

**FOURTH FIVE-YEAR REVIEW REPORT FOR  
DEREWAL CHEMICAL COMPANY SUPERFUND SITE  
HUNTERDON COUNTY, NEW JERSEY**



**Prepared by**

**U.S. Environmental Protection Agency  
Region 2  
New York, New York**

A handwritten signature in blue ink, appearing to read "John Prince", is written over a horizontal dashed line.

**John Prince, Acting Division Director**

*June 14, 2017*

**Date**

510622



## Table of Contents

LIST OF ABBREVIATIONS & ACRONYMS .....	2
I. INTRODUCTION .....	3
FIVE-YEAR REVIEW SUMMARY FORM .....	5
II. RESPONSE ACTION SUMMARY .....	5
Basis for Taking Action .....	5
Response Actions .....	6
Status of Implementation .....	7
Systems Operations/Operation & Maintenance .....	9
III. PROGRESS SINCE THE LAST REVIEW .....	9
IV. FIVE-YEAR REVIEW PROCESS .....	10
Community Notification, Involvement & Site Interviews .....	10
Data Review .....	10
Site Inspection .....	11
V. TECHNICAL ASSESSMENT .....	11
QUESTION A: Is the remedy functioning as intended by the decision documents? .....	11
QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid? .....	12
QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy? .....	13
VI. ISSUES/RECOMMENDATIONS .....	13
VII. PROTECTIVENESS STATEMENT .....	14
VIII. NEXT REVIEW .....	14

Figure 1-1 – Site Location Map

Figure 2-1 – Monitoring Well Locations

Figure 3 – Graphs

Tables 1 & 2 – Cleanup Levels Selected in the ROD

## **LIST OF ABBREVIATIONS & ACRONYMS**

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FYR	Five-Year Review
IA	Interagency Agreement
ICs	Institutional Controls
ISCO	In-Situ Chemical Oxidation
LTRA	Long-Term Remedial Action
MCL	Maximum Contaminant Limit
MW	Monitoring Well
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NJDEP	New Jersey Department of Environmental Protection
NPL	National Priorities List
O&M	Operation and Maintenance
RAO	Remedial Action Objectives
RI / FS	Remedial Investigation / Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
USACE	United States Army Corps of Engineers
UST	Underground Storage Tank
VOC	Volatile Organic Compound

## **I. INTRODUCTION**

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of remedies in order to determine if the remedies are and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and identify recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP)(40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the fourth FYR for the DeRewal Chemical Company Superfund Site. The triggering action for this policy review is the signing date of the previous FYR report, July 5, 2012. The FYR has been prepared due to the fact that it is the policy of EPA to conduct FYRs at sites where the remediation will take longer than five years to achieve unlimited use/unrestricted exposure (UU/UE).

The Site consists of one Operable Unit (OU), which will be addressed in this FYR.

The DeRewal Chemical Company Superfund site FYR was led by Lawrence Granite, the EPA Remedial Project Manager (RPM). Participants included Robert McKnight (Northern New Jersey Remediation Section Chief), Urszula Kinahan (Human Health Risk Assessor), Natalie Loney (Community Involvement Coordinator (CIC)), Mindy Pensak (Ecological Risk Assessor) and Michael Scorca (Hydrogeologist) of EPA. The review began on September 13, 2016.

### **Site Background**

#### **Physical Characteristics**

The DeRewal Chemical Company site is located in Kingwood Township, Hunterdon County, New Jersey. The site lies between New Jersey State Route 29 to the east and the Delaware River to the west. A bike path divides the site into eastern and western portions (see Figure 1-1). The site is located within the 100-year floodplain of the Delaware River, and its topography is flat to gently sloping toward the west.

The native soils beneath the site are predominantly fine-grained, and typically consist of a clayey silt, silt and silty sand. A coarser-grained layer consisting of a poorly sorted sand to sandy gravel is typically encountered at the base of the soil horizon, immediately overlying a weathered argillite bedrock zone, which rests on competent bedrock of the Triassic-aged Brunswick Shale. This gravel is interpreted to be a stream deposit and has an approximate thickness of two feet. Currently, much of the site is underlain by clean remediation backfill. The overall thickness of the native and backfill soils is about 12 to 16 feet.

The shallow water-bearing zone located in the unconsolidated material above the bedrock often contains little water. The depth to groundwater beneath the site is variable and dependent on seasonal fluctuations and recent precipitation events. In very dry periods, several groundwater monitoring wells are dry. During periods when significant groundwater is encountered at the site, it is usually within the basal gravel overlying the bedrock. The shallow water-bearing zone is not a source of potable water in the surrounding area. Groundwater in the unconsolidated material flows generally to the west toward the Delaware River and shows more of a southwestern component in the southern portion of the site. Groundwater flow in the upper part of the bedrock is also oriented toward the west.

### Land and Resource Use

The DeRewal Chemical Company site is situated on an approximately 8.4-acre parcel. The bike path is part of the Delaware and Raritan Canal State Park. Three buildings were located on the site: a building formerly occupied by the DeRewal Chemical Company, a garage, and a private residence. The building formerly occupied by the DeRewal Chemical Company and the garage were demolished in 1997 as part of EPA's remedial action at the site. The residence was demolished by the State of New Jersey in 2012.

Kingwood Township obtained title to portions of the site through tax foreclosure proceedings. The State of New Jersey obtained a conservation easement from the Township dated January 31, 2002 which incorporated portions of the site into the Delaware River Greenway, and established prohibitions on any activity that would be intrusive or inconsistent with public open-space uses. In November 2002, the New Jersey Department of Environmental Protection (NJDEP) purchased the portion of the site which included the residence from the Township. They conserve the property as open space.

