

October 22, 2008



Ms. Michelle Tipple  
New York State Department of Environmental Conservation (NYSDEC)  
Region 3  
21 South Putt Corners Road  
New Paltz, NY 12561

Subject: Revised Work Scope for a Supplemental Potassium Permanganate Application  
Hangar D, Westchester County Airport  
White Plains, New York

Dear Ms. Tipple:

Confirming our recent conversations, ExxonMobil is planning to implement the following revised work scope to conduct a supplemental potassium permanganate application at Hangar D of the Westchester County Airport pursuant to the following documents for the subject site: the December 2001 Remedial Investigation (RI) Report, the December 2001 Feasibility Study Report, Consent Order W3-0918-0204 dated July 15, 2002, and the January 2003 Remedial Design/Remedial Action Plan (RDRAP).

The revised work scope herein replaces that submitted on October 7, 2008. The October 7th work scope proposed to add potassium permanganate at four new test points to be installed upgradient (north) of well MW-01. As we discussed, there is a sink in this area and the actual test point locations will be subject to avoiding the sink and associated piping. We have also since completed the October Progress Report and are proposing that well MW-8S become one of the application points as the most upgradient well in shallow bedrock with elevated concentrations of total volatile organic compounds (TVOCs) in groundwater. This revised work scope therefore proposes that the supplemental potassium permanganate application be conducted at the three test points proposed for the north corner of the hangar and at existing well MW-8S. Additional information on the construction of proposed test points has also been included. Please refer to Sections 2.1 and 2.2, Figure 1, and Attachment B.

## **1.0 BACKGROUND / REMEDIAL ACTIVITIES CONDUCTED**

As proposed in the RDRAP, soil vapor extraction (SVE) was selected as the remedial alternative for chlorinated volatile organic compounds (CVOCs) found in site soils and in-situ oxidation using potassium permanganate was selected as the remedial alternative for CVOCs in groundwater at the site. In 2004, a SVE system was installed and started-up to remediate impacted soils above the water table where they were found in the vicinity of well MW-02. In August 2001, a pilot test was conducted when approximately 800 pounds of potassium permanganate was injected into the subsurface in two separate application areas, near wells MW-01 and MW-02.

Post-application groundwater sampling results collected one month after potassium permanganate injection indicated a reduction in overall CVOC concentrations in the overburden and shallow bedrock wells in both areas. However, results from samples collected three months after application indicated some rebound of contaminant concentrations in the MW-01 area. Due to an overall reduction in groundwater contaminant concentrations achieved from the first pilot test, a second potassium permanganate application was conducted in the same areas in September



2004. Again, results from samples collected three months after the application indicated rebound of contaminant concentrations in the MW-01 area.

CVOC concentration graphs for groundwater in each well in each area, as well as total CVOC concentration graphs for each area, are included in Attachment A. A site map showing the application areas is included as Figure 1. Refer to the most recent<sup>1</sup> Quarterly Progress Report for additional site information.

## 2.0 PROPOSED ACTIONS

Since remedial progress is apparent in the MW-02 area (refer to Attachment A), a supplemental application of potassium permanganate is proposed to target the MW-01 area.

Woodard & Curran first proposes to conduct a one day pre-application investigation to advance up to seven soil borings upgradient (to the north) and near well MW-01. Groundwater flow direction was previously described in the December 2001 RI Report as generally flowing north to south (refer to Attachment B). To confirm the local groundwater flow direction and to potentially be used for chemical application, a 2-inch PVC test point will be completed within each bore hole. Soil and groundwater samples will be collected from each location for VOC analysis. In addition, one soil sample will be collected for soil oxidant demand (SOD) testing. All site groundwater monitoring wells and test points will be gauged to develop a refined groundwater contour plan.

Once the pre-application investigation is complete, Woodard & Curran will conduct a one day potassium permanganate application. Up to 385 pounds (175 kilograms) of potassium permanganate will be added to test points in the vicinity of well MW-01. A Material Safety Data Sheet for potassium permanganate is included as Attachment C.

Work will be conducted under the prevailing Health & Safety Plan for the site. The table below summarizes proposed actions, with additional, expanded information in the subsequent sections.

Pre-Application	Application Activities	Post-Application
1. Complete and submit USEPA UIC Form. 2. Complete seven test points by Geoprobe® technology. 3. Collect soil and groundwater samples. 4. Gauge all monitoring wells and test points to confirm groundwater flow direction.	5. Prepare Potassium Permanganate slurry solution for application to subsurface. 6. Add Potassium Permanganate at four locations in the MW-01 area.	7. Perform post-application groundwater monitoring one month and three months after application. 8. Include a summary of findings and evaluation of results in a letter report. 9. Resume groundwater monitoring and reporting in accordance with the prevailing plan for the site.

### 2.1 Pre-Application Activities

An Underground Injection Control (UIC) Class V Well Inventory Form will be submitted to the United States Environmental Protection Agency (USEPA) for the potassium permanganate application.

<sup>1</sup> October 9, 2008 as of this writing.



Upon notice from the NYSDEC that this work is approved, Woodard & Curran will then conduct a pre-application investigation and advance up to seven soil borings in the vicinity of well MW-01 (refer to Figure 1). Soil borings will be advanced continuously from the ground surface to the top of bedrock. Continuous soil samples will be collected in acetate sleeves, visually classified and screened for TVOCs using a photoionization detector. One soil sample will be collected from each boring for VOC analysis from the interval with the highest TVOC reading or just above the water table. In addition, one soil sample will be collected from the southernmost boring for soil oxidant demand (SOD) testing. Results from the SOD testing will be used with historic data to document the oxidant demand from environmental media in the MW-01 area. A 2-inch PVC test point will be completed within each bore hole. Construction of the proposed test points will be similar to that of existing well MW-01. The points will be set at the top of bedrock (approximately 15 feet below the hangar floor) with 10 feet of 2" dia. 10-slot PVC screen and #1 sand pack. Groundwater samples will be collected from each test point and analyzed for VOCs and field groundwater quality parameters (dissolved oxygen, oxidation-reduction potential, pH, temperature, conductivity).

## **2.2 Application Activities**

Once the pre-application activities are complete, Woodard & Curran will conduct a one day potassium permanganate application. Up to 175 kilograms (385 pounds) of potassium permanganate will be injected into four locations in the MW-01 area. This dosage is based on the previous pilot test applications conducted at the site and our understanding of the site geology and constraints to complete the application activities in a safe controlled manner while also reducing the contaminant mass within the application area.

The supplemental potassium permanganate application is proposed to be conducted at the three points proposed for the north (upgradient) corner of the hangar and at existing well MW-8S, the most upgradient well in shallow bedrock with elevated concentrations of TVOCs in groundwater. Existing wells MW-02 and MW-7S, existing points GP-2B, GP-03, and the proposed new test point downgradient (south) of GP-2B will be available for post-addition monitoring. Relative elevations are included in the attached Figure 3-2 from the RI Report revised to include existing and proposed test points.

The potassium permanganate will be premixed in a mix tank and applied to the subsurface with a high-pressure grout pump. The mix tank will consist of a 125-gallon open topped drum. The powdered potassium permanganate will be mixed with water in the 125-gallon drum, which will be placed on polyethylene sheeting to minimize the chance of spills. The solution will be pumped with a high pressure grout pump into the aquifer at a rate of 15-20 gallons per hour.

## **2.3 Post-Application Activities**

One month and three months following application activities, field groundwater quality parameters (dissolved oxygen, oxidation-reduction potential, pH, temperature, conductivity) will be monitored in all monitoring wells and test points and groundwater will be sampled and analyzed from up to 15 monitoring wells and any test points not used for potassium permanganate application. Groundwater samples will be analyzed for VOCs by EPA Method 8260. Thereafter, the prevailing groundwater monitoring plan for the site will resume.



### 3.0 SCHEDULE

The pre-application and application activities are expected to take four field days and are scheduled for the weeks of November 10 and 17, 2008. Post-application groundwater sampling events are proposed one month and three months following application, in December 2008 and February 2009.

### 4.0 REPORT OF FINDINGS

Within sixty days of receipt of post-application laboratory analytical data, Woodard & Curran will summarize the results and findings in a letter to NYSDEC. The information presented in the letter will include:

- Summary of activities, field data, and laboratory results;
- Expanded understanding of the chemical distribution in subsurface media and a refined groundwater contour map below the hangar floor;
- Evaluation of the persistence of potassium permanganate in the subsurface; and
- Dissolved contaminant percent reductions observed as a result of application activities.

Please do not hesitate to contact me at (203) 271-0379 with if you need any additional information to facilitate your review and approval of this IRM. Thank you again for your time and assistance.

Sincerely,

WOODARD & CURRAN INC.

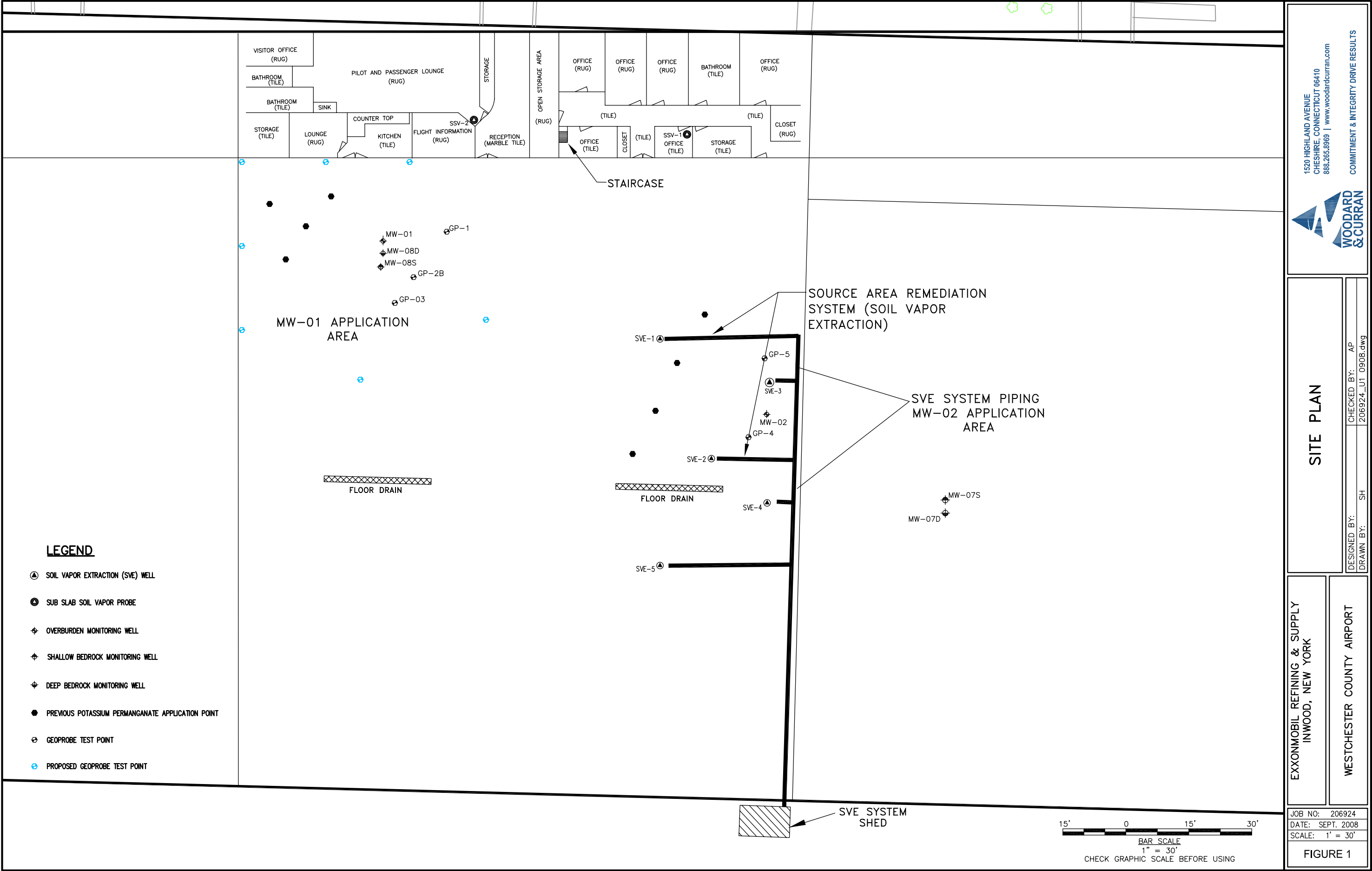
Anne E. Proctor, PE  
Sr. Project Manager

cc: M. Lamarre – ExxonMobil  
N. Walz – NYSDOH  
M. Parletta - Westchester County Airport  
E. Faulkner, R. Martinez - Landmark Aviation  
M. DeGloria - GES

