THOMAS R. SUOZZI
COUNTY EXECUTIVE

RAYMOND A. RIBEIRO, P.E.
COMMISSIONER

COUNTY OF NASSAU
DEPARTMENT OF PUBLIC WORKS
1194 PROSPECT AVENUE
WESTBURY, NEW YORK 11590-2723

July 9, 2009

Ms. Cynthia Whitfield, P.E.
New York State Department of
Environmental Conservation
Division of Environmental Remediation, 12th Floor
625 Broadway
Albany, New York 12233-7011

Re: Mitchel Field Purex Groundwater Remediation Facility (MFPGRF)
Periodic Review Report – 2009

Dear Ms. Whitfield:

Please find enclosed two (2) copies of the 2009 "**Periodic Review Report**" and the Certification form for the Mitchel Field Purex Groundwater Remediation Project. The report was prepared following the suggested outline provided in your May 14, 2009, "45-Day Reminder Notice: Site management Periodic Review."

If you have any questions regarding the report or activities at the site, please contact Mr. Kenneth Arnold, P.E. at (516) 571-6850.

Very truly yours,

Joseph L. Davenport, P.E.
Deputy Commissioner of Public Works

JLD:KGA:jb
Encls.

c: Walter Parish, Hazardous Waste Remediation Engineer, NYSDEC, Region 1
Kenneth G. Arnold, Unit Head, Water/Wastewater Engineering Unit
Michael Flaherty, Hydrogeologist III

K:\ADMIN\Letters for Signature\Water Management\Brown\Ltr to Whitfield, NYSDEC - Transmittal of Periodic Review Report (MF).doc

Enclosure 1

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Site Management Periodic Review Report Notice
Institutional and Engineering Controls Certification Form

Site Details **Box 1**

Site No. 130014

Site Name Purex-Mitchell Field

Site Address: COMMERCIAL AVENUE Zip Code: 11530

City/Town: Garden City

County: Nassau

Allowable Use(s) (if applicable, does not address local zoning): Industrial

Site Acreage: 0.5

Verification of Site Details **Box 2**

	YES	NO
1. Are the Site Details above, correct?	☒	☐
If NO, are changes handwritten above or included on a separate sheet?	☐	
2. Has some or all of the site property been sold, subdivided, merged, or undergone a tax map amendment since the initial/last certification?	☐	☒
If YES, is documentation or evidence that documentation has been previously submitted included with this certification?	☐	
3. Have any federal, state, and/or local permits (e.g., building, discharge) been issued for or at the property since the initial/last certification?	☐	☒
If YES, is documentation (or evidence that documentation has been previously submitted) included with this certification?	☐	
4. If use of the site is restricted, is the current use of the site consistent with those restrictions?	☒	☐
If NO, is an explanation included with this certification?	☐	
5. For non-significant-threat Brownfield Cleanup Program Sites subject to ECL 27-1415.7(c), has any new information revealed that assumptions made in the Qualitative Exposure Assessment regarding offsite contamination are no longer valid?	☐	☐ N/A
If YES, is the new information or evidence that new information has been previously submitted included with this Certification?	☐	
6. For non-significant-threat Brownfield Cleanup Program Sites subject to ECL 27-1415.7(c), are the assumptions in the Qualitative Exposure Assessment still valid (must be certified every five years)?	☐	☐ N/A
If NO, are changes in the assessment included with this certification?	☐	

SITE NO. 130014 Box 3

Description of Institutional Controls

Parcel	Institutional Control
S_B_L Image: **440.56-001-80**	Decision Document

Box 4

Description of Engineering Controls

Parcel	Engineering Control
S_B_L Image: **440.56-001-80**	Groundwater Containment Pump & Treat Subsurface Barriers

Attach documentation if IC/ECs cannot be certified or why IC/ECs are no longer applicable. (See instructions)

Control Description for Site No. 130014

Parcel: 440.56-001-80

The IC is the Consent Order (CO). CO Appendix A paragrah III defines the remedial program as 1) Installation of containment wall 2) Installation & operation of soil flushing system 3) installation & operation of 6 extraction wells 4) Installation & operation of 6 purge wells offsite 5) construction & operation of 1400 GPM P&T plant 6) construction & operation of treated water discharge system & 7) installation & operation of monitoring wells. Discharge criteria, including steps to follow for exceedences, and specific shut down criteria are provided in CO, including post-shutdown monitoring & Requisite Remedial technology &/or wellhead treatment of public water supplies.

Box 5

Periodic Review Report (PRR) Certification Statements

1. I certify by checking "YES" below that:

   a) the Periodic Review report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

   b) to the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and the information presented is accurate and compete.

YES	NO
☒	☐

2. If this site has an IC/EC Plan (or equivalent as required in the Decision Document), for each Institutional or Engineering control listed in Boxes 3 and/or 4, I certify by checking "YES" below that all of the following statements are true:

   (a) the Institutional Control and/or Engineering Control(s) employed at this site is unchanged since the date that the Control was put in-place, or was last approved by the Department;

   (b) nothing has occurred that would impair the ability of such Control, to protect public health and the environment;

   (c) access to the site will continue to be provided to the Department, to evaluate the remedy, including access to evaluate the continued maintenance of this Control;

   (d) nothing has occurred that would constitute a violation or failure to comply with the Site Management Plan for this Control; and

   (e) if a financial assurance mechanism is required by the oversight document for the site, the mechanism remains valid and sufficient for its intended purpose established in the document.

YES	NO
☒	☐

3. If this site has an Operation and Maintenance (O&M) Plan (or equivalent as required in the Decision Document);

   I certify by checking "YES" below that the O&M Plan Requirements (or equivalent as required in the Decision Document) are being met.

YES	NO
☒	☐

4. If this site has a Monitoring Plan (or equivalent as required in the remedy selection document);

   I certify by checking "YES" below that the requirements of the Monitoring Plan (or equivalent as required in the Decision Document) is being met.

YES	NO
☒	☐

IC CERTIFICATIONS
SITE NO. 130014

Box 6

SITE OWNER OR DESIGNATED REPRESENTATIVE SIGNATURE

I certify that all information and statements in Boxes 2 and/or 3 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I Raymond A. Ribeiro (print name) at 1194 Prospect Avenue, Westbury (print business address),

am certifying as Commissioner of Public Works (Owner or Remedial Party)

for the Site named in the Site Details Section of this form.

Signature of Owner or Remedial Party Rendering Certification — Date: 7/6/09

IC/EC CERTIFICATIONS

Box 7

QUALIFIED ENVIRONMENTAL PROFESSIONAL (QEP) SIGNATURE

I certify that all information in Boxes 4 and 5 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

I Raymond A. Ribeiro (print name) at 1194 Prospect Avenue, Westbury (print business address),

am certifying as a Qualified Environmental Professional for the Department of Public Works

(Owner or Remedial Party) for the Site named in the Site Details Section of this form.

Signature of Qualified Environmental Professional, for the Owner or Remedial Party, Rendering Certification

Stamp — Date: 7/6/09

STATE OF NEW YORK
RAYMOND A. RIBEIRO
No. 072665
LICENSED PROFESSIONAL ENGINEER

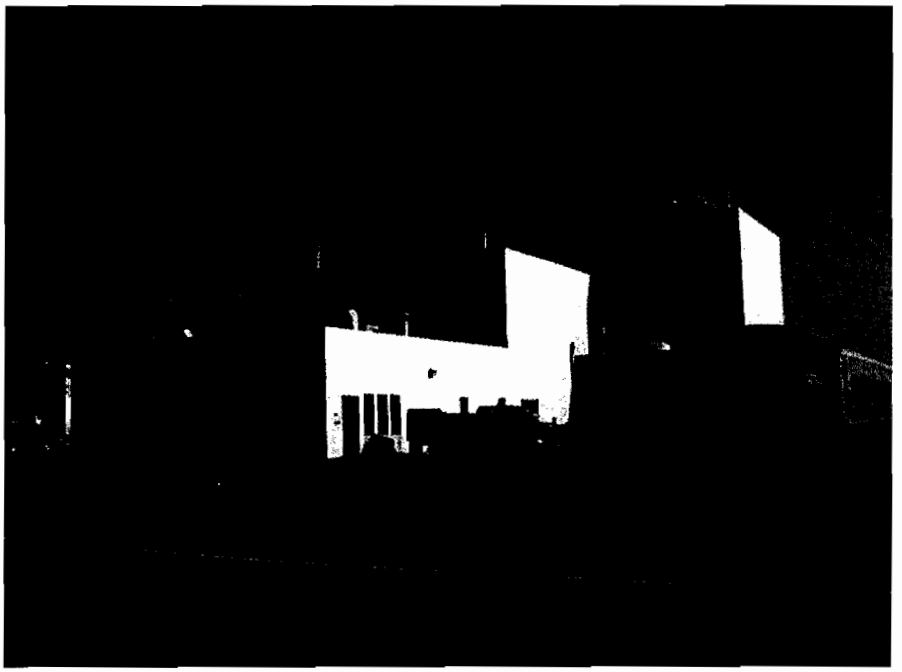
PUREX SITE at MITCHEL FIELD
GROUNDWATER REMEDIATION

DEPARTMENT OF PUBLIC WORKS

Nassau County

Long Island, New York

PERIODIC REVIEW REPORT



2009

1.0 Introduction

A. The Mitchel Field Site was acquired from the Purex Corporation by Nassau County to accommodate the construction / expansion of the MSBA (Metropolitan Suburban Bus Authority) Garage site located in East Garden City, New York. During the course of the expansion project; while conducting investigations to evaluate potential new water supply sources, soil and groundwater contamination were discovered at the site in 1981. Following discovery, Nassau County and the Office of the New York State Attorney General initiated legal action against Purex Corporation. This action resulted in a Consent Order which was issued on August 21, 1985 which required Purex Corporation to design, build and operate a treatment system to restore local soil and groundwater to specified target conditions. The Mitchel Field Purex Groundwater Remediation Facility (MFPGRF), was constructed to extract contaminated groundwater from two separate areas (a highly contaminated source area which is surrounded by a hydraulic retaining wall and a more diffuse down gradient plume area), treat the water to meet the State's required standards, and discharge the treated water to a County recharge basin. Purex Corporation initiated groundwater treatment in 1990 and was required to operate the system for a minimum of 10 years. Upon completion of this operational requirement the Nassau County Department of Public Works assumed treatment operations on January 1, 2003 and continues to operate the facility.