As noted above, a bike path divides the site into eastern and western portions. It appears to be a popular recreational feature.

### History of Contamination

In 1970, Mr. Manfred DeRewal leased the eastern portion of the site from the Flemington Block and Supply Company. From 1970 to 1973, the DeRewal Chemical Company used the facility for the storage of chemicals. The first of a series of reports of improper chemical handling at the facility was received by the NJDEP in 1972, which led to several unsuccessful attempts to force the company to abide by permit requirements. Numerous spills were reported in 1973, including one incident in which a tank truck containing a highly acidic chromium solution was allowed to drain onto the soil. Inspectors estimated that the spill involved 3,000 to 5,000 gallons of waste.

## **FIVE-YEAR REVIEW SUMMARY FORM**

<b>SITE IDENTIFICATION</b>		
<b>Site Name:</b> DEREWAL CHEMICAL COMPANY		
<b>EPA ID:</b> NJD980761373		
<b>Region:</b> 2	<b>State:</b> NJ	<b>City/County:</b> Kingwood/Hunterdon
<b>SITE STATUS</b>		
<b>NPL Status:</b> Final		
<b>Multiple OUs?</b> No	<b>Has the site achieved construction completion?</b> Yes	
<b>REVIEW STATUS</b>		
<b>Lead agency:</b> EPA <i>[If "Other Federal Agency", enter Agency name]:</i>		
<b>Author name (Federal or State Project Manager):</b> Lawrence A. Granite		
<b>Author affiliation:</b> EPA		
<b>Review period:</b> 3/1/2017 - 5/31/2017		
<b>Date of site inspection:</b> 5/10/2017		
<b>Type of review:</b> Policy		
<b>Review number:</b> 4		
<b>Triggering action date:</b> 7/5/2012		
<b>Due date (five years after triggering action date):</b> 7/5/2017		

## **II. RESPONSE ACTION SUMMARY**

### **Basis for Taking Action**

Following the listing of the site on the National Priorities List in 1984, EPA began a Remedial Investigation (RI) and a Feasibility Study (FS) to determine the nature and extent of contamination at the site. The RI/FS determined that contamination was present in the soil and the shallow groundwater, but that the site was not contributing contamination to surface water at levels detrimental to human health or the environment. Under the land-use conditions at the site and neighboring areas during the RI/FS, the principal exposure pathways through which humans might potentially be exposed to site contaminants were through groundwater and direct contact with contaminated soil. Soil contaminants frequently

detected included trichloroethene, tetrachloroethene, toluene, fluoranthene, pyrene, benzo(b)fluoranthene, chromium, copper, lead and zinc. With respect to the shallow groundwater, contaminants of concern included trichloroethene, tetrachloroethene, 1,2-dichloroethene (total), methylene chloride, 1,1,1-trichloroethane, chromium, copper, lead, nickel and zinc. It was also determined that the area was sensitive for the discovery of cultural resources. In particular, the area adjacent to the Delaware River was determined to be extremely sensitive with respect to prehistoric occupation.

The ecological risk assessment performed during the RI indicated that contaminants in the soil were present at concentrations that could result in toxic effects to plants.

### **Response Actions**

In November 1973, the State of New Jersey ordered the DeRewal Chemical Company to excavate the contaminated soil and place it on an impermeable liner. It is believed that some soil was placed on plastic sheeting at the site, but was left uncovered and allowed to erode. In 1974, the DeRewal Chemical Company filed for bankruptcy. In 1984, the site was inspected by a team of EPA and contractor personnel to evaluate the need for immediate removal of the contaminated soil. Immediate removal was not recommended.

Based upon the findings the RI/FS, EPA selected a remedy in a Record of Decision (ROD), signed on September 29, 1989, which included the following major elements:

- Excavation of soil contaminated with organic and inorganic compounds above action levels;
- On-site thermal treatment of the organic-contaminated soil;
- On-site solidification/stabilization of the thermally treated soil and the remaining inorganic-contaminated soil;
- Extraction of shallow groundwater contaminated above drinking water standards, on-site storage, and off-site disposal at an approved industrial wastewater treatment facility;
- Provision of a treatment system for the on-site residential well;
- Appropriate environmental monitoring to ensure the effectiveness of the remedy; and
- Establishment of deed restrictions, as necessary, to ensure the effectiveness of the remedy.

The ROD indicated that the objectives of the selected remedy were to eliminate the threat of exposure from direct contact with contaminated soil and reduce the threat of exposure to groundwater contamination. In order to achieve these objectives, the ROD specifically called for NJDEP Action

Levels to be used as soil cleanup criteria for metals, total volatile organics and total semi-volatile organics (including polycyclic aromatic hydrocarbons). The ROD also called for Maximum Contaminant Levels (MCLs) under the January 1989 amendments to the New Jersey Safe Drinking Water Act to be used as cleanup criteria for the shallow groundwater. Tables 1 and 2 provide the aforementioned cleanup levels selected in the ROD.

