U	U	U	U	U	0.50	0.9 [4]
Endrin Ketone	U	U	U	U	U	U	U	U	U	U	U	U	0.10	---
Endrin Aldehyde	U	9 P	U	16 P	19 P	U	U	U	U	U	U	U	0.10	---
alpha-Chlordane	U	U	U	U	U	U	U	U	U	U	U	U	0.05	0.0015 [1]
gamma-Chlordane	U	U	U	U	U	U	U	U	U	U	U	U	0.05	0.0015 [1]
Toxaphene	U	U	U	U	U	U	U	U	U	U	U	U	5.0	0.015 [2]
Aroclor-1016	U	U	U	U	U	U	U	U	U	U	U	U	1.0	0.012 [1]
Aroclor-1221	U	U	U	U	U	U	U	U	U	U	U	U	2.0	0.012 [1]
Aroclor-1232	U	U	U	U	U	U	U	U	U	U	U	U	1.0	0.012 [1]
Aroclor-1242	U	U	U	U	U	U	U	U	U	U	U	U	1.0	0.012 [1]
Aroclor-1248	U	120 J	70 JP	U	140	97	81 JP	90	U	97 P	98 P	U	1.0	0.012 [1]
Aroclor-1254	U	U	U	U	U	U	U	U	U	U	U	U	1.0	0.012 [1]
Aroclor-1260	U	U	U	U	U	U	U	U	U	U	U	U	1.0	0.012 [1]
Total PCBs	0	120	70	0	140	97	81	90	0	97	98	0		22.7 [3]

QUALIFIERS:

U: Compound analyzed for but not detected

J: Compound found at a concentration below the CRDL, value estimated

P: Greater than 25% difference for detected concentrations between the two GC columns

NOTES:

--- : No criterion available for compound

* : Screening levels determined by most protective value of Human Health, Aquatic Chronic, ERL guidelines, Aquatic Acute, and Wildlife Toxicity Levels as listed in NYSDEC Technical Guidance for Screening Contaminated Sediment, Nov. 22, 1993

[1] : Human Health Toxicity Level

[2] : Aquatic Chronic Toxicity Level

[3] : Effects Range-Low (ERL) guidance values from Long et al. (1995)

[4] : Aquatic Acute Toxicity Level

[5] : Wildlife Toxicity Level

: Indicates value exceeds Toxicity Screening Level

APPENDIX H

Tentatively Identified Compounds

15 (12-75)

New York State Department of Environmental Conservation

MEMORANDUM

TO: George Heitzman, BERA
FROM: Christine McGrath, QAU, ISS, BCS
SUBJECT: Tappan Terminal

DATE: MAR 2 9 1999

RECEIVED
MAR 2 9 1999
Bureau of Eastern Remedial Action

I have reviewed the Tentatively Identified Compounds (TICs) for the attached samples that were analyzed for Volatiles and Semivolatiles. I have summarized my review of each sample on a copy of the Form 1F for each sample.

Most of the TICs are hydrocarbons and polyaromatic hydrocarbons (PAHs). PAHs are starting materials and intermediates in the process for the synthesis of dyes. I have characterized other TICs as carbazoles and amides which are also intermediates in the dye process. In addition, there are random detections of pyridines and anthraquinones that are also associated with the synthesis of dyes.

The TICs that are labeled as unknowns did not have a distinctive ion pattern that could be characterized and are probably mixtures of intermediates or by products from the manufacturing process. It is not unusual to have this level of unknown contamination from an industrial process site.

I have clarified on the sample Form 1Fs that the semivolatile analysis TICs that are labeled as unknown ACP are unknown aldol condensation products that are formed in the extraction procedure for the preparation of the sample extract for analysis and are not site contaminants.

If you have any questions, please do not hesitate to call me at 7-9280.

Attachment

cc: w/o att.: J. Rankin

S. McCormick

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SS-7

Lab Name: ANAlab-Randolph Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1

Matrix: (soil/water) SOIL Lab Sample ID: 298136

Sample wt/vol: -- 5.000 (g/mL) G Lab File ID: H0255

Level: (low/med) LOW Date Received: 09/25/98

% Moisture: not dec. 1. Date Analyzed: 09/29/98

GC Column: DB-624 ID: .53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: ____ (uL)

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	80-56-8	ALPHA-PINENE	22.64	46.	J N
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SS-10

Lab Name: ANAlab-Randolph Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1

Matrix: (soil/water) SOIL Lab Sample ID: 298139

Sample wt/vol: 5.000 (g/mL) G Lab File ID: H0258

Level: (low/med) LOW Date Received: 09/25/98

% Moisture: not dec. 9. Date Analyzed: 09/29/98

GC Column: DB-624 ID: .53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: ____ (uL)

Number TICs found: 14 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	- -	UNKNOWN ALKANE	19.08	24.	J
2.	- -	UNKNOWN CYCLIC ALKANE	19.35	26.	J
3.	- -	~~UNKNOWN~~ a hydrocarbon	19.83	26.	J
4.	- -	UNKNOWN ALKANE	20.00	23.	J
5.	2216-33-3	OCTANE, 3-METHYL-	20.27	130.	J N
6.	- -	UNKNOWN CYCLIC ALKANE	21.02	160.	J
7.	- -	UNKNOWN a hydrocarbon	21.72	160.	J
8.	2051-30-1	OCTANE, 2,4-DIMETHYL-	22.24	91.	J N
9.	696-29-7	CYCLOHEXANE, (1-METHYLETHYL)	22.42	100.	J N
10.	- -	UNKNOWN a hydrocarbon	23.39	90.	J
11.	- -	UNKNOWN CYCLIC ALKANE	24.03	40.	J
12.	- -	UNKNOWN a hydrocarbon	24.50	56.	J
13.	- -	UNKNOWN ALKANE a hydrocarbon	24.91	160.	J
14.	- -	UNKNOWN a hydrocarbon	25.27	43.	J
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1E

EPA SAMPLE NO.

SB-2

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: ANAlab Randolph Contract:

Lab Code: ANA_R Case No.: SAS No.: SDG No.: SB-1

Matrix: (soil/water) SOIL Lab Sample ID: 299048

Sample wt/vol: 5.000 (g/mL) G Lab File ID: H0566

Level: (low/med) LOW Date Received: 10/07/98

% Moisture: not dec. 20. Date Analyzed: 10/16/98

GC Column: DB-624 ID: .53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: ____ (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	110-54-3	HEXANE	10.09	7.	J N
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SD-6

Lab Name: ANAlab Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SD-1

Matrix: (soil/water) SOIL Lab Sample ID: 300600

Sample wt/vol: 5.000 (g/mL) G Lab File ID: H0762

Level: (low/med) LOW Date Received: 11/06/98

% Moisture: not dec. 48. Date Analyzed: 11/11/98

GC Column: DB-624 ID: .25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: ____ (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	75-05-8	ACETONITRILE	8.35	59.	J N
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SD-7

Lab Name: ANAlab Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SD-1

Matrix: (soil/water) SOIL Lab Sample ID: 300601

Sample wt/vol: 5.000 (g/mL) G Lab File ID: H0763

Level: (low/med) LOW Date Received: 11/06/98

% Moisture: not dec. 60. Date Analyzed: 11/11/98

GC Column: DB-624 ID: .25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: ____ (uL)

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	75-05-8	ACETONITRILE	8.33	40.	J N
2.	110-54-3	HEXANE	10.07	12.	BJ N
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SD-10

Lab Name: ANAlab Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SD-1

Matrix: (soil/water) SOIL Lab Sample ID: 300604

Sample wt/vol: 5.000 (g/mL) G Lab File ID: H0765

Level: (low/med) LOW Date Received: 11/06/98

% Moisture: not dec. 51. Date Analyzed: 11/11/98

GC Column: DB-624 ID: .25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: ____ (uL)

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	75-05-8	ACETONITRILE	8.36	10.	J N
2.	110-54-3	HEXANE	10.08	12.	BJ N
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GW-5

Lab Name: ANAlab Randolph Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: GW-1

Matrix: (soil/water) WATER Lab Sample ID: 299074

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: H0506

Level: (low/med) LOW Date Received: 10/07/98

% Moisture: not dec._____ Date Analyzed: 10/13/98

GC Column: DB-624 ID: .53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: ____ (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	1634-04-4	METHYL-T-BUTYL ETHER	9.48	22.	J N
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

MW-1A

Lab Name: ANALAB,INC.,RANDOLPH. Contract: DVIRKA+BARTILUCCI,P.C.

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: MW-1A

Matrix: (soil/water) WATER Lab Sample ID: O298704

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: B9953.D

Level: (low/med) _____ Date Received: 10/1/98

% Moisture: not dec. 100 Date Analyzed: 10/3/98

GC Column: RTX-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Concentration Units:

Number TICs found: 1 (ug/L or ug/Kg) ug/L

CAS Number	Compound Name	RT	Est. Conc.	Q
1.	Unknown	3.03	66	J
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
MW-4

Lab Name: ANALAB,INC.,RANDOLPH. Contract: DVIRKA+BARTILUCCI,P.C.

Lab Code: ANA Case No.: SAS No.: SDG No.: MW-1A

Matrix: (soil/water) WATER Lab Sample ID: O298711

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: B9947.D

Level: (low/med) Date Received: 10/1/98

% Moisture: not dec. 100 Date Analyzed: 10/2/98

GC Column: RTX-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 3 Concentration Units: (ug/L or ug/Kg) ug/L

CAS Number	Compound Name	RT	Est. Conc.	Q
1.	Unknown	3.02	60	J
2. 60-29-7	Ether	6.05	280	J
3.	Unknown a hydrocarbon	9.20	410	J
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-5

Lab Name: ANALAB,INC.,RANDOLPH. Contract: DVIRKA+BARTILUCCI,P.C.

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: MW-1A

Matrix: (soil/water) WATER Lab Sample ID: O298709

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: H0410.D

Level: (low/med) _____ Date Received: 10/1/98

% Moisture: not dec. 100 Date Analyzed: 10/8/98

GC Column: RTX-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 3 Concentration Units: (ug/L or ug/Kg) ug/L

CAS Number	Compound Name	RT	Est. Conc.	Q
1. 60-29-7	Ether	7.00	7	J
2. 1634-04-4	Propane, 2-methoxy-2-methyl-	9.54	3	J
3. 108-20-3	Diisopropyl ether	10.76	17	J
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

(MTBE)

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
OW-5A

Lab Name: ANALAB,INC.,RANDOLPH. Contract: DVIRKA+BARTILUCCI,P.C.

Lab Code: ANA Case No.: SAS No.: SDG No.: MW-1A

Matrix: (soil/water) WATER Lab Sample ID: O298712

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: H0417.D

Level: (low/med) Date Received: 10/1/98

% Moisture: not dec. 100 Date Analyzed: 10/8/98

GC Column: RTX-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 2 Concentration Units: (ug/L or ug/Kg) ug/L

CAS Number	Compound Name	RT	Est. Conc.	Q
1. 60-29-7	Ether	7.00	8	J
2. 110-54-3	Hexane	10.13	5	J
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

OW-8

Lab Name: ANALAB,INC.,RANDOLPH. Contract: DVIRKA+BARTILUCCI,P.C.

Lab Code: ANA Case No.: SAS No.: SDG No.: MW-1A

Matrix: (soil/water) WATER Lab Sample ID: O298703

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: B9952.D

Level: (low/med) Date Received: 10/1/98

% Moisture: not dec. 100 Date Analyzed: 10/3/98

GC Column: RTX-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 1 Concentration Units: (ug/L or ug/Kg) ug/L

CAS Number	Compound Name	RT	Est. Conc.	Q
1.	Unknown a Hydrocarbon	6.06	690	J
2.	Unknown	9.21	790	J
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-10

Lab Name: ANALAB,INC.,RANDOLPH. Contract: DVIRKA+BARTILUCCI,P.C.

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: MW-1A

Matrix: (soil/water) WATER Lab Sample ID: O298705

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: B9954.D

Level: (low/med) _____ Date Received: 10/1/98

% Moisture: not dec. 100 Date Analyzed: 10/3/98

GC Column: RTX-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Concentration Units:

Number TICs found: 2 (ug/L or ug/Kg) ug/L

CAS Number	Compound Name	RT	Est. Conc.	Q
1. 106-46-7	1,4-Dichlorobenzene	24.35	30	J
2. 541-73-1	1,3-Dochlorobenzene	25.23	23	J
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
MW-15

Lab Name: ANALAB,INC.,RANDOLPH. Contract: DVIRKA+BARTILUCCI,P.C.

Lab Code: ANA Case No.: SAS No.: SDG No.: MW-1A

Matrix: (soil/water) WATER Lab Sample ID: O298706

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: B9955.D

Level: (low/med) Date Received: 10/1/98

% Moisture: not dec. 100 Date Analyzed: 10/3/98

GC Column: RTX-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 2 Concentration Units: (ug/L or ug/Kg) ug/L

CAS Number	Compound Name	RT	Est. Conc.	Q
1. 106-46-7	1,4-Dichlorobenzene	24.14	55	
2. 541-73-1	1,3-Dichlorobenzene	24.34	257	
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

MW-15DL

Lab Name: ANALAB,INC.,RANDOLPH. Contract: DVIRKA+BARTILUCCI,P.C.

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: MW-1A

Matrix: (soil/water) WATER Lab Sample ID: O298706L

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: H0420.D

Level: (low/med) _____ Date Received: 10/1/98

% Moisture: not dec. 100 Date Analyzed: 10/8/98

GC Column: RTX-624 ID: 0.53 (mm) Dilution Factor: 50.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 3 Concentration Units: (ug/L or ug/Kg) ug/L

CAS Number	Compound Name	RT	Est. Conc.	Q
1.	Unknown 2-methoxy-2-methyl propane	9.53	77	J
2. 110-54-3	Hexane	10.12	95	J
3. 106-46-7	Benzene, 1,4-dichloro-	25.76	60	J
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

(MTBE)

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
MW-17

Lab Name: ANALAB,INC.,RANDOLPH. Contract: DVIRKA+BARTILUCCI,P.C.

Lab Code: ANA Case No.: SAS No.: SDG No.: MW-1A

Matrix: (soil/water) WATER Lab Sample ID: O298716

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: H0415.D

Level: (low/med) Date Received: 10/1/98

% Moisture: not dec. 100 Date Analyzed: 10/8/98

GC Column: RTX-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Number TICs found: 1 Concentration Units: (ug/L or ug/Kg) ug/L

CAS Number	Compound Name	RT	Est. Conc.	Q
1. 1634-04-4	Propane, 2-methoxy-2-methyl-	9.55	6	J
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

(MTBE)

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

OW-19A

Lab Name: ANALAB,INC.,RANDOLPH. Contract: DVIRKA+BARTILUCCI,P.C.

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: MW-1A

Matrix: (soil/water) WATER Lab Sample ID: O298715

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: H0414.D

Level: (low/med) _____ Date Received: 10/1/98

% Moisture: not dec. 100 Date Analyzed: 10/8/98

GC Column: RTX-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 2 Concentration Units: (ug/L or ug/Kg) ug/L

CAS Number	Compound Name	RT	Est. Conc.	Q
1. 60-29-7	Ether	6.99	270	J
2. 108-20-3	Diisopropyl ether	10.75	62	J
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

OW-25

Lab Name: ANALAB,INC.,RANDOLPH. Contract: DVIRKA+BARTILUCCI,P.C.