#### Attachments:

Figure 1: Site Plan  
Attachment A: Groundwater Concentration Graphs  
Attachment B: Remedial Investigation Report Figures 3-1 and 3-2  
Attachment C: Material Safety Data Sheet for Potassium Permanganate

0206924.03.003



1520 HIGHLAND AVENUE  
CHESHIRE, CONNECTICUT 06410  
888.285.8969 | www.woodardcurran.com



## SITE PLAN

DESIGNED BY: SH  
CHECKED BY: AP  
206924\_U1\_0908.dwg

EXXONMOBIL REFINING & SUPPLY  
INWOOD, NEW YORK

WESTCHESTER COUNTY AIRPORT

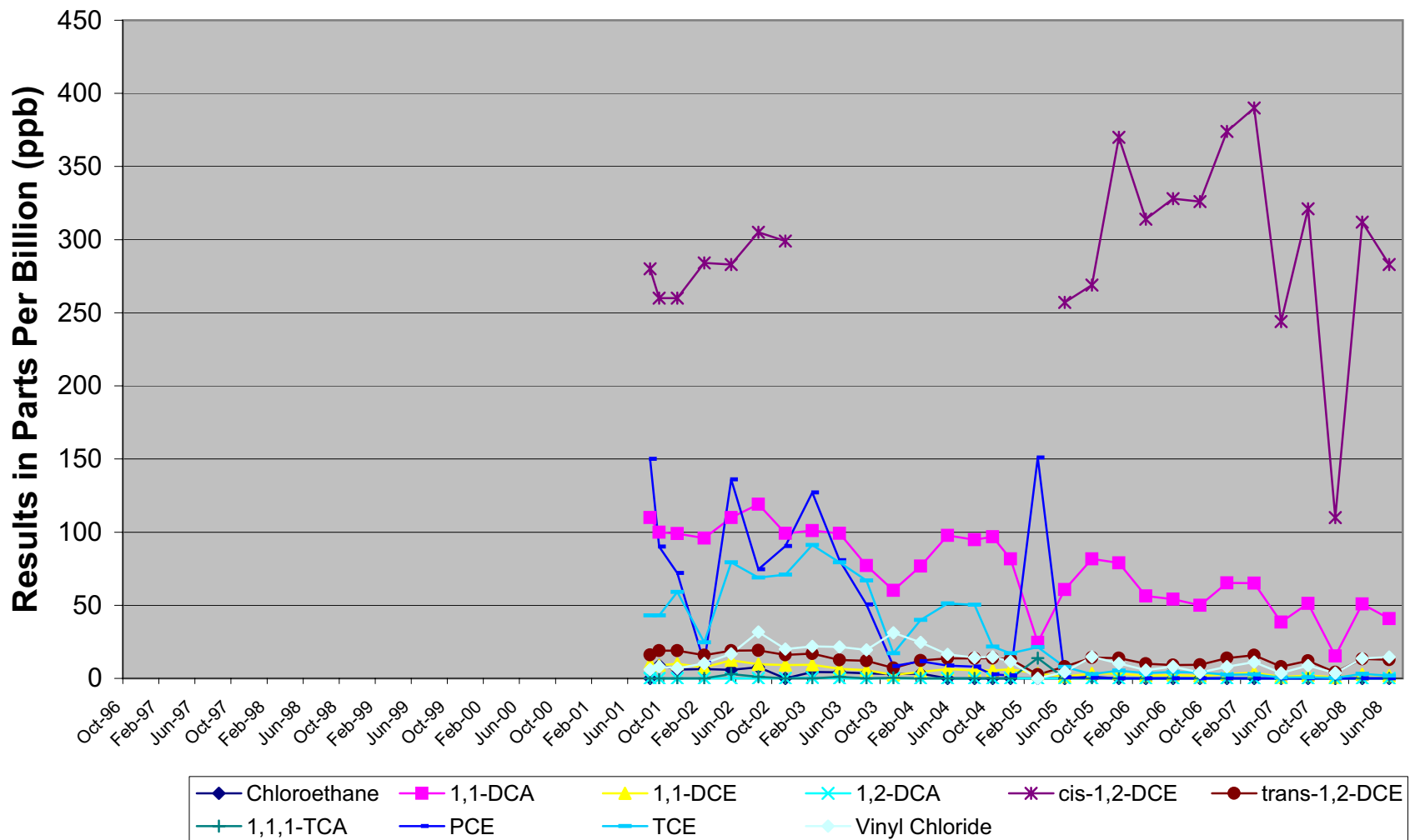
JOB NO: 206924  
DATE: SEPT. 2008  
SCALE: 1" = 30'

FIGURE 1

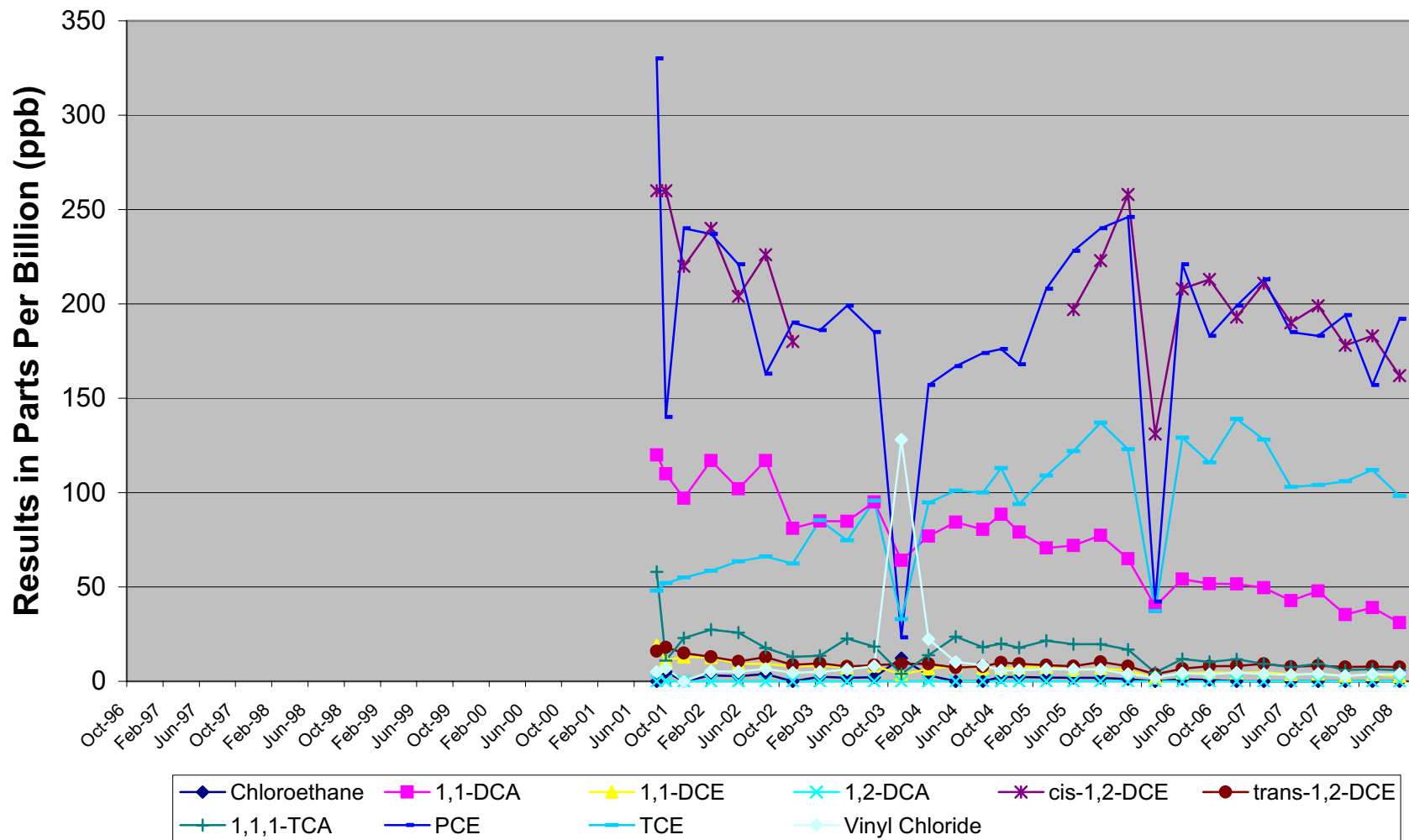
## ATTACHMENT A – GROUNDWATER CONCENTRATION GRAPHS