A remedial design (RD) effort, which included treatability studies and a cultural resources survey, was performed from 1989 to 1997. As a result of information obtained during the RD, EPA issued an Explanation of Significant Differences (ESD) in December 1994 which modified the remedy for organic-contaminated soil from on-site to off-site thermal treatment. EPA determined that off-site treatment could be performed in a shorter time frame for similar cost. EPA further modified the remedy following treatability studies which showed that treated inorganic-contaminated soil would continue to leach contaminants at unacceptable concentrations. A June 1997 ESD documented a change from on-site treatment of inorganic-contaminated soil to off-site treatment and disposal. The 1997 ESD further documented that the chromium-contaminated soil located below the water table would not require excavation because the soil was not leaching chromium into the groundwater at a level above its New Jersey State Drinking Water MCL. The impact to groundwater was the only exposure pathway of concern to EPA for the chromium-contaminated soil since it is located 10 to 15 feet below the ground surface. Concerning the groundwater remedy, the 1997 ESD stated that EPA would reevaluate the need for remediation of groundwater at the site following completion of the remedial action for the soil.

### **Status of Implementation**

A cultural resources mitigation action took place in November and December 1996 which resulted in the recovery of more than 3,000 Native American artifacts, many dating back more than 1,000 years. EPA worked cooperatively with Kingwood Township and transferred all of the artifacts to the Township. A number of the artifacts are on public display at the Kingwood Township Municipal Building. The contractor, Hunter Research, Inc., prepared a report on the cultural resources mitigation action. The report was provided to Kingwood Township.

Under an Interagency Agreement (IA) with the U.S. Army Corps of Engineers (USACE), a contract for the remediation of the soil was awarded in May 1997. A remediation contractor, R&R International, Inc., mobilized to the site in July 1997 and completed the soil cleanup in July 1998. Approximately 60,000 tons of contaminated soil were excavated and disposed of off-site. Restoration activities were also completed in 1998.

The ROD called for extraction of shallow groundwater contaminated above drinking water standards, on-site storage, and off-site disposal at an approved industrial wastewater treatment facility. Therefore, groundwater monitoring was performed prior and subsequent to the soil cleanup. As anticipated in the ESD, the levels of most contaminants in groundwater decreased significantly over much of the site after the soil remediation was completed. However, one portion of the site, which was a central area west of the bike path, continued to exhibit little decline in contaminant concentrations. As a result, EPA

determined that it was appropriate to implement the groundwater remedy in that portion of the site. Construction activities for the groundwater remediation system began in July 2003 and were completed in September 2003. The activities included the installation of four groundwater extraction wells, underground conveyance piping to a pump-station building, and a 20,000-gallon underground storage tank (UST). A spill containment pad and an access road were also constructed and were utilized for the transfer of the UST's contents to trucks for off-site treatment and disposal. Following a one-year operational and functional period, long-term remedial action (LTRA) activities commenced in December 2004. Approximately 4.6 million gallons of groundwater were extracted at the site and sent off-site for treatment and disposal during the LTRA.

EPA suspended operation and removed the groundwater extraction well pumps in April 2014 and securely stored the pumps in the pump-station building at the site in anticipation of an in-situ chemical oxidation (ISCO) pilot test. The ISCO pilot test involved two rounds of injection. The rounds took place in April 2014 and in April 2015. EPA successfully completed the pilot test which resulted in significant reduction of the remaining groundwater VOC contamination at the site. EPA then installed slow-release oxidant-containing cylinders at the site in September 2015. The cylinders, a paraffin product impregnated with oxidant, were placed in 12 injection wells and groundwater monitoring wells MW-604, MW-605 and MW-609 (which were previously used to inject oxidant). EPA plans to remove the cylinders in summer 2017.

EPA transferred primary responsibility for the site to NJDEP on September 30, 2015.

In October 2012, NJDEP hired a contractor to demolish the on-site residence, which was unoccupied. The demolition of the residence was NJDEP's initiative. The residential well was properly abandoned by a New Jersey-licensed driller.

### *Institutional Controls*

The ROD called for the establishment of deed restrictions, as necessary, to ensure the effectiveness of the remedy. At that time it was anticipated that contaminated soils would be solidified and disposed of on-site. Subsequently, EPA issued ESDs which called for the contaminated soils to be treated and disposed of off site. Approximately 60,000 tons of contaminated soil were excavated and disposed of off site. There was no on-site disposal. Therefore, the deed restrictions envisioned in the ROD for soils became unnecessary. However, EPA has required certain institutional controls at the site under the terms of an Agreement and Covenant Not to Sue (Agreement), also known as a prospective purchaser agreement. On July 31, 2002, EPA executed an Agreement with the property owners of the site: the Township of Kingwood and NJDEP.

The Agreement prohibits the disturbance of monitoring wells and the groundwater remediation system at the site. It also bars the Township and NJDEP from using the shallow groundwater at the site while the site is being addressed. A conservation easement and the 2002 Agreement with the owners of the site limit construction of buildings at the site.

## **Systems Operations/Operation & Maintenance**

There is no operation, maintenance or monitoring associated with the soil remedial action.

Upon assuming responsibility of site operation and maintenance in 2015, NJDEP has continued the suspension of operation of the groundwater remediation system. Groundwater monitoring wells at the site are currently sampled by NJDEP approximately four times per year. As many as approximately 24 wells are sampled. Analytical parameters include sodium persulfate, VOCs and metals.

### *Climate Change*

Potential site impacts from climate change have been assessed, and the performance of the remedy is currently not at risk due to the expected effects of climate changes in the region and near the site.

## **III. PROGRESS SINCE THE LAST REVIEW**

This section includes the protectiveness determinations and statements from the **last** FYR as well as the recommendations from the **last** FYR and the current status of those recommendations.

**Table 2:** Protectiveness Determinations/Statements from the 2012 FYR

<b>OU #</b>	<b>Protectiveness Determination</b>	<b>Protectiveness Statement</b>
1 (Site-wide)	Protective	The groundwater remedy at the OU is expected to be protective upon completion, and in the interim, exposure pathways that could result in unacceptable risks are being controlled.