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: MW-1A

Matrix: (soil/water) WATER Lab Sample ID: O298713

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: H0412.D

Level: (low/med) _____ Date Received: 10/1/98

% Moisture: not dec. 100 Date Analyzed: 10/8/98

GC Column: RTX-624 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Concentration Units:

Number TICs found: 2 (ug/L or ug/Kg) ug/L

CAS Number	Compound Name	RT	Est. Conc.	Q
1. 60-29-7	Ether	7.01	96	J
2. 108-20-3	Diisopropyl ether	10.77	150	J
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

OW-26

Lab Name: ANAlab Randolph Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: LMS-6

Matrix: (soil/water) WATER Lab Sample ID: 298830

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: H0486

Level: (low/med) LOW Date Received: 10/02/98

% Moisture: not dec._____ Date Analyzed: 10/12/98

GC Column: DB-624 ID: .53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: ____ (uL)

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	60-29-7	DIETHYL ETHER	6.97	360.	J N
2.	108-20-3	DIISOPROPYL ETHER	10.72	410.	J N
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SS-1

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1

Matrix: (soil/water) SOIL Lab Sample ID: 298130

Sample wt/vol: 30.08 (g/ml) G Lab File ID: J3448.D

Level: (low/med) LOW Date Received: 09/25/98

% Moisture: 7.72 decanted: (Y/N) N Date Extracted: 09/28/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/08/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.08

Number TICs found: 22

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	000103-71-9	Benzene, isocyanato-	5.93	92	JN
2.		unknown	11.49	120	J
3.	006283-25-6	Benzenamine, 2-chloro-5-nitro-	13.00	200	JN
4.		~~unknown~~ a phthalate	14.45	84	J
5.	000610-48-0	Anthracene, 1-methyl-	14.79	86	JN
6.	000203-64-5	4H-Cyclopenta[def]phenanthrene	14.91	120	JN
7.	000084-65-1	9,10-Anthracenedione	15.24	220	JN
8.	003674-66-6	Phenanthrene, 2,5-dimethyl-	15.59	91	JN
9.	000081-64-1	9,10-Anthracenedione, 1,4-dihydr	16.42	79	JN
10.	000243-17-4	11H-Benzo[b]fluorene	16.48	110	JN
11.		unknown	16.62	90	J
12.	000301-02-0	9-Octadecenamide, (Z)-	16.94	210	JN
13.	000203-12-3	Benzo[ghi]fluoranthene	17.25	90	JN
14.	003351-31-3	Chrysene, 3-methyl-	18.19	79	JN
15.		unknown	18.41	150	J
16.		~~unknown~~ an amide	18.96	560	J
17.		unknown	19.72	280	J
18.	000192-97-2	Benzo[e]pyrene	19.86	520	JN
19.		unknown	20.53	770	J
20.		unknown	21.39	370	J
21.		unknown	22.01	320	J
22.		~~unknown~~ a polyaromatic hydrocarbon	23.50	85	J
23.		unknown	26.30	130	J
24.	000629-59-4	Tetradecane	14.61	70	J
25.		a hydrocarbon	20.94	120	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
SS-2

Lab Name: ANALab-Randolph Facility Contract:
Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1
Matrix: (soil/water) SOIL Lab Sample ID: 298131
Sample wt/vol: 30.04 (g/ml) G Lab File ID: J3449.D
Level: (low/med) LOW Date Received: 09/25/98
% Moisture: 6.94 decanted: (Y/N) N Date Extracted: 09/28/98
Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/08/98
Injection Volume: 2.0 (uL) Dilution Factor: 1.0
GPC Cleanup: (Y/N) Y pH: 6.45

Number TICs found: 21 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000103-71-9	Benzene, isocyanato-	5.91	87	JN
2. 000622-58-2	Benzene, 1-isocyanato-4-methyl-	7.10	73	JN
3. 000106-49-0	~~unknown~~ p-Aminotoluene	7.15	72	J
4. 000102-36-3	Benzene, 1,2-dichloro-4-isocyana	9.37	76	JN
5.	unknown	11.49	93	J
6. 006283-25-6	Benzenamine, 2-chloro-5-nitro-	13.00	150	JN
7. 000081-64-1	9,10-Anthracenedione, 1,4-dihydr	16.46	840	JN
8.	~~unknown~~ an amide	18.97	810	J
9.	unknown	20.56	2800	J
10.	unknown	20.75	180	J
11.	unknown	21.19	410	J
12.	unknown	21.32	550	J
13.	unknown	21.42	370	J
14.	unknown	22.05	2200	J
15.	unknown	22.29	140	J
16.	unknown	22.40	120	J
17.	unknown	22.50	1800	J
18.	unknown	22.60	350	J
19.	unknown	23.00	100	J
20.	unknown	23.64	480	J
21.	unknown	24.01	88	J
22.	Nonadecane	19.71	170	J
23.	Heneicosene	20.93	430	J
24.	Octadecane	21.82	300	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
SS-3

Lab Name: ANALab-Randolph Facility Contract:
Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1
Matrix: (soil/water) SOIL Lab Sample ID: 298132
Sample wt/vol: 30.04 (g/ml) G Lab File ID: J3443.D
Level: (low/med) LOW Date Received: 09/25/98
% Moisture: 6.8 decanted: (Y/N) N Date Extracted: 09/28/98
Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/08/98
Injection Volume: 2.0 (uL) Dilution Factor: 1.0
GPC Cleanup: (Y/N) Y pH: 7.58

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	~~unknown~~ a phthalate	14.44	72	J
2. 000301-02-0	9-Octadecenamide, (Z)-	16.93	460	JN
3.	~~unknown~~ an amide	18.94	630	J
4. 000000-00-0	2-Chloro-7-methylquinoxaline	23.57	430	JN

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SS-4

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1

Matrix: (soil/water) SOIL Lab Sample ID: 298133

Sample wt/vol: 30.1 (g/ml) G Lab File ID: J3470.D

Level: (low/med) LOW Date Received: 09/25/98

% Moisture: 19.08 decanted: (Y/N) N Date Extracted: 09/28/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/09/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 6.24

Number TICs found: 11 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000108-42-9	m-Chloroaniline	7.71	220	JN
2. 000090-12-0	Naphthalene, 1-methyl-	9.44	150	JN
3. 000095-82-9	Benzenamine, 2,5-dichloro-	9.58	370	JN
4. 000581-42-0	Naphthalene, 2,6-dimethyl-	10.21	130	JN
5. 000575-41-7	Naphthalene, 1,3-dimethyl-	10.34	98	JN
6.	unknown a phthalate	14.44	100	J
7. 000613-12-7	Anthracene, 2-methyl-	14.74	110	JN
8. 000610-48-0	Anthracene, 1-methyl-	14.78	150	JN
9.	unknown	21.03	820	J
10.	unknown a polyaromatic hydrocarbon	21.41	1500	J
11.	unknown a polyaromatic hydrocarbon	21.87	670	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
SS-5

Lab Name: ANALab-Randolph Facility Contract:
Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1
Matrix: (soil/water) SOIL Lab Sample ID: 298134
Sample wt/vol: 30.03 (g/ml) G Lab File ID: J3479.D
Level: (low/med) LOW Date Received: 09/25/98
% Moisture: 9.05 decanted: (Y/N) N Date Extracted: 09/28/98
Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/09/98
Injection Volume: 2.0 (uL) Dilution Factor: 2.0
GPC Cleanup: (Y/N) Y pH: 8.32

Number TICs found: 35 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000098-86-2	Acetophenone	7.05	340	JND
2. 000095-53-4	Benzenamine, 2-methyl-	7.11	360	JND
3. 000095-51-2	o-Chloroaniline	7.70	2800	JND
4.	unknown	10.33	190	JD
5.	unknown	14.17	170	JD
6.	unknown	14.39	190	JD
7.	~~unknown~~ a carbazole	14.42	270	JD
8. 81064-65-1	~~unknown~~ 9,10-Anthracenedione	15.21	310	JD
9.	unknown	15.67	220	JD
10. 000129-43-1	9,10-Anthracenedione, 1-hydroxy	15.82	1500	JND
11.	unknown	15.87	370	JD
12.	unknown	16.20	420	JD
13. 000081-64-1	9,10-Anthracenedione, 1,4-dihydr	16.42	4400	JND
14. 000135-88-6	2-Naphthalenamine, N-phenyl-	16.51	4600	JND
15.	unknown	16.57	210	JD
16.	unknown	16.60	260	JD
17.	~~unknown~~ a polyaromatic hydrocarbon	16.78	1400	JD
18.	~~unknown~~ [illegible] an amide	16.91	520	JD
19.	unknown	16.94	900	JD
20.	unknown	17.33	1100	JD
21.	unknown	17.40	660	JD
22.	unknown	17.85	420	JD
23.	unknown	17.98	670	JD
24. 005405-96-9	1,1'-Binaphthalene, 3,3',4,4'-tetra	18.01	480	JND
25.	~~unknown~~ an amide	18.91	730	JD
26.	unknown	18.96	1900	JD
27.	unknown	19.15	680	JD
28.	unknown	19.59	1500	JD
29.	unknown	20.50	7000	JD
30.	unknown	20.71	1800	JD
31.	~~unknown~~ a polyaromatic hydrocarbon	20.98	530	JD
32.	unknown	21.29	3000	JD
33.	unknown	21.39	1200	JD
34.	unknown	21.99	5800	JD

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
SS-5

Lab Name: ANALab-Randolph Facility Contract:
Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1
Matrix: (soil/water) SOIL Lab Sample ID: 298134
Sample wt/vol: 30.03 (g/ml) G Lab File ID: J3479.D
Level: (low/med) LOW Date Received: 09/25/98
% Moisture: 9.05 decanted: (Y/N) N Date Extracted: 09/28/98
Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/09/98
Injection Volume: 2.0 (uL) Dilution Factor: 2.0
GPC Cleanup: (Y/N) Y pH: 8.32

Number TICs found: 35 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
35.	unknown	22.56	1900	JD

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SS-6

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1

Matrix: (soil/water) SOIL Lab Sample ID: 298135

Sample wt/vol: 30.06 (g/ml) G Lab File ID: J3480.D

Level: (low/med) LOW Date Received: 09/25/98

% Moisture: 6.29 decanted: (Y/N) N Date Extracted: 09/28/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/09/98

Injection Volume: 2.0 (uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) Y pH: 7.82

Number TICs found: 41

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
35.	unknown	19.00	370	JD
36.	unknown	20.55	1400	JD
37.	unknown	20.74	230	JD
38.	unknown	21.33	440	JD
39.	unknown	21.42	320	JD
40.	unknown	22.02	680	JD
41.	unknown	22.59	220	JD

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
SS-8

Lab Name: ANALab-Randolph Facility Contract:
Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1
Matrix: (soil/water) SOIL Lab Sample ID: 298137
Sample wt/vol: 30.15 (g/ml) G Lab File ID: J3468.D
Level: (low/med) LOW Date Received: 09/25/98
% Moisture: 17.73 decanted: (Y/N) N Date Extracted: 09/28/98
Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/09/98
Injection Volume: 2.0 (uL) Dilution Factor: 1.0
GPC Cleanup: (Y/N) Y pH: 6.14

Number TICs found: 25 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000098-86-2	Acetophenone	7.06	120	JN
2. 000829-26-5	~~unknown~~ 2,3,6-trimethyl Naphthalene	11.38	85	J
3. 000099-55-8	Benzenamine, 2-methyl-5-nitro-	11.87	82	JN
4.	unknown	12.41	82	J
5. 000120-21-8	Benzaldehyde, 4-(diethylamino)-	12.85	230	JN
6. 000000-00-0	Tetrahydrotecomanine	12.98	260	JN
7.	unknown	13.39	89	J
8. 000486-25-9	9H-Fluoren-9-one	13.45	94	JN
9.	~~unknown~~ a phthalate	14.43	95	J
10. 000610-48-0	Anthracene, 1-methyl-	14.73	110	JN
11. 000613-12-7	Anthracene, 2-methyl-	14.77	150	JN
12. 000832-69-9	Phenanthrene, 1-methyl-	14.90	190	JN
13. 000779-02-2	Anthracene, 9-methyl-	14.93	85	JN
14. 000781-43-1	9,10-Dimethylanthracene	15.58	140	JN
15. 001576-67-6	~~unknown~~ 3,6-dimethyl Phenanthrene	15.62	110	J
16. 005737-13-3	Cyclopenta(def)phenanthrenone	15.66	120	JN
17. 000243-17-4	~~unknown~~ 11H-Benzo[b]fluorene	16.47	200	J
18. 002381-21-7	Pyrene, 1-methyl-	16.59	120	JN
19.	~~unknown~~ an amide	16.93	320	J
20. 000082-05-3	7H-Benz[de]anthracen-7-one	17.07	150	JN
21.	~~unknown~~ an amide	18.96	1700	J
22.	unknown	20.52	620	J
23.	unknown	22.47	300	J
24.	unknown	22.89	710	J
25.	~~unknown~~ a polyaromatic hydrocarbon	23.48	370	J
26. 000593-45-3	Octadecane	20.93	810	J
27. 100629-92-5	Nonadecane	19.71	1100	J
28. 000593-45-3	Octadecane	15.23	420	J
29. 000629-78-7	Heptadecane	14.59	130	J
30. 000544-76-3	Hexadecane	12.78	100	J
31. 000629-50-5	Tridecane	11.69	90J	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
SS-9

Lab Name: ANALab-Randolph Facility Contract:
Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1
Matrix: (soil/water) SOIL Lab Sample ID: 298138
Sample wt/vol: 30.04 (g/ml) G Lab File ID: J3466.D
Level: (low/med) LOW Date Received: 09/25/98
% Moisture: 9.92 decanted: (Y/N) N Date Extracted: 09/28/98
Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/09/98
Injection Volume: 2.0 (uL) Dilution Factor: 1.0
GPC Cleanup: (Y/N) Y pH: 6.89

Number TICs found: 10 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000575-41-7	Naphthalene, 1,3-dimethyl-	10.34	77	JN
2.	~~unknown~~ a polyaromatic hydrocarbon	11.38	110	J
3. 000081-64-1	9,10-Anthracenedione, 1,4-dihydr	16.42	250	JN
4.	~~unknown~~ an amide	16.92	370	J
5.	~~unknown~~ an amide	18.94	1300	J
6.	unknown	20.51	240	J
7.	unknown	22.46	310	J
8.	unknown	23.09	290	J
9.	unknown	23.54	200	J
10.	unknown	25.99	120	J
11. 000593-45-3	Octadecane	20.93	420	J
12. 000112-95-8	Eicosane	16.63	160	J
13. 000629-97-0	Docosane	16.22	290	J
14. 000629-62-9	Pentadecane	15.23	370	J
15. 000629-92-5	Nonadecane	14.60	360	J
16. 006975-98-0	~~2 CH3's for~~ 2-methyldecane	14.55	180	J
17. 001560-89-0	2-methylheptadecane	14.40	80	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
SS-10

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1

Matrix: (soil/water) SOIL Lab Sample ID: 298139

Sample wt/vol: 30.08 (g/ml) G Lab File ID: J3478.D

Level: (low/med) LOW Date Received: 09/25/98

% Moisture: 8.5 decanted: (Y/N) N Date Extracted: 09/28/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/09/98

Injection Volume: 2.0 (uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) Y pH: 7.48

CONCENTRATION UNITS:

Number TICs found: 36 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000493-02-7	Naphthalene, decahydro-, trans-	6.94	960	JND
2.	~~unknown~~ hydrocarbon	7.15	890	JD
3. 002958-76-1	Naphthalene, decahydro-2-methyl	7.70	720	JND
4.	~~unknown~~ hydrocarbon	7.93	740	JD
5.	~~unknown~~ hydrocarbon	8.60	540	JD
6.	~~unknown~~ substituted cyclohexane	8.73	1300	JD
7. 006682-71-9	1H-Indene, 2,3-dihydro-4,7-dimethyl	8.87	540	JND
8. 000090-12-0	Naphthalene, 1-methyl-	9.47	850	JND
9. 002613-76-5	~~unknown~~ 2,3-dihydro-1,1,3-trimethyl-1H-Indene	9.57	2300	JD
10.	~~unknown~~ a hydrocarbon	9.65	6900	JD
11.	~~unknown~~ a hydrocarbon	10.12	1400	JD
12. 000581-40-8	Naphthalene, 2,3-dimethyl-	10.26	5600	JND
13. 000581-40-8	Naphthalene, 2,3-dimethyl-	10.41	7100	JND
14. 001795-15-9	Cyclohexane, octyl-	10.51	2500	JND
15.	~~unknown~~ a hydrocarbon	10.64	1400	JD
16. 000000-00-0	Decahydro-4,4,8,9,10-pentameth	10.72	3600	JND (a hydrocarbon
17.	~~unknown~~ a hydrocarbon	10.81	1500	JD
18.	~~unknown~~ a hydrocarbon	11.36	2800	JD
19. 002131-42-2	Naphthalene, 1,4,6-trimethyl-	11.43	7000	JND
20.	~~unknown~~ a hydrocarbon	11.54	1100	JD
21.	~~unknown~~ a hydrocarbon	12.10	2600	JD
22. 000529-05-5	Azulene, 7-ethyl-1,4-dimethyl-	12.46	4000	JND
23.	~~unknown~~ a hydrocarbon	13.19	2400	JD
24.	~~unknown~~ a biphenyl (not chlorinated)	13.24	1500	JD
25.	~~unknown~~ a hydrocarbon	14.68	850	JD
26. 000613-12-7	Anthracene, 2-methyl-	14.82	1300	JND
27.	unknown	15.14	1700	JD
28.	(~~unknown~~) c	15.23	860	JD
29. 003674-69-9	Phenanthrene, 4,5-dimethyl-	15.34	660	JND
30. 001576-67-6	Phenanthrene, 3,6-dimethyl-	15.44	1200	JND
31. 001576-67-6	Phenanthrene, 3,6-dimethyl-	15.49	750	JND
32. 003674-66-6	Phenanthrene, 2,5-dimethyl-	15.61	950	JND
33.	(~~unknown~~) c	15.91	2700	JD
34. 003674-73-5	Phenanthrene, 2,3,5-trimethyl-	16.19	810	JND

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
SS-10

Lab Name: ANALab-Randolph Facility Contract:
Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1
Matrix: (soil/water) SOIL Lab Sample ID: 298139
Sample wt/vol: 30.08 (g/ml) G Lab File ID: J3478.D
Level: (low/med) LOW Date Received: 09/25/98
% Moisture: 8.5 decanted: (Y/N) N Date Extracted: 09/28/98
Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/09/98
Injection Volume: 2.0 (uL) Dilution Factor: 2.0
GPC Cleanup: (Y/N) Y pH: 7.48

Number TICs found: 36 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
35.	unknown hydrocarbon / phthalate mixture	16.90	840	JD
36.	unknown an amide	18.90	910	JD
37. 000544-76-3	Hexadecane	15.65	1,600	J
38. 000112-95-8	Eicosane	14.58	1,300	J
39. 006418-43-5	3-methyl Hexadecane	14.16	950	J
40. 001921-70-6	2,6,10,14-tetramethyl-Pentadecane	12.97	15,000	J
41. 017301-28-9	3,6-dimethyl-Undecane	12.26	11,000	J
42. 055045-07-3	2-methyl-5-propyl-Dodecane	10.58	9,900	J
43.	a hydrocarbon	9.82	4,400	J
44. 001560-96-9	2-methyl-Tridecane	9.77	1,900	J
45. 026730-12-1	4-methyl-Tridecane	9.73	3,000	J
46. 062016-34-6	2,3,7-trimethyl Octane	9.00	1,900	J
47. 017301-23-4	2,6-dimethyl Undecane	8.81	750	J
48. 006044-71-9	6-methyl Dodecane	8.45	850	J
49. 002847-72-5	4-methyl Decane	6.54	870	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
SS-11

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1

Matrix: (soil/water) SOIL Lab Sample ID: 298140

Sample wt/vol: 30.07 (g/ml) G Lab File ID: J3445.D

Level: (low/med) LOW Date Received: 09/25/98

% Moisture: 5.51 decanted: (Y/N) N Date Extracted: 09/28/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/08/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.16

CONCENTRATION UNITS:

Number TICs found: 8 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000243-17-4	11H-Benzo[b]fluorene	16.47	73	JN
2. 000301-02-0	9-Octadecenamide, (Z)-	16.92	520	JN
3.	unknown amide	18.95	590	J
4. 000205-82-3	Benzo[j]fluoranthene	19.83	150	JN
5.	~~unknown~~ hydrocarbon	21.38	140	J
6.	~~unknown~~ hydrocarbon	22.18	90	J
7.	unknown	22.53	110	J
8.	unknown	23.69	110	J
9. 000593-45-3	Octadecane	19.71	340	J
10. 000629-94-7	Heneicosane	20.94	850	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
SS-12RE

Lab Name: ANALab-Randolph Facility Contract:
Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1
Matrix: (soil/water) SOIL Lab Sample ID: 298141 RE
Sample wt/vol: 30.05 (g/ml) G Lab File ID: J3507.D
Level: (low/med) LOW Date Received: 09/25/98
% Moisture: 26.95 decanted: (Y/N) N Date Extracted: 09/28/98
Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/10/98
Injection Volume: 2.0 (uL) Dilution Factor: 2.0
GPC Cleanup: (Y/N) Y pH: 7.26

Number TICs found: 15 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000622-58-2	~~unknown~~ Benzene, 1-isocyanato-4-methyl	7.07	250	JD
2. 000106-49-0	p-Aminotoluene	7.18	350	JND
3. 000095-82-9	Benzenamine, 2,5-dichloro-	9.58	4000	JND
4. 000634-93-5	Benzenamine, 2,4,6-trichloro-	10.22	310	JND
5. 000093-37-8	Quinoline, 2,7-dimethyl-	10.34	210	JND
6.	unknown	11.73	240	JD
7. 000099-55-8	Benzenamine, 2-methyl-5-nitro-	11.88	1300	JND
8. 032444-63-6	2-Propenenitrile, 3-[4-(dimethyla	12.97	530	JND
9. 029509-92-0	Pyrimidine, 4-chloro-6-methyl-2-p	13.48	250	JND
10. 000129-43-1	9,10-Anthracenedione, 1-hydroxy	15.83	1600	JND
11. 000081-64-1	9,10-Anthracenedione, 1,4-dihydr	16.42	1500	JND
12.	unknown	17.40	1800	JD
13.	~~unknown~~ an amide	18.92	620	JD
14.	unknown	20.52	1800	JD
15.	unknown 21.97 ~~22.00~~	7,100 950		JD
16.	an amide	16.93	2,300	J
17.	a hydrocarbon	20.98	1,000	J
18.	unknown	21.29	1,700	J
19.	unknown	22.56	85.0	J
20. 000629-92-5	Nonadecane	14.59	51 U	J
21. 055045-11-9	5-propyl-Tridecane	12.85	1,200	J
22. 001560-96-9	2-methyl-Tridecane	12.78	430	J
23. 000630-01-3	Hexacosane	12.18	560	J
24. 000544-76-3	Hexadecane	11.68	370	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SS-13

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1

Matrix: (soil/water) SOIL Lab Sample ID: 298142

Sample wt/vol: 30.03 (g/ml) G Lab File ID: J3474.D

Level: (low/med) LOW Date Received: 09/25/98

% Moisture: 9.5 decanted: (Y/N) N Date Extracted: 09/28/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/09/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.55

Number TICs found: 6 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown	5.88	91	J
2. 000065-85-0	Benzoic Acid	8.01	160	JN
3. 000579-07-7	1,2-Propanedione, 1-phenyl-	8.06	98	JN
4.	unknown	9.56	100	J
5.	unknown	10.67	85	J
6.	unknown	14.97	100	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SS-14

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1

Matrix: (soil/water) SOIL Lab Sample ID: 298143

Sample wt/vol: 30.06 (g/ml) G Lab File ID: J3475.D

Level: (low/med) LOW Date Received: 09/25/98

% Moisture: 2.54 decanted: (Y/N) N Date Extracted: 09/28/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/09/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.22

Number TICs found: 23

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000095-51-2	o-Chloroaniline	7.70	87	JN
2.	~~unknown~~ a phthalate	14.42	150	J
3. 000613-12-7	Anthracene, 2-methyl-	14.72	86	JN
4. 000610-48-0	Anthracene, 1-methyl-	14.76	92	JN
5. 000610-48-0	Anthracene, 1-methyl-	14.89	130	JN
6. 000057-10-3	Hexadecanoic acid	14.99	71	JN
7. 000084-65-1	9,10-Anthracenedione	15.21	240	JN
8. 003674-66-6	Phenanthrene, 2,5-dimethyl-	15.56	76	JN
9.	unknown	15.60	70	J
10. 000081-64-1	9,10-Anthracenedione, 1,4-dihydr	16.41	140	JN
11. 002381-21-7	~~unknown~~ 1-methyl Pyrene	16.45	140	J
12. 000090-30-2	~~unknown~~ N-phenyl-1-Naphthalenamine	16.50	100	J
13.	~~unknown~~ an amide	16.90	310	J
14. 000082-05-3	7H-Benz[de]anthracen-7-one	17.05	100	JN
15.	~~unknown~~ a polyaromatic hydrocarbon	17.22	81	J
16. 001705-85-6	~~unknown~~ 2-methyl-Triphenylene	18.09	84	J
17. 034384-63-9	Indolo[2,3-a]quinolizine-2-ethanol,	18.48	87	JN
18.	~~unknown~~ an amide	18.92	1300	J
19. 000205-82-3	Benzo[j]fluoranthene	19.82	460	JN
20.	unknown	20.49	790	J
21.	unknown	21.98	290	J
22.	unknown	23.45	300	J
23.	unknown	23.51	220	J
24. 000629-59-4	Tetradecane	14.58	90	J
25. 000629-78-7	Heptadecane	12.76	80	J
26. 000112-95-8	Eicosane	11.67	100	J
27. 000544-76-3	Hexadecane	9.19	70	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
SS-15

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1

Matrix: (soil/water) SOIL Lab Sample ID: 298144

Sample wt/vol: 30 (g/ml) G Lab File ID: J3477.D

Level: (low/med) LOW Date Received: 09/25/98

% Moisture: 7.51 decanted: (Y/N) N Date Extracted: 09/28/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/09/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.08

Number TICs found: 30 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	000098-86-2	Acetophenone	7.05	110	JN
2.		unknown	7.69	97	J
3.	004292-75-5	~~unknown~~ Hexyl-Cyclohexane	8.70	81	J
4.	000090-12-0	Naphthalene, 1-methyl-	9.43	130	JN
5.	000000-00-0	Decahydro-4,4,8,9,10-pentameth	9.93	98	JN
6.	000581-42-0	Naphthalene, 2,6-dimethyl-	10.20	120	JN
7.	000581-40-8	Naphthalene, 2,3-dimethyl-	10.34	150	JN
8.		~~unknown~~ a polyaromatic hydrocarbon	10.37	200	J
9.	000000-00-0	Decahydro-4,4,8,9,10-pentameth	10.66	180	JN
10.	000829-26-5	Naphthalene, 2,3,6-trimethyl-	11.37	120	JN
11.		unknown a polyaromatic hydrocarbon	12.38	90	J
12.	000093-09-4	2-Naphthalenecarboxylic acid	12.96	78	JN
13.		unknown a phthalate	14.43	84	J
14.	000779-02-2	Anthracene, 9-methyl-	14.77	210	JN
15.		unknown a polyaromatic hydrocarbon	14.89	88	J
16.	020020-02-4	Naphthalene, 1,2,3,4-tetrachloro-	14.93	110	JN
17.	053555-64-9	Naphthalene, 1,3,5,7-tetrachloro-	15.10	140	JN
18.	055720-43-9	Naphthalene, 1,4,6,7-tetrachloro-	15.40	170	JN
19.	001576-67-6	Phenanthrene, 3,6-dimethyl-	15.56	97	JN
20.	003674-66-6	Phenanthrene, 2,5-dimethyl-	15.61	77	JN
21.		unknown	15.89	350	J
22.		unknown	16.45	1700	J
23.	041411-62-5	1,1'-Biphenyl, 2,3,3',4,5,6-hexachl	16.57	650	JN
24.	033979-03-2	1,1'-Biphenyl, 2,2',4,4',6,6'-hexac	16.78	620	JN
25.		unknown	16.93	660	J
26.		unknown	17.11	240	J
27.		unknown	17.16	1000	J
28.	052663-67-9	1,1'-Biphenyl, 2,2',3,3',5,5',6-hept	17.42	720	JN
29.		~~unknown~~ an Amide	18.95	760	J
30.		unknown	21.00	730	J
31.	000629-78-7	Heptadecane	20.92	720	J
32.		a hydrocarbon	17.87	420	J
33.	000629-97-0	Docosane	16.63	210	J
34.	000544-76-3	Hexadecane	16.21	310	J
35.	000112-95-8	Eicosane	15.22	380	J
36.	000629-92-5	Nonadecane	14.59	240	J
37.	001921-70-6	2,6,10,14 Tetramethyl Pentadecane	12.84	270	J

1061

(over)

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SS-16

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1

Matrix: (soil/water) SOIL Lab Sample ID: 298145

Sample wt/vol: 1.06 (g/ml) G Lab File ID: J3446.D

Level: (low/med) MED Date Received: 09/25/98

% Moisture: 10.06 decanted: (Y/N) N Date Extracted: 09/28/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/08/98

Injection Volume: 2.0 (uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) Y pH: 6.85

Number TICs found: 23 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		unknown	16.61	11000	JD
2.	007560-49-8	2-Propenoic acid, 3-(3,4,5-trimeth	16.81	16000	JND
3.	000301-02-0	9-Octadecenamide, (Z)-	16.93	20000	JND
4.		unknown	17.35	18000	JD
5.	000116-85-8	9,10-Anthracenedione, 1-amino-4	17.63	11000	JND
6.	084305-82-8	6-(2-Formylhydrazino)-N,N'-bis(is	18.00	61000	JND
7.		unknown	18.66	14000	JD
8.		~~unknown~~ an amide	18.95	16000	JD
9.		unknown	19.01	100000	JD
10.		unknown	19.18	27000	JD
11.		unknown	19.52	17000	JD
12.		unknown	20.56	360000	JD
13.		unknown	20.75	26000	JD
14.		unknown	21.33	66000	JD
15.		~~unknown~~ a poly aromatic hydrocarbon	21.38	11000	JD
16.		unknown	21.42	35000	JD
17.		unknown	22.06	280000	JD
18.		unknown	22.61	39000	JD
19.	000095-53-4	Benzenamine, 2-methyl-	7.14	38000	JND
20.	000102-04-5	2-Propanone, 1,3-diphenyl-	14.60	18000	JND
21.	000129-43-1	9,10-Anthracenedione, 1-hydroxy	15.84	34000	JND
22.		unknown	16.22	12000	JD
23.	000081-64-1	9,10-Anthracenedione, 1,4-dihydr	16.43	96000	JND