**Volatile Organic Compounds**  
**Hangar D, Westchester County Airport**  
**Well GP-02B      MW-01 Area**

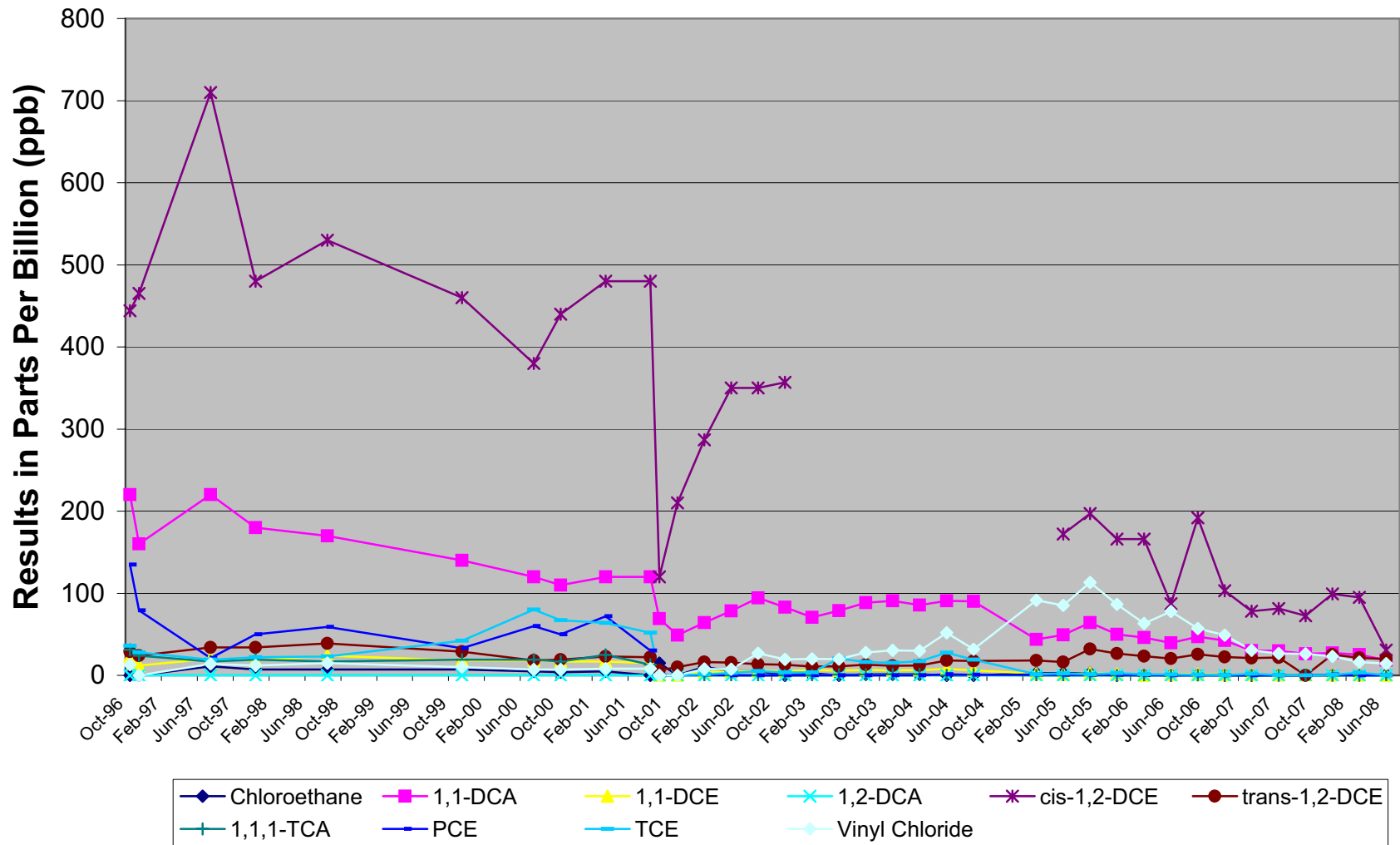


**Volatile Organic Compounds**  
**Hangar D, Westchester County Airport**  
**Well GP-03      MW-01 Area**

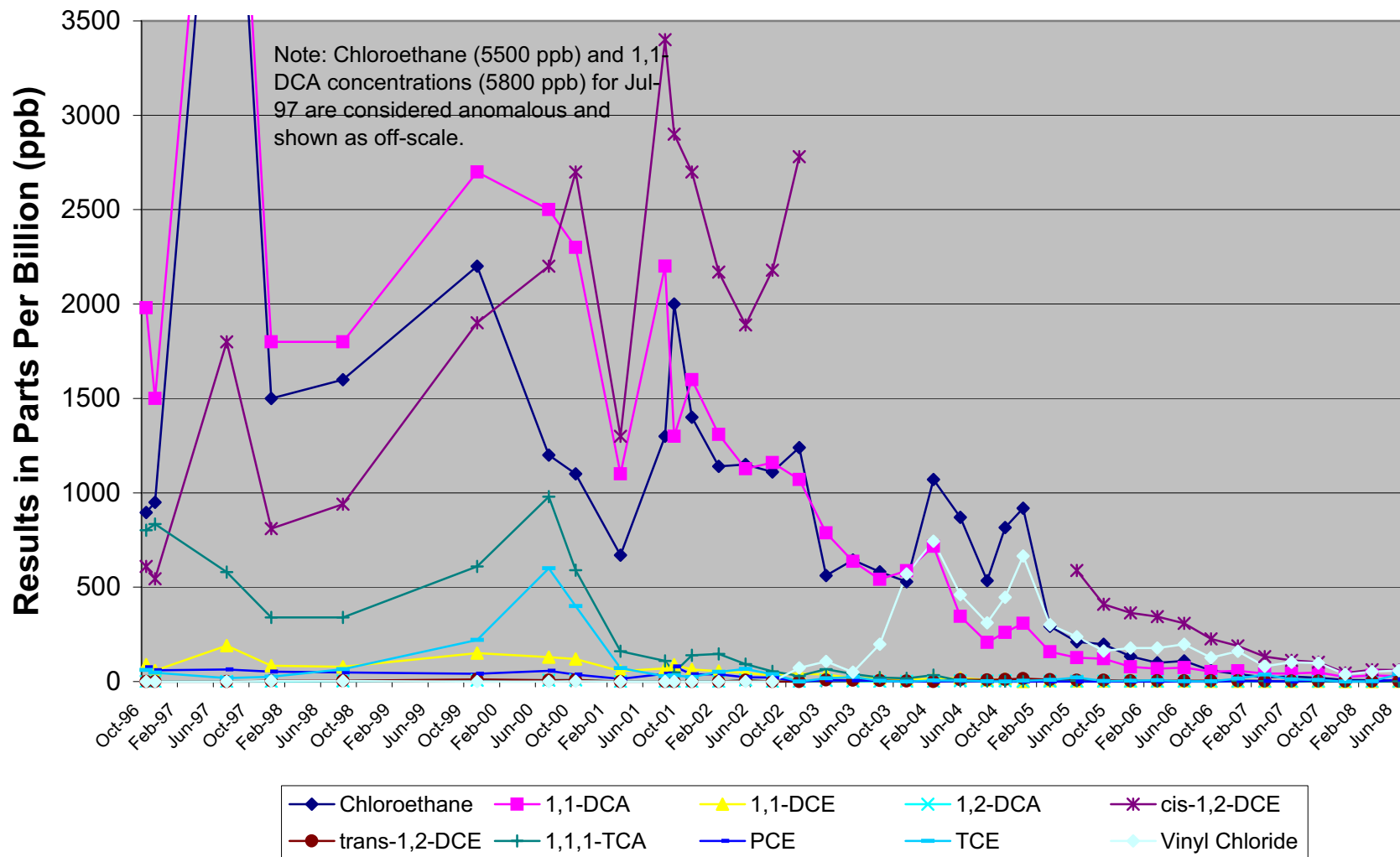




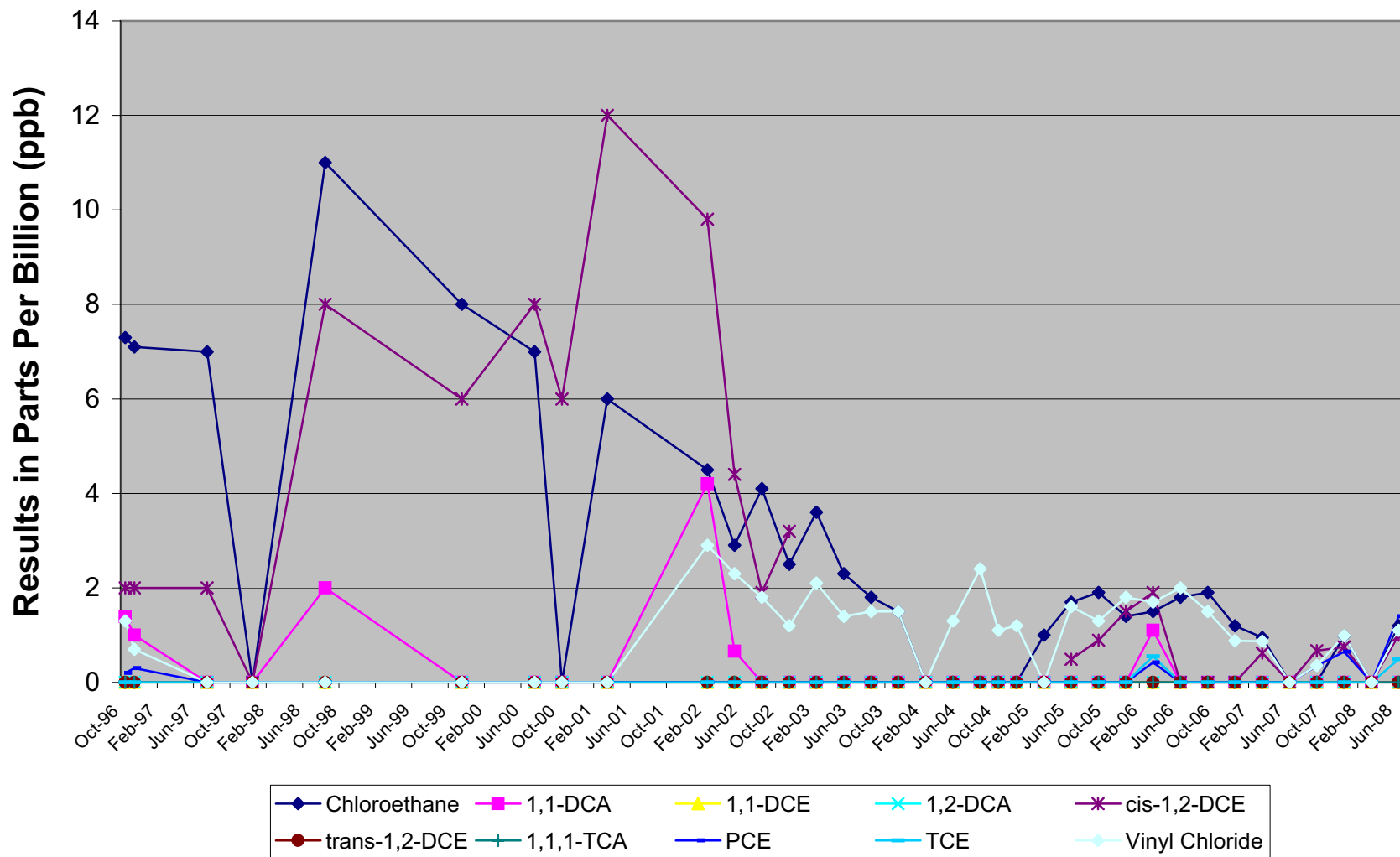
**Volatile Organic Compounds**  
**Hangar D, Westchester County Airport**  
**Well MW-01      MW-01 Area**



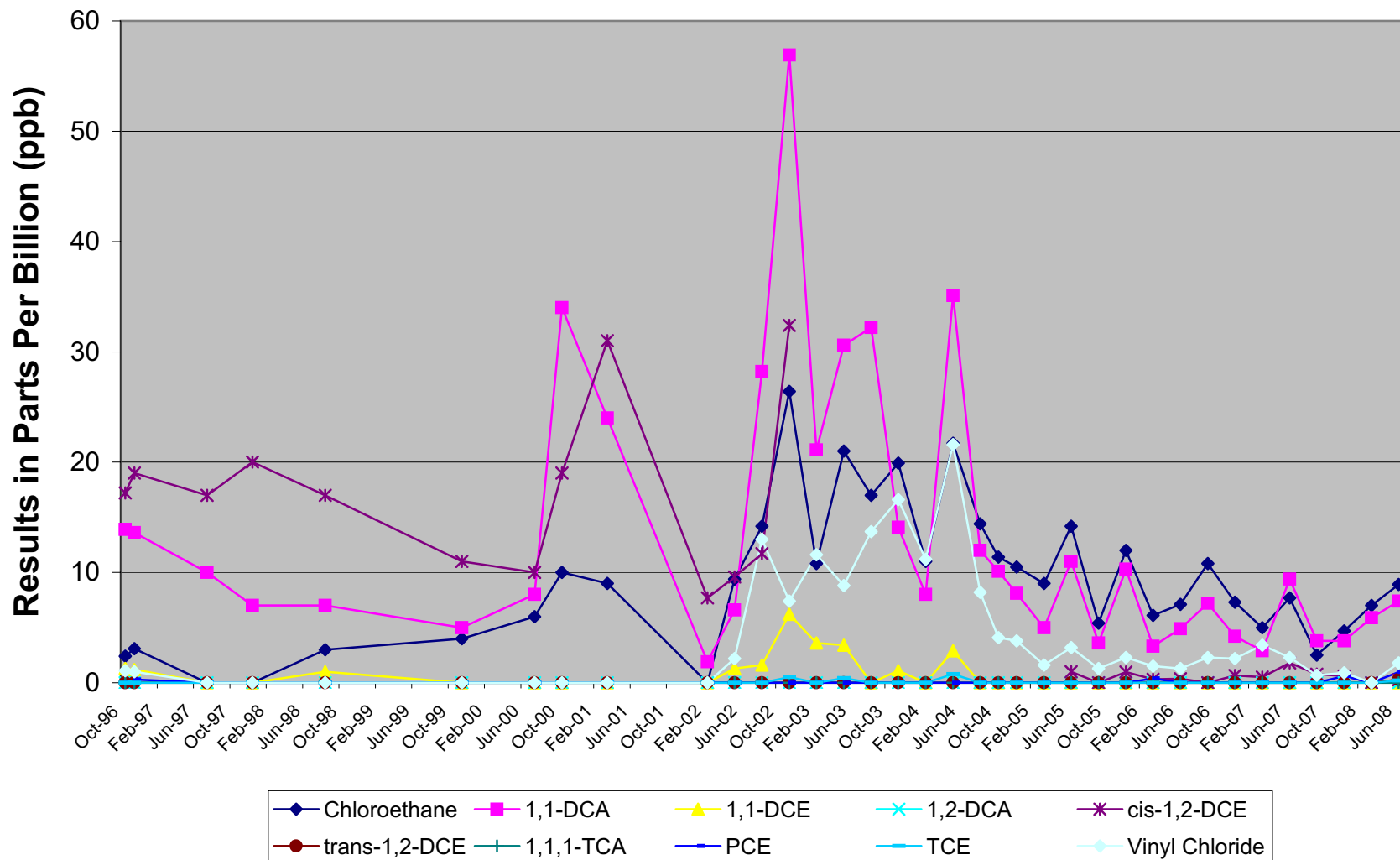
**Volatile Organic Compounds**  
**Hangar D, Westchester County Airport**  
**Well MW-02      MW-02 Area**