The 2012 FYR did not identify any issue or make any recommendation for the protection of public health and/or the environment which was not included or anticipated by the site decision documents. In addition, there has been no redevelopment or change in site use since the 2012 FYR was completed.

Since the last FYR was completed in July 2012, operation of the groundwater remediation system was suspended to allow for the performance by EPA of an ISCO pilot test. EPA successfully completed the pilot test which resulted in significant reduction of the remaining groundwater VOC contamination at the site.

In addition, as part of an effort to identify a residual VOC source area and to refine a conceptual site model, EPA installed four additional overburden wells in 2012 and eleven upper bedrock monitoring wells in 2013. Other activities undertaken since the 2012 FYR included a study of overburden soil vapors using passive collector equipment, bench-scale testing of soil and weathered bedrock for adsorption capacity, and potential effectiveness of reductive and oxidant chemical reagents.

Results of these investigations and the groundwater sampling confirmed the preliminary assessment in the 2012 FYR which suggested that some residual VOC contamination exists within the overburden soil and the upper portion of the bedrock in a limited area west of the bike path.

## **IV. FIVE-YEAR REVIEW PROCESS**

### **Community Notification, Involvement & Site Interviews**

On November 14, 2016, EPA Region 2 posted a notice on its website indicating that it would be reviewing site cleanups and remedies at 38 Superfund sites in New York and New Jersey, including the DeRewal Chemical Company site. The announcement can be found at the following web address:

[https://www.epa.gov/sites/production/files/2016-11/documents/five\\_year\\_reviews\\_fy2017\\_final.pdf](https://www.epa.gov/sites/production/files/2016-11/documents/five_year_reviews_fy2017_final.pdf).

In addition to this notification, EPA provided a public notice to Kingwood Township on April 13, 2017 with a request that the notice be posted to the Township's web site. The purpose of the public notice was to inform the community that EPA is conducting an FYR to ensure that the remedy implemented at the site remains protective of human health and the environment and is functioning as intended by the decision documents. In addition, the notice included the RPM and the CIC e-mail addresses and telephone numbers. The EPA RPM was not contacted by any members of the community regarding this FYR.

EPA has made all site-related documents available to the public in the administrative record repository maintained at the EPA Region 2 office (290 Broadway, New York, New York 10007). Furthermore, when this five-year review is completed, copies will be sent to Kingwood Township and to the local site repository located at the Hunterdon County Library on New Jersey State Route 12 in Raritan Township.

### **Data Review**

Groundwater quality sampling was conducted from the site-wide network of monitoring wells in June 2012, April 2013, September 2016, and December 2016. The four extraction wells were sampled bimonthly during operation of the system until April 1, 2014.

Overall, the magnitude of the VOC plume has decreased in the upper part of the bedrock. During the baseline monitoring round before the oxidant additions, the highest TCE (430 ug/L) and PCE (69.3 ug/L) concentrations in the bedrock wells were observed in well MW-607 (see Figure 2-1). In 2016, TCE and PCE concentrations at MW-607 had declined to 13.7 and 10.7 ug/L, respectively. The oxidant additions were also highly effective at well MW-602, where TCE decreased from 172 ug/L to 17.5 ug/L in December 2016. Graphs showing trends in chemical concentrations at selected wells are shown in Fig. 3.

The ISCO additions have thus far been less effective at well MW-603. Before the ISCO treatment, TCE and PCE concentrations were 137 and 67.9 ug/L, respectively. Although there was a decrease in TCE to as low as 31.6 ug/L in June 2015, the TCE concentration reached 114 ug/L during the most recent sampling in December 2016. PCE concentrations showed a similar declining trend followed by an increase back to 66.4 ug/L in December 2016.

VOCs in the overburden groundwater have demonstrated some decreasing concentrations following the ISCO treatment, but concentrations have been variable. TCE concentrations have decreased from historical highs in 2012, however, they still remain above the NJ State and federal MCLs in some wells.

One significant effect of the oxidant treatment was to increase the redox-potential in the groundwater system. Consequently, chromium has transformed chemically from the trivalent state to the hexavalent state, which dissolves more readily into groundwater.

In order to evaluate the potential discharge of hexavalent chromium to the nearby Delaware River, samples of surface water, pore water, and sediments were collected at five locations in the river along the Site in October 2014, which was six months after the initial ISCO injection. Results for hexavalent chromium were non-detect in most samples and detected concentrations for hexavalent and total chromium were comparable to pre-ISCO treatment concentrations that were observed in groundwater. The study concluded that the Site did not seem to be discharging any significant amount of hexavalent chromium into the Delaware River.

### **Site Inspection**

Tommy Rabon (NJDEP) visits the site approximately once per month. Kingwood Township has been maintaining the grass and the pump-station building has been secure. No issues related to the UST have been noted. Also, no issues that would impact current or future protectiveness have been observed. In addition, an inspection of the site was conducted on 5/10/2017. In attendance were Lawrence Granite and Robert McKnight (representatives of EPA) and Daniel Sirkis (USACE). The purpose of the inspection was to assess the protectiveness of the remedy. Nothing out of the ordinary was noted. No issues impacting current or future protectiveness were observed.

## **V. TECHNICAL ASSESSMENT**

**QUESTION A:** Is the remedy functioning as intended by the decision documents?

The soil remedy selected in the ROD was fully implemented as intended.