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
SS-17

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1

Matrix: (soil/water) SOIL Lab Sample ID: 298146

Sample wt/vol: 1 (g/ml) G Lab File ID: J3447.D

Level: (low/med) MED Date Received: 09/25/98

% Moisture: 10.31 decanted: (Y/N) N Date Extracted: 09/28/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/08/98

Injection Volume: 2.0 (uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) Y pH: 6.97

Number TICs found: 8 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000106-49-0	p-Aminotoluene	7.14	79000	JND
2. 000129-43-1	9,10-Anthracenedione, 1-hydroxy	15.83	82000	JND
3. 000081-64-1	9,10-Anthracenedione, 1,4-dihydr	16.48	1400000	JND
4.	unknown polyaromatic hydrocarbon	16.80	170000	JD
5.	unknown	20.52	320000	JD
6.	unknown	21.45	1100000	JD
7.	unknown	22.18	5200000	JD
8.	unknown	26.28	360000	JD

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
SS-18

Lab Name: ANALab-Randolph Facility Contract:
Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1
Matrix: (soil/water) SOIL Lab Sample ID: 298147
Sample wt/vol: 1.03 (g/ml) G Lab File ID: J3431.D
Level: (low/med) MED Date Received: 09/25/98
% Moisture: 5.12 decanted: (Y/N) N Date Extracted: 09/28/98
Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/08/98
Injection Volume: 2.0 (uL) Dilution Factor: 1.0
GPC Cleanup: (Y/N) Y pH: 7.65

Number TICs found: 11 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000135-88-6	2-Naphthalenamine, N-phenyl-	16.52	3800	JN
2.	unknown	17.38	2300	J
3. 000629-54-9	Hexadecanamide	18.95	3200	JN
4.	unknown	19.05	2600	J
5.	unknown	19.44	10000	J
6. 000121-69-7	unknown N,N-dimethyl-Benzenamine	19.62	13000	J
7. 000192-97-2	Benzo[e]pyrene	19.84	3700	JN
8.	unknown	20.51	5100	J
9.	unknown	20.58	2100	J
10.	unknown	22.01	9100	J
11.	unknown	24.30	4400	J
12. 000593-49-7	Heptacosane	21.81	2600	J
13. 000112-95-8	Eicosane	21.38	6100	J
14. 000544-76-3	Hexadecane	20.93	4400	J
15. 000629-97-0	Docosane	20.40	3500	J
16. 000629-92-5	Nonadecane	19.70	3300	J
17.	a hydrocarbon	18.99	3700	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SS-19

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1

Matrix: (soil/water) SOIL Lab Sample ID: 298148

Sample wt/vol: 30.04 (g/ml) G Lab File ID: J3463.D

Level: (low/med) LOW Date Received: 09/25/98

% Moisture: 7.35 decanted: (Y/N) N Date Extracted: 09/28/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/09/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7

Number TICs found: 11 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000106-47-8	p-Chloroaniline	7.71	81	JN
2.	unknown a polyaromatic hydrocarbon	14.89	91	J
3. 000081-64-1	9,10-Anthracenedione, 1,4-dihydr	16.41	180	JN
4.	unknown a polyaromatic hydrocarbon	16.45	130	J
5.	unknown a polyaromatic hydrocarbon	16.78	79	J
6.	unknown an amide	16.91	410	J
7. 000301-02-0	9-Octadecenamide, (Z)-	18.94	870	JN
8.	unknown	20.51	640	J
9.	unknown	21.00	500	J
10.	unknown	21.38	1200	J
11.	unknown	22.00	870	J
12. 000629-99-2	Pentacosane	20.93	470	J
13. 000629-97-0	Docosane	20.39	310	J
14. 000629-78-7	Heptadecane	19.70	570	J
15. 000544-76-3	Hexadecane	17.86	170	J
16. 000629-59-4	Tetradecane	17.01	90	J
17. 000593-45-3	Octadecane	17.42	80	J
18. 000112-95-8	Eicosane	16.21	80	J
19. 000629-62-9	Pentadecane	15.22	200	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SS-20

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1

Matrix: (soil/water) SOIL Lab Sample ID: 298149

Sample wt/vol: 1.05 (g/ml) G Lab File ID: J3432.D

Level: (low/med) MED Date Received: 09/25/98

% Moisture: 6.73 decanted: (Y/N) N Date Extracted: 09/28/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/08/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 6.92

Number TICs found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	~~unknown~~ an amide	18.95	2500	J
2. 000192-97-2	Benzo[e]pyrene	19.84	3300	JN
3.	unknown	20.52	3300	J
4.	unknown	22.00	3500	J
5.	~~unknown~~ a polyaromatic hydrocarbon	22.29	4000	J
6.	~~unknown~~ a polyaromatic hydrocarbon	22.43	3800	J
7.	unknown	22.53	2600	J
8.	~~unknown~~ a polyaromatic hydrocarbon	23.50	2100	J
9.	unknown	24.30	2200	J
10.	unknown	26.16	3800	J
11. 055333-99-8	7-hexyl-Eicosane	21.37	4900	J
12. 007225-64-1	9-octyl-heptadecane	20.93	4800	J
13. 000593-49-7	Heptacosane	20.40	4300	J
14. 000629-92-5	Nonadecane	19.71	6100	J
15.	a hydrocarbon	18.99	3900	J
16. 000593-45-3	Octadecane	18.39	2700	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SS-21

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1

Matrix: (soil/water) SOIL Lab Sample ID: 298150

Sample wt/vol: 30.06 (g/ml) G Lab File ID: J3464.D

Level: (low/med) LOW Date Received: 09/25/98

% Moisture: 6.34 decanted: (Y/N) N Date Extracted: 09/28/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/09/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.16

Number TICs found: 44

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	000102-36-3	Benzene, 1,2-dichloro-4-isocyana	9.34	280	JN
2.	000095-82-9	Benzenamine, 2,5-dichloro-	9.58	660	JN
3.	000099-55-8	Benzenamine, 2-methyl-5-nitro-	11.87	130	JN
4.	005131-60-2	1,3-Benzenediamine, 4-chloro-	12.97	140	JN
5.	000486-25-9	9H-Fluoren-9-one	13.45	200	JN
6.		unknown poly aromatic hydrocarbon	13.56	92	J
7.	000132-65-0	Dibenzothiophene	13.60	170	JN
8.	000085-02-9	Benzo[f]quinoline	14.21	100	JN
9.		unknown *	14.44	110	J
10.	007372-88-5	Dibenzothiophene, 4-methyl-	14.58	150	JN
11.	000610-48-0	Anthracene, 1-methyl-	14.73	290	JN
12.	000613-12-7	Anthracene, 2-methyl-	14.77	340	JN
13.	000610-48-0	Anthracene, 1-methyl-	14.83	120	JN
14.	000203-64-5	4H-Cyclopenta[def]phenanthrene	14.89	460	JN
15.	000613-12-7	Anthracene, 2-methyl-	14.93	140	JN
16.	000084-65-1	9,10-Anthracenedione	15.23	620	JN
17.	003674-66-6	Phenanthrene, 2,5-dimethyl-	15.41	120	JN
18.	001576-67-6	Phenanthrene, 3,6-dimethyl-	15.46	120	JN
19.	003674-66-6	Phenanthrene, 2,5-dimethyl-	15.57	140	JN
20.		unknown a poly aromatic hydrocarbon	15.61	150	J
21.	000238-84-6	11H-Benzo[a]fluorene	16.47	250	JN
22.	000243-17-4	unknown 11H-Benzo[b]fluorene	16.54	99	J
23.	002381-21-7	Pyrene, 1-methyl-	16.58	130	JN
24.		unknown	16.61	120	J
25.	000082-05-3	7H-Benz[de]anthracen-7-one	17.07	140	JN
26.	000239-35-0	Benzo[b]naphtho[2,1-d]thiophene	17.19	120	JN
27.		unknown a polyaromatic hydrocarbon	17.23	130	J
28.	000082-05-3	7H-Benz[de]anthracen-7-one	17.32	100	JN
29.	001705-84-6	Triphenylene, 2-methyl-	18.11	180	JN
30.	001705-85-7	Chrysene, 6-methyl-	18.17	100	JN
31.		unknown an amide	18.93	240	J
32.		unknown a poly aromatic hydrocarbon	18.97	340	J
33.	000192-97-2	Benzo[e]pyrene	19.48	420	JN
34.	000205-82-3	Benzo[j]fluoranthene	19.85	1200	JN

* mixture of a dibenzothiophene and a poly aromatic hydrocarbon

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
SS-21

Lab Name: ANALab-Randolph Facility Contract:
Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1
Matrix: (soil/water) SOIL Lab Sample ID: 298150
Sample wt/vol: 30.06 (g/ml) G Lab File ID: J3464.D
Level: (low/med) LOW Date Received: 09/25/98
% Moisture: 6.34 decanted: (Y/N) N Date Extracted: 09/28/98
Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/09/98
Injection Volume: 2.0 (uL) Dilution Factor: 1.0
GPC Cleanup: (Y/N) Y pH: 7.16

Number TICs found: 44 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
35.	~~unknown~~ a polyaromatic hydrocarbon	20.50	220	J
36.	~~unknown~~ a polyaromatic hydrocarbon	21.46	350	J
37.	unknown	21.79	230	J
38.	unknown	21.99	490	J
39.	unknown	22.26	350	J
40.	unknown	22.39	190	J
41.	unknown	22.50	460	J
42.	unknown	22.87	180	J
43.	~~unknown~~ a polyaromatic hydrocarbon	23.46	170	J
44.	unknown	26.06	340	J
45. 054833-48-6	2,6,10,15-Tetramethyl Heptadecane	21.36	510	J
46. 000544-76-3	Hexadecane	20.92	410	J
47. 000112-95-8	Eicosane	20.37	330	J
48. 000593-45-3	Octadecane	19.68	760	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SS-22

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1

Matrix: (soil/water) SOIL Lab Sample ID: 298151

Sample wt/vol: 30.05 (g/ml) G Lab File ID: J3465.D

Level: (low/med) LOW Date Received: 09/25/98

% Moisture: 26.23 decanted: (Y/N) N Date Extracted: 09/28/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/09/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.49

Number TICs found: 45 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	000102-36-3	Benzene, 1,2-dichloro-4-isocyana	9.34	240	JN
2.	000095-82-9	Benzenamine, 2,5-dichloro-	9.57	340	JN
3.		~~unknown~~ a polyaromatic hydrocarbon	11.57	160	J
4.	000486-25-9	9H-Fluoren-9-one	13.44	230	JN
5.	000605-02-7	Naphthalene, 1-phenyl-	14.44	380	JN
6.	016587-52-3	Dibenzothiophene, 3-methyl-	14.58	200	JN
7.	000613-12-7	Anthracene, 2-methyl-	14.73	280	JN
8.	000610-48-0	Anthracene, 1-methyl-	14.77	340	JN
9.	000613-12-7	Anthracene, 2-methyl-	14.83	270	JN
10.	002531-84-2	Phenanthrene, 2-methyl-	14.90	780	JN
11.	000779-02-2	Anthracene, 9-methyl-	14.94	320	JN
12.	000057-10-3	~~unknown~~ Hexadecanoic Acid	15.00	250	J
13.	001207-15-4	2,8-Dimethyldibenzo(B,D)thiophe	15.12	220	JN
14.	035465-71-5	2-Phenylnaphthalene	15.21	500	JN
15.	000084-65-1	9,10-Anthracenedione	15.24	490	JN
16.	001576-67-6	Phenanthrene, 3,6-dimethyl-	15.41	330	JN
17.	001576-67-6	Phenanthrene, 3,6-dimethyl-	15.47	310	JN
18.	001576-67-6	Phenanthrene, 3,6-dimethyl-	15.49	250	JN
19.	003674-66-6	Phenanthrene, 2,5-dimethyl-	15.59	1100	JN
20.	001576-67-6	Phenanthrene, 3,6-dimethyl-	15.62	310	JN
21.	005737-13-3	Cyclopenta(def)phenanthrenone	15.70	200	JN
22.		~~unknown~~ a polyaromatic hydrocarbon	15.87	230	J
23.		~~unknown~~ a polyaromatic hydrocarbon	16.20	280	J
24.	000238-84-6	11H-Benzo[a]fluorene	16.48	620	JN
25.	003442-78-2	Pyrene, 2-methyl-	16.60	480	JN
26.	002381-21-7	Pyrene, 1-methyl-	16.70	310	JN
27.	002381-21-7	Pyrene, 1-methyl-	16.73	200	JN
28.	000082-05-3	7H-Benz[de]anthracen-7-one	17.09	320	JN
29.	000239-35-0	Benzo[b]naphtho[2,1-d]thiophene	17.20	330	JN
30.		~~unknown~~ a polyaromatic hydrocarbon	17.25	360	J
31.	003351-28-8	Chrysene, 1-methyl-	18.14	340	JN
32.	003351-28-8	Chrysene, 1-methyl-	18.21	190	JN
33.		~~unknown~~ a polyaromatic hydrocarbon	18.36	260	J
34.		~~unknown~~ an amide	18.95	420	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
SS-22

Lab Name: ANALab-Randolph Facility Contract:
Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1
Matrix: (soil/water) SOIL Lab Sample ID: 298151
Sample wt/vol: 30.05 (g/ml) G Lab File ID: J3465.D
Level: (low/med) LOW Date Received: 09/25/98
% Moisture: 26.23 decanted: (Y/N) N Date Extracted: 09/28/98
Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/09/98
Injection Volume: 2.0 (uL) Dilution Factor: 1.0
GPC Cleanup: (Y/N) Y pH: 7.49

Number TICs found: 45 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
35. 000205-82-3	Benzo[j]fluoranthene	19.53	920	JN
36. 000192-97-2	Benzo[e]pyrene	19.90	2200	JN
37.	unknown	20.39	490	J
38.	unknown	20.52	360	J
39.	unknown	20.81	250	J
40.	unknown	21.37	820	J
41. 000053-70-3	Dibenz[a,h]anthracene	21.47	600	JN
42. 000053-70-3	Dibenz[a,h]anthracene	21.79	280	JN
43.	unknown	21.99	580	J
44.	unknown	22.88	790	J
45. 000192-65-4	Naphtho[1,2,3,4-def]chrysene	23.47	330	JN
46. 000629-97-0	Docosane	20.92	780	J
47. 1000629-92-5	Nonadecane	19.70	1500	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
SS-23

Lab Name: ANALab-Randolph Facility Contract:
Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1
Matrix: (soil/water) SOIL Lab Sample ID: 298152
Sample wt/vol: 30.08 (g/ml) G Lab File ID: J3476.D
Level: (low/med) LOW Date Received: 09/25/98
% Moisture: 4.2 decanted: (Y/N) N Date Extracted: 09/28/98
Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/09/98
Injection Volume: 2.0 (uL) Dilution Factor: 1.0
GPC Cleanup: (Y/N) Y pH: 8.27