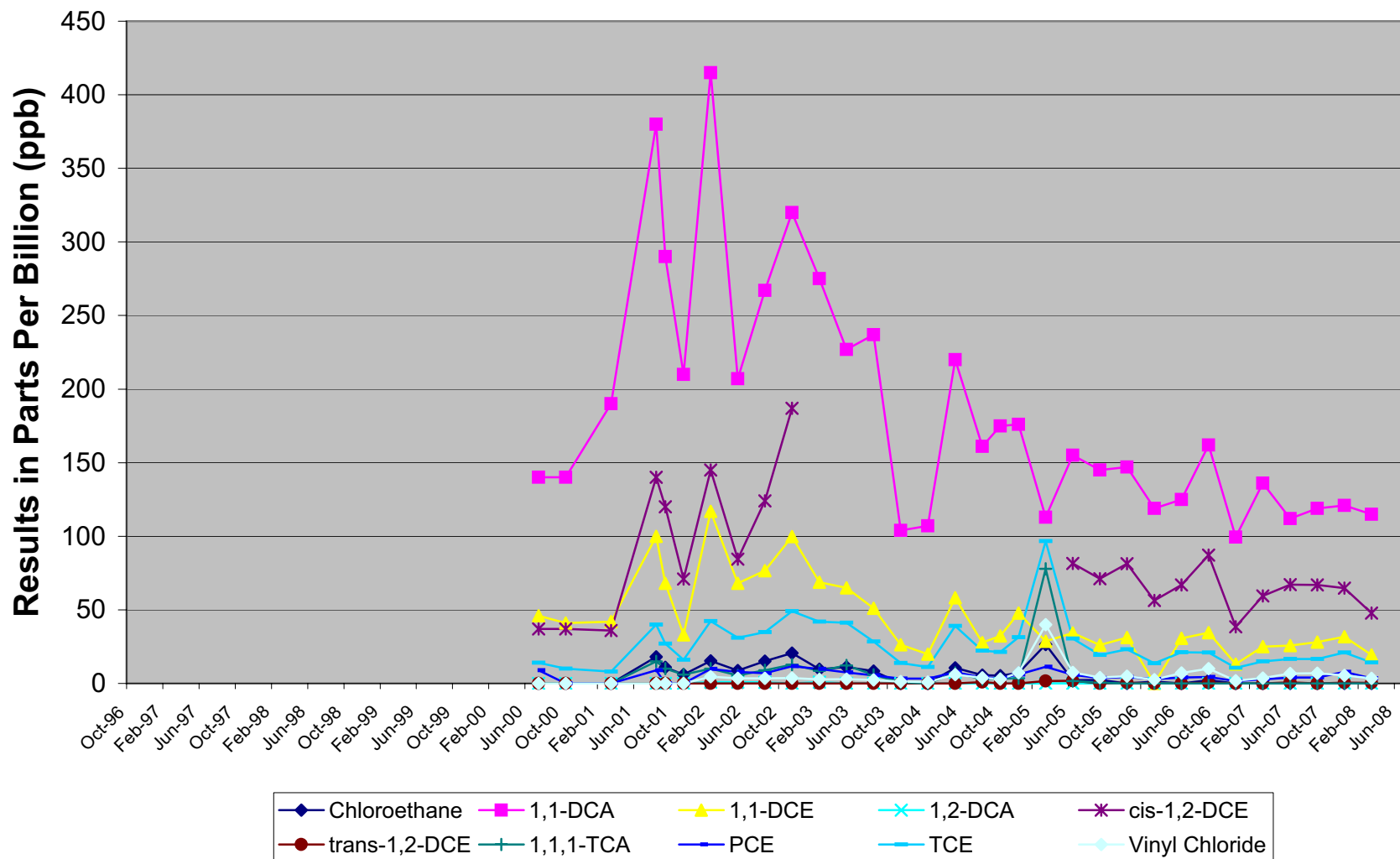
**Volatile Organic Compounds**  
**Hangar D, Westchester County Airport**  
**Well MW-03      Downgradient Area**



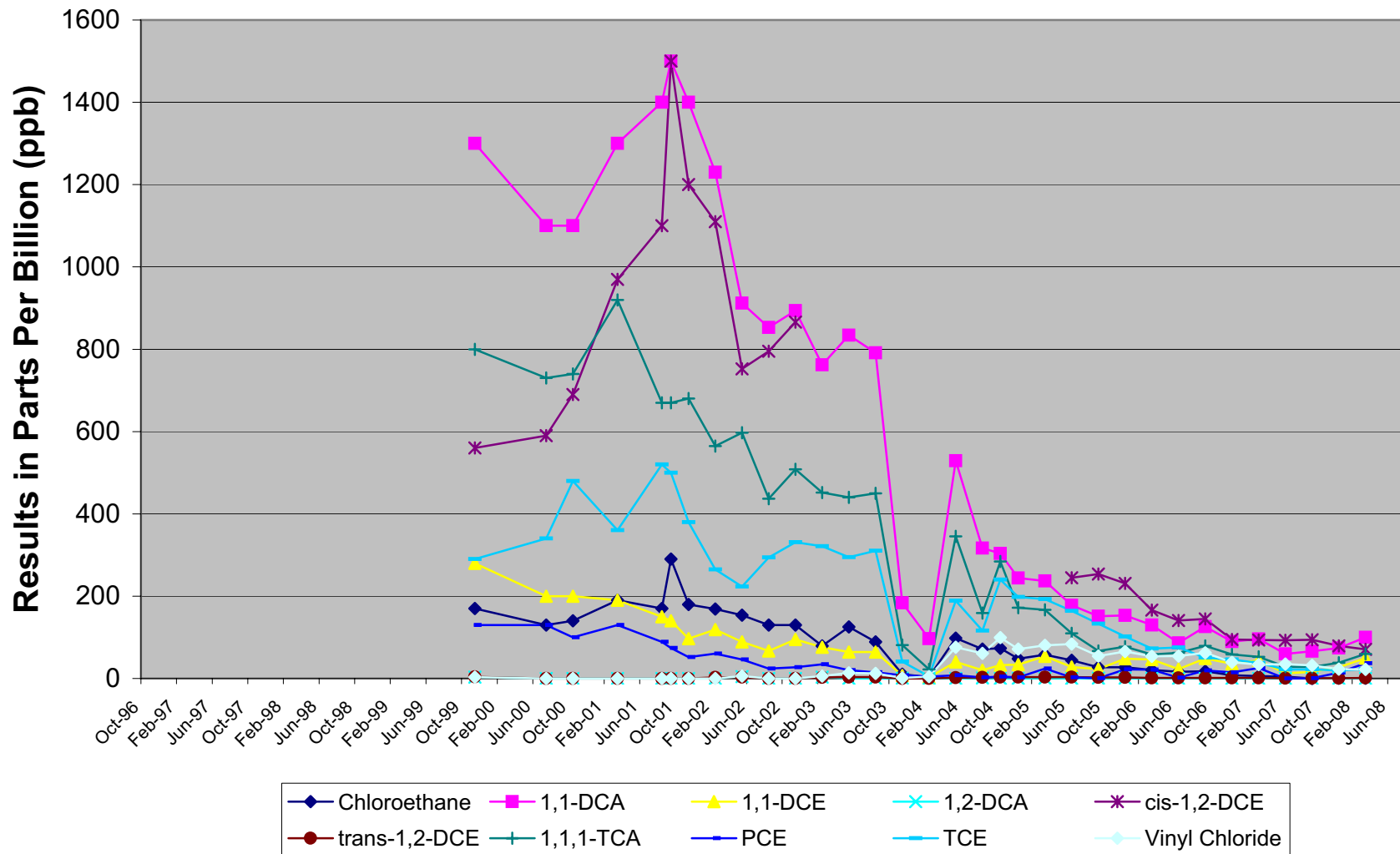
**Volatile Organic Compounds**  
**Hangar D, Westchester County Airport**  
**Well MW-04      Downgradient Area**