Consistent with the ROD, the groundwater remedy consisted of extracting the shallow contaminated groundwater, storing the contaminated groundwater on-site, and transporting it off-site for treatment and disposal. These activities included monitoring of groundwater extraction wells and were performed in accordance with an approved Operation and Maintenance Manual. Operation of the groundwater

extraction system was suspended in 2014 to allow for the performance by EPA of an ISCO pilot test. EPA successfully completed the pilot test which resulted in significant reduction of the remaining VOC contamination at the site. Subsequently, EPA installed slow-release oxidant-containing cylinders at the site in September 2015. Groundwater monitoring wells at the site are currently sampled by NJDEP approximately four times per year. Results of the pilot test will be further evaluated after NJDEP completes eight rounds of sampling.

Although not selected in a remedy decision document, EPA entered into an agreement with the Township and NJDEP which prohibits the disturbance of monitoring wells and the groundwater remediation system at the site. It also bars the Township and NJDEP from using the shallow groundwater at the site while the site is being addressed.

**QUESTION B:** Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

There have been no physical changes to the site that would adversely affect the protectiveness of the remedy. The exposure assumptions and the toxicity values that were used to estimate the potential risks and hazards to human health followed the general risk assessment practice at the time the risk assessment was performed. Although the risk assessment process has been updated and specific parameters and toxicity values may have changed, the risk assessment process that was used is still consistent with current practice and the need to implement a remedial action remains valid.

The potential for soil vapor intrusion (VI) into indoor air is evaluated when site soils and/or groundwater are known or suspected to contain VOCs. Although this pathway was not considered during the risk assessment, it was evaluated in the previous FYRs and found to be insignificant or incomplete. Currently, the site does not contain any buildings other than the pump-station building, therefore, the VI pathway remains incomplete. If in the future buildings were to be constructed on or within 100 feet of the site, they would be subject to a VI study based on elevated levels of VOCs (most notably TCE and PCE) in groundwater beneath the site. A conservation easement and the 2002 Agreement with the owners of the site limit construction of buildings at the site.

MCLs under the 1989 amendments to the New Jersey Safe Drinking Water Act were used as cleanup criteria for the shallow groundwater. Data collected within the past five years indicate that PCE, TCE and chromium remain above their respective cleanup goals in on-site wells. Current NJ GWQS for PCE and TCE (1 ug/L) are consistent with the cleanup goals selected in the ROD and remain protective. The ROD selected cleanup goal for chromium was 50 ug/L; this value is lower than the current NJ GWQS of 70 ug/L and hence remains protective.

NJDEP Action Levels, dated June 1, 1988, were used as cleanup criteria for site soils. With the exception of total chromium, the current remediation standards for inorganics in soil are generally higher (i.e., less stringent) than the cleanup goals selected in the ROD and, therefore, the implemented soil remedy remains protective.

A soil cleanup level of 100 mg/kg was selected as the site cleanup goal for total chromium. Currently, NJDEP has not developed soil remediation standards for trivalent or hexavalent chromium as part of its Remediation Standards rule N.J.A.C. 7:26D; however, in 2007, NJDEP by policy chose to apply a soil cleanup criterion of 20 mg/kg for sites contaminated with hexavalent chromium. During the RI, sampling and speciation of hexavalent chromium was conducted in site soil west and east of the bike path. The maximum detected hexavalent concentration in these samples (13 mg/kg) did not exceed the current NJDEP policy value of 20 mg/kg. Further, since extensive excavation of metal-contaminated site soils has been conducted as part of the selected remedy, it is unlikely that hexavalent chromium concentrations in soil are presently higher than they were at the time of the RI. Based on these considerations, the cleanup goals and actions conducted to date remain protective of human health.

As discussed previously in the data review section, samples were collected from the Delaware River to assess if hexavalent chromium was migrating from the site or discharging to the river. Total chromium concentrations detected in sediments ranged from 21.2 to 29.7 mg/kg and were consistent with the upgradient sediment detection of 25 mg/kg (location DP-1). Of the five samples collected, only one showed a positive detection of hexavalent chromium (at 0.47 mg/kg), which is well below NJ's current policy value of 20 mg/kg. Additionally, total chromium and hexavalent chromium were not detected in surface water samples. Based on these results, any potential exposure to surface water or sediments by nearby recreators is expected to be minimal and not a human health concern.

The ecological risk assessment performed during the RI indicated that contaminants in the soil were present at concentrations that could result in toxic effects to plants. The ROD noted that there was stressed vegetation in areas on the site. The ROD further noted that since the area west of the bike path was vegetated and even heavily wooded, it was likely that the presence of contaminants in that area did not pose significant risks to those plants and trees. Given that the contaminated soils were subsequently excavated by EPA and disposed of off-site, the potential for toxic effects in plants at the site has been mitigated. EPA's cleanup activities have resulted in the interruption of the exposure pathways for ecological receptors and thus the remedial action objectives used at the time of the ROD are still valid.

**QUESTION C:** Has any **other** information come to light that could call into question the protectiveness of the remedy?

No.

## VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
<b>OU(s) without Issues/Recommendations Identified in the Five-Year Review:</b>
<b>OU1 (Site-wide)</b>

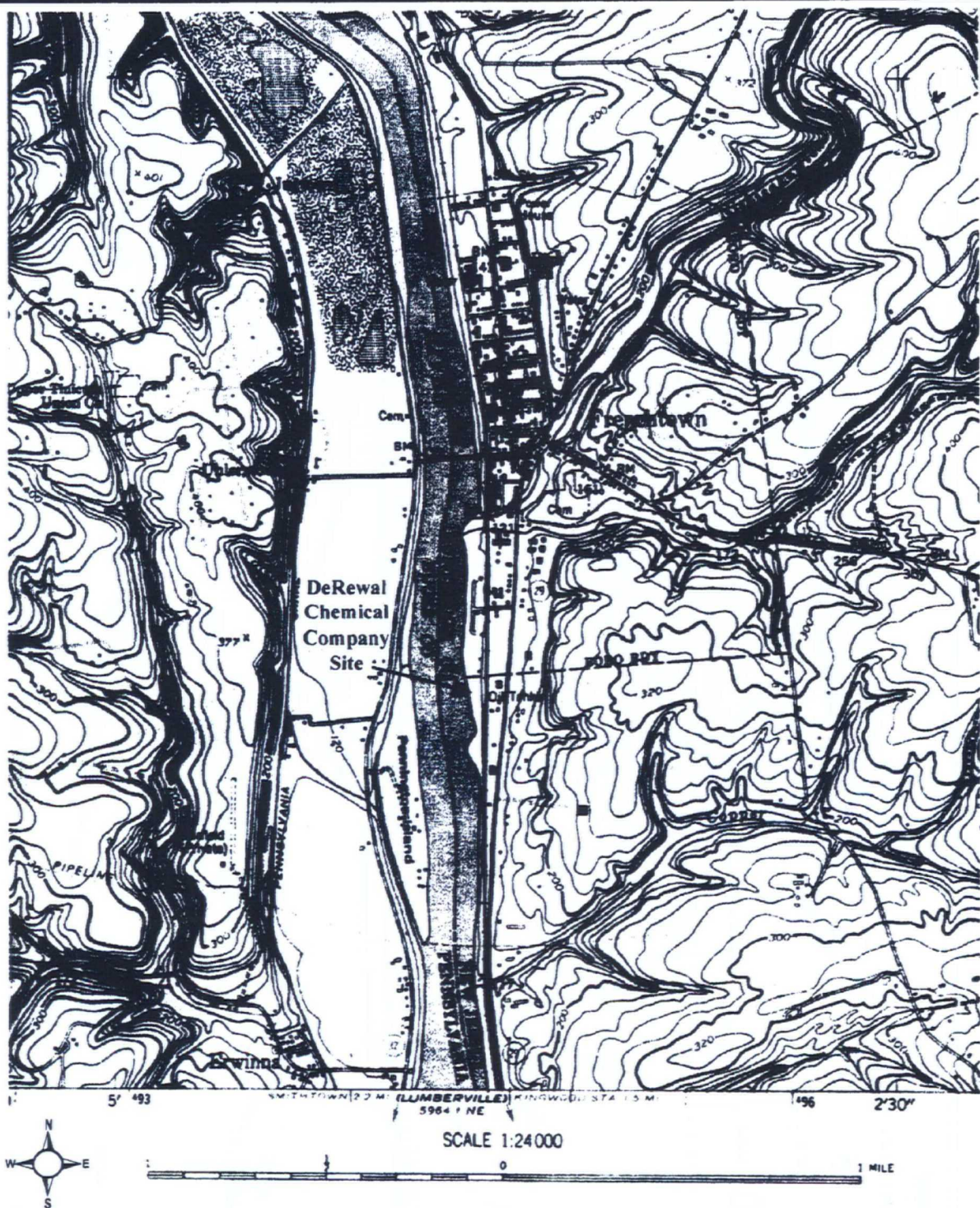
## VII. PROTECTIVENESS STATEMENT

Protectiveness Statement(s)		
<i>Operable Unit:</i> OU 1 (Site-wide)	<i>Protectiveness Determination:</i> Protective	<i>Planned Addendum Completion Date:</i> N/A <a href="#">Click here to enter a date</a>
<i>Protectiveness Statement:</i> The remedy is protective of human health and the environment.		

Sitewide Protectiveness Statement	
<i>Protectiveness Determination:</i> Protective	<i>Planned Addendum Completion Date:</i> N/A <a href="#">Click here to enter a date</a>
<i>Protectiveness Statement:</i> The remedy is protective of human health and the environment.	

## VIII. NEXT REVIEW

The next FYR for the DeRewal Chemical Company Superfund Site is required five years from the completion date of this review.