CONCENTRATION UNITS:
Number TICs found: 40 (ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	000098-86-2	~~unknown~~ Acetophenone	7.06	72	J
2.	000095-51-2	o-Chloroaniline	7.70	630	JN
3.	000102-36-3	Benzene, 1,2-dichloro-4-isocyana	9.34	89	JN
4.	000090-12-0	Naphthalene, 1-methyl-	9.43	120	JN
5.	000095-82-9	Benzenamine, 2,5-dichloro-	9.57	480	JN
6.		unknown	9.73	76	J
7.	000581-40-8	Naphthalene, 2,3-dimethyl-	10.33	170	JN
8.	002245-38-7	Naphthalene, 1,6,7-trimethyl-	11.52	77	JN
9.	000099-55-8	Benzenamine, 2-methyl-5-nitro-	11.86	110	JN
10.		~~unknown~~ a polyaromatic hydrocarbon	11.91	100	J
11.	007320-53-8	Dibenzofuran, 4-methyl-	12.10	120	JN
12.	000121-87-9	Benzenamine, 2-chloro-4-nitro-	12.97	130	JN
13.		~~unknown~~ a substituted benzene	13.38	76	J
14.	000486-25-9	9H-Fluoren-9-one	13.44	190	JN
15.	020071-09-4	Benzene, 1,1'-(1,2-cyclobutanedi	13.52	88	JN
16.	000132-65-0	Dibenzothiophene	13.59	210	JN
17.		unknown	14.02	100	J
18.		unknown	14.15	71	J
19.	000085-02-9	Benzo[f]quinoline	14.20	85	JN
20.	002444-68-0	Anthracene, 9-ethenyl-	14.44	120	JN
21.	000610-48-0	Anthracene, 1-methyl-	14.73	250	JN
22.	000613-12-7	Anthracene, 2-methyl-	14.77	290	JN
23.	000610-48-0	Anthracene, 1-methyl-	14.83	150	JN
24.		~~unknown~~ a polyaromatic hydrocarbon	14.89	480	J
25.	000832-64-4	Phenanthrene, 4-methyl-	14.93	150	JN
26.	000057-10-3	Hexadecanoic acid	15.00	100	JN
27.	000084-65-1	9,10-Anthracenedione	15.22	530	JN
28.	001576-67-6	Phenanthrene, 3,6-dimethyl-	15.46	89	JN
29.	003674-66-6	Phenanthrene, 2,5-dimethyl-	15.57	110	JN
30.	000129-43-1	9,10-Anthracenedione, 1-hydroxy	15.84	100	JN
31.		unknown	15.93	140	J
32.	000243-42-5	Benzo[b]naphtho[2,3-d]furan	16.13	85	JN
33.	000081-64-1	9,10-Anthracenedione, 1,4-dihydr	16.42	100	JN
34.	000238-84-6	11H-Benzo[a]fluorene	16.46	210	JN

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SS-23

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1

Matrix: (soil/water) SOIL Lab Sample ID: 298152

Sample wt/vol: 30.08 (g/ml) G Lab File ID: J3476.D

Level: (low/med) LOW Date Received: 09/25/98

% Moisture: 4.2 decanted: (Y/N) N Date Extracted: 09/28/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/09/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.27

Number TICs found: 40 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
35. 000135-88-6	2-Naphthalenamine, N-phenyl-	16.51	180	JN
36. 003442-78-2	Pyrene, 2-methyl-	16.59	86	JN
37. 000243-46-9	Benzo[b]naphtho[2,3-d]thiophene	17.19	140	JN
38.	unknown	17.38	210	J
39.	unknown	22.00	780	J
40.	unknown	23.16	920	J
41. 000629-59-4	Tetradecane	20.93	680	J
42.	a mixture of hydrocarbon and a Thiophene	14.58	150	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SS-24

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SS-1

Matrix: (soil/water) SOIL Lab Sample ID: 298153

Sample wt/vol: 30.1 (g/ml) G Lab File ID: J3473.D

Level: (low/med) LOW Date Received: 09/25/98

% Moisture: 18.29 decanted: (Y/N) N Date Extracted: 09/28/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/09/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.8

CONCENTRATION UNITS:

Number TICs found: 28 (ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	000098-86-2	Acetophenone	7.05	110	JN
2.	000095-51-2	o-Chloroaniline	7.70	510	JN
3.	000099-99-0	Benzene, 1-methyl-4-nitro-	8.53	110	JN
4.	000090-12-0	Naphthalene, 1-methyl-	9.42	230	JN
5.	000095-82-9	Benzenamine, 2,5-dichloro-	9.57	840	JN
6.	000100-17-4	Benzene, 1-methoxy-4-nitro-	10.10	300	JN
7.	000581-42-0	Naphthalene, 2,6-dimethyl-	10.20	260	JN
8.	000581-40-8	Naphthalene, 2,3-dimethyl-	10.33	230	JN
9.	000571-61-9	Naphthalene, 1,5-dimethyl-	10.36	120	JN
10.	000581-40-8	Naphthalene, 2,3-dimethyl-	10.49	85	JN
11.	002027-17-0	Naphthalene, 2-(1-methylethyl)-	10.99	86	JN
12.	002131-42-2	Naphthalene, 1,4,6-trimethyl-	11.23	98	JN
13.	000099-55-8	Benzenamine, 2-methyl-5-nitro-	11.86	210	JN
14.		~~unknown~~ a polyaromatic hydrocarbon	11.92	130	J
15.		~~unknown~~ a polyaromatic hydrocarbon	11.99	82	J
16.		unknown	12.10	94	J
17.		unknown	12.85	96	J
18.	000505-57-7	2-Hexenal	12.99	640	JN
19.	000099-59-2	Benzenamine, 2-methoxy-5-nitro-	13.34	350	JN
20.		unknown	13.38	130	J
21.	000486-25-9	9H-Fluoren-9-one	13.46	450	JN
22.	000132-65-0	Dibenzothiophene	13.60	290	JN
23.		~~unknown~~ a polyaromatic hydrocarbon	14.45	160	J
24.	000610-48-0	Anthracene, 1-methyl-	14.74	330	JN
25.	000610-48-0	Anthracene, 1-methyl-	14.78	450	JN
26.		~~unknown~~ a polyaromatic hydrocarbon	14.91	670	J
27.	000610-48-0	Anthracene, 1-methyl-	14.95	250	JN
28.	000084-65-1	9,10-Anthracenedione	15.24	860	JN
29.	000629-50-5	Tridecane	11.68	80	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET EPA SAMPLE NO.

TENTATIVELY IDENTIFIED COMPOUNDS

SB-1

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: SB1

Matrix: (soil/water) SOIL Lab Sample ID: 299047

Sample wt/vol: 30.08 (g/ml) G Lab File ID: J3776.D

Level: (low/med) LOW Date Received: 10/07/98

% Moisture: 41.16 decanted: (Y/N) N Date Extracted: 10/13/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/23/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 6.85

CONCENTRATION UNITS:

Number TICs found: 34 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown	6.71	2100	J
2.	unknown	6.77	410	J
3. 000100-00-5	Benzene, 1-chloro-4-nitro-	8.50	2800	JN
4. 000090-12-0	Naphthalene, 1-methyl-	9.24	260	JN
5. 000581-42-0	Naphthalene, 2,6-dimethyl-	10.02	280	JN
6. 000581-40-8	Naphthalene, 2,3-dimethyl-	10.14	390	JN
7. 000571-58-4	Naphthalene, 1,4-dimethyl-	10.31	380	JN
8. 007320-53-8	Dibenzofuran, 4-methyl-	11.84	340	JN
9. 006283-25-6	Benzenamine, 2-chloro-5-nitro-	12.78	990	JN
10. 000099-30-9	2,6-Dichloro-4-nitroaniline	13.05	280	JN
11. 000203-64-5	4H-Cyclopenta[def]phenanthrene	14.69	180	JN
12. 005737-13-3	Cyclopenta(def)phenanthrenone	15.50	190	JN
13.	unknown poly aromatic hydrocarbon	15.76	190	J
14. 000243-42-5	Benzo[b]naphtho[2,3-d]furan	16.02	250	JN
15. 001210-12-4	9-Anthracenecarbonitrile	16.05	170	JN
16. 000238-84-6	11H-Benzo[a]fluorene	16.29	630	JN
17. 000243-17-4	11H-Benzo[b]fluorene	16.37	210	JN
18. 003442-78-2	Pyrene, 2-methyl-	16.41	210	JN
19. 000084-15-1	o-Terphenyl	16.79	390	JN
20. 000082-05-3	7H-Benz[de]anthracen-7-one	16.89	250	JN
21. 000243-46-9	Benzo[b]naphtho[2,3-d]thiophene	17.00	230	JN
22.	unknown Poly aromatic hydrocarbon	17.04	600	J
23.	unknown poly aromatic hydrocarbon	17.09	200	J
24. 000082-05-3	7H-Benz[de]anthracen-7-one	17.14	250	JN
25. 003646-57-9	Diazene, bis(4-nitrophenyl)-	17.63	630	JN
26. 001705-84-6	Triphenylene, 2-methyl-	17.87	210	JN
27. 000205-82-3	Benzo[j]fluoranthene	19.15	460	JN
28.	unknown poly aromatic hydrocarbon	19.27	230	J
29. 000205-82-3	Benzo[j]fluoranthene	19.62	1700	JN
30. 000192-97-2	Benzo[e]pyrene	19.78	1100	JN
31.	unknown	19.83	960	J
32.	unknown poly aromatic hydrocarbon	21.24	380	J
33. 000000-00-0	1,2:3,4-Dibenzpyrene	23.14	230	JN
34.	unknown polyaromatic hydrocarbon	23.85	320	J

* are back to hydrocarbons

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
SB-1DL

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: SB1

Matrix: (soil/water) SOIL Lab Sample ID: 299047 DL

Sample wt/vol: 30.08 (g/ml) G Lab File ID: J3840.D

Level: (low/med) LOW Date Received: 10/07/98

% Moisture: 41.16 decanted: (Y/N) N Date Extracted: 10/13/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/27/98

Injection Volume: 2.0 (uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) Y pH: 6.85

CONCENTRATION UNITS:

Number TICs found: 28 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000121-73-3	Benzene, 1-chloro-3-nitro-	8.45	2700	JND
2. 000090-12-0	Naphthalene, 1-methyl-	9.20	350	JND
3. 000575-37-1	Naphthalene, 1,7-dimethyl-	9.99	310	JND
4. 000581-40-8	Naphthalene, 2,3-dimethyl-	10.11	390	JND
5. 002245-38-7	Naphthalene, 1,6,7-trimethyl-	11.13	310	JND
6. 007320-53-8	Dibenzofuran, 4-methyl-	11.82	320	JND
7. 007320-53-8	Dibenzofuran, 4-methyl-	11.95	410	JND
8.	unknown	12.08	370	JD
9. 000121-87-9	Benzenamine, 2-chloro-4-nitro-	12.82	1500	JND
10. 000099-30-9	2,6-Dichloro-4-nitroaniline	13.08	430	JND
11. 000203-64-5	4H-Cyclopenta[def]phenanthrene	14.71	260	JND
12.	unknown	15.79	300	JD
13.	unknown	16.05	740	JD
14. 000238-84-6	11H-Benzo[a]fluorene	16.33	650	JND
15.	unknown	16.43	760	JD
16. 002381-21-7	Pyrene, 1-methyl-	16.58	350	JND
17. 000084-15-1	o-Terphenyl	16.83	290	JND
18. 000123-95-5	Octadecanoic acid, butyl ester	16.86	570	JND
19. 000082-05-3	7H-Benz[de]anthracen-7-one	16.94	280	JND
20.	unknown	16.96	280	JD
21.	unknown	17.08	550	JD
22.	unknown	17.14	240	JD
23.	unknown	17.21	340	JD
24.	unknown	17.46	230	JD
25.	unknown	18.22	460	JD
26. 000192-97-2	Benzo[e]pyrene	19.60	1600	JND
27.	unknown	20.10	620	JD
28.	unknown	20.29	630	JD

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SB-2

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: SB1

Matrix: (soil/water) SOIL Lab Sample ID: 299048

Sample wt/vol: 30.1 (g/ml) G Lab File ID: J3828.D

Level: (low/med) LOW Date Received: 10/07/98

% Moisture: 19.62 decanted: (Y/N) N Date Extracted: 10/13/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/27/98

Injection Volume: 2.0 (uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) Y pH: 6.48

CONCENTRATION UNITS:

Number TICs found: 13 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown	5.67	440	JD
2. 000108-42-9	m-Chloroaniline	7.49	650	JND
3. 000084-65-1	9,10-Anthracenedione	15.00	190	JND
4.	unknown a pyrethroid	15.36	880	JD
5. 007704-34-9	Sulfur	15.44	330	JND
6. 000081-64-1	9,10-Anthracenedione, 1,4-dihydr	16.22	350	JND
7. 000135-88-6	2-Naphthalenamine, N-phenyl-	16.31	270	JND
8.	unknown	18.61	250	JD
9.	unknown	19.02	340	JD
10.	unknown	20.17	2500	JD
11.	unknown	21.12	200	JD
12.	unknown	21.72	1300	JD
13.	unknown a hydrocarbon	23.08	850	JD
	Triacontane	17.62	210	
	a hydrocarbon	18.09	210	
	Nonadecane	19.31	390	

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SB-3

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SB1

Matrix: (soil/water) SOIL Lab Sample ID: 299049

Sample wt/vol: 30.08 (g/ml) G Lab File ID: J3829.D

Level: (low/med) LOW Date Received: 10/07/98

% Moisture: 24.21 decanted: (Y/N) N Date Extracted: 10/13/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/27/98

Injection Volume: 2.0 (uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) Y pH: 6.69

Number TICs found: 23 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	~~unknown~~ a hydrocarbon	6.61	260	JD
2.	~~unknown~~ a alkyaromatic hydrocarbon	6.73	820	JD
3.	~~unknown~~ a hydrocarbon	6.84	290	JD
4.	~~unknown~~ a hydrocarbon	6.95	700	JD
5.	unknown	7.22	250	JD
6. 002958-76-1	Naphthalene, decahydro-2-methy	7.31	340	JND
7. 000527-53-7	Benzene, 1,2,3,5-tetramethyl-	7.41	230	JND
8. 000095-51-2	o-Chloroaniline	7.49	1100	JND
9. 002039-89-6	Benzene, 2-ethenyl-1,4-dimethyl-	7.70	410	JND
10.	unknown a hydrocarbon	8.16	310	JD
11. 054676-39-0	Cyclohexane, 2-butyl-1,1,3-trimet	8.38	1000	JND
12.	unknown	8.50	480	JD
13.	unknown	8.60	580	JD
14. 024949-42-6	6-Tridecene, 7-methyl-	8.89	280	JND
15.	unknown	9.12	320	JD
16.	unknown a hydrocarbon	9.43	1800	JD
17.	unknown a hydrocarbon	9.47	1800	JD
18.	unknown a hydrocarbon	9.74	1200	JD
19. 054965-05-8	Cyclohexane, 1,1,3-trimethyl-2-(3	9.82	1300	JND
20. 000582-16-1	Naphthalene, 2,7-dimethyl-	10.16	2200	JND
21.	unknown	10.19	2600	JD
22.	unknown a hydrocarbon	10.48	3300	JD
23.	unknown	11.27	1500	JD
	3,3-dimethyl octane	6.34	240	J
	2,6-dimethyl undecane	8.25	480	J
	4,6-dimethyl dodecane	8.78	800	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
SB-4

Lab Name: ANALab-Randolph Facility Contract:
Lab Code: ANA Case No.: SAS No.: SDG No.: SB1
Matrix: (soil/water) SOIL Lab Sample ID: 299050
Sample wt/vol: 30.09 (g/ml) G Lab File ID: J3777.D
Level: (low/med) LOW Date Received: 10/07/98
% Moisture: 10.92 decanted: (Y/N) N Date Extracted: 10/13/98
Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/23/98
Injection Volume: 2.0 (uL) Dilution Factor: 1.0
GPC Cleanup: (Y/N) Y pH: 6.79