B. Groundwater treatment operations at the site have been ongoing for over 19 years. Over this time period progress in meeting remedial objectives has been made in the following areas:

- The collection and treatment of volatile organic compounds (VOC's) in the Upper Glacial Aquifer has been completed.
- Total volatile organic compounds (TVOC), concentrations in the source area have been reduced from **600 ppm** to **1 ppm**.
- TVOC concentrations in wells located in the Upper Magothy portion of the downgradient plume have been reduced from over **30 ppm** to less than **50 ppb** at a majority of the monitoring well locations. Those monitoring wells with TVOC concentrations exceeding 50 ppb have achieved an asymptotic condition.
- TVOC concentrations in all monitoring wells located in the lower portion of the Magothy aquifer have met the water condition specified in the cleanup criteria (see Appendix) for the site; however concentrations ranging from 150 to 500 ppb have been observed in recovery well W-383D and treatment is ongoing.
- TVOC concentrations greater than **200 ppb** have been observed in two separate lower Magothy well cluster locations upgradient of the Purex plume.
- TVOC concentrations in the majority of monitoring wells located in the Upper Magothy portion of the down gradient Purex Plume have met the water condition specified in the cleanup criteria (see Appendix).

C. The Purex-Mitchel Field site continues to operate in general compliance with all guidelines set forth in the original Order of Consent signed with the Purex Corporation and Nassau County. The concentrations of several volatile organic compounds in the plant's effluent have occasionally exceeded their discharge limitations however; this condition has been corrected through regularly scheduled cleaning of the stripping tower media.

The County of Nassau believes that cleanup of the Upper Magothy portion of the downgradient plume is essentially complete; although TVOC concentrations in all Lower Magothy monitoring wells are less than 5 ppb, concentrations ranging from 150 to 500 ppb are being collected from recovery well W-383D, the source of this contamination remains unclear.

D. Future modifications to the remedial effort should be considered focusing on the use of current treatment technology to abate the remaining contamination in the source area.

2.0 Site Overview

A. The MFPGRF is located adjacent to the five – acre Metropolitan Suburban Bus Authority (MSBA) bus garage site in East Garden City, New York (figure 1). The site is bounded on the north by Commercial Avenue, Oak Street to the west, and Quentin Roosevelt Boulevard to the east. The surrounding industrial area is occupied by several remedial sites including the former Commander Oil Corporation Site, the former Pasely Solvent Corporation Site, (EPA ID: NYD991292004) and Win-Holt Equipment Corporation (NYSDEC Site# 130088/V-00243-1), as well as several other small businesses and warehouses. The site is also located within 1.5 miles of the Roosevelt Field Shopping Center, Nassau Veterans Memorial Coliseum, Nassau Community College and Hofstra University.

The depth to groundwater in the Mitchel Field area ranges from 20 to 30 feet below grade. The first groundwater investigations conducted at the site in 1984 identified a plume of volatile organic compounds in both the Glacial and Upper portions of the Magothy Aquifer migrating south – southwest of the source area. Total volatile organic concentrations in the source area exceeded **600 ppm**; concentrations decreased in the plume area with increasing distance from the source. Specific organic compounds originally identified at the site included:

- 1, 2 Dichloroethane
- 1,1- Dichloroethylene
- Trans-1,2- Dichlorethylene
- Methylene Chloride
- Tetrachlorethylene
- Toluene
- 1,1,1- Trichloroethane
- Trichloroethylene
- Vinyl Chloride

The MFPGRF was designed by Canonie Environmental for Purex Corporation and included all process equipment associated with air stripping, pressure filtration, carbon adsorption and vapor emission treatment necessary for groundwater treatment and recharge.

Figure 1

Legend

- Monitoring Wells (Upper Magothy)
- Containment Area

Site Location

PUREX SITE & VICINITY

PUREX SITE MAP

Mitchel Field, NY

Prepared By: - NCDPW - Water/Wastewater Engineering Unit

N W E S

0 62.5 125 250 375 500 Feet

Nassau County

Geographic Information System

Date: 6/10/2009

B. The selected remedy for the Purex Mitchel Field Site included a remediation which was to be performed in two phases involving source area and plume recovery treatment schemes. During the first phase of operation 700 gpm of groundwater was withdrawn from the source area for treatment and recirculation. Flow into the source area was restricted by the installation of steel sheeting that was keyed into an existing clay confining layer. Simultaneously, 700 gpm of groundwater was recovered from plume area wells for treatment and discharge into the Oak Street recharge basin. The groundwater treatment facility was designed to individually treat these two distinct influent streams during the first phase of operation. This phase concentrated on restoration of the source area and plume recovery within the glacial aquifer.
As originally proposed; upon completion of the source area restoration, the second phase of the site remediation included further cleanup of the Glacial Aquifer as well as plume recovery from the Upper Magothy Formation. During the second phase, the treatment facility was designed to function as a single influent stream process operating at flow rates up to 1,400 gpm.

Today, due to the occurrence of low levels of individual volatile organic compounds and overall reductions in TVOC concentrations the MFPGRF continues to treat both source area and downgradient contamination at reduced flow rates using fewer recovery wells. Source area TVOC concentrations of up to **1 ppm** are being treated using recovery wells W-3 and W-4D at a combined flow rate of 300 gpm. Groundwater collected from the Upper Magothy plume at concentrations ranging from less than 5 ppb to 50 ppb is being treated using recovery well W-187 at a rate of 200 gpm; while Lower Magothy contamination which has been detected at a single location at concentrations ranging from 150 to 500 ppb is being collected by recovery well W-383D at a flow rate of 75 gpm.

3.0 Remedy Performance, Effectiveness, and Protectiveness

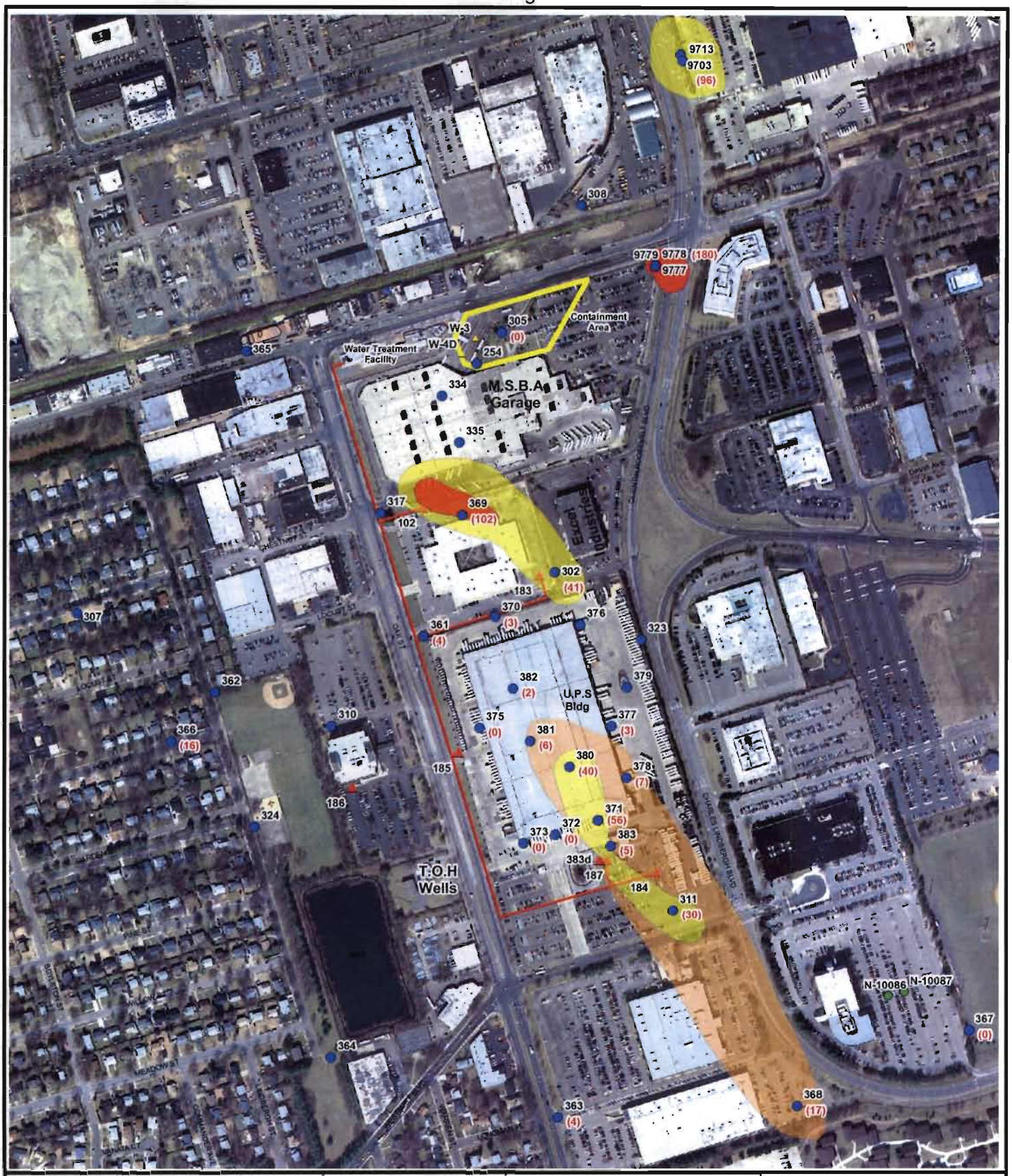
The overall remedy performance at the Purex-Mitchel Field Site has been very effective over the 19 years of treatment operations. Although volatile organic compounds (VOC's) remain in groundwater collected from the source area (which is surrounded by a hydraulic retaining wall); overall VOC concentrations have been reduced from over 600 ppm to approximately 1 ppm. Cleanup of the Upper Glacial Plume of volatile organics has been completed.

Remaining groundwater contamination exists in a plume of VOC's located in the Upper Magothy Aquifer and at a single recovery well location screened within the Lower Magothy Aquifer. The most recent groundwater samples were collected from twenty-six (26) groundwater monitoring wells and from three recovery wells for each of the two (2) Semi-Annual sampling events conducted in 2008. As part of these monitoring events, three (3) additional groundwater monitoring wells are sampled on an annual basis in October. The results of the 2008 Semi-Annual sampling analyses are presented in the following tables. These tables list only those compounds that have been historically detected at the Purex site.

Figure 2 presents an aerial site map with the known extent of groundwater contamination in the upper portion of the Magothy formation, based on the October 2008 monitoring well sampling results. Of the twenty-six (26) semi-annual monitoring wells sampled, fifteen (15) wells had TVOCs less than 10 ppb for both 2008 sampling events, nine (9) wells had at least one sampling event where its TVOC was greater than 10 ppb but less than 100 ppb and three (3) wells had at least one sampling event where its TVOC was greater than 100 ppb.