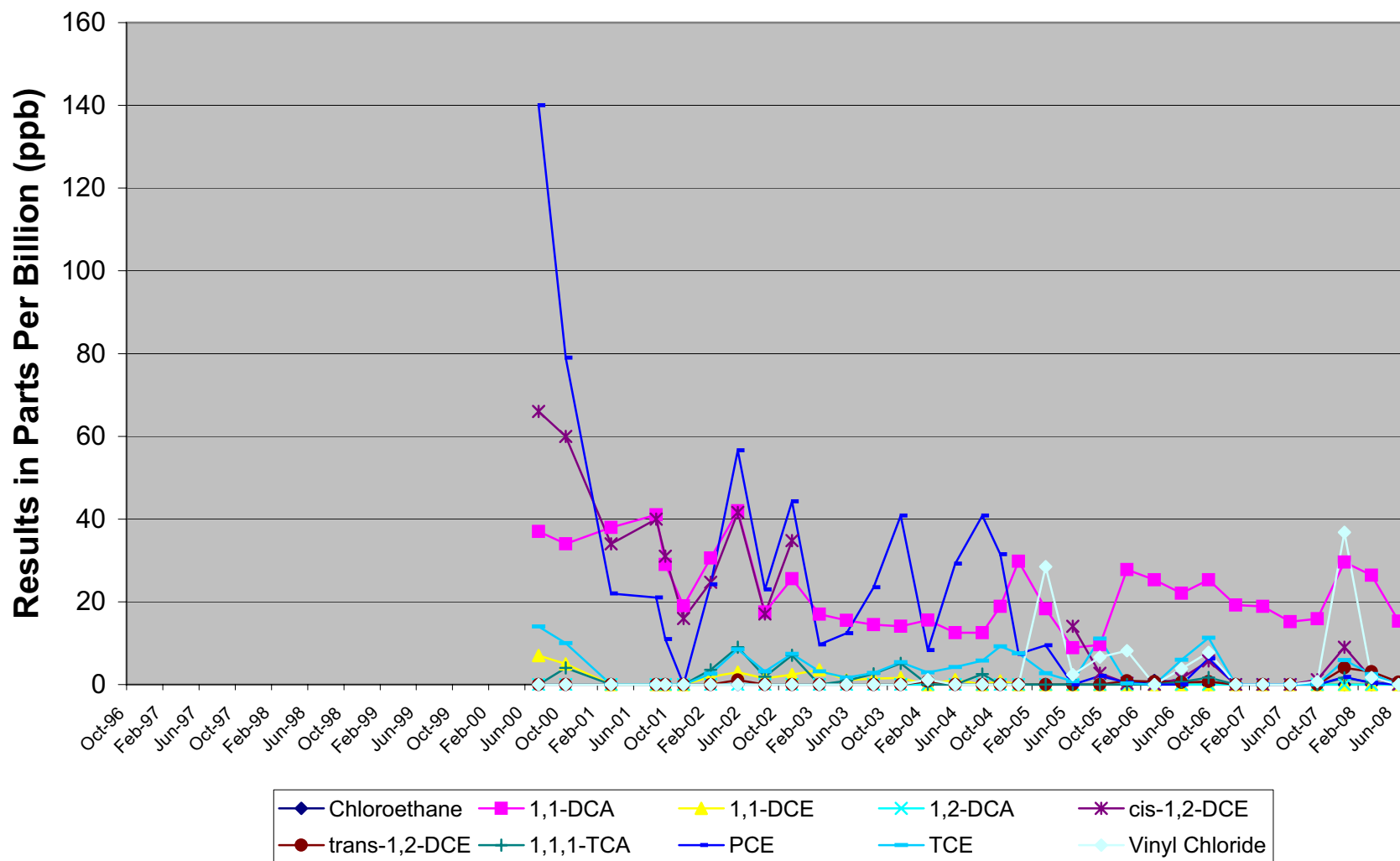
**Volatile Organic Compounds**  
**Hangar D, Westchester County Airport**  
**Well MW-07D      MW-02 Area**



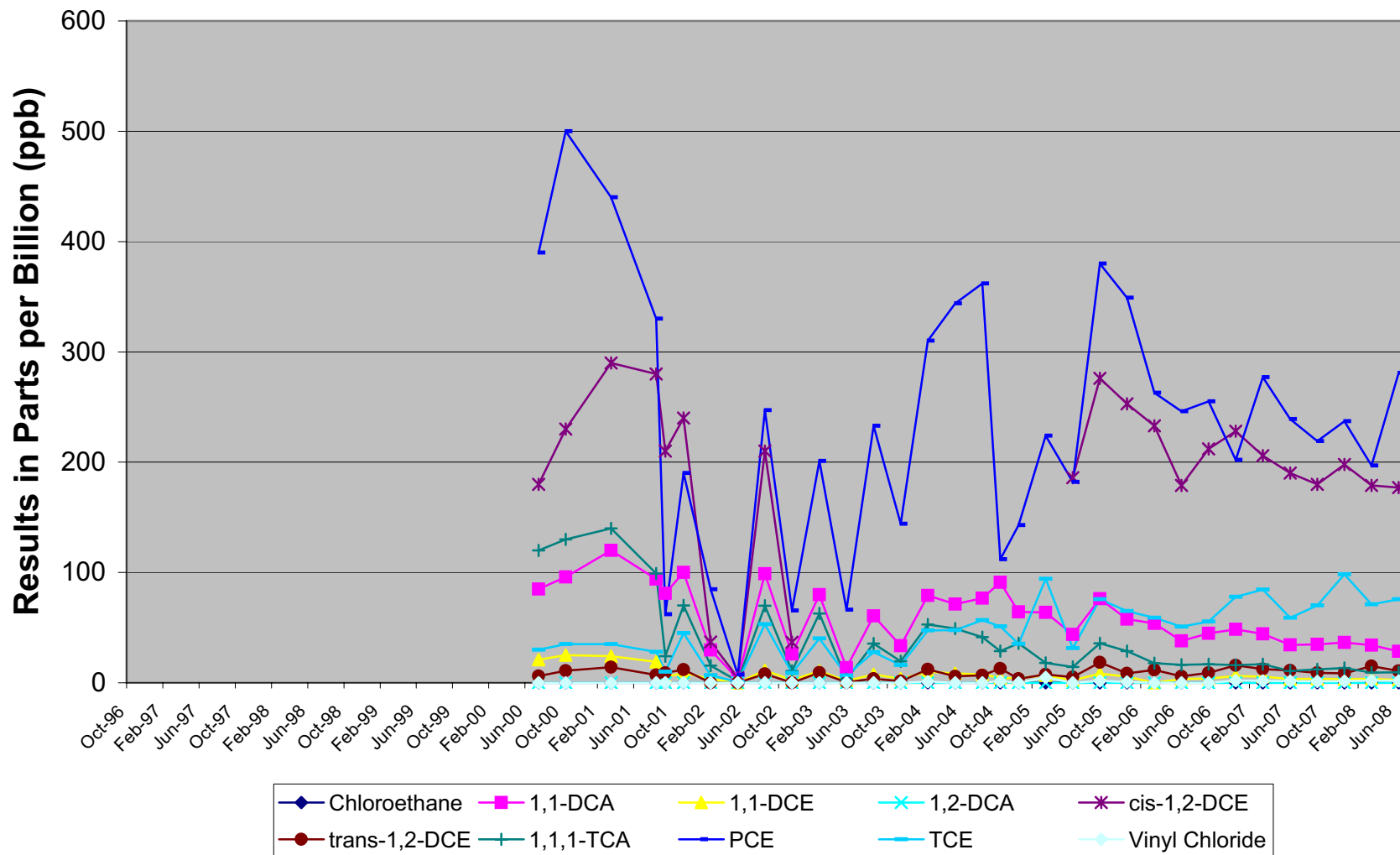
**Volatile Organic Compounds**  
**Hangar D, Westchester County Airport**  
**Well MW-07S      MW-02 Area**