CONCENTRATION UNITS:
Number TICs found: 4 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown	6.69	200	J
2.	unknown	18.66	730	J
3.	unknown a hydrocarbon	5.60	2200	J
4.	unknown	6.08	1300	J
5.	Tetradecane	9.86	110	J
6.	2,6,10,14-Tetramethylheptadecane	10.35	200	J
7.	Dodecane	11.17	~~700~~ 150	J
8.	Hexadecane	11.47	320	J
9.	2-methyl Nonadecane	11.95	390	J
10.	Heptadecane	12.51	660	J
11.	3,6-Dimethyl Undecane	12.59	120	J
12.	Octadecane	13.72	970	J
13.	Nonadecane	14.43	570	J
14.	Pentadecane	15.67	480	J
15.	Docosane	16.67	150	J
16.	Octadecane	16.48	90	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SB-5

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SB1

Matrix: (soil/water) SOIL Lab Sample ID: 299051

Sample wt/vol: 30.13 (g/ml) G Lab File ID: J3778.D

Level: (low/med) LOW Date Received: 10/07/98

% Moisture: 28.57 decanted: (Y/N) N Date Extracted: 10/13/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/23/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 6.21

CONCENTRATION UNITS:

Number TICs found: 8 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown	6.69	430	J
2.	unknown	6.77	210	J
3.	unknown	16.00	98	J
4. 000081-64-1	9,10-Anthracenedione, 1,4-dihydroxy	16.24	200	JN
5.	unknown	20.20	510	J
6.	unknown	23.85	160	J
7.	unknown	5.58	680	J
8.	unknown	6.07	1100	J
9. 017301-26-7/2	9-dimethyl undecane	18.67	100	J
10. 000630-06-8	Hexatriacontane	19.33	130	J
11. 007098-22-8	Tetratetracontane	20.09	140	J
12. 000629-94-7	Heneicosane	20.68	190	J
13. 000593-49-7	Heptacosane	21.15	250	J
14. 007225-64-1	9-octyl-heptadecane	21.56	260	J
15. 000630-07-9	Pentatriacontane	22.01	220	J
16. ~~000593-49-7 Heptacosane~~ 000630-06-8	Hexatriacontane	22.50	190	J
17. 001560-84-5	2-methyl-Eicosane	23.04	130	J
18. 000629-97-0	Docosane	23.66	107	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET EPA SAMPLE NO.

TENTATIVELY IDENTIFIED COMPOUNDS

SB-6

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: SB1

Matrix: (soil/water) SOIL Lab Sample ID: 299052

Sample wt/vol: 30.1 (g/ml) G Lab File ID: J3779.D

Level: (low/med) LOW Date Received: 10/07/98

% Moisture: 18.51 decanted: (Y/N) N Date Extracted: 10/13/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/23/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 6.44

CONCENTRATION UNITS:

Number TICs found: 38 (ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		unknown	6.69	210	J
2.		unknown	11.15	100	J
3.	000486-25-9	9H-Fluoren-9-one	13.18	270	JN
4.	000132-65-0	Dibenzothiophene	13.34	220	JN
5.	000229-87-8	Phenanthridine	13.99	89	JN
6.		unknown ~~Phenol~~ phthalate	14.23	120	J
7.	000610-48-0	Anthracene, 1-methyl-	14.52	240	JN
8.	002531-84-2	Phenanthrene, 2-methyl-	14.56	310	JN
9.	000610-48-0	Anthracene, 1-methyl-	14.63	110	JN
10.	000203-64-5	4H-Cyclopenta[def]phenanthrene	14.69	460	JN
11.	000779-02-2	Anthracene, 9-methyl-	14.73	170	JN
12.	035465-71-5	2-Phenylnaphthalene	15.00	220	JN
13.	000084-65-1	9,10-Anthracenedione	15.04	510	JN
14.	003674-69-9	Phenanthrene, 4,5-dimethyl-	15.22	94	JN
15.	003674-66-6	Phenanthrene, 2,5-dimethyl-	15.38	99	JN
16.	005737-13-3	Cyclopenta(def)phenanthrenone	15.48	83	JN
17.	000243-42-5	Benzo[b]naphtho[2,3-d]furan	16.02	93	JN
18.	000238-84-6	11H-Benzo[a]fluorene	16.28	220	JN
19.	000082-05-3	7H-Benz[de]anthracen-7-one	16.89	130	JN
20.	000239-35-0	Benzo[b]naphtho[2,1-d]thiophene	17.00	170	JN
21.		unknown polyaromatic hydrocarbon	17.04	170	J
22.	000082-05-3	7H-Benz[de]anthracen-7-one	17.13	120	JN
23.		unknown polyaromatic hydrocarbon	17.45	90	J
24.	001705-84-6	Triphenylene, 2-methyl-	17.87	110	JN
25.	001705-84-6	Triphenylene, 2-methyl-	17.93	99	JN
26.		unknown	18.64	400	J
27.		unknown poly aromatic hydrocarbon	18.87	120	J
28.	000205-99-2	Benz[e]acephenanthrylene	19.15	410	JN
29.	000205-82-3	Benzo[j]fluoranthene	19.48	1300	JN
30.	000192-97-2	Benzo[e]pyrene	19.76	400	JN
31.		unknown	20.07	170	J
32.		unknown	20.21	210	J
33.		unknown polyaromatic hydrocarbon	21.23	290	J
34.	000215-58-7	Benzo[b]triphenylene	21.49	190	JN

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SB-6

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: SB1

Matrix: (soil/water) SOIL Lab Sample ID: 299052

Sample wt/vol: 30.1 (g/ml) G Lab File ID: J3779.D

Level: (low/med) LOW Date Received: 10/07/98

% Moisture: 18.51 decanted: (Y/N) N Date Extracted: 10/13/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/23/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 6.44

CONCENTRATION UNITS:

Number TICs found: 38 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
35.	unknown	21.73	370	J
36. 000191-26-4	Dibenzo[def,mno]chrysene	21.81	130	JN
37.	unknown	22.20	130	J
38. 000192-65-4	Naphtho[1,2,3,4-def]chrysene	23.13	150	JN
39. 000112-95-8	Eicosane	18.12	90	J
40. 000593-45-3	Octadecane	19.34	780	J
41. 000629-94-7	Heneicosane	20.69	200	J
42. 000544-76-3	Hexadecane	21.15	220	J
43. 014167-59-0	Tetratriacontane	22.01	210	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
SB-6 DL

Lab Name: ANALab-Randolph Facility Contract:
Lab Code: ANA Case No.: SAS No.: SDG No.: SB1
Matrix: (soil/water) SOIL Lab Sample ID: 299052 DL
Sample wt/vol: 30.1 (g/ml) G Lab File ID: J3841.D
Level: (low/med) LOW Date Received: 10/07/98
% Moisture: 18.51 decanted: (Y/N) N Date Extracted: 10/13/98
Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/27/98
Injection Volume: 2.0 (uL) Dilution Factor: 2.0
GPC Cleanup: (Y/N) Y pH: 6.44

CONCENTRATION UNITS:
Number TICs found: 21 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown ACP *	6.05	1200	JD
2. 000486-25-9	9H-Fluoren-9-one	13.15	250	JND
3. 000132-65-0	Dibenzothiophene	13.31	200	JND
4. 000832-69-9	Phenanthrene, 1-methyl-	14.50	280	JND
5. 000779-02-2	Anthracene, 9-methyl-	14.55	290	JND
6. 000203-64-5	4H-Cyclopenta[def]phenanthrene	14.68	420	JND
7. 035465-71-5	2-Phenylnaphthalene	15.00	250	JND
8. 000084-65-1	9,10-Anthracenedione	15.04	440	JND
9.	unknown polyaromatic hydrocarbon	15.76	170	JD
10. 000243-42-5	Benzo[b]naphtho[2,3-d]furan	16.03	250	JND
11. 000238-84-6	11H-Benzo[a]fluorene	16.30	370	JND
12. 000082-05-3	7H-Benz[de]anthracen-7-one	16.92	210	JND
13. 000239-35-0	Benzo[b]naphtho[2,1-d]thiophene	17.02	180	JND
14.	unknown polyaromatic hydrocarbon	17.06	220	JD
15.	unknown	18.76	960	JD
16.	unknown polyaromatic hydrocarbon	18.89	190	JD
17. 000192-97-2	Benzo[e]pyrene	19.19	400	JND
18. 000192-97-2	Benzo[e]pyrene	19.53	1600	JND
19.	unknown	20.32	390	JD
20.	unknown	21.22	160	JD
21.	unknown polyaromatic hydrocarbon	21.35	240	JD

* ACP - Aldol Condensation Product, produced in the sample extraction procedure, not a site contaminate.

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.: SB-7

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SB1

Matrix: (soil/water) SOIL Lab Sample ID: 299053

Sample wt/vol: 30.07 (g/ml) G Lab File ID: J3838.D

Level: (low/med) LOW Date Received: 10/07/98

% Moisture: 29.02 decanted: (Y/N) N Date Extracted: 10/13/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/27/98

Injection Volume: 2.0 (uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) Y pH: 6.88

Number TICs found: 7 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown ACP *	6.05	1400	JD
2. 000081-64-1	9,10-Anthracenedione, 1,4-dihydr	16.29	3200	JND
3.	unknown amide	18.74	1000	JD
4. 000192-97-2	Benzo[e]pyrene	19.48	260	JND
5.	unknown	20.35	2600	JD
6.	unknown	21.35	2000	JD
7.	unknown	21.97	780	JD

* ACP - Aldol Condensation Product, produced in the sample extraction procedure, not a site contaminate.

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
SB-8

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SB1

Matrix: (soil/water) SOIL Lab Sample ID: 299054

Sample wt/vol: 30 (g/ml) G Lab File ID: J3826.D

Level: (low/med) LOW Date Received: 10/07/98

% Moisture: 19.98 decanted: (Y/N) N Date Extracted: 10/13/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/27/98

Injection Volume: 2.0 (uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) Y pH: 7.14

Number TICs found: 17 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown ACP *	5.67	1000	JD
2.	Unknown ACP *	6.67	180	JD
3.	unknown polyaromatic hydrocarbon	10.15	170	JD
4. 002245-38-7	Naphthalene, 1,6,7-trimethyl-	11.12	260	JND
5. 000779-02-2	Anthracene, 9-methyl-	14.50	200	JND
6. 000610-48-0	Anthracene, 1-methyl-	14.54	190	JND
7.	unknown polyaromatic hydrocarbon	14.67	340	JD
8. 035465-71-5	2-Phenylnaphthalene	14.99	190	JND
9. 003674-66-6	Phenanthrene, 2,5-dimethyl-	15.38	200	JND
10.	unknown	15.73	310	JD
11.	unknown	16.04	170	JD
12. 000238-84-6	11H-Benzo[a]fluorene	16.28	880	JND
13.	unknown polyaromatic hydrocarbon	16.60	380	JD
14.	unknown	17.23	420	JD
15.	unknown polyaromatic hydrocarbon	20.73	1700	JD
16.	unknown polyaromatic hydrocarbon	21.14	2300	JD
17.	unknown polyaromatic hydrocarbon	21.57	880	JD

18. 061141-72-8 4,6-dimethyldodecane 12.50 320 J

* ACP - Aldol Condensation Product, produced in the extraction, not a site contaminant.

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
SB-8RE

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: SB1

Matrix: (soil/water) SOIL Lab Sample ID: 299054 RE

Sample wt/vol: 30 (g/ml) G Lab File ID: J3837.D

Level: (low/med) LOW Date Received: 10/07/98

% Moisture: 19.98 decanted: (Y/N) N Date Extracted: 10/13/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/27/98

Injection Volume: 2.0 (uL) Dilution Factor: 2.0

GPC Cleanup: (Y/N) Y pH: 7.14

CONCENTRATION UNITS:

Number TICs found: 8 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown polyaromatic hydrocarbon	10.15	170	JD
2. 002131-42-2	Naphthalene, 1,4,6-trimethyl-	11.12	300	JND
3. 000613-12-7	Anthracene, 2-methyl-	14.51	210	JND
4. 002531-84-2	Phenanthrene, 2-methyl-	14.55	210	JND
5.	unknown polyaromatic hydrocarbon	14.69	350	JD
6. 035465-71-5	2-Phenylnaphthalene	15.02	210	JND
7.	unknown	15.77	280	JD
8. 000238-84-6	11H-Benzo[a]fluorene	16.32	570	JND
9.	a hydrocarbon	12.52	310	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET EPA SAMPLE NO.

TENTATIVELY IDENTIFIED COMPOUNDS

SB-9

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: SB1

Matrix: (soil/water) SOIL Lab Sample ID: 299055

Sample wt/vol: 30.05 (g/ml) G Lab File ID: J3780.D

Level: (low/med) LOW Date Received: 10/07/98

% Moisture: 13.48 decanted: (Y/N) N Date Extracted: 10/13/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/23/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.09

CONCENTRATION UNITS:

Number TICs found: 11 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown	5.58	2200	J
2.	unknown	5.69	99	J
3.	unknown	5.91	110	J
4.	unknown	6.69	540	J
5.	unknown	6.76	110	J
6.	unknown * polyaromatic hydrocarbon	11.15	86	J
7. 000832-64-4	Phenanthrene, 4-methyl-	14.57	91	JN
8.	unknown	21.15	570	J
9.	unknown	23.86	130	J
10.	unknown	6.07	1900	J
11.	unknown	10.48	57	J
12. 000629-59-4	Tetradecane	9.85	140	J
13. 003891-98-3	2,6,10-Trimethyldodecane	10.35	70	J
14. 05-5045-11-9	5-propyltridecane	11.92	90	J
15. 000629-78-7	Heptadecane	12.48	140	J
16. 000111-01-3	Squalene	12.55	190	J
17. 000629-92-5	Nonadecane	14.41	120	J
18. 000629-97-0	Docosane	16.06	140	J
19. 000593-45-3	Octadecane	16.48	130	J
20. 000544-85-4	Dotriacontane	19.72	260	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SB-10

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SB1

Matrix: (soil/water) SOIL Lab Sample ID: 299056

Sample wt/vol: 30.09 (g/ml) G Lab File ID: J3825.D

Level: (low/med) LOW Date Received: 10/07/98

% Moisture: 9.81 decanted: (Y/N) N Date Extracted: 10/13/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 10/26/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 6.77

Number TICs found: 20 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		unknown	6.67	510	J
2.	000493-02-7	Naphthalene, decahydro-, trans-	6.72	190	JN
3.		unknown hydrocarbon	6.83	280	J
4.	000874-41-9	Benzene, 1-ethyl-2,4-dimethyl-	6.97	440	JN
5.		unknown	7.32	180	J
6.	002958-76-1	Naphthalene, decahydro-2-methy	7.48	210	JN
7.		unknown	7.72	200	J
8.	054676-39-0	Cyclohexane, 2-butyl-1,1,3-trimet	8.38	210	JN
9.	004292-92-6	Cyclohexane, pentyl-	8.50	550	JN
10.	000090-12-0	Naphthalene, 1-methyl-	9.24	310	JN
11.		unknown a substituted cyclohexane	9.43	390	J
12.	000581-42-0	Naphthalene, 2,6-dimethyl-	10.02	190	JN
13.	000581-40-8	Naphthalene, 2,3-dimethyl-	10.15	350	JN
14.	000575-37-1	Naphthalene, 1,7-dimethyl-	10.18	250	JN
15.	001795-15-9	Cyclohexane, octyl-	10.28	250	JN
16.		unknown	10.47	170	J
17.	002131-42-2	Naphthalene, 1,4,6-trimethyl-	11.15	230	JN
18.	000529-05-5	Azulene, 7-ethyl-1,4-dimethyl-	12.09	240	JN
19.		unknown a poly aromatic hydrocarbon	12.78	170	J
20.	010544-50-0	Sulfur, mol. (S8)	15.44	200	JN
21.	001120-21-4	undecane	7.14	880	J
22.		a hydrocarbon		220	J
23.	007045-71-8	2-methyl undecane	7.77	260	J
24.	017312-55-9	3,8-dimethyl decane	7.84	350	J
25.	000112-40-3	Dodecane	8.12	1300	J
25.	017301-23-4	2,6-dimethyl undecane	8.25	550	J
26.		a hydrocarbon	8.59	430	J

(over)

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SD1

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SD-1

Matrix: (soil/water) SOIL Lab Sample ID: 300595

Sample wt/vol: 30.04 (g/ml) G Lab File ID: J4095.D

Level: (low/med) LOW Date Received: 11/06/98

% Moisture: 56.53 decanted: (Y/N) N Date Extracted: 11/11/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 11/19/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 6.47

Number TICs found: 5

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown	5.41	1100	J
2.	unknown a hydrocarbon	6.14	620	J
3.	unknown	6.52	1600	J
4. 000192-97-2	Benzo[e]pyrene	19.24	170	JN
5.	unknown	23.51	180	J
6.	a hydrocarbon	20.47	160	J
7.	a hydrocarbon	21.38	170	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET EPA SAMPLE NO.