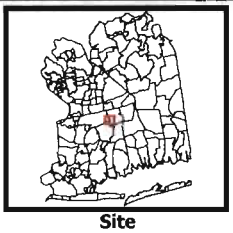
The plot of total volatile organic compound (TVOC), concentrations prepared from the October 2008 monitoring well sampling results reveal two relatively narrow plumes, the first located immediately south of the MSBA garage extends to the southeast and is approximately 650 ft. long, the second plume, located beneath UPS also extends to the southeast and is approximately 2,000 ft. long. Both plumes are approximately 250 ft. wide. Most of the plume of contamination appears to have originally emanated from beneath the former Purex site. The overall configuration of the VOC plume has been modified due to past pumpage from offsite recovery wells W-183 and W-184. Over time, pumping effects from these wells have separated the original plume and appear to have drawn volatile organics from other sources. TVOC concentrations within the first (northern) plume range from 41 ppb to 102 ppb in the vicinity of plume recovery well W-183. Concentrations within the second, southernmost plume range from BDL to 56 ppb. The leading edge of the Purex plume terminates at the three southernmost plume recovery wells (W-184, W-187 and W-383D), located in the United Parcel Service (UPS) parking lot. Elevated TVOC concentrations observed in groundwater samples collected from W-311R (30 ppb) and W-368 (17ppb) may be from a secondary source.

Figure 2



Legend

- Upper Magothy Monitoring Wells
- (56) With TVOC(ppb) Reading for 10/08
- Plume Recovery Wells
- Source Area Recovery Wells
- Containment Area
- Influent Pipe
- Heating-Cooline Wells
- Purex TVOC(ppb) Contour Oct.,2008
  - >5ppb
  - >25ppb
  - >100ppb



Site Location

PUREX SITE & VICINITY

PUREX TVOC (ppb)
October, 2008

Mitchel Field, NY

Prepared By: - NCDPW - Water/Wastewater Engineering Unit

N
W E
S

0 62.5 125 250 375 500 Feet

Nassau County

Geographic Information System

Date: 6/01/2009

PUREX SITE

SEMI-ANNUAL GROUNDWATER SAMPLING RESULTS FOR 2008

VOLATILE ORGANICS COMPOUNDS (ppb)

	WELL W-234 DATE SAMPLED		WELL W-402 DATE SAMPLED		WELL W-405 DATE SAMPLED		WELL W-435 DATE SAMPLED		WELL W-461 DATE SAMPLED		WELL W-302 DATE SAMPLED		WELL W-305 DATE SAMPLED		WELL W-311R DATE SAMPLED	
	4/3/08	10/21/08	3/25/08	10/7/08	4/3/08	10/20/08	4/3/08	10/21/08	3/25/08	10/8/08	3/25/08	10/7/08	4/3/08	10/20/08	3/27/08	10/14/08
1,1,1,2-Tetrachloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2.0	2.2
1,1,2-Trichloro-1,1,2-trifluoroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2-Trichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1-Dichloroethane	1.4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1-Dichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	6.3	8.2
1,2,3-Trichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,3-Trichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,4,5-Tetramethylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,4-Trimethylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2.4	BDL	BDL	BDL	BDL	BDL
1,2-Dichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-T-Dichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,3,5-Trimethylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,3-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,4-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bromochloromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Carbon Tetrachloride	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chlorodifluoromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chloroform	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	3.4	4.2
Chloromenthane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
cis-1,2-Dichloroethylene	4.4	BDL	BDL	BDL	BDL	BDL	0.58J	BDL	BDL	BDL	11.0	4.3	BDL	BDL	5.9	2.9
Dichlorodifluoromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ethyl Benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Isopropylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
m,p-Xylene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methyl t-Butylether (MTBE)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methylene Chloride	9.9B	BDL	2.9B	BDL	7.7B	BDL	6.3B	BDL	3.9B	BDL	4.6B	38B	6.6B	5.5B	BDL	BDL
Naphthalene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
n-Butyl Benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
n-Propylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
o-Xylene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
p-Ethyltoluene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
p-Isopropyltoluene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
sec-Butyl Benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
t-1,2 Dichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
tert-Butyl Benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Tetrachloroethylene	13.0	7.7	3.7	2.8	2.2	2.7	3.6	3	2.4	2.4	41.0	27.0	0.88J	BDL	17.0	3.8
Toluene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Trichlorodifluoromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Trichloroethylene	3.4	BDL	BDL	BDL	BDL	BDL	1.4	2.4	1.5	1.1	13.0	10.0	BDL	BDL	18.0	9.1
Vinyl Chloride	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
TVOC	22.2	7.7	3.7	2.8	2.2	2.7	5.0	5.4	3.9	3.5	67.4	41.3	0.0	0.0	52.6	30.4

BDL - Below detection limits B - Analyte detected in associated Method Blank All results in ppb

PUREX SITE

SEMI-ANNUAL GROUNDWATER SAMPLING RESULTS FOR 2008

VOLATILE ORGANICS COMPOUNDS (ppb)

	WELL W-361 DATE SAMPLED		WELL W-363 DATE SAMPLED		WELL W-366 DATE SAMPLED		WELL W-367 DATE SAMPLED		WELL W-368 DATE SAMPLED		WELL W-369 DATE SAMPLED		WELL W-370 DATE SAMPLED		WELL W-371 DATE SAMPLED	
	4/18/08	10/7/08		10/23/08	3/24/08	10/10/08	3/24/08	10/8/08	2/24/08	10/14/08	3/26/08	10/8/08	3/25/08	10/7/08	3/21/08	10/14/08
1,1,1,2-Tetrachloroethane	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane	BDL	BDL		BDL	BDL	BDL	BDL	BDL	0.94J	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2-Trichloro-1,1,2-trifluoroethane	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2-Trichloroethane	BDL	BDL	Well Scheduled for One Sample Per Year	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1-Dichloroethane	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1-Dichloroethene	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.89J	BDL	BDL	BDL	BDL	BDL
1,2,3-Trichlorobenzene	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,3-Trichloropropane	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,4,5-Tetramethylbenzene	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,4-Trimethylbenzene	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dichlorobenzene	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	5.2
1,2-Dichloroethane	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-T-Dichloroethene	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,3,5-Trimethylbenzene	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,3-Dichlorobenzene	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,4-Dichlorobenzene	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bromochloromethane	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Carbon Tetrachloride	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chlorobenzene	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chlorodifluoromethane	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chloroform	BDL	BDL		BDL	BDL	BDL	BDL	BDL	3.7	1.6	BDL	BDL	BDL	BDL	BDL	BDL
Chloromethane	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
cis-1,2-Dichloroethylene	BDL	BDL		3.9	BDL	BDL	BDL	BDL	5.4	2.2	12.0	64	BDL	BDL	BDL	25.0
Dichlorodifluoromethane	BDL	BDL		BDL	BDL	BDL	BDL	BDL	6.2	3.6	BDL	BDL	BDL	BDL	BDL	BDL
Ethyl Benzene	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Hexachlorobutadiene	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Isopropylbenzene	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
m,p-Xylene	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methyl t-Butylether (MTBE)	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methylene Chloride	3.0B	33B		9.7B	BDL	0.8B	BDL	BDL	BDL	BDL	3.0B	BDL	6.2B	35B	BDL	BDL
Naphthalene	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
n-Butyl Benzene	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
n-Propylbenzene	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
o-Xylene	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
p-Ethyltoluene	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
p-Isopropyltoluene	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
sec-Butyl Benzene	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
tert-Butyl Benzene	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Tetrachloroethylene	4.3	3.8		BDL	BDL	.72J	BDL	BDL	11	3.5	4.6	26	4.6	2.8	BDL	5.5
Toluene	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Trichlorodifluoromethane	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Trichloroethylene	BDL	BDL		BDL	14.0	16	BDL	BDL	14.0	6.5	5.1	8.4	BDL	BDL	BDL	7.4
Vinyl Chloride	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	1.1	3.4	BDL	BDL	BDL	13
TVOC	4.3	3.8	0.0	3.9	14.0	16.0	0.0	0.0	40.3	17.4	22.8	101.8	4.6	2.8	0.0	56.1

BDL - Below detection limits B - Analyte detected in associated Method Blank All results in ppb

PUREX SITE

SEMI-ANNUAL GROUNDWATER SAMPLING RESULTS FOR 2008

VOLATILE ORGANICS COMPOUNDS (ppb)

	WELL W-372 DATE SAMPLED		WELL W-373 DATE SAMPLED		WELL W-375 DATE SAMPLED		WELL W-377 DATE SAMPLED		WELL W-378 DATE SAMPLED		WELL W-380 DATE SAMPLED		WELL W-381 DATE SAMPLED		WELL W-382 DATE SAMPLED	
	3/21/08	10/16/08	3/27/08	10/16/08	3/26/08	10/16/08	3/26/08	10/16/08	3/26/08	10/16/08	4/2/08	10/17/08	4/2/08	10/17/08	4/2/08	10/20/08
1,1,1,2-Tetrachloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2-Trichloro-1,1,2-trifluoroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2-Trichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1-Dichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	.54J	BDL	BDL	BDL	BDL	BDL
1,1-Dichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,3-Trichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,3-Trichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,4,5-Tetramethylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,4-Trimethylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	12.0	8.6	2.7	2.7	2.0	2.4
1,2-Dichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-T-Dichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,3,5-Trimethylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,3-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,4-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bromochloromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Carbon Tetrachloride	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chlorodifluoromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chloroform	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chloromenthane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
cis-1,2-Dichloroethylene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2.9	2.4	BDL	BDL	BDL	BDL
Dichlorodifluoromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ethyl Benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Isopropylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
m,p-Xylene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methyl t-Butylether (MTBE)	BDL	BDL	BDL	BDL	BDL	BDL	2.6	2.9	BDL	BDL	43.0	28.0	6.5	2.8	BDL	BDL
Methylene Chloride	8.8B	1.9B	BDL	3.1B	3.8B	3.4B	5.2B	3.4B	4.4B	2.1B	7.9B	BDL	7.8B	BDL	5.3B	5.3B
Naphthalene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
n-Butyl Benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
n-Propylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
o-Xylene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
p-Ethyltoluene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
p-Isopropyltoluene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
sec-Butyl Benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
t-1,2 Dichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
tert-Butyl Benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Tetrachloroethylene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.98J	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Toluene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Trichlorodifluoromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Trichloroethylene	BDL	BDL	BDL	BDL	1.4	.81J	BDL	BDL	2.0	7	BDL	BDL	BDL	BDL	BDL	BDL
Vinyl Chloride	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1.6	1.4	BDL	BDL	BDL	BDL
TVOC	0.0	0.0	0.0	0.0	1.4	0.0	2.6	2.9	2.0	7.0	59.5	40.4	9.2	5.5	0.0	2.4

BDL - Below detection limits B - Analyte detected in associated Method Blank All results in ppb

PUREX SITE

SEMI-ANNUAL SAMPLING RESULTS FOR 2008

VOLATILE ORGANICS COMPOUNDS (ppb)