**Volatile Organic Compounds**  
**Hangar D, Westchester County Airport**  
**Well MW-08D      MW-01 Area**

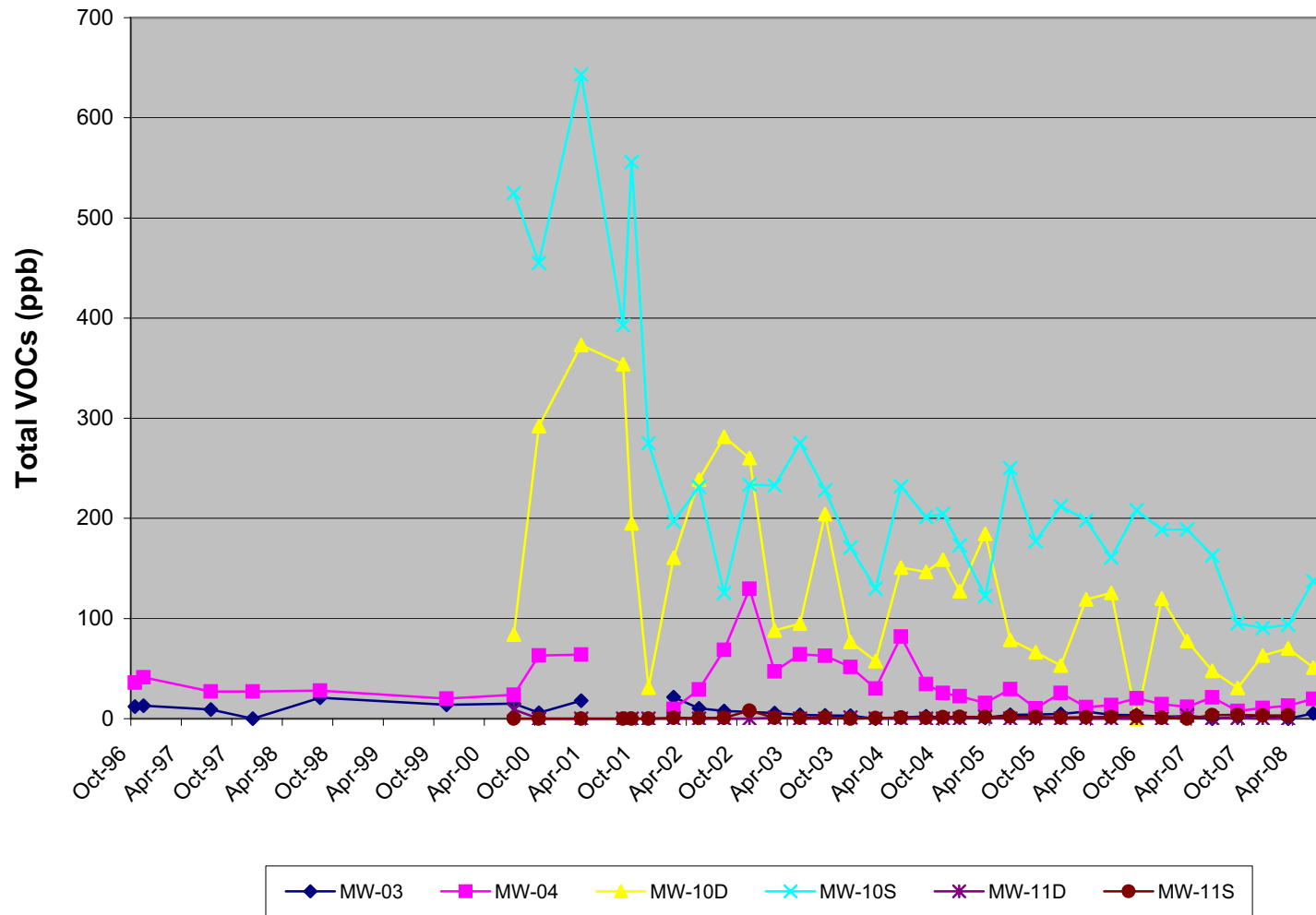


**Volatile Organic Compounds**  
**Hangar D, Westchester County Airport**  
**Well MW-08S      MW-01 Area**

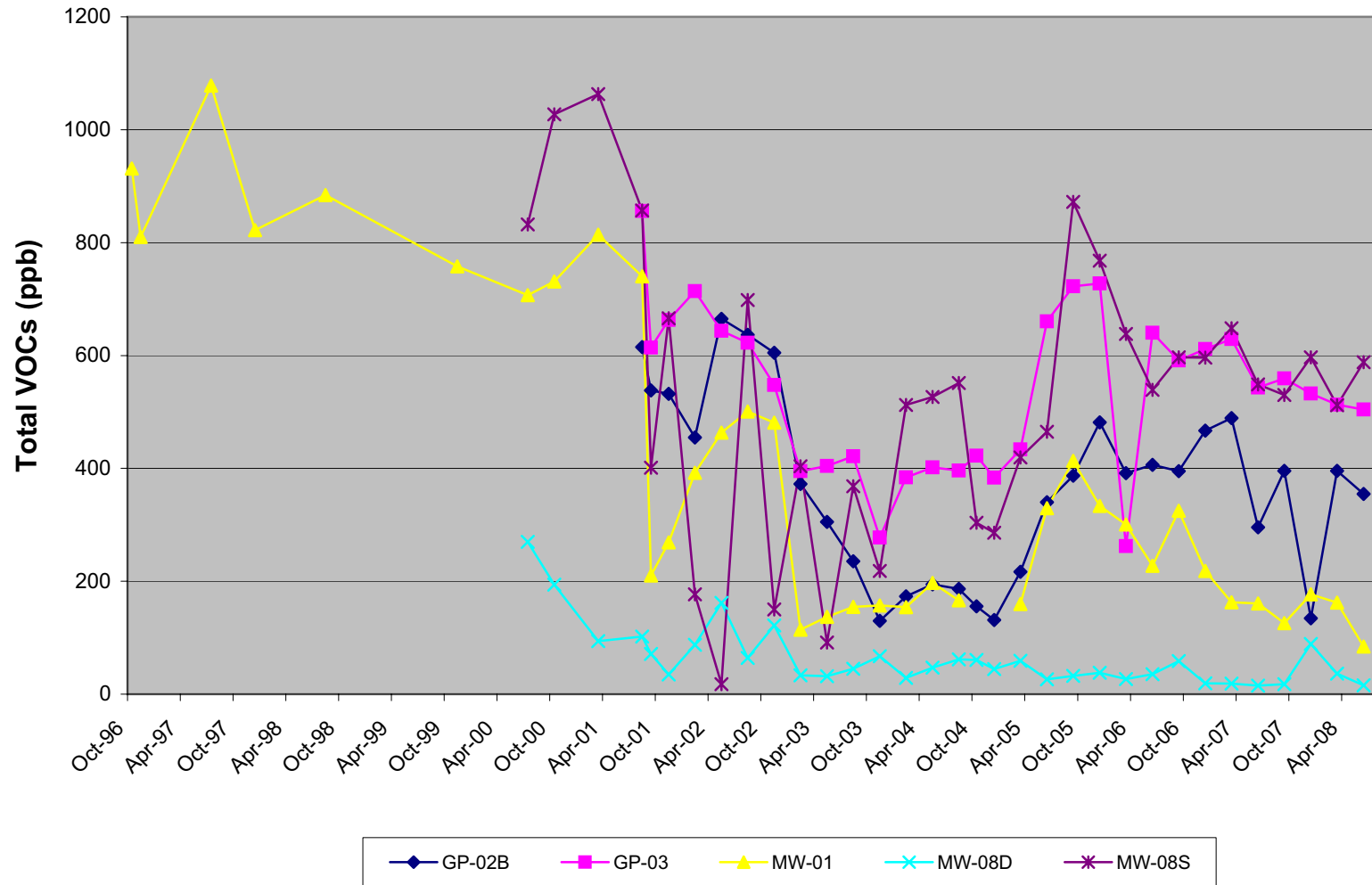




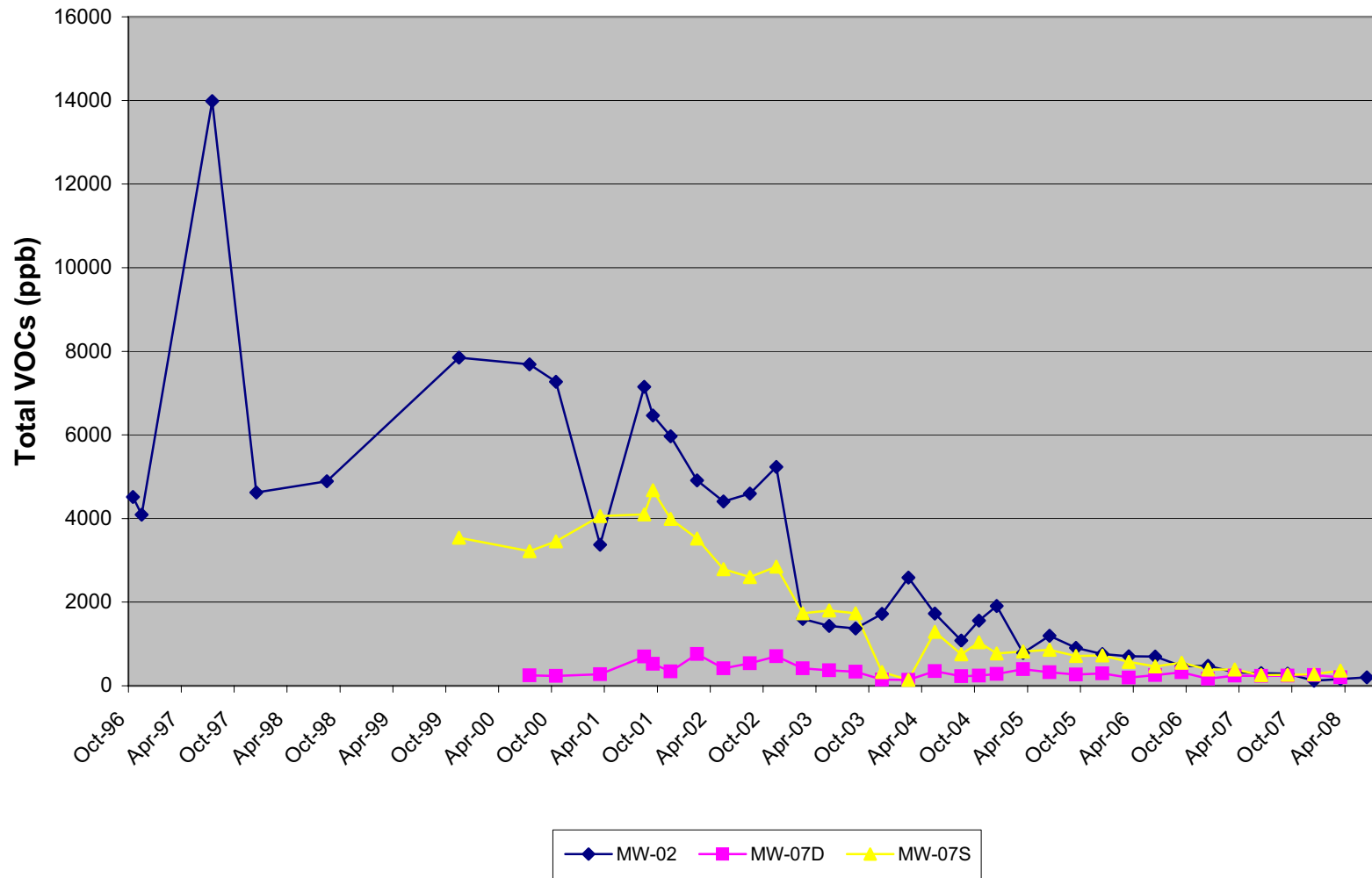
**Total Volatile Organic Compounds by Well in Each Site Area  
Hangar D, Westchester County Airport  
Downgradient Area**