## FIGURE 1-1 GENERAL LOCATION MAP

DeRewal Chemical Company  
Kingwood Township, NJ

Drawing No.: C048.086-001

Revision No.: 1

Compiled By: RML

Drawn By: RML

Date Drawn: 2/20/98

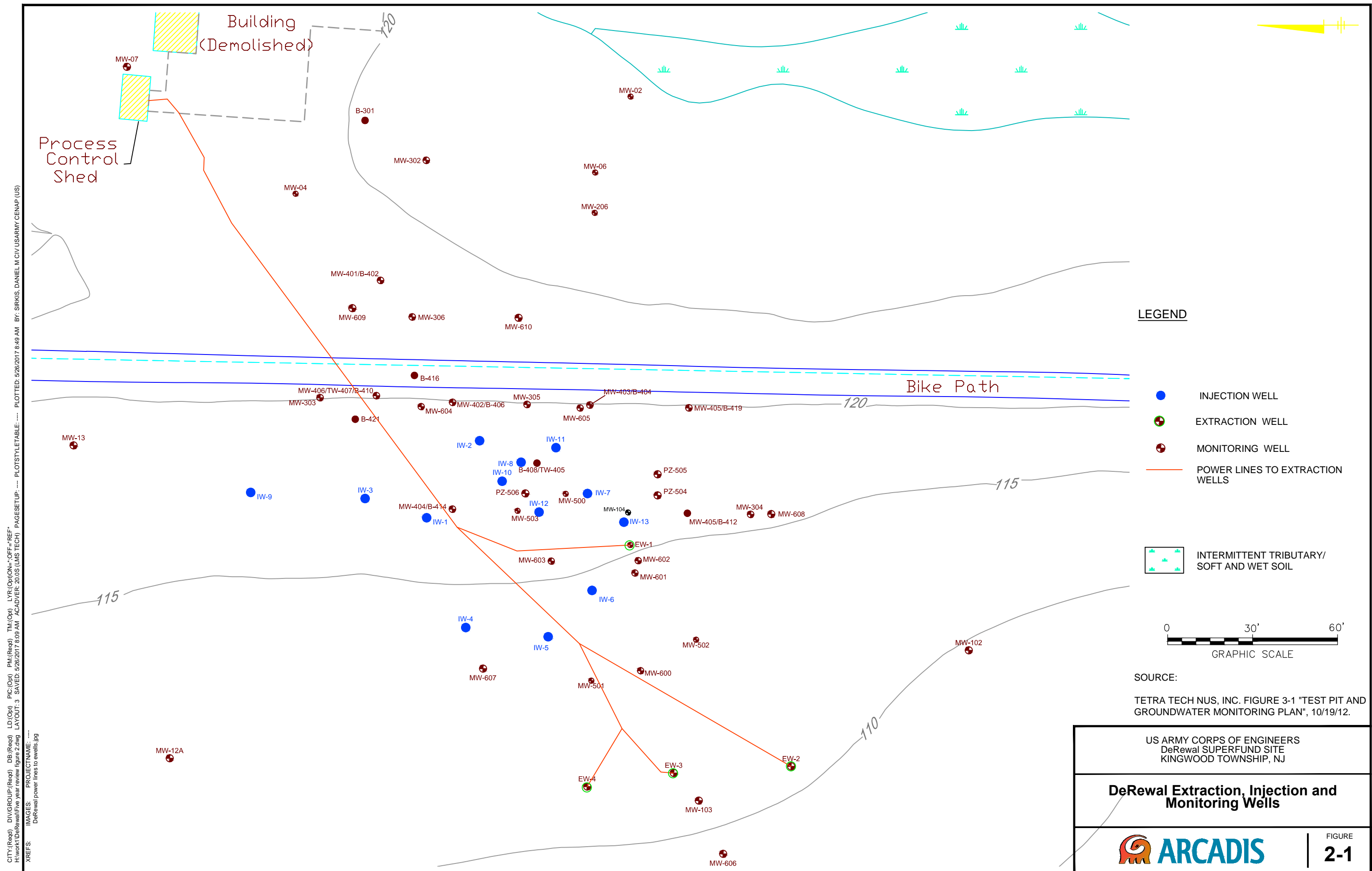
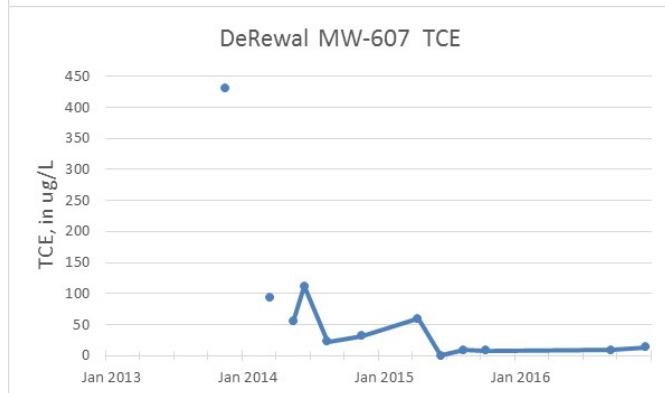
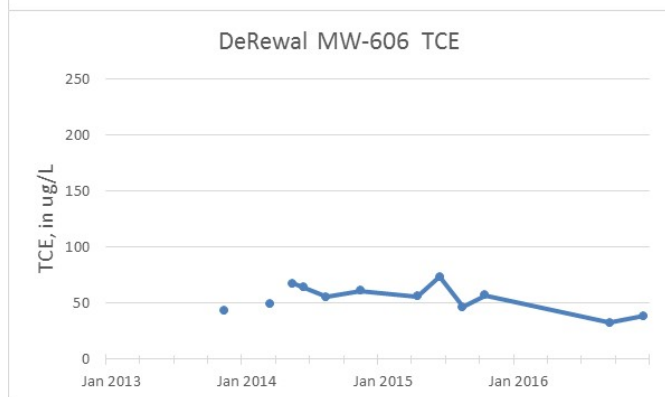