	WELL W-383 DATE SAMPLED		WELL X-156 DATE SAMPLED		WELL X-157 DATE SAMPLED		RECOVERY WELL W-3 DATE SAMPLED		RECOVERY WELL W-4D DATE SAMPLED		RECOVERY WELL W-183 DATE SAMPLED		RECOVERY WELL W-184 DATE SAMPLED		RECOVERY WELL W-187 DATE SAMPLED		RECOVERY WELL W-383D DATE SAMPLED	
	3/27/08	10/14/08		10/22/08		10/22/08							4/3/08			10/23/08		10/23/08
1,1,1,2-Tetrachloroethane	BDL	BDL		BDL		BDL							BDL			BDL		BDL
1,1,1-Trichloroethane	BDL	BDL		5.1		40.0							BDL			BDL		11
1,1,2-Trichloro-1,1,2-trifluoroethane	BDL	BDL		BDL		7.1							BDL			BDL		BDL
1,1,2-Trichloroethane	BDL	BDL		BDL		BDL							BDL			BDL		BDL
1,1-Dichloroethane	BDL	BDL		2.0		2.5							BDL			1.4		5.2
1,1-Dichloroethene	BDL	BDL		5.3		190.0							3.0			1.2		18.0
1,2,3-Trichlorobenzene	BDL	BDL	Well Scheduled for One Sample Per Year	BDL	Well Scheduled for One Sample Per Year	BDL	No Entry into Vault No Sample	No Entry into Vault No Sample	No Entry into Vault No Sample	No Entry into Vault No Sample	Pump Failure No Sample	Pump Failure No Sample	BDL	Well Off No Sample	Well Off No Sample	BDL	Well Off No Sample	BDL
1,2,3-Trichloropropane	BDL	BDL		BDL		BDL							BDL			BDL		BDL
1,2,4,5-Tetramethylbenzene	BDL	BDL		BDL		BDL							BDL			BDL		BDL
1,2,4-Trimethylbenzene	BDL	BDL		BDL		BDL							BDL			BDL		BDL
1,2-Dichlorobenzene	5.7	BDL		BDL		BDL							BDL			BDL		BDL
1,2-Dichloroethane	BDL	BDL		BDL		1.6							BDL			BDL		BDL
1,2-T-Dichloroethene	BDL	BDL		BDL		BDL							BDL			BDL		BDL
1,3,5-Trimethylbenzene	BDL	BDL		BDL		BDL							BDL			BDL		BDL
1,3-Dichlorobenzene	BDL	BDL		BDL		BDL							BDL			BDL		BDL
1,4-Dichlorobenzene	BDL	BDL		BDL		BDL							BDL			BDL		BDL
Benzene	BDL	BDL		BDL		BDL							BDL			BDL		BDL
Bromochloromethane	BDL	BDL		BDL		BDL							BDL			BDL		BDL
Carbon Tetrachloride	BDL	BDL		BDL		BDL							BDL			BDL		BDL
Chlorobenzene	BDL	BDL		BDL		BDL							BDL			BDL		BDL
Chlorodifluoromethane	BDL	BDL		BDL		BDL							BDL			BDL		BDL
Chloroform	BDL	BDL		BDL		BDL							1.9			BDL		2.6
Chloromenthane	BDL	BDL		BDL		BDL							BDL			BDL		BDL
cis-1,2-Dichloroethylene	55.0	4.9		5.5		BDL							12			22.0		100
Dichlorodifluoromethane	BDL	BDL		BDL		BDL							BDL			BDL		BDL
Ethyl Benzene	BDL	BDL		BDL		BDL							BDL			BDL		BDL
Isopropylbenzene	BDL	BDL		BDL		BDL							BDL			BDL		BDL
m,p-Xylene	BDL	BDL		BDL		BDL							BDL			BDL		BDL
Methyl t-Butylether (MTBE)	BDL	BDL		BDL		BDL							BDL			BDL		BDL
Methylene Chloride	BDL	BDL		13B		11B							6B			7.8B		6.9B
Naphthalene	BDL	BDL		BDL		BDL							BDL			BDL		BDL
n-Butyl Benzene	BDL	BDL		BDL		BDL							BDL			BDL		BDL
n-Propylbenzene	BDL	BDL		BDL		BDL							BDL			BDL		BDL
o-Xylene	BDL	BDL		BDL		BDL							BDL			BDL		BDL
p-Ethyltoluene	BDL	BDL		BDL		BDL							BDL			BDL		BDL
p-Isopropyltoluene	BDL	BDL		BDL		BDL							BDL			BDL		BDL
sec-Butyl Benzene	BDL	BDL		BDL		BDL							BDL			BDL		BDL
t-1,2 Dichloroethene	BDL	BDL		BDL		BDL							BDL			BDL		BDL
tert-Butyl Benzene	BDL	BDL		BDL		BDL							BDL			BDL		BDL
Tetrachloroethylene	14.0	BDL		70.0		1.4							4.5			6.1		130
Toluene	BDL	BDL		BDL		BDL							BDL			BDL		BDL
Trichlorodifluoromethane	BDL	BDL		BDL		BDL							BDL			BDL		BDL
Trichloroethylene	13.0	BDL		7.9		12.0							8.8			10.0		250
Vinyl Chloride	26	BDL		BDL		1.7							BDL			2.4		7.3
TVOC	113.7	4.9	0.0	95.8	0.0	256.3	0.0	0.0	0.0	0.0	0.0	0.0	30.2	0.0	0.0	43.1	0.0	524.1

BDL - Below detection limits B - Analyte detected in associated Method Blank All results in ppb

Historically, varying levels of volatile organic compounds are also observed to the south beyond the known extent of the Purex plume in the vicinity of monitoring wells MW-311R, MW-367 and 368. These wells had TVOC concentrations ranging from 17 to 56 ppb. This contamination is believed to be associated with the operation of a closed loop cooling system in the vicinity of 50 Charles Lindbergh Blvd. NYSDEC records indicate that two heating and cooling wells, N-10086 and N-10087 operate in the parking lot of the Reckson Building (50 Charles Lindbergh Blvd). These wells are approximately 900 feet southeast of Purex monitoring well W-311R. Any volatile organic compounds that might be captured and introduced during recharge could fall under the combined hydraulic influence of recovery wells W-184 and W-187 and be drawn into the Purex plume. During the 2008 sampling rounds groundwater collected from monitoring well W-311R was found to contain up to 7 volatile organic compounds; historically, dichlorodiflouromethane has also been detected in groundwater samples collected from this well. This compound is not common to the Purex plume and is a form of Freon that can be linked to cooling system operation. Dichlorodifluoromethane was also detected in groundwater samples collected from monitoring well W-368 at a concentration of 4 ppb.

The extent of volatile organic groundwater contamination in the Upper Glacial and Upper Magothy portions of the aquifer downgradient of the former Purex Industries Site and its position relative to existing monitoring and recovery wells and the underlying sediments can be examined by reviewing geologic cross section A – A' (figure 2a,3). This cross section was prepared using both lithologic and geophysical data obtained while installing each of the wells in the section. The section line covers a linear distance of over 4,600 feet. The northernmost well in the section line is county groundwater network monitoring well N-9703 (X-156). This well is upgradient of the Purex site and its source area. The southernmost well in the section is heating/cooling well N-10087, this well is located in the parking lot of the Reckson Associates building (50 Quentin Roosevelt Blvd.). From north to south there are seven groundwater monitoring wells (W-305, 369, 382, 381, 380, 311R) and one groundwater Recovery well (W-187) which lie along the section line.

The area beneath the Purex/Mitchel Field site is underlain by varying amounts of fill and 25 to 60 feet of unconsolidated sand and gravel, the water table occurs locally in natural sediments approximately 20 to 30 feet below grade. These materials are considered to be part of the Upper Glacial Aquifer. These sediments are moderately to highly permeable and they are immediately underlain by a relatively dense, silty grey clay. This unit averages from 6 to 12 feet in thickness and acts as a confining unit across much of the site. The clay is absent in the vicinity of groundwater monitoring well W-369. The top of the Magothy Formation is found immediately beneath the clay. In this area, the Magothy Formation consists of a well stratified, tan, brown fine to medium grained sand with occasional layers of silty sand and clay.

Each of the monitoring wells in the cross section is screened in the upper portion of the Magothy Formation at depths ranging from 90 to 115 feet. The total volatile organic compound concentrations (ppb) detected in each of the wells during the October 2008 sampling event are posted near their individual screened intervals. Concentrations found in the plume range from BDL to 102 ppb.

Measured TVOC concentrations in five of the seven Upper Magothy plume wells were found to be below the "Water Condition" specified in the remediation criteria (see Appendix) for the site.

Figure 2a

Legend

- X-section Line @N9703-N10087 A-A'
- Monitoring Wells (Upper Magothy)
- Purex Recovery Wells

Site Location

PUREX SITE & VICINITY
GEOLOGIC CROSS SECTION
LINE A-A'
Mitchel Field, NY

Prepared By: - NCDPW - Water/Wastewater Engineering Unit

N
W E
S

0 62.5 125 250 375 500 Feet

Nassau County

Geographic Information System

Date: 6/11/2009

A

A'

ELEVATION IN FEET

150
100
50
Sea Level
−50
−100

N-9703/(X-156)
BEND IN SECTION
COMMERCIAL AVE.
W-305
MSBA/LIB
BEND IN SECTION
CONCEPT 400
W-369
W-370
UPS
W-382
W-381
W-380
W-187(Recovery Well)
BEND IN SECTION
W-311R
BEND IN SECTION
N-10087

Containment Area

BDL
96ppb
TD=106'
TD=90'
102ppb
TD=102'
3ppb
TD=102'
2ppb
6ppb
TD=102'
TD=102'
40ppb
TD=104'
43ppb
TD=113'
30ppb
TD=115'
BDL
TD=120'

LEGEND

- SILTY SAND/CLAY
- SAND & GRAVEL
- FILL
- WATER TABLE
- FINE–MEDIUM SAND
- CLAY
- 102ppb — October 2008 TVOC (ppb)
- SCREENED INTERVAL OF WELL

SCALE
HORIZONTAL 1"=300'
VERTICAL 1"=30'

NO.	REVISION DESCRIPTION	DATE
0	ORIGINAL RELEASE	XXX

FILE NAME: H:\Water–Wastewater Engineering\Purex\Geologic x–section\X–Section N9703–N10087(A–A")		CONTRACT NUMBER	SHEET NO. 1 OF 1
SCALE: AS SHOWN	DWG. NO. 001	DRAWN BY: J. KEISER	DATE 5/28/09
DESIGNED BY: M. FLAHERTY	DATE 5/09	CHECKED BY: M. FLAHERTY	DATE 5/28/09

FIGURE 3

COUNTY OF NASSAU
DEPARTMENT OF PUBLIC WORKS
WATER/WASTEWATER
ENGINEERING UNIT

UPPER MAGOTHY GEOLOGIC
CROSS SECTION (A–A')
N–9703 THRU N–10087
PUREX/MITCHEL FIELD
GARDEN CITY, NEW YORK

The 96 ppb of volatile organic compounds detected in N- 9703 (X-156) are not part of the Purex plume and are believed to originate from another source. Groundwater monitoring well W-311R exceeded its individual "Water Condition" value of 5 ppb for 1, 1 Dichloroethene by 3 ppb. This well is believed to be impacted by volatile organics which have been drawn into the area and circulated by the heating and cooling wells located at the Reckson Associates building. The only well found in the plume to exceed both its individual and total compound criteria was W-369 which exceeded the individual water condition concentration of 50 ppb established for C- 1, 2 Dichloroethylene by 14 ppb and the total compound concentration of 100 ppb by 2 ppb.