TENTATIVELY IDENTIFIED COMPOUNDS

SD2

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: SD-1

Matrix: (soil/water) SOIL Lab Sample ID: 300596

Sample wt/vol: 30.08 (g/ml) G Lab File ID: J4096.D

Level: (low/med) LOW Date Received: 11/06/98

% Moisture: 56.29 decanted: (Y/N) N Date Extracted: 11/11/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 11/19/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.15

CONCENTRATION UNITS:

Number TICs found: 3 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.	unknown	5.40	1500	J	
2.	unknown	6.53	1500	J	
3. 010544-50-0	Sulfur, mol. (S8)	15.27	320	JN	not a site contaminant

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
SD3

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SD-1

Matrix: (soil/water) SOIL Lab Sample ID: 300597

Sample wt/vol: 30.06 (g/ml) G Lab File ID: J4097.D

Level: (low/med) LOW Date Received: 11/06/98

% Moisture: 48.42 decanted: (Y/N) N Date Extracted: 11/11/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 11/19/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.72

CONCENTRATION UNITS:

Number TICs found: 8 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.	unknown	5.40	1000	J	
2.	unknown a hydrocarbon	6.14	400	J	
3.	unknown	6.53	1900	J	
4. 010544-50-0	Sulfur, mol. (S8)	15.27	310	JN	not a site contaminate
5.	unknown	20.49	230	J	
6.	unknown	20.93	170	J	
7.	unknown a hydrocarbon	22.80	150	J	
8.	unknown	23.52	210	J	
9.	a hydrocarbon	21.39	170	J	
10.	a hydrocarbon	22.26	150	J	

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
SD4

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: SD-1

Matrix: (soil/water) SOIL Lab Sample ID: 300598

Sample wt/vol: 30.02 (g/ml) G Lab File ID: J4114.D

Level: (low/med) LOW Date Received: 11/06/98

% Moisture: 29.75 decanted: (Y/N) N Date Extracted: 11/11/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 11/23/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.51

CONCENTRATION UNITS:

Number TICs found: 12 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown	5.40	1300	J
2.	unknown	6.52	630	J
3. 000121-87-9	Benzenamine, 2-chloro-4-nitro-	12.37	180	JN
4. 000099-30-9	2,6-Dichloro-4-nitroaniline	12.69	360	JN
5. 020020-02-4	Naphthalene, 1,2,3,4-tetrachloro-	15.03	150	JN
6. 053555-64-9	Naphthalene, 1,3,5,7-tetrachloro-	15.23	120	JN
7. 032598-14-4	1,1'-Biphenyl, 2,3,3',4,4'-pentachloro	16.02	110	JN
8.	unknown	16.10	230	J
9.	unknown	16.79	110	J
10.	unknown	19.93	290	J
11.	unknown	22.13	170	J
12.	unknown	23.54	110	J
13.	~~unknown~~ a hydrocarbon	24.40 ~~14.39~~ ~~6.86~~	170	J
14.	a hydrocarbon	20.49	100	J
15.	a hydrocarbon	22.29	100	J

Qu 2-26-99

Qu 2-26-99

Qu 2-26-99

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET EPA SAMPLE NO.

TENTATIVELY IDENTIFIED COMPOUNDS

SD5

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: SD-1

Matrix: (soil/water) SOIL Lab Sample ID: 300599

Sample wt/vol: 30.03 (g/ml) G Lab File ID: J4099.D

Level: (low/med) LOW Date Received: 11/06/98

% Moisture: 54.62 decanted: (Y/N) N Date Extracted: 11/11/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 11/19/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 6.33

CONCENTRATION UNITS:

Number TICs found: 3 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown	5.41	1200	J
2.	unknown	6.14	590	J
3.	unknown	6.52	1600	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET EPA SAMPLE NO.

TENTATIVELY IDENTIFIED COMPOUNDS

SD6

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: SD-1

Matrix: (soil/water) SOIL Lab Sample ID: 300600

Sample wt/vol: 30.01 (g/ml) G Lab File ID: J4100.D

Level: (low/med) LOW Date Received: 11/06/98

% Moisture: 47.79 decanted: (Y/N) N Date Extracted: 11/11/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 11/19/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 5.92

CONCENTRATION UNITS:

Number TICs found: 5 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.	unknown	5.41	810	J	
2.	unknown	6.14	430	J	
3.	~~unknown~~ a hydrocarbon	6.53	1100	J	
4. 010544-50-0	Sulfur, mol. (S8)	15.27	210	JN	not a site contaminate
5.	~~unknown~~ a hydrocarbon	20.48	160	J	

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SD7

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: SD-1

Matrix: (soil/water) SOIL Lab Sample ID: 300601

Sample wt/vol: 30.04 (g/ml) G Lab File ID: J4101.D

Level: (low/med) LOW Date Received: 11/06/98

% Moisture: 59.78 decanted: (Y/N) N Date Extracted: 11/11/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 11/19/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 6.36

CONCENTRATION UNITS:

Number TICs found: 4 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown	5.40	2100	J
2.	unknown	6.53	1900	J
3. 000205-82-3	Benzo[j]fluoranthene	18.66	220	JN
4.	unknown	23.52	310	J
5.	a hydrocarbon	20.46	200	J
6.	a hydrocarbon	20.96	220	J
7.	a hydrocarbon	21.38	330	J
8.	a hydrocarbon	21.80	310	J
9.	a hydrocarbon	22.26	220	J
10.	a hydrocarbon	22.77	200	J

3

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET EPA SAMPLE NO.

TENTATIVELY IDENTIFIED COMPOUNDS

SD8

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: SD-1

Matrix: (soil/water) SOIL Lab Sample ID: 300602

Sample wt/vol: 30.05 (g/ml) G Lab File ID: J4102.D

Level: (low/med) LOW Date Received: 11/06/98

% Moisture: 38.61 decanted: (Y/N) N Date Extracted: 11/11/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 11/19/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.79

Number TICs found: 6

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown	5.41	3200	J
2.	~~unknown~~ a hydrocarbon	6.53	540	J
3.	unknown	7.46	440	J
4.	unknown	8.57	340	J
5.	unknown	8.79	120	J
6.	unknown	23.52	180	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
SD9

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: SD-1

Matrix: (soil/water) SOIL Lab Sample ID: 300603

Sample wt/vol: 30 (g/ml) G Lab File ID: J4103.D

Level: (low/med) LOW Date Received: 11/06/98

% Moisture: 51.97 decanted: (Y/N) N Date Extracted: 11/11/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 11/19/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 6.11

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown	5.41	870	J
2.	unknown	6.15	400	J
3.	unknown	6.53	1100	J
4.	~~unknown~~ a polyaromatic hydrocarbon	18.66	220	J
5.	unknown	23.51	140	J
6.	a hydrocarbon	21.38	170	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.: SD10

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: SD-1

Matrix: (soil/water) SOIL Lab Sample ID: 300604

Sample wt/vol: 30.09 (g/ml) G Lab File ID: J4104.D

Level: (low/med) LOW Date Received: 11/06/98

% Moisture: 51.21 decanted: (Y/N) N Date Extracted: 11/11/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 11/19/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 8.01

CONCENTRATION UNITS:

Number TICs found: 4 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.	unknown	5.41	770	J	
2.	unknown	6.52	960	J	
3. 010544-50-0	Sulfur, mol. (S8)	15.27	170	JN	not a site contaminate
4.	unknown a hydrocarbon	20.48	170	J	

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET EPA SAMPLE NO.

TENTATIVELY IDENTIFIED COMPOUNDS

SD11

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: SD-1

Matrix: (soil/water) SOIL Lab Sample ID: 300605

Sample wt/vol: 30.1 (g/ml) G Lab File ID: J4113.D

Level: (low/med) LOW Date Received: 11/06/98

% Moisture: 55.41 decanted: (Y/N) N Date Extracted: 11/11/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 11/23/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 7.48

CONCENTRATION UNITS:

Number TICs found: 5 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.	unknown	5.40	1300	J	
2.	unknown	6.52	1300	J	
3. 010544-50-0	Sulfur, mol. (S8)	15.26	180	JN	not a site contaminate
4.	unknown	20.49	160	J	
5.	~~unknown~~ a hydrocarbon	21.40	150	J	

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET EPA SAMPLE NO.

TENTATIVELY IDENTIFIED COMPOUNDS

SD12

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: SD-1

Matrix: (soil/water) SOIL Lab Sample ID: 300606

Sample wt/vol: 30.11 (g/ml) G Lab File ID: J4106.D

Level: (low/med) LOW Date Received: 11/06/98

% Moisture: 55.22 decanted: (Y/N) N Date Extracted: 11/11/98

Concentrated Extract Volume: 500 (uL) Date Analyzed: 11/19/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: 6.96

CONCENTRATION UNITS:

Number TICs found: 4 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.	unknown	5.41	650	J	
2.	unknown	6.53	820	J	
3. 010544-50-0	Sulfur, mol. (S8)	15.27	180	JN	not a site contaminate
4.	unknown	20.49	190	J	
5.	a hydrocarbon	21.39	230	J	

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-1A

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: MW-1A

Matrix: (soil/water) WATER Lab Sample ID: 298704

Sample wt/vol: 990 (g/ml) ML Lab File ID: J3523.D

Level: (low/med) LOW Date Received: 10/01/98

% Moisture: decanted: (Y/N) N Date Extracted: 10/02/98

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/11/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

Number TICs found: 30 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown a hydrocarbon	6.99	2	J
2. 000108-44-1	Benzenamine, 3-methyl-	7.09	2	JN
3. 000108-44-1	Benzenamine, 3-methyl-	7.14	4	JN
4. 000576-26-1	Phenol, 2,6-dimethyl-	7.44	6	JN
5. 000095-51-2	o-Chloroaniline	7.69	130	JN
6. 000105-67-9	Phenol, 2,4-dimethyl-	7.82	23	JN
7. 000108-68-9	Phenol, 3,5-dimethyl-	8.02	30	JN
8. 000106-48-9	Parachlorophenol	8.30	11	JN
9.	unknown a pyridine	8.57	4	J
10. 001123-94-0	Phenol, 4-ethyl-3-methyl-	8.66	27	JN
11. 000698-71-5	Phenol, 3-ethyl-5-methyl-	8.86	37	JN
12. 000123-31-9	Hydroquinone	8.98	10	JN
13. 000499-75-2	Phenol, 2-methyl-5-(1-methylethy	9.18	11	JN
14.	unknown a hydrocarbon	9.21	3	J
15.	unknown	9.35	20	J
16. 000697-82-5	Phenol, 2,3,5-trimethyl-	9.38	7	JN
17. 053951-50-1	Benzaldehyde, ethyl-	9.41	18	JN
18. 018441-56-0	2-Methyl-4-propylphenol	9.45	5	JN
19. 000615-67-8	1,4-Benzenediol, 2-chloro-	9.53	7	JN
20.	unknown	9.62	16	J
21.	unknown	9.69	15	J
22.	unknown	9.74	7	J
23. 020294-32-0	6-Methyl-4-indanol	9.94	3	JN
24. 003637-01-2	Ethanone, 1-(3,4-dimethylphenyl)	10.00	6	JN
25.	unknown	10.16	4	J
26. 020294-32-0	6-Methyl-4-indanol	10.23	5	JN
27. 000000-00-0	2,5-Dimethyl-6,7-dihydro-(5H)-cy	10.48	7	JN
28.	unknown	10.65	3	J
29.	unknown substituted phosphoric acid	10.99	5	J
30. 010544-50-0	Sulfur, mol. (S8)	15.62	11	JN

not a site related contaminate

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MWS1

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: MWS1

Matrix: (soil/water) WATER Lab Sample ID: 298295

Sample wt/vol: 990 (g/ml) ML Lab File ID: J3492.D

Level: (low/med) LOW Date Received: 09/29/98

% Moisture: _____ decanted: (Y/N) N Date Extracted: 10/02/98

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/09/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:

Number TICs found: 3 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1. 000106-48-9	Parachlorophenol	8.31	32	JN	
2. 010544-50-0	Sulfur, mol. (S8)	15.66	34	JN	natural, not a site contaminant
3.	unknown	20.46	13	J	

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MWD1

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: MWS1

Matrix: (soil/water) WATER Lab Sample ID: 298296

Sample wt/vol: 980 (g/ml) ML Lab File ID: J3493.D

Level: (low/med) LOW Date Received: 09/29/98

% Moisture: _____ decanted: (Y/N) N Date Extracted: 10/02/98

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/09/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:

Number TICs found: 5 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	~~unknown~~ hydrocarbon	5.87	6	J
2.	~~unknown~~ substituted quinoline	7.71	4	J
3. 001526-17-6	2-Fluoro-6-nitrophenol	7.89	3	JN
4.	unknown a fluoronitrophenol	9.53	4	J
5.	unknown a naphthalenamine and hydrocarbon	11.13	2	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-4

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: MW-1A

Matrix: (soil/water) WATER Lab Sample ID: 298711

Sample wt/vol: 990 (g/ml) ML Lab File ID: J3534.D

Level: (low/med) LOW Date Received: 10/01/98

% Moisture: decanted: (Y/N) N Date Extracted: 10/02/98

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/11/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 9

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.	unknown	7.42	2	J	
2.	unknown	7.79	5	J	
3. 000123-31-9	Hydroquinone	8.92	8	JN	
4. 000615-67-8	1,4-Benzenediol, 2-chloro-	9.50	2	JN	
5. 000569-41-5	Naphthalene, 1,8-dimethyl-	10.16	2	JN	
6. 000581-40-8	Naphthalene, 2,3-dimethyl-	10.28	3	JN	
7.	unknown a benzenesulfonamide	12.36	5	J	
8. 000080-39-7	Benzenesulfonamide, N-ethyl-4-	13.06	3	JN	
9. 010544-50-0	Sulfur, mol. (S8)	15.60	9	JN	not a site contaminant

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-5

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: MW-1A

Matrix: (soil/water) WATER Lab Sample ID: 298709

Sample wt/vol: 990 (g/ml) ML Lab File ID: J3528.D

Level: (low/med) LOW Date Received: 10/01/98

% Moisture: _____ decanted: (Y/N) N Date Extracted: 10/02/98

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/11/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:

Number TICs found: 2 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1. 000123-31-9	Hydroquinone	8.94	3	JN	
2. 010544-50-0	Sulfur, mol. (S8)	15.62	5	JN	not a site contaminant

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET EPA SAMPLE NO.