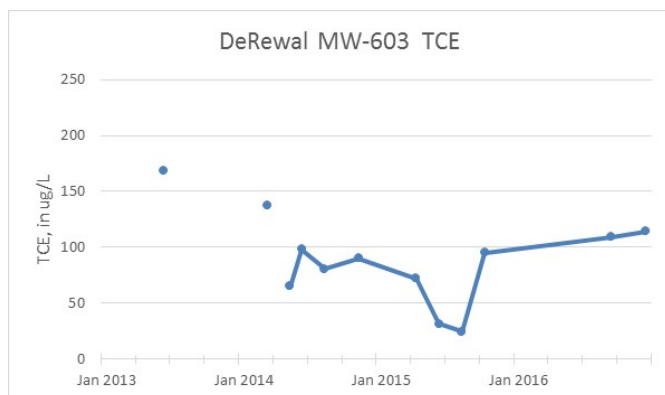
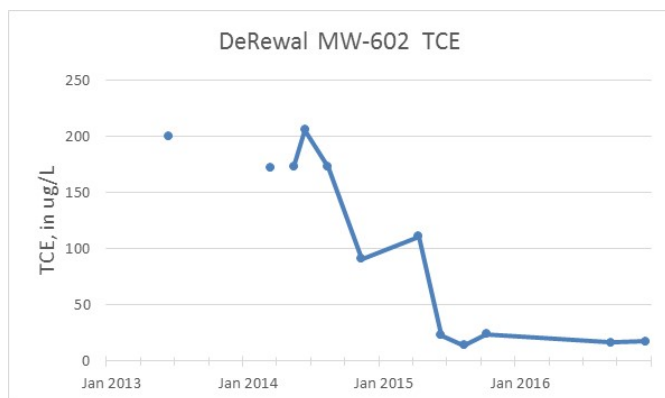
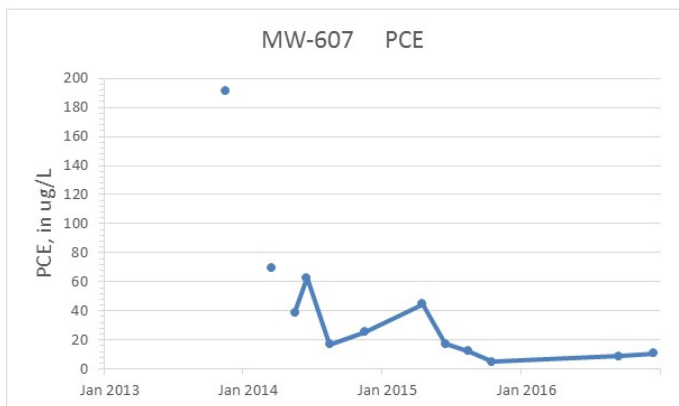
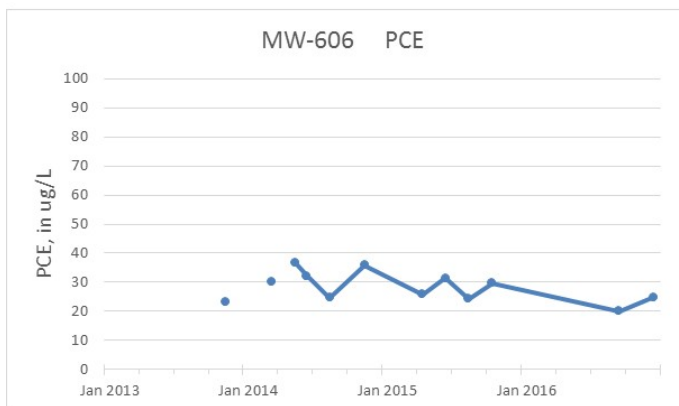
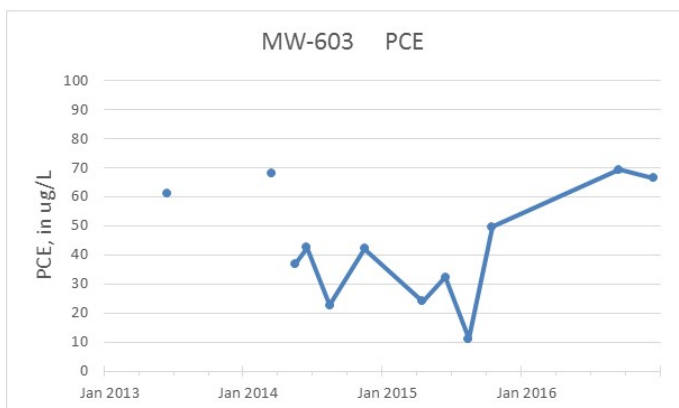
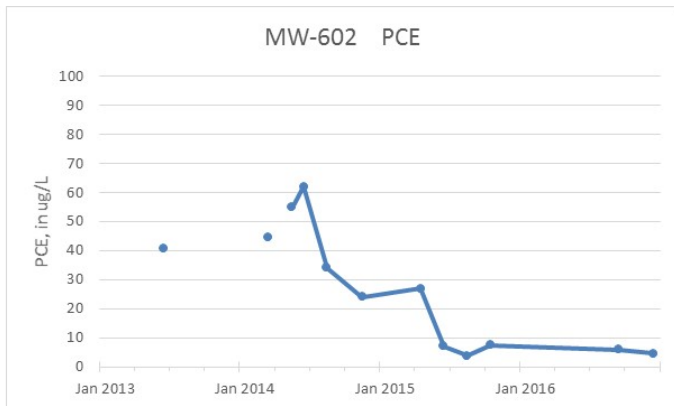
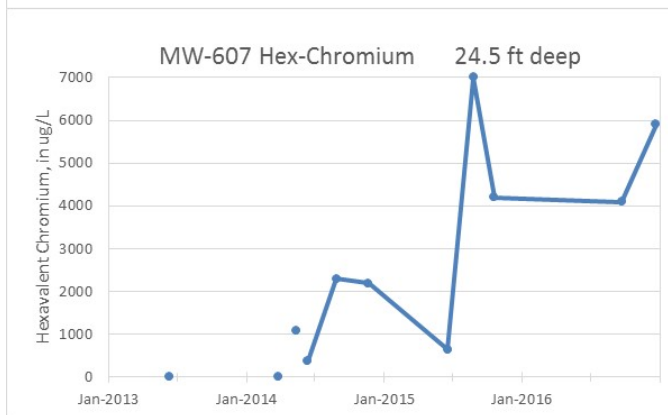