Review of the monitoring well data collected during 2008 indicates that the location of the operating recovery wells is correct, provides hydraulic control and allows for efficient recovery of contaminated groundwater from the MFGRP's plume.

In 2008, the MFGRP was in its eighteenth (18^{th}) year of the remediation. To better illustrate the progress made in obtaining the site's clean-up objectives, historical plots of the sampling results from wells located within the Upper Magothy portion of the offsite plume that still exhibit measurable levels of contamination in 2008 are presented in Figures 4 through 10. A summary of these plots is as follows:

Historical High TVOC's

Monitoring Well	Concentration	Date	2008 Concentration
302	23,000 ppb	5/22/90	41 ppb
311R	34,600 ppb	7/20/89	30 ppb
371	22,756 ppb	1/5/95	56 ppb
380	32,780 ppb	10/26/95	40 ppb
381	7,870 ppb	10/25/95	6 ppb
383	23,814 ppb	10/26/95	5 ppb
234	11,411 ppb	7/29/93	8 ppb

Review of the data presented indicates that the bulk of the Upper Magothy Remediation, from a contaminant mass standpoint, has been completed at the MFGRP site. The current aerial extent and the remaining levels of contamination at the MRGRP site reflects a low concentration asymptotic condition which is characteristic of long term pump and treat remediations.

Figure 4

W-302
VOC CONCENTRATIONS
1984 to 2008

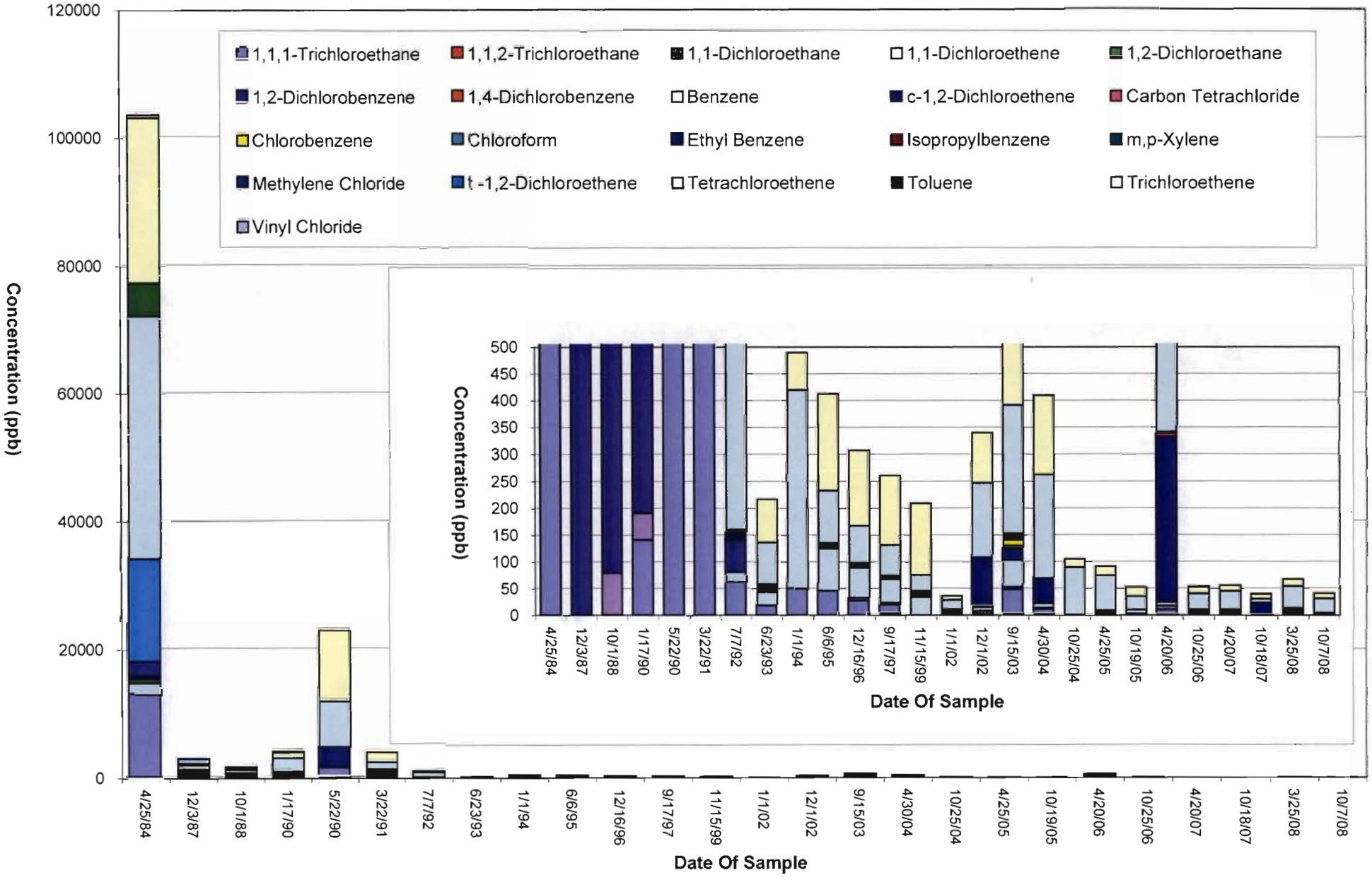


Figure 5

W-311R
VOC CONCENTRATIONS
1988 to 2008

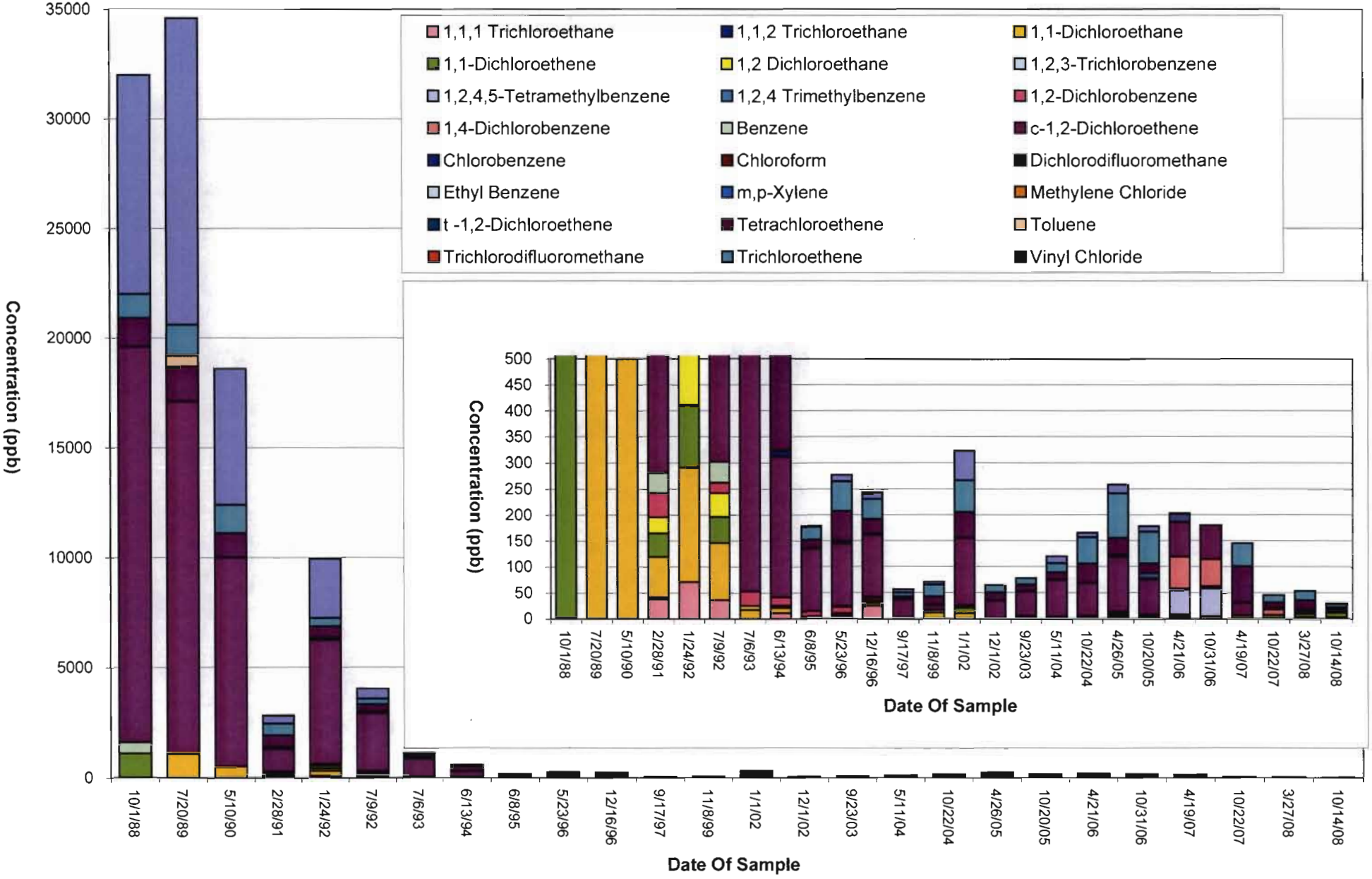


Figure 6

W-371
VOC CONCENTRATIONS
1995 to 2008

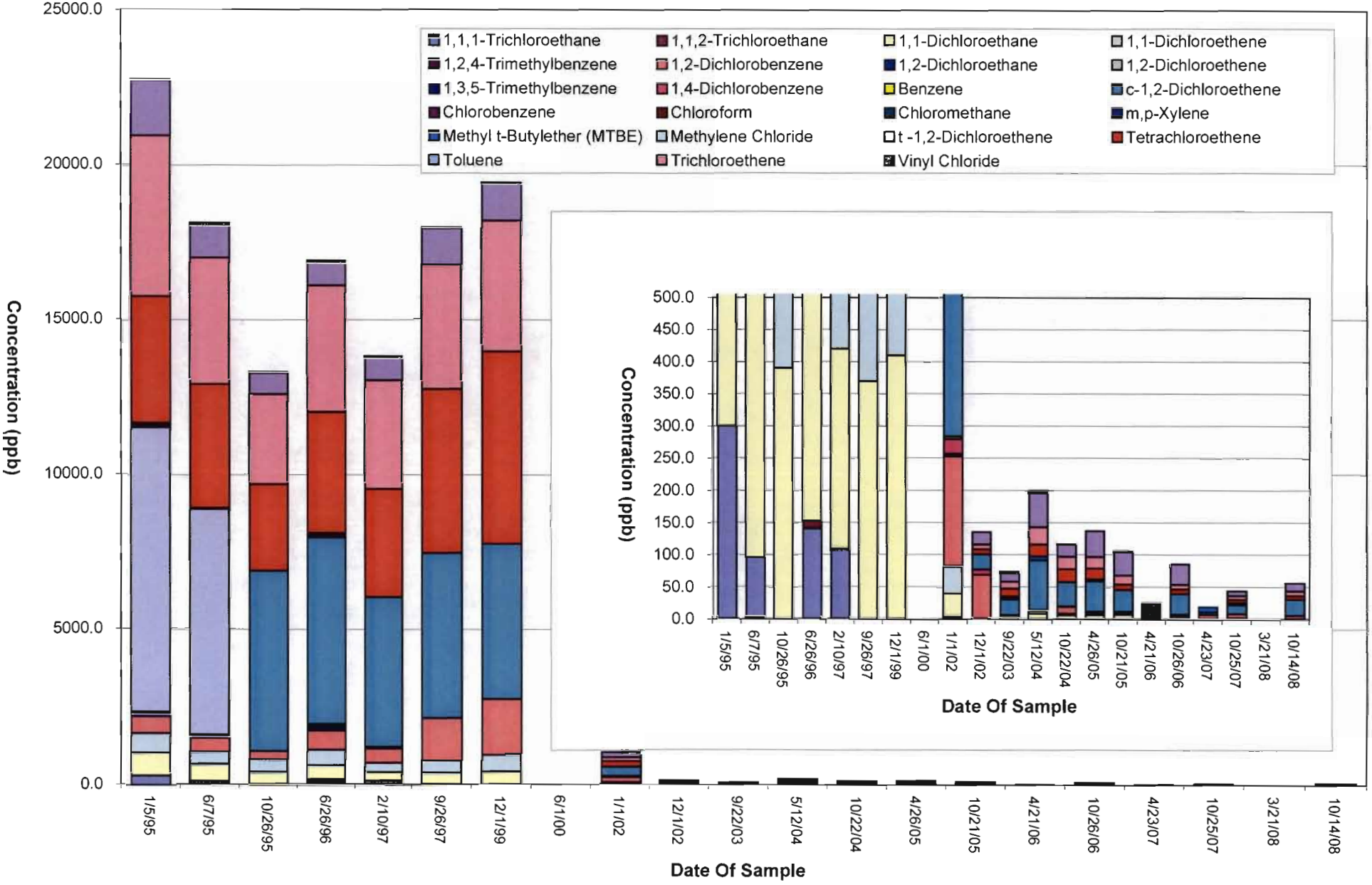


Figure 7

W-380
VOC CONCENTRATIONS
1995 to 2008

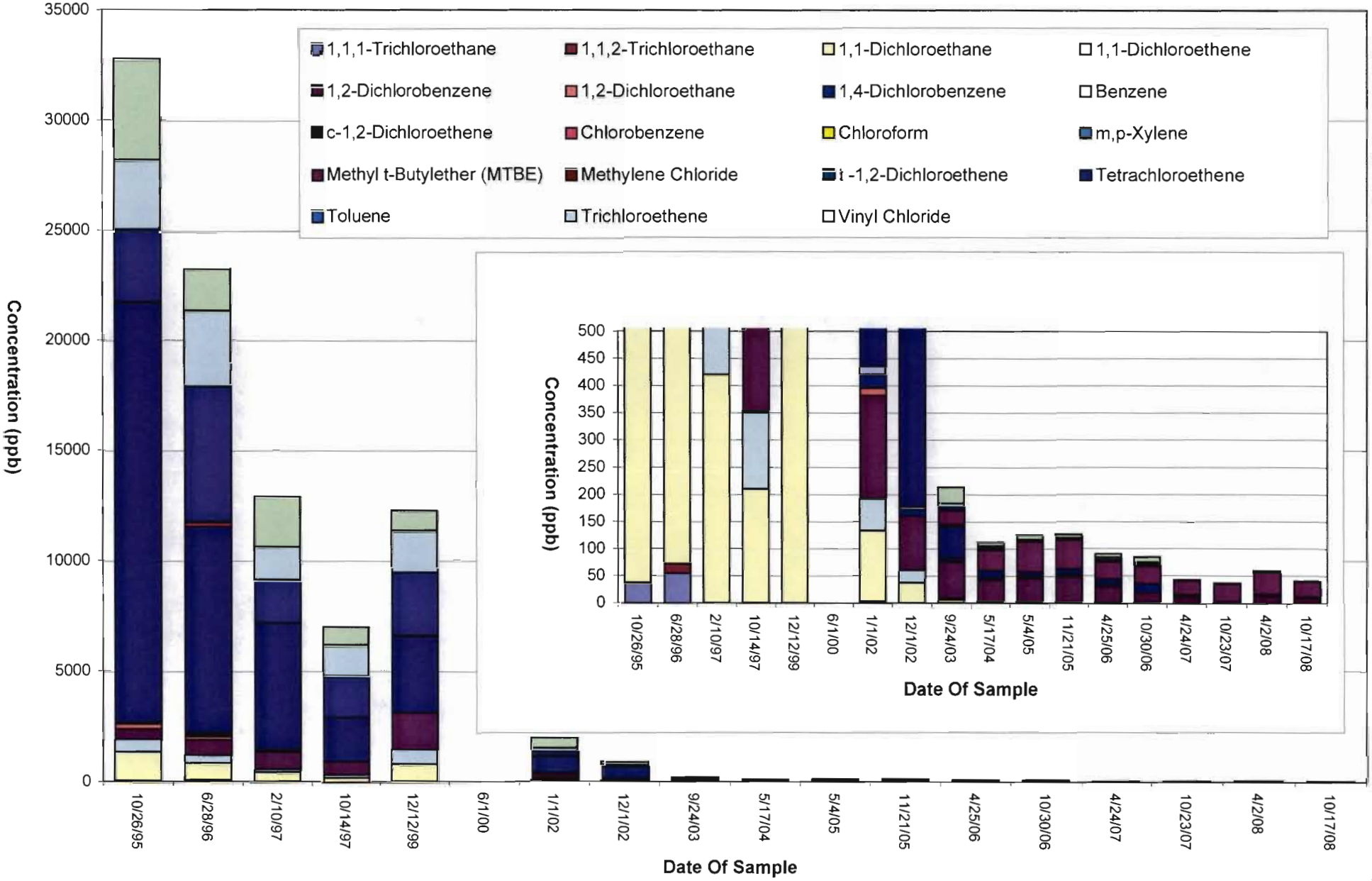


Figure 8

W-381
VOC CONCENTRATIONS
1995 to 2008

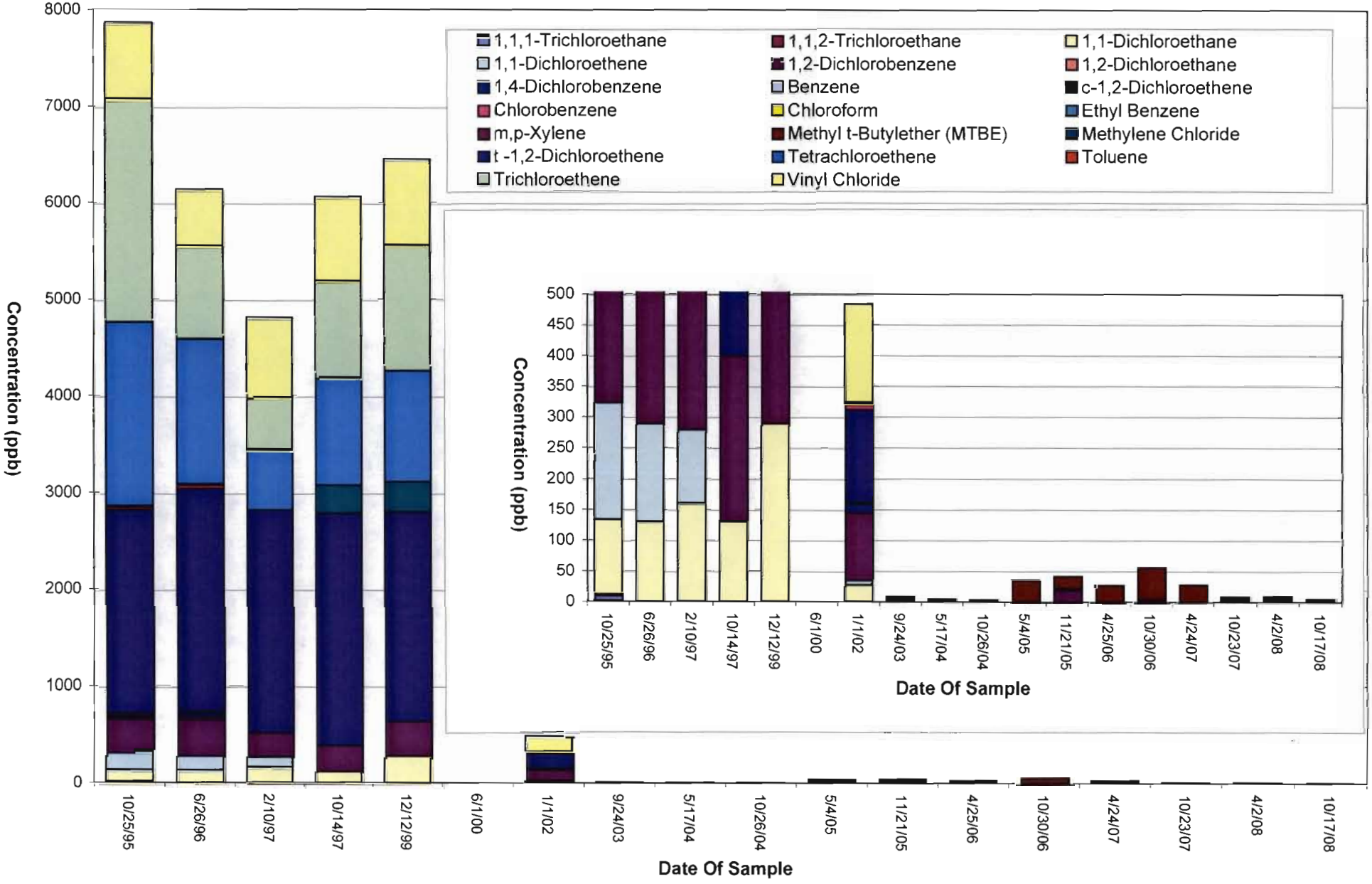


Figure 9

W-383
VOC CONCENTRATIONS
1995 to 2008

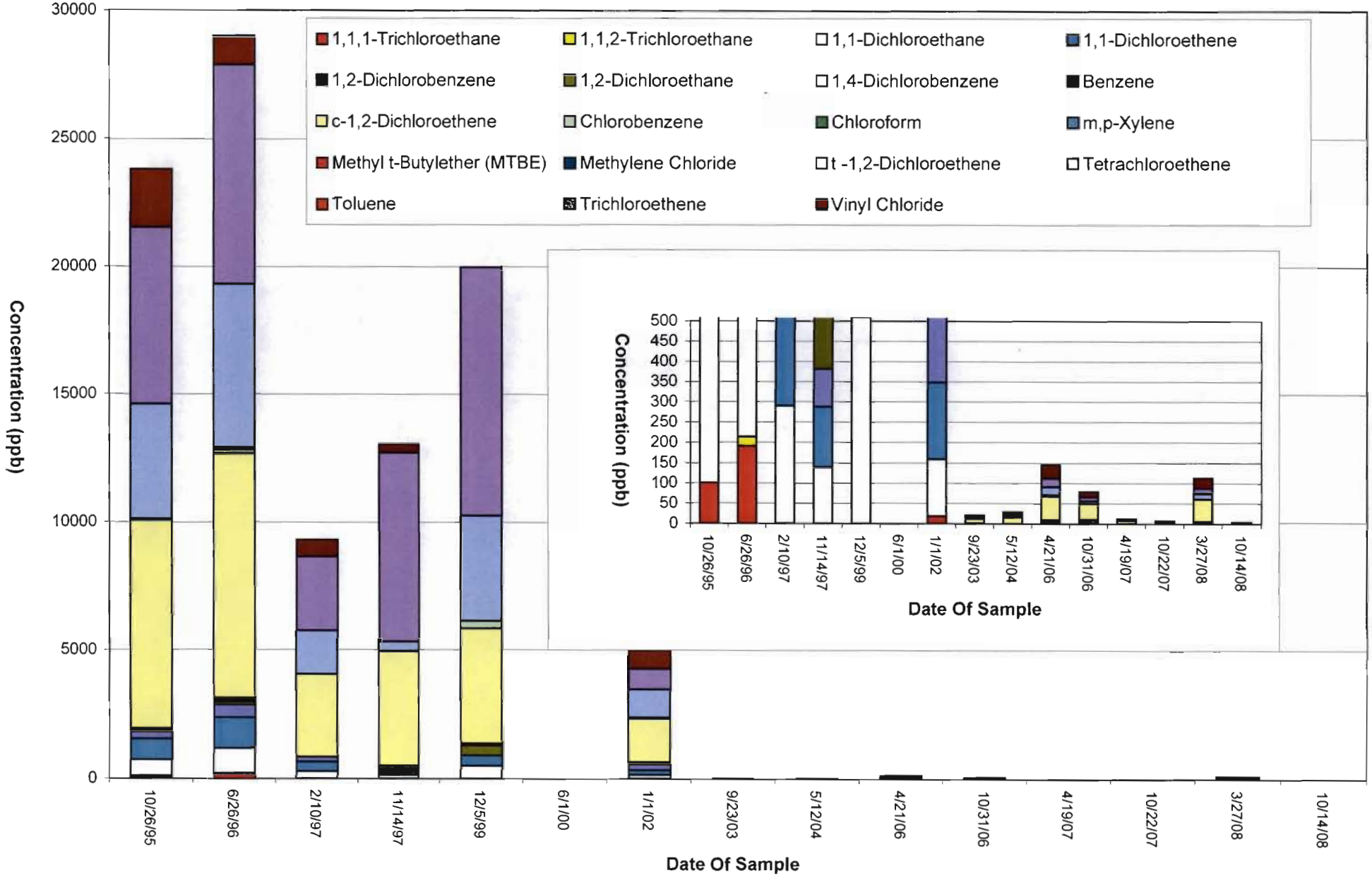
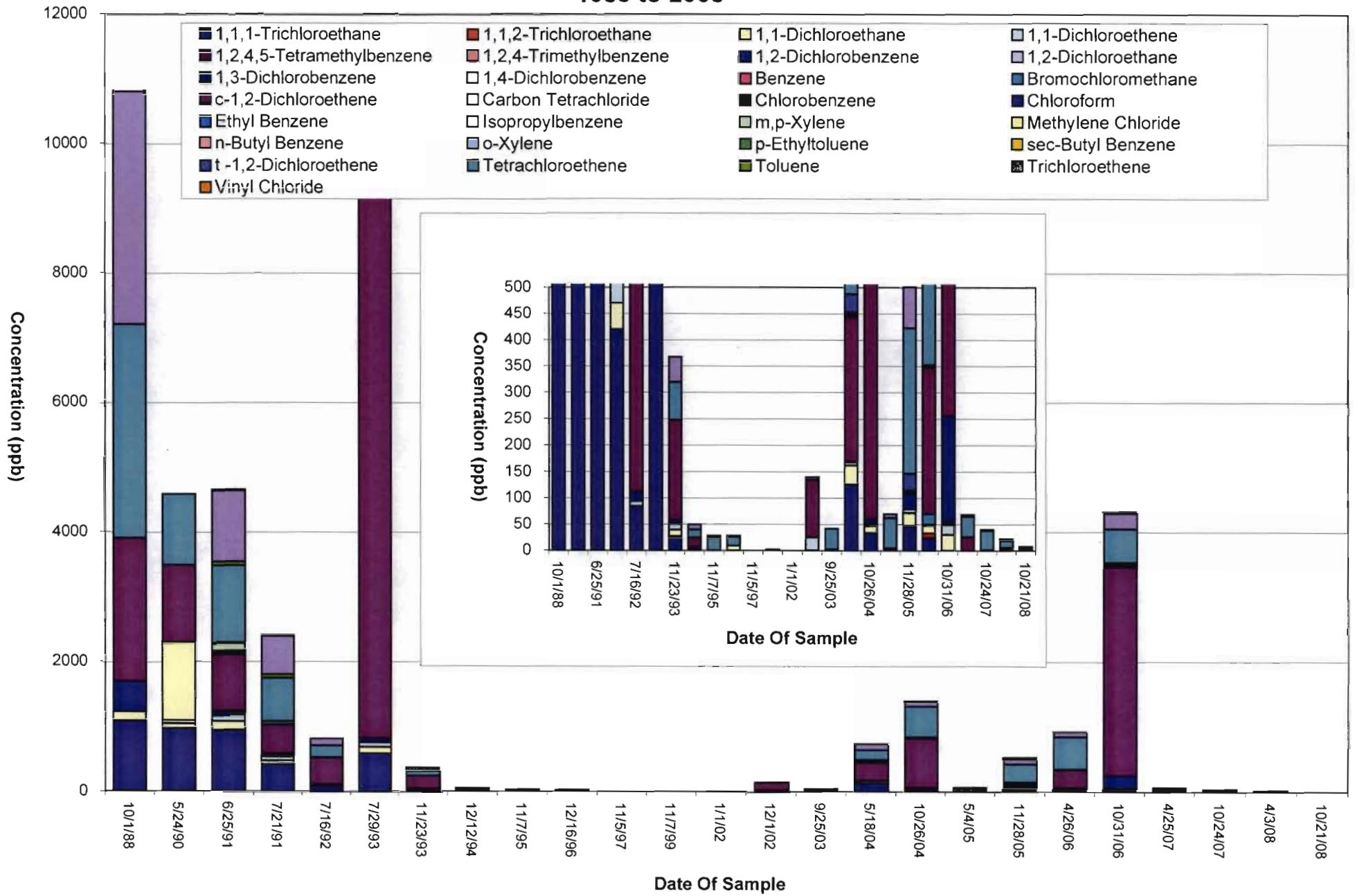


Figure 10

W-234
VOC CONCENTRATIONS
1988 to 2008



Groundwater conditions in the Lower Magothy portion of the aquifer downgradient of the former Purex site can also be examined using the Semi-annual groundwater data collected in 2008. There are four Lower Magothy downgradient wells which were sampled during this period; W-402, W-405, W-435, and W-461. TVOC concentrations in groundwater samples collected from these wells are very low; all four wells exhibited concentrations below 6 ppb for both the spring and fall sampling events. There are also two upgradient monitoring well clusters which are screened within this deeper interval which have also been sampled; Nassau County Groundwater Monitoring Well Network wells N-9713/X-157 and N-9779/X-164. These wells are located to the north and east of the original Purex source area along Quentin Roosevelt Blvd. and at the corner of Quentin Roosevelt Blvd. and Commercial Ave. (figure 11).

The upgradient monitoring wells exhibited much higher TVOC concentrations than the other monitoring wells in the cross section. Lower Magothy monitoring well N-9713/X-157 had a TVOC concentration of 256 ppb in groundwater with 190 ppb of 1,1 Dichloroethene and Lower Magothy well N-9779/X-164 (which was sampled separately on 6/11/08), had a TVOC concentration of 219 ppb, including 130 ppb of 1,1 Dichloroethene. The single groundwater recovery well screened within this interval; W-383D had a measured TVOC concentration of 524 ppb in the October 2008 sampling round. The majority of this total was comprised of three volatile organic compounds: Tetrachloroethylene (130 ppb), Trichloroethylene (250 ppb) and cis – 1, 2 Dichloroethylene (100 ppb). The positions of these monitoring wells relative to the local underlying sediments and each other are depicted in geologic cross section B-B'(figures 11,12).

The sediments present in the Lower Magothy are lithologically similar to those previously described for the Upper Magothy Formation which is largely composed of a tan-brown, fine to medium grained well sorted micaceous quartz sand with several layers of silty sand and clay. Higher concentrations of volatile organic compounds are observed in upgradient wells N-9713 and N-9779 and recovery well W-383D. The occurrence of these VOC's is dichotomous in nature, there is no continuous plume of volatile organics which can be described for this interval within the local aquifer, rather there appears to be a separate unknown source of volatile organics northeast of the former Purex site and a single hotspot of unknown origin in the immediate vicinity of recovery well W-383D.

4.0 IC/EC Compliance Report (not applicable)

This section is not applicable as remediation at this site is governed by a Consent Judgment signed with the New York State Department of Law on August 21, 1985.

5.0 Monitoring Plan Compliance Report (not applicable)

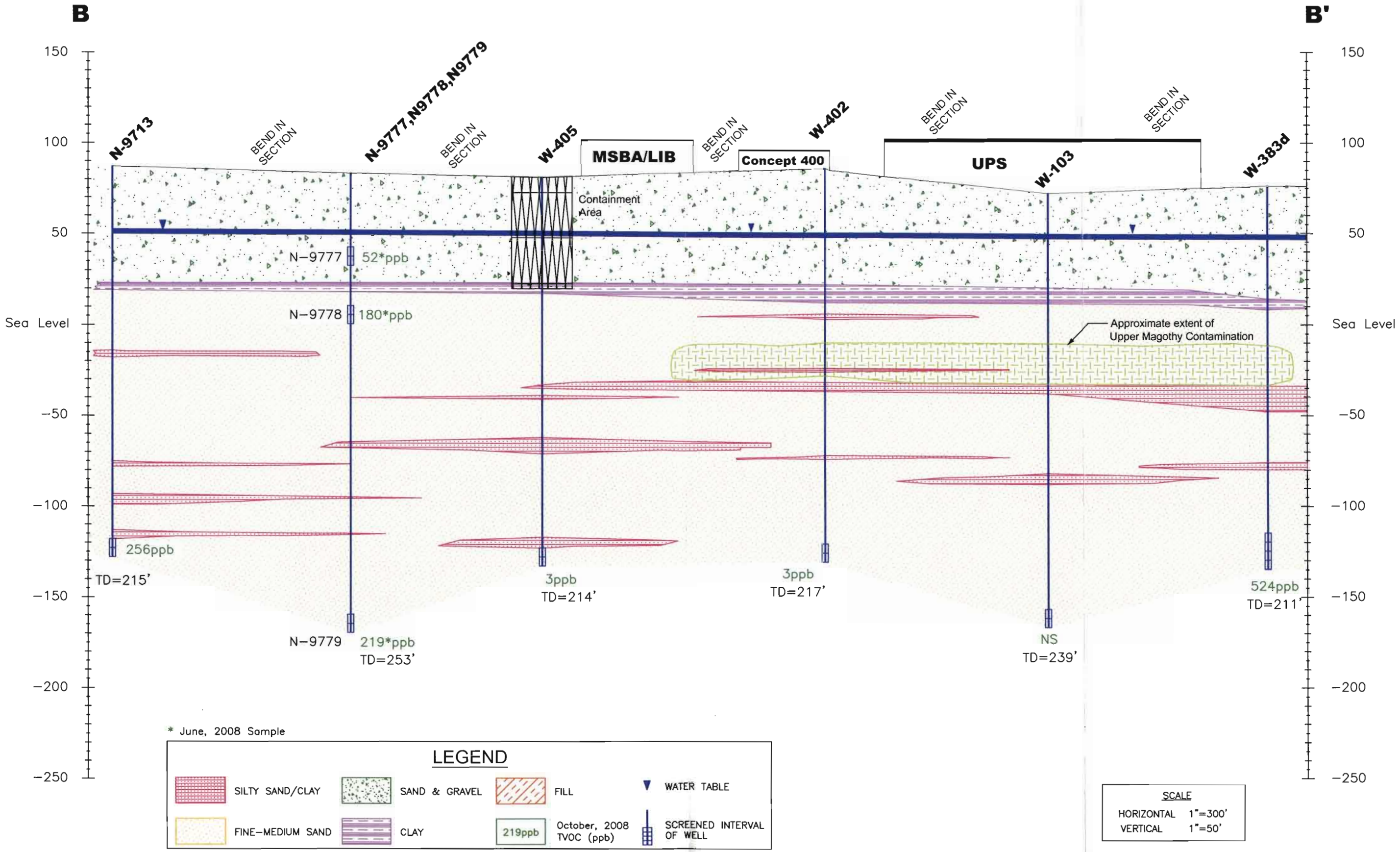
This section is not applicable as remediation at this site is governed by a Consent Judgment signed with the New York State Department of Law on August 21, 1985.

6.0 Operation & Maintenance (O&M) Plan Compliance Report (not applicable)

This section is not applicable as remediation at this site is governed by a Consent Judgment signed with the New York State Department of Law on August 21, 1985.

Figure 11


B
N-9713
N-9714
408
N-9777
N-9778
N-9779
405
434
435
M.S.B.A.
Garage
102
402
183
409
461
EW-103
U.P.S
Bldg
185
186
B'
383d
187
184
N-10086
N-10087
414
415
Legend
Lower Magothy Aquifer Wells
Heating-Cooling Wells
X-Section Line @N9713-W383d B-B'
Containment Area
Railroad
Site
Location
LOWER MAGOTHY AQUIFER
WELLS WITH GEOLOGIC
CROSS SECTION LINE B-B'
Mitchel Field, NY
Prepared By: - NCDPW - Water/Wastewater
Engineering Unit
0 75 150 300 450 600
Feet
Nassau County
Geographic Information System
Copyright 1993-2007
County of Nassau, New York
Date: 6/17/2009



			FILE NAME: H:\Water-Wastewater Engineering\Purex\Geologic x-section\Purex-gcsmf(N9713-N9777-W383d)B-B'		CONTRACT NUMBER	SHEET NO. 1 OF 1
			SCALE: AS SHOWN	DWG. NO. 001	DRAWN BY: J. KEISER	DATE 6/11/09
0	ORIGINAL RELEASE	XXX	DESIGNED BY: M. FLAHERTY	DATE 6/09	CHECKED BY: M. FLAHERTY	DATE 6/11/09
NO.	REVISION DESCRIPTION	DATE				

Figure 12

COUNTY OF NASSAU
DEPARTMENT OF PUBLIC WORKS
WATER/WASTEWATER
ENGINEERING UNIT

LOWER MAGOTHY GEOLOGIC CROSS SECTION(B−B')
N−9713 THRU W−383d
PUREX/MITCHEL FIELD
GARDEN CITY, NEW YORK

7.0 Overall PRR Conclusions and Recommendations

A. The original remedy (pump and treat used in combination with soil flushing and impermeable barriers) selected for the site in 1985 has proven to be highly effective. Levels of TVOCs have been significantly reduced in groundwater, unsaturated soils remediated and hydraulic control within the containment area maintained. The nineteen years of treatment have eliminated TVOC contamination from the Upper Glacial portion of the offsite plume, reduced volatile organic concentrations in the Upper Magothy portion of the offsite plume to levels below the "Water Condition" established in the remedial criteria section of the original Consent Judgment at most monitoring and recovery well locations. Those wells which exceed the "Water Condition" appear to have stabilized volatile organic concentrations and achieved asymptotic conditions. Contamination in the lower portion of the Magothy Formation appears to be confined to a single recovery well location and there is a question as to whether this is associated with the Purex Site or from another source.

B. Overall the objectives of the remedial plan has been met. The offsite monitoring wells are all either below the Water Condition or have reached asymptotic levels. The source area contamination has been reduced significantly and controlled by the remedial program defined in the Consent Order. There is a concern on behalf of the County that that unknown sources of volatile organics are contributing to the overall plume and should be investigated further by a regulatory agency. Additionally the remaining source area groundwater conditions should be re-evaluated and an updated form of treatment should be selected from current NYSDEC approved treatment technologies.

C. It is recommended that the frequency of the PRR for this site remain at an annual basis. The County does believe with the exception of the Source Area the requirements for site closure have been achieved because the offsite wells are either below Water Condition or at asymptotic levels. The County is concerned that the treatment plant equipment, offsite piping and recovery wells are all reaching the end of their usefull life and will require a significant capital investment to continue to operate. The County does not believe such an investment is warranted based upon the level of contamination remaining. The County would like to initiate discussions on what documentation is required to support a decision to discontinue the treatment of the offsite plume. Additionally the County would like to initiate discussions on utilizing an alternative treatment technology to remediate the remaining TVOC contamination in the Source Area.

Appendix

REMEDIATION CRITERIA

Shutdown at any one or more of the extraction or purge wells shall occur when the "Remediation Criteria" are met. The Remediation Criteria are met when either condition described below is met:

1. The Water Condition set forth in Table 3 is met for three consecutive months, in accordance with the following methodology:
   (a) Samples taken from the extraction or purge well and related monitoring wells will be analyzed and the data will be statistically evaluated to determine the concentrations for individual compounds and Total Volatile Organic Compounds. If there is no statistically significant difference between the data and the Water Condition at the 95 percent confidence limit (using "t" statistics) then the extraction or purge well may be shut down. In the event that the analysis of the extraction or purge well data meets the Water Condition and the related monitoring wells do not, the extraction or purge well may be shut down and the Remedial System adjusted as appropriate. The need for the installation of additional extraction or purge wells will be assessed on the basis of whether additional wells are necessary to affect the areas which are contaminated with chemicals attributable to the Property.
2. The "Zero Slope Condition" is met as follows: when the slope of the curve of the concentrations of the chemicals listed in Table 2 and Total Volatile Organic Compounds, as calculated is deemed zero. The determination of said concentration shall be made on a well-by-well basis at all pertinent extraction, purge, and monitoring wells within the containment area or within the offsite area. The determination of whether there is a zero slope shall be made as follows:
   (a) Samples shall be taken at the locations and frequencies stated in the Monitoring Plan.

(b) The data collected over the preceding twelve (12) month period will be examined and the concentration values for the individual compounds and the Total Volatile Organic Compounds and the associated confidence limits will be computed and plotted.

(c) If the curve suggested by these data points is linear, then a straight line using least squares regression model shall be fitted to the data and the slope of the fitted line shall be considered as the estimated slope for purposes of this paragraph.

(d) If the data points suggest a non-linear form, then an exponential curve using a least squares regression model shall be fitted to the data. The estimated slope for purposes of this paragraph shall be the first derivative of the curve at a value of time halfway between the dates of the last two sample points.

(e) The estimated slope shall be deemed to be zero if:

1) that slope is less than or equal to zero and greater than or equal to negative 30 ppb/year; and

2) the rate of change of that slope is equal to zero or indicates a continuously decreasing concentration.

(f) If the mean concentration in a well is less than or equal to 200 ppb, and the procedure defined above results in a positive slope, then the 95 percent confidence interval shall be calculated for the slope of the regression line; if a zero slope is within this confidence interval, then the estimated slope shall be deemed to be zero.

(g) The concentration at a well shall be deemed to meet the Zero Slope Condition if the estimated slope is deemed to be zero.

Data showing contamination that can statistically be demonstrated as not attributable to the original Purex Property may be excluded from the data evaluation used to determine whether the Remediation Criteria has been met. This exclusion shall be made upon confirmation of a non-Property source.

Table 3

Water Condition

Parameter	Concentration
Benzene	5
Toluene	50
Xylene	50
Trichloroethene	50
Tetrachloroethene	50
1,1-Dichloroethene	5
cis-1,2-Dichloroethene	50
trans-1,2-Dichloroethene	50
trans-1,3-Dichloropropene	2
cis-1,3-Dichloropropene	2
Methylene Chloride	50
Chloroform	100*
1,1,2-Trichloroethane	50
1,2-Dichloroethane	5
1,1,2,2-Tetrachloroethane	50
1,1,1-Trichloroethane	50
1,1,2-Trichloro-1,2,2-trifluoroethane	50
Bromodichloromethane	100*
Dibromochloromethane	100*
Bromoform	100*
1,1-Dichloroethane	50
Carbon Tetrachloride	50
1,4-Dichlorobenzene	50
Vinyl Chloride	5
Chlorobenzene	50
Ethyl Benzene	50
Total Compounds	100

NOTES:

(1) Concentrations in ug/1 (micrograms/liter), parts per billion.

(2) Sum of these four compounds shall not exceed 100 ug/1. (*)

(3) Total compounds are defined as the sum of all the compounds listed above.

(4) As set forth in Appendix C, Section 6, the methodologies to be used are EPA methods 624 and 625. Any analyte not found in concentrations at or above the method's detection limit shall be deemed to meet the Water Condition.