TENTATIVELY IDENTIFIED COMPOUNDS

OW-5A

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: MW-1A

Matrix: (soil/water) WATER Lab Sample ID: 298712

Sample wt/vol: 990 (g/ml) ML Lab File ID: J3535.D

Level: (low/med) LOW Date Received: 10/01/98

% Moisture: _____ decanted: (Y/N) N Date Extracted: 10/02/98

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/11/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:

Number TICs found: 31 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown camphor	8.89	7	J
2.	unknown	8.99	21	J
3.	unknown	9.07	17	J
4.	unknown	9.17	8	J
5.	unknown camphor/hydrocarbon	9.31	25	J
6.	unknown	9.41	12	J
7.	unknown	9.53	11	J
8.	unknown	9.64	14	J
9.	unknown	9.99	18	J
10.	unknown	10.06	11	J
11.	unknown	10.46	20	J
12.	unknown	11.35	8	J
13.	unknown a phthalate	11.46	14	J
14. 037050-05-8	3,4-Octadiene, 7-methyl-	11.76	6	JN
15.	unknown	6.35	5	J
16.	unknown	6.57	3	J
17.	unknown	7.34	7	J
18.	unknown	7.46	6	J
19.	unknown	7.51	3	J
20.	unknown	7.59	2	J
21.	unknown	7.64	8	J
22.	unknown	7.80	5	J
23.	unknown	7.83	2	J
24.	unknown	7.93	2	J
25.	unknown	7.97	4	J
26.	unknown	8.04	8	J
27.	unknown	8.09	4	J
28.	unknown	8.30	5	J
29.	unknown	8.59	17	J
30.	unknown	8.71	12	J
31.	unknown	8.76	3	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-6

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: MWS1

Matrix: (soil/water) WATER Lab Sample ID: 298299

Sample wt/vol: 995 (g/ml) ML Lab File ID: J3496.D

Level: (low/med) LOW Date Received: 09/29/98

% Moisture: decanted: (Y/N) N Date Extracted: 10/02/98

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/09/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000000-00-0	1,3-cis-Dihydroxycrinane	20.45	4	JN

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
MW-9A

Lab Name: ANALab-Randolph Facility Contract:
Lab Code: ANA Case No.: SAS No.: SDG No.: MWS1
Matrix: (soil/water) WATER Lab Sample ID: 298298
Sample wt/vol: 990 (g/ml) ML Lab File ID: J3495.D
Level: (low/med) LOW Date Received: 09/29/98
% Moisture: decanted: (Y/N) N Date Extracted: 10/02/98
Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/09/98
Injection Volume: 2.0 (uL) Dilution Factor: 1.0
GPC Cleanup: (Y/N) N pH:

Number TICs found: 11 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1. 000095-51-2	o-Chloroaniline	7.68	6	JN	
2. 000108-43-0	Phenol, 3-chloro-	8.30	5	JN	
3.	~~unknown~~ a chlorobenzenediamine	10.47	24	J	
4. 000135-19-3	2-Naphthalenol	11.07	5	JN	
5. 000609-20-1	1,4-Benzenediamine, 2,6-dichlor	11.74	17	JN	
6.	unknown a hydrocarbon	15.26	5	J	
7. 010544-50-0	Sulfur, mol. (S8)	15.67	9	JN	not a site contaminant
8. 000602-09-5	[1,1'-Binaphthalene]-2,2'-diol	18.17	85	JN	
9.	unknown	18.43	4	J	
10. 000000-00-0	4,4'-Bi-1-naphthol	19.79	4	JN	
11.	unknown	20.46	7	J	

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

OW9A

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: MW-1A

Matrix: (soil/water) WATER Lab Sample ID: 298702

Sample wt/vol: 990 (g/ml) ML Lab File ID: J3521.D

Level: (low/med) LOW Date Received: 10/01/98

% Moisture: _____ decanted: (Y/N) N Date Extracted: 10/02/98

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/11/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:

Number TICs found: 2 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.	unknown	7.80	2	J	
2. 010544-50-0	Sulfur, mol. (S8)	15.62	9	JN	not a site contaminant

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-10

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: MW-1A

Matrix: (soil/water) WATER Lab Sample ID: 298705

Sample wt/vol: 995 (g/ml) ML Lab File ID: J3524.D

Level: (low/med) LOW Date Received: 10/01/98

% Moisture: _____ decanted: (Y/N) N Date Extracted: 10/02/98

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/11/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:

Number TICs found: 9 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000103-69-5	Benzenamine, N-ethyl-	7.66	61	JN
2. 000106-48-9	Parachlorophenol	8.30	13	JN
3. 000529-65-7	Acetamide, n-ethyl-N-phenyl-	9.71	12	JN
4.	unknown	10.68	6	J
5.	unknown	11.82	20	J
6. 000580-51-8	[1,1'-Biphenyl]-3-ol	13.05	10	JN
7.	unknown	13.13	5	J
8.	unknown	15.50	8	J
9. 000602-09-5	[1,1'-Binaphthalene]-2,2'-diol	18.11	25	JN

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

OW-12

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: MW-1A

Matrix: (soil/water) WATER Lab Sample ID: 298708

Sample wt/vol: 990 (g/ml) ML Lab File ID: J3527.D

Level: (low/med) LOW Date Received: 10/01/98

% Moisture: _____ decanted: (Y/N) N Date Extracted: 10/02/98

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/11/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000106-49-0	p-Aminotoluene	7.08	16	JN
2.	unknown a hydrocarbon	11.54	6	J
3.	unknown a hydrocarbon	13.63	24	J
4.	unknown a pyridine	15.68	130	J
5.	unknown	20.43	18	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

OW-15

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: MWS1

Matrix: (soil/water) WATER Lab Sample ID: 298297

Sample wt/vol: 995 (g/ml) ML Lab File ID: J3494.D

Level: (low/med) LOW Date Received: 09/29/98

% Moisture: decanted: (Y/N) N Date Extracted: 10/02/98

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/09/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

Number TICs found: 8 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.	~~unknown~~ a substituted pyridine	8.59	3	J	
2. 000579-10-2	Acetamide, N-methyl-N-phenyl-	9.28	3	JN	
3. 003674-66-6	Phenanthrene, 2,5-dimethyl-	15.55	2	JN	
4. 010544-50-0	Sulfur, mol. (S8)	15.63	5	JN	not a site contamin
5.	~~unknown~~ a hydrocarbon	17.42	3	J	
6. 000602-09-5	[1,1'-Binaphthalene]-2,2'-diol	18.12	8	JN	
7.	unknown	20.46	6	J	
8.	~~unknown~~ a hydrocarbon	22.19	3	J	

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-15

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: MW-1A

Matrix: (soil/water) WATER Lab Sample ID: 298706

Sample wt/vol: 995 (g/ml) ML Lab File ID: J3525.D

Level: (low/med) LOW Date Received: 10/01/98

% Moisture: _____ decanted: (Y/N) N Date Extracted: 10/02/98

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/11/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

Number TICs found: 8

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000578-54-1	Benzenamine, 2-ethyl-	7.67	39	JN
2. 000106-48-9	Parachlorophenol	8.30	18	JN
3. 000091-63-4	Quinoline, 2-methyl-	9.37	6	JN
4.	unknown	9.72	6	J
5. 000090-41-5	[1,1'-Biphenyl]-2-amine	11.72	23	JN
6.	unknown	11.81	17	J
7. 000092-69-3	p-Hydroxybiphenyl	13.04	24	JN
8. 000602-09-5	[1,1'-Binaphthalene]-2,2'-diol	18.11	7	JN

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW-17

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: MW-1A

Matrix: (soil/water) WATER Lab Sample ID: 298716

Sample wt/vol: 995 (g/ml) ML Lab File ID: J3539.D

Level: (low/med) LOW Date Received: 10/01/98

% Moisture: _____ decanted: (Y/N) N Date Extracted: 10/02/98

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/11/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

Number TICs found: 1 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown	7.79	5	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

OW-17

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: MW-1A

Matrix: (soil/water) WATER Lab Sample ID: 298707

Sample wt/vol: 995 (g/ml) ML Lab File ID: J3526.D

Level: (low/med) LOW Date Received: 10/01/98

% Moisture: _____ decanted: (Y/N) N Date Extracted: 10/02/98

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/11/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:

Number TICs found: 13 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 000106-49-0	p-Aminotoluene	7.13	150	JN
2. 000464-48-2	Bicyclo[2.2.1]heptan-2-one, 1,7,7	7.85	11	JN
3.	unknown	7.89	8	J
4. 000106-48-9	Parachlorophenol	8.31	23	JN
5. 000579-66-8	Benzenamine, 2,6-diethyl-	8.75	8	JN
6. 000932-62-7	3-Acetyl-1-methylpyrrole	8.84	10	JN
7.	unknown	10.32	27	J
8. 000135-19-3	2-Naphthalenol	11.07	9	JN
9.	unknown	15.66	81	J
10. 000129-43-1	9,10-Anthracenedione, 1-hydroxy	15.80	17	JN
11. 000081-64-1	9,10-Anthracenedione, 1,4-dihydr	16.38	17	JN
12.	unknown	16.56	12	J
13.	unknown a polyaromatic hydrocarbon	16.77	33	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

OW-19A

Lab Name: ANALab-Randolph Facility Contract:

Lab Code: ANA Case No.: SAS No.: SDG No.: MW-1A

Matrix: (soil/water) WATER Lab Sample ID: 298715

Sample wt/vol: 995 (g/ml) ML Lab File ID: J3538.D

Level: (low/med) LOW Date Received: 10/01/98

% Moisture: decanted: (Y/N) N Date Extracted: 10/02/98

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/11/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

Number TICs found: 4 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown	7.79	4	J
2. 010544-50-0	Sulfur, mol. (S8)	15.61	11	JN
3. 000602-09-5	[1,1'-Binaphthalene]-2,2'-diol	18.08	3	JN
4. 000301-02-0	9-Octadecenamide, (Z)-	18.83	3	JN

not a site contaminate

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
OW-20

Lab Name: ANALab-Randolph Facility Contract:
Lab Code: ANA Case No.: SAS No.: SDG No.: MW-1A
Matrix: (soil/water) WATER Lab Sample ID: 298714
Sample wt/vol: 990 (g/ml) ML Lab File ID: J3537.D
Level: (low/med) LOW Date Received: 10/01/98
% Moisture: decanted: (Y/N) N Date Extracted: 10/02/98
Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/11/98
Injection Volume: 2.0 (uL) Dilution Factor: 1.0
GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:
Number TICs found: 2 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1. 018368-76-8	Pyridine, 2-chloro-3-methyl-	7.65	3	JN	
2. 010544-50-0	Sulfur, mol. (S8)	15.60	5	JN	not a site contaminant

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET EPA SAMPLE NO.

TENTATIVELY IDENTIFIED COMPOUNDS

OW27A

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: MW-1A

Matrix: (soil/water) WATER Lab Sample ID: 298701

Sample wt/vol: 995 (g/ml) ML Lab File ID: J3520.D

Level: (low/med) LOW Date Received: 10/01/98

% Moisture: _____ decanted: (Y/N) N Date Extracted: 10/02/98

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/11/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:

Number TICs found: 6 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1. 000095-51-2	o-Chloroaniline	7.67	4	JN	
2. 000106-48-9	Parachlorophenol	8.30	4	JN	
3. 000615-67-8	1,4-Benzenediol, 2-chloro-	9.52	30	JN	
4. 000130-15-4	1,4-Naphthalenedione	10.24	9	JN	
5. 010544-50-0	Sulfur, mol. (S8)	15.64	15	JN	not a site contaminant
6. 000602-09-5	[1,1'-Binaphthalene]-2,2'-diol	18.11	17	JN	

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GW1

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: GW1

Matrix: (soil/water) WATER Lab Sample ID: 299071

Sample wt/vol: 990 (g/ml) ML Lab File ID: J3768.D

Level: (low/med) LOW Date Received: 10/07/98

% Moisture: _____ decanted: (Y/N) N Date Extracted: 10/11/98

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/22/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:

Number TICs found: 2 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown	5.52	6	J
2.	unknown (Z)-9-Octadecenamide	18.62	3	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GW2

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: GW1

Matrix: (soil/water) WATER Lab Sample ID: 299072

Sample wt/vol: 980 (g/ml) ML Lab File ID: J3769.D

Level: (low/med) LOW Date Received: 10/07/98

% Moisture: _____ decanted: (Y/N) N Date Extracted: 10/11/98

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/22/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:

Number TICs found: 10 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.	unknown	5.56	4	J	
2. 000106-49-0	p-Aminotoluene	6.94	3	JN	
3.	unknown	9.36	7	J	
4.	2,6-Dichloro-p-phenylenediamne	11.52	5	JN	
5. 010544-50-0	Sulfur, mol. (S8)	15.47	7	JN	Not a site contaminate
6.	unknown	15.49	6	J	
7. 000081-64-1	9,10-Anthracenedione, 1,4-dihydr	16.24	4	JN	
8.	unknown	16.81	2	J	
9. 000301-02-0	9-Octadecenamide, (Z)-	18.63	3	JN	
10. 000106-48-9	Parachlorophenol	~~8.15~~ 8.01	6	JN	

2-26-99

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GW3

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: GW1

Matrix: (soil/water) WATER Lab Sample ID: 299073

Sample wt/vol: 990 (g/ml) ML Lab File ID: J3770.D

Level: (low/med) LOW Date Received: 10/07/98

% Moisture: _____ decanted: (Y/N) N Date Extracted: 10/11/98

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/22/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:

Number TICs found: 2 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown	5.51	6	J
2. 000301-02-0	9-Octadecenamide, (Z)-	18.63	3	JN

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GW4

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: GW1

Matrix: (soil/water) WATER Lab Sample ID: 299075

Sample wt/vol: 990 (g/ml) ML Lab File ID: J3835.D

Level: (low/med) LOW Date Received: 10/07/98

% Moisture: _____ decanted: (Y/N) N Date Extracted: 10/11/98

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/27/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	000143-22-6	Ethanol, 2-[2-(2-butoxyethoxy)eth	10.47	3	JN
2.		unknown	18.18	2	J
3.		unknown (Z)-9-Octadecen-amide	18.76	5	J

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GW5

Lab Name: ANALab-Randolph Facility Contract: _____

Lab Code: ANA Case No.: _____ SAS No.: _____ SDG No.: GW1

Matrix: (soil/water) WATER Lab Sample ID: 299074

Sample wt/vol: 990 (g/ml) ML Lab File ID: J3771.D

Level: (low/med) LOW Date Received: 10/07/98

% Moisture: _____ decanted: (Y/N) N Date Extracted: 10/11/98

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 10/23/98

Injection Volume: 2.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

Number TICs found: 3 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	unknown	5.52	3	J
2. 000143-22-6	Ethanol, 2-[2-(2-butoxyethoxy)eth	10.47	4	JN
3.	unknown 2-9-Octadecen-amide	18.63	3	J