**Total Volatile Organic Compounds by Well in Each Site Area  
Hangar D, Westchester County Airport  
MW-01 Area**



**Total Volatile Organic Compounds by Well in Each Site Area  
Hangar D, Westchester County Airport  
MW-02 Area**

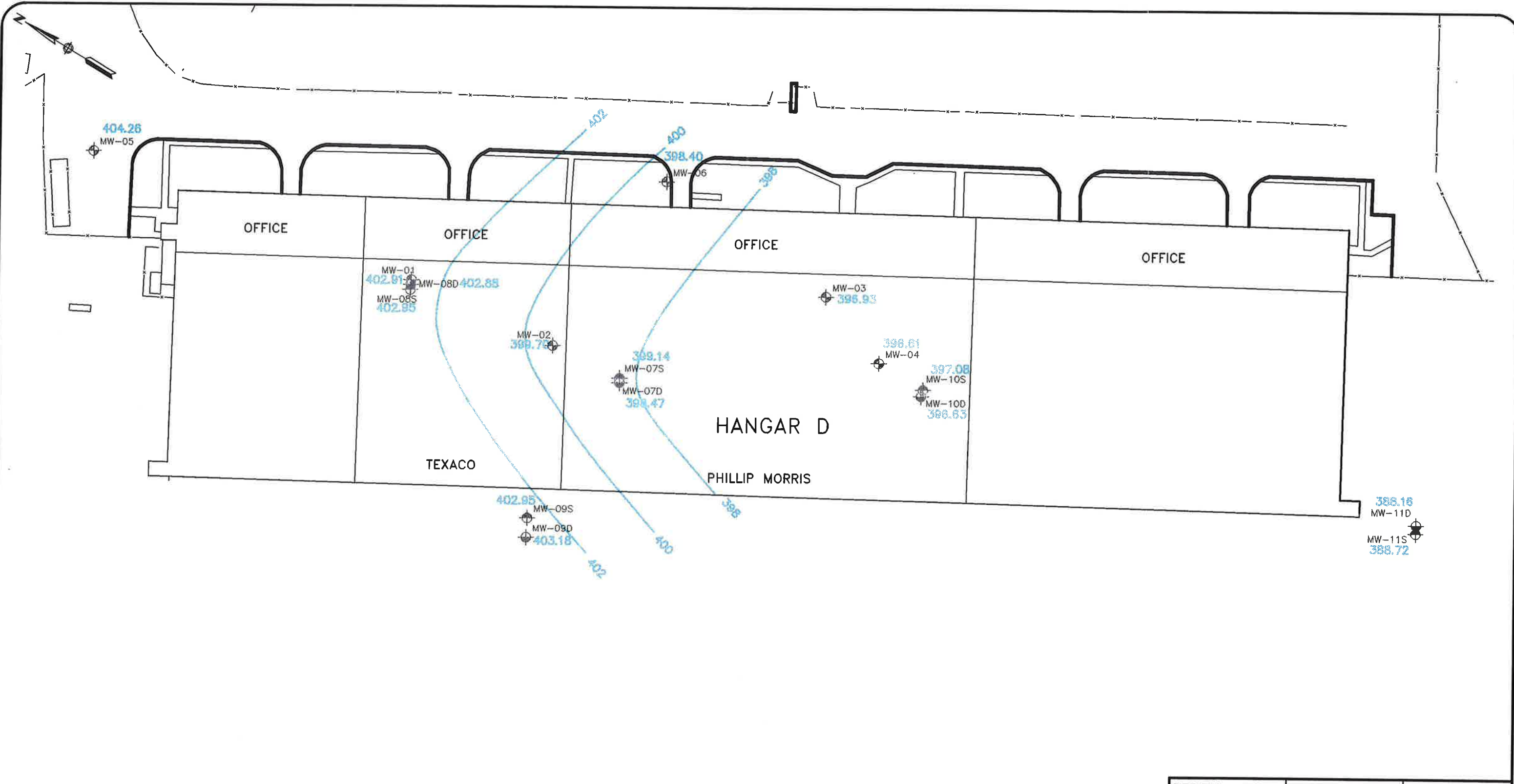




## **ATTACHMENT B – REMEDIAL INVESTIGATION REPORT**

### **FIGURE 3-1: GROUNDWATER CONTOUR PLAN**

### **FIGURE 3-2: GEOLOGIC CROSS SECTION A-A' REVISED TO INCLUDE EXISTING AND PROPOSED TEST POINTS**




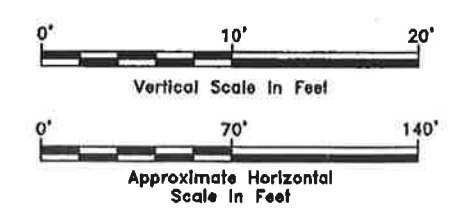
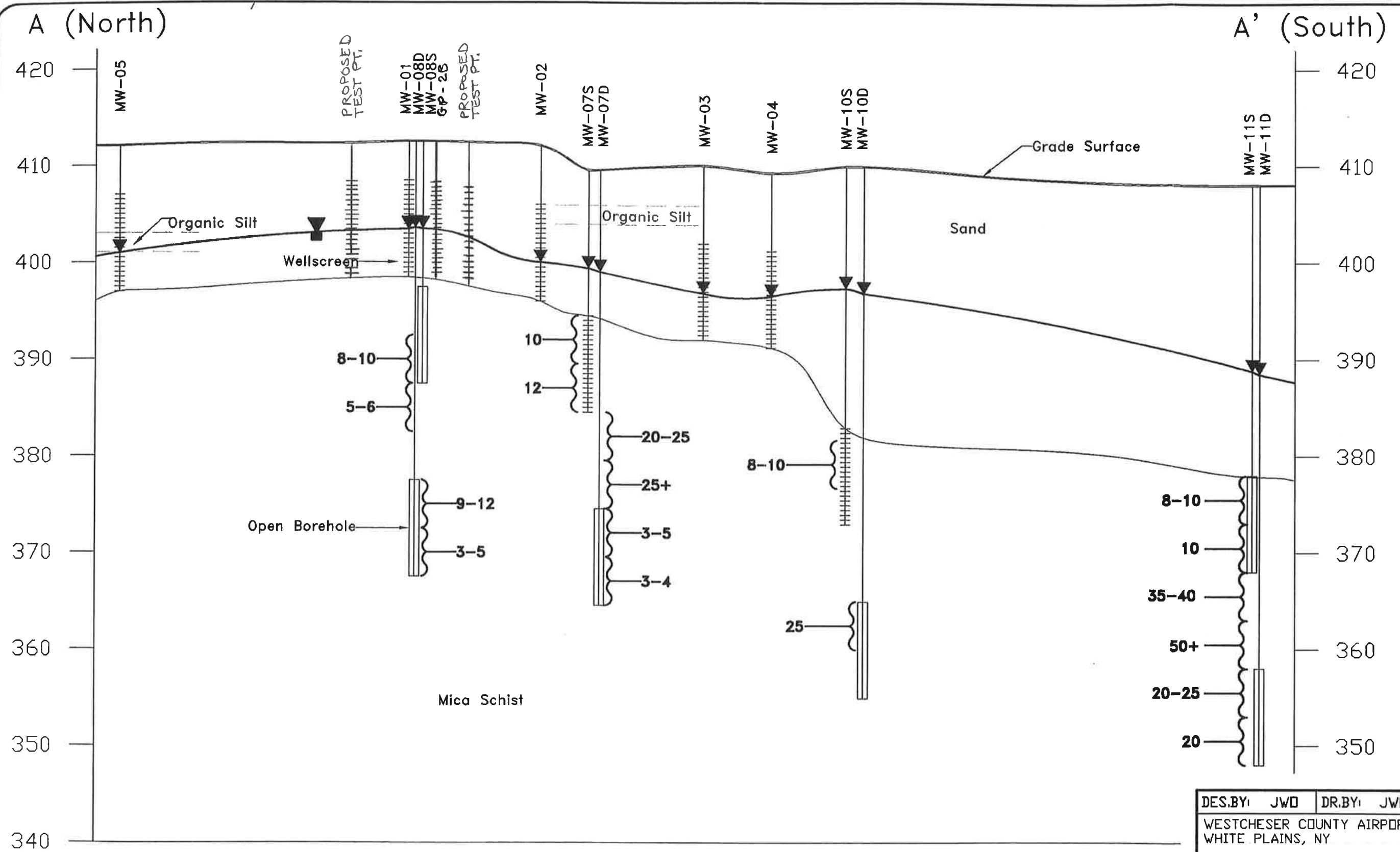
**NOTES**

- 1. ALL LOCATIONS & DIMENSIONS OF SITE FEATURES, PROPERTY LINES & SAMPLING LOCATIONS ARE APPROX.
- 2. BASE MAP PROVIDED ELECTRONICALLY FROM XDD, INC. IN FEBRUARY 2001.

**LEGEND**

- MW-01 - OVERBURDEN MONITORING WELL
- MW-08S - SHALLOW BEDROCK MONITORING WELL
- MW-08D - DEEP BEDROCK MONITORING WELL

DES.BY: JWO	DR.BY: JWO	CK.BY: MED
WESTCHESER COUNTY AIRPORT WHITE PLAINS, NY		
<b>REMEDIAL INVESTIGATION REPORT</b>		
FIGURE 3-1		
<b>GROUNDWATER CONTOUR PLAN</b>		
SCALE: 1"=60'	PROJECT NO: 205265	
DATE: NOVEMBER 2001	FIGURE 1	RI FIGURE 2
 <b>WOODARD &amp; CURRAN</b> Engineering · Science · Operations		



DES.BY: JWO	DR.BY: JWO	CK.BY: MED
WESTCHESER COUNTY AIRPORT WHITE PLAINS, NY		
<b>REMEDIAL INVESTIGATION REPORT</b>		
FIGURE 3-2		
<b>GEOLOGIC CROSS SECTION A - A'</b>		
SCALE: 1"=60'	PROJECT NO: 205265	
DATE: MARCH 2001	FIGURE 1 HOLBROOK.DWG	
<b>WOODARD &amp; CURRAN</b> Engineering · Science · Operations		



## **ATTACHMENT C – MATERIAL SAFETY DATA SHEET FOR POTASSIUM PERMANGANATE**



# RemOx®S

## ISCO Reagent

EC- SAFETY DATA SHEET according to Regulation (EC) № 1907/2006 of the European Parliament and of the Council, of 18 December 2006 concerning REACH

### MATERIAL SAFETY DATA SHEET

Page 1 of 9

#### Section 1 Chemical Product and Company Identification

<b>PRODUCT NAME:</b> RemOx® S ISCO Reagent <b>TRADE NAME:</b> RemOx® S ISCO Reagent		<b>Revised Date:</b> April 2008
<b>USES OF SUBSTANCE:</b> RemOx® S ISCO Reagent is an oxidant recommended for applications that require a strong oxidant.		
<b>COMPANY NAME (Europe):</b> CARUS NALON S.L.	<b>COMPANY ADDRESS:</b> Carus Nalon S.L. Barrio Nalon, s/n 33100 Trubia-Oviedo Espana, Spain	<b>INFORMATION:</b> (34) 985-785-513 (34) 985-785-513 <a href="http://www.caruseurope.com">www.caruseurope.com</a> (Web) <a href="mailto:carus@carusnalon.com">carus@carusnalon.com</a> (Email)
<b>COMPANY NAME (US):</b> CARUS CORPORATION	<b>INFORMATION:</b> (34) 985-785-513	
	<b>EMERGENCY TELEPHONE:</b> (34) 985-785-513	
	<b>COMPANY ADDRESS:</b> 315 Fifth Street Peru, IL 61354, USA	
	<b>INFORMATION:</b> (815)-223-1500 <a href="http://www.caruscorporation.com">www.caruscorporation.com</a> (Web) <a href="mailto:salesmkt@caruscorporation.com">salesmkt@caruscorporation.com</a> (Email)	
	<b>EMERGENCY TELEPHONE:</b> (800) 435 -6856 (USA) (800) 424-9300 (CHEMTREC, USA) (815-223-1500 (Other countries)	

#### Section 2 Hazards Identification

##### 1. EYE CONTACT

RemOx® S ISCO Reagent is damaging to eye tissue on contact. It may cause severe burns that result in damage to the eye.

##### 2. SKIN CONTACT

Contact of solutions at room temperature may be irritating to the skin, leaving brown stains.  
Concentrated solutions at elevated temperature and crystals are damaging to the skin.

##### 3. INHALATION

Acute inhalation toxicity data are not available. However, airborne concentrations of RemOx® S ISCO Reagent the form of dust or mist may cause damage to the respiratory tract.

##### 4. INGESTION

RemOx® S ISCO Reagent , if swallowed, may cause severe burns to mucous membranes of the mouth, throat, esophagus, and stomach.








# RemOx®S ISCO Reagent

EC- SAFETY DATA SHEET according to Regulation (EC) № 1907/2006 of the European Parliament and of the Council, of 18 December 2006 concerning REACH

## MATERIAL SAFETY DATA SHEET

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### Section 3 Hazardous Ingredients

<u>MATERIAL OR COMPONENT</u>	<u>CAS NO.</u>	<u>EINECS</u>	<u>HAZARD DATA</u>
Potassium Permanganate	7722-64-7	231-760-3	PEL/C 5 mg Mn per cubic meter of air  TLV-TWA 0.2 mg Mn per cubic meter of air
<u>HAZARD SYMBOLS:</u>			
			
<b>O</b>	<b>Xn</b>	<b>N</b>	
<u>RISK PHRASES:</u>			
8	Contact with combustibles may cause fire.		
22	Harmful if swallowed.		
50/53	Very toxic to aquatic organisms, may cause long-term effects in the aquatic environment.		
<u>SAFETY PHRASES:</u>			
60	This material and its container must be disposed of as hazardous waste.		
61	Avoid releases to the environment. Refer to special instructions / Safety data sheet.		

### Section 4 First Aid Measures

#### 1. EYES

Immediately flush eyes with large amounts of water for at least 15 minutes holding lids apart to ensure flushing of the entire surface. Do not attempt to neutralize chemically. Seek medical attention immediately. **Note to physician:** Soluble decomposition products are alkaline. Insoluble decomposition product is brown manganese dioxide.

#### 2. SKIN

Immediately wash contaminated areas with water. Remove contaminated clothing and footwear. Wash clothing and decontaminate footwear before reuse. Seek medical attention immediately if irritation is severe or persistent.

#### 3. INHALATION

Remove person from contaminated area to fresh air. If breathing has stopped, resuscitate and administer oxygen if readily available. Seek medical attention immediately.

#### 4. INGESTION

Never give anything by mouth to an unconscious or convulsing person. If person is conscious, give large quantities of water. Seek medical attention immediately.



# RemOx®S

## ISCO Reagent

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### MATERIAL SAFETY DATA SHEET

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## Section 5 Fire Fighting Measures

<b>NFPA* HAZARD SIGNS</b>		
Health Hazard	1	= Materials which under fire conditions would give off irritating combustion products. (less than 1 hour exposure) Materials that on the skin could cause irritation.
Flammability Hazard	0	= Materials that will not burn.
Reactivity Hazard	0	= Materials which in themselves are normally stable, even under fire exposure conditions, and which are not reactive with water.
Special Hazard	OX	= Oxidizer
<b>*National Fire Protection Association 704 (USA)</b>		
<b>FIRST RESPONDERS:</b>		Wear protective gloves, boots, goggles, and respirator. In case of fire, wear positive pressure breathing apparatus. Approach incident with caution.
<b>FLASHPOINT</b>		None
<b>FLAMMABLE OR EXPLOSIVE LIMITS</b>		Lower: Nonflammable Upper: Nonflammable
<b>EXTINGUISHING MEDIA</b>		Use large quantities of water. Water will turn pink to purple if in contact with RemOx® S ISCO Reagent. Dike to contain. Do not use dry chemicals, CO <sub>2</sub> Halon® or foams.
<b>SPECIAL FIREFIGHTING PROCEDURES</b>		If material is involved in fire, flood with water. Cool all affected containers with large quantities of water. Apply water from as far a distance as possible. Wear self-contained breathing apparatus and full protective clothing.
<b>UNUSUAL FIRE AND EXPLOSION</b>		Powerful oxidizing material. May decompose spontaneously if exposed to heat (150°C / 302°F). May be explosive in contact with certain other chemicals (Section 10). May react violently with finely divided and readily oxidizable substances. Increases burning rate of combustible material.

## Section 6 Accidental Release Measures

<b>PERSONAL PRECAUTIONS:</b>
Ensure adequate ventilation. Avoid dust formation. Avoid inhalation and contact with eyes and skin. Personnel should wear protective clothing suitable for the task. Remove all ignition sources and incompatible materials before attempting clean up.
<b>ENVIRONMENTAL PRECAUTIONS:</b>
Do not flush into sanitary sewer system or surface water. If accidental release into the environment occurs, inform the responsible authorities. Keep the product away from drains, sewers, surface and ground water and soil.
<b>STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:</b>
Clean up spills immediately by sweeping or shoveling up the material. Do not return spilled material to the original container – transfer to a clean metal drum. To clean contaminated surfaces or floors, flush with abundant quantities of water into sewer, if permitted by federal, state, and local regulations - if not, collect water and treat chemically (Section 13).



# RemOx®S ISCO Reagent

EC- SAFETY DATA SHEET according to Regulation (EC) № 1907/2006 of the European Parliament and of the Council, of 18 December 2006 concerning REACH

## MATERIAL SAFETY DATA SHEET

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### Section 7 Handling and Storage

#### **WORK/HYGIENIC PRACTICES**

Wash hands thoroughly with soap and water after handling RemOx® S ISCO Reagent. Do not eat, drink or smoke when working with RemOx® S ISCO Reagent. Wear proper protective equipment. Remove clothing, if it becomes contaminated.

#### **VENTILATION REQUIREMENTS**

Provide sufficient mechanical and/or local exhaust to maintain exposure below the TLV/TWA.

#### **CONDITIONS FOR SAFE STORAGE**

Store in accordance with NFPA 430 requirements for Class II oxidizers. Protect containers from physical damage. Store in a cool, dry area in closed containers. Segregate from acids, peroxides, formaldehyde, and all combustible, organic, or easily oxidizable materials including antifreeze and hydraulic fluid.

### Section 8 Exposure Controls and Personal Protection

#### **RESPIRATORY PROTECTION**

In cases where overexposure to dust may occur, the use of an approved NIOSH-MSHA dust respirator or an air supplied respirator is advised. Engineering or administrative controls should be implemented to control dust

#### **EYE**

Faceshield, goggles, or safety glasses with side shields should be worn. Provide eyewash in working area.

#### **GLOVES**

Rubber or plastic gloves should be worn.

#### **OTHER PROTECTIVE EQUIPMENT**

Normal work clothing covering arms and legs, and rubber, or plastic apron should be worn.

### Section 9 Physical and Chemical Properties

#### **APPEARANCE AND ODOR**

Dark purple solid with metallic luster, odorless

#### **BOILING POINT, 760 mm Hg**

Not applicable

#### **VAPOR PRESSURE (mm Hg)**

Not applicable

#### **SOLUBILITY IN WATER % BY SOLUTION**

6% at 20°C (68°F) and 20% at 65°C (149°F)

#### **PERCENT VOLATILE BY VOLUME**

Not volatile

#### **EVAPORATION RATE**

Not applicable

#### **MELTING POINT**

Starts to decompose with evolution of oxygen (O<sub>2</sub>) at temperatures above 150°C (302°F). Once initiated, the decomposition is exothermic and self-sustaining.

#### **SPECIFIC GRAVITY**

2.7 at 20°C (68°F)

#### **BULK DENSITY**

Approximately 1.45 - 1.6 kg / l

#### **VAPOR DENSITY (AIR=1)**

Not applicable

#### **OXIDIZING PROPERTIES**

Strong oxidizer



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## ISCO Reagent

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## Section 12 Ecological Information

### ENTRY TO THE ENVIRONMENT

Potassium permanganate has a low estimated lifetime in the environment, being readily converted by oxidizable materials to insoluble  $MnO_2$ .

### BIOCONCENTRATION POTENTIAL

In non-reducing and non-acidic environments,  $MnO_2$  is insoluble and has a very low bioaccumulative potential.

### AQUATIC TOXICITY

The toxicity data for Potassium permanganate is given below:

Rainbow trout, 96 hour $LC_{50}$ :	1.8 mg/L
Bluegill sunfish, 96 hour $LC_{50}$ :	2.3 mg/L
Milk fish (Chanos Chanos)/ 96 hour $LC_{50}$ :	>1.4mg/l

## Section 13 Disposal Considerations

Offer surplus and non-recyclable product or solutions to a licensed disposal company.

Reduce RemOx® S ISCO Reagent in aqueous solutions with sodium thiosulfate, a bisulfite or ferrous salt solution. The bisulfite or ferrous salt may require some dilute sulfuric acid (10% w/w) to promote reduction. Neutralize with sodium carbonate to neutral pH, if acid was used. Decant or filter and deposit sludge in approved landfill. Where permitted, the sludge may be drained into sewer with large quantities of water. Contact Carus Corporation for additional recommendations.

Packaging materials must be triple rinsed to remove all RemOx® S ISCO Reagent prior to re-cycling or disposal.

## Section 14 Transport Information

USA (land, D.O.T.)	<b>Proper Shipping Name:</b> 49 CFR172.101....Potassium Permanganate <b>Hazard Class:</b> 49 CFR172.101....Oxidizer <b>ID Number:</b> 49 CFR172.101....UN 1490 <b>Packing Group:</b> 49 CFR172.101....II <b>Division:</b> 49 CFR172.101....5.1
European Labeling in accordance Road/Rail Transport (ADR/RID)	<b>ID Number:</b> UN 1490 <b>ADR/RID Class</b> 5.1 <b>Description of Goods:</b> Potassium Permanganate <b>Hazard Identification No.</b> 50
European Labeling in accordance with EC directive (Water, I.M.O.)	<b>Proper Shipping Name:</b> Potassium Permanganate <b>Hazard Class:</b> Oxidizer <b>ID Number:</b> UN 1490 <b>Packing Group:</b> II <b>Division:</b> 5.1 <b>Marine Pollutant:</b> No



# RemOx®S

## ISCO Reagent

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#### Section 14 Transport Information (contd.)

European Labeling in accordance with EC directive (Air, I.C.A.O.)	<b>Proper Shipping Name:</b>	Potassium Permanganate
	<b>Hazard Class:</b>	Oxidizer
	<b>ID Number:</b>	UN 1490
	<b>Packing Group:</b>	II
	<b>Division:</b>	5.1

#### Section 15 Regulatory Information

##### EUROPEAN AND INTERNATIONAL REGULATIONS:

##### MARKINGS ACCORDING TO EU GUIDELINES:

The product has been classified and marked in accordance with EU directives/ordinances on hazardous materials.

##### CHEMICAL NAME

Potassium Permanganate

##### CAS NO.

7722-64-7

##### EINECS

231-760-3

##### UN NUMBER

UN 1490

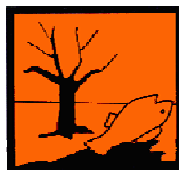
##### CODE LETTER AND HAZARD DESIGNATION OF THE PRODUCT:



**O**  
Oxidizer



**Xn**  
Harmful



**N**  
Dangerous to the Environment

##### RISK PHRASES:

- 8 Contact with combustibles may cause fire.
- 22 Harmful if swallowed.
- 50/53 Very toxic to aquatic organisms, may cause long-term effects in the aquatic environment.

##### SAFETY PHRASES:

- 60 This material and its container must be disposed of as hazardous waste.
- 61 Avoid releases to the environment. Refer to special instructions / Safety data sheet.



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## Section 10 Stability and Reactivity

<b>STABILITY</b>	Under normal conditions, the material is stable.
<b>CONDITIONS TO AVOID</b>	Contact with incompatible materials or heat (150°C / 302°F) could result in violent exothermic chemical reaction.
<b>INCOMPATIBLE MATERIALS</b>	Acids, peroxides, formaldehyde, anti-freeze, hydraulic fluids and all combustible organic or readily oxidizable inorganic materials including metal powders. With hydrochloric acid, chlorine gas is liberated.
<b>HAZARDOUS DECOMPOSITION PRODUCTS</b>	When involved in a fire, RemOx® S ISCO Reagent may liberate corrosive fumes.
<b>CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION</b>	Material is not known to polymerize.

## Section 11 Toxicological Information

### POTASSIUM PERMANGANATE:

#### 1. ACUTE TOXICITY

##### INGESTION:

LD 50 oral rat: 780 mg/kg male (14 days); 525 mg/kg female (14 days).

Harmful if swallowed. ALD: 10g. Ingestion may cause nausea, vomiting, sore throat, stomach-ache and eventually lead to a perforation of the intestine. Liver and kidney injuries may occur.

##### SKIN CONTACT:

LD 50 dermal no data available.

The product may be absorbed into the body through the skin. Major effects of exposure: severe irritation, brown staining of skin.

##### INHALATION:

LC 50 inhalation: No data available.

The product may be absorbed into the body by inhalation. Major effects of exposure: respiratory disorder, cough.

#### 2. CHRONIC TOXICITY

No known cases of chronic poisoning due to permanganates have been reported. Prolonged exposure, usually over many years, to heavy concentrations of manganese oxides in the form of dust and fumes may lead to chronic manganese poisoning, chiefly involving the central nervous system.

#### 3. CARCINOGENICITY

Potassium permanganate has not been classified as a carcinogen by ACGIH, NIOSH, OSHA, NTP, or IARC.

#### 4. MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

Potassium permanganate solution will cause further irritation of tissue, open wounds, burns or mucous membranes.



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### Section 15 Regulatory Information (contd.)

#### US FEDERAL REGULATIONS:

##### CHEMICAL INVENTORY STATUS – PART 1

<u>Ingredient</u>	<u>CAS. NO.</u>	<u>TSCA</u>	<u>EC</u>	<u>Japan</u>	<u>Australia</u>
Potassium Permanganate	7722-64-7	Yes	Yes		

##### CHEMICAL INVENTORY STATUS – PART 2 --- CANADA---

<u>Ingredient</u>	<u>CAS. NO.</u>	<u>Korea</u>	<u>DSL</u>	<u>NDSL</u>	<u>PHIL</u>
Potassium Permanganate	7722-64-7	No	Yes		

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulation (CPR, Canada) and the MSDS contains all of the information required by the CPR.

##### FEDERAL, STATE & INTERNATIONAL REGULATIONS – PART 1

<u>Ingredient</u>	<u>CAS. NO.</u>	<u>SARA 302</u>		<u>SARA 313</u>	
		<u>RQ</u>	<u>TPQ</u>	<u>List</u>	<u>Chemical Catg.</u>
Potassium Permanganate	7722-64-7	N/A	N/A	Yes	Yes
(Manganese compounds)					

##### FEDERAL, STATE & INTERNATIONAL REGULATIONS – PART 2

<u>Ingredient</u>	<u>CAS. NO.</u>	<u>CERCLA</u>	<u>RCRA</u>	<u>TSCA 8(d)</u>
Potassium Permanganate	7722-64-7	Yes (RQ =100 lbs)	D001	No

<u>Ingredient</u>	<u>CAS. NO.</u>	<u>CWC</u>	<u>TSCA 12(b)</u>	<u>CDTA</u>	<u>SARA</u>
Potassium Permanganate	7722-64-7	No	No	<u>311/312</u>	4545 Kg

<u>Ingredient</u>	<u>CAS. NO.</u>	<u>Acute</u>	<u>Chronic</u>	<u>Fire</u>	<u>Pressure</u>	<u>Reactivity</u>	<u>Pure/Liquid</u>
Potassium Permanganate	7722-64-7	Yes	Yes	Yes	No	No	Pure

<u>Ingredient</u>	<u>CAS. NO.</u>	<u>Australian Hazchem Code</u>	<u>Poison Schedule</u>	<u>WHMIS</u>
Potassium Permanganate				C, D2B



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### Section 16 Other Information

NIOSH	National Institute for Occupational Safety and Health
MSHA	Mine Safety and Health Administration
OSHA	Occupational Safety and Health Administration
NTP	National Toxicology Program
IARC	International Agency for Research on Cancer
PEL	Permissible Exposure Limit
C	Ceiling Exposure Limit
TLV-TWA	Threshold Limit Value-Time Weighted Average
CAS	Chemical Abstract Service
EINECS	Inventory of Existing Chemical Substances (European)

Chithambarathanu Pillai (S.O.F.)  
April 2008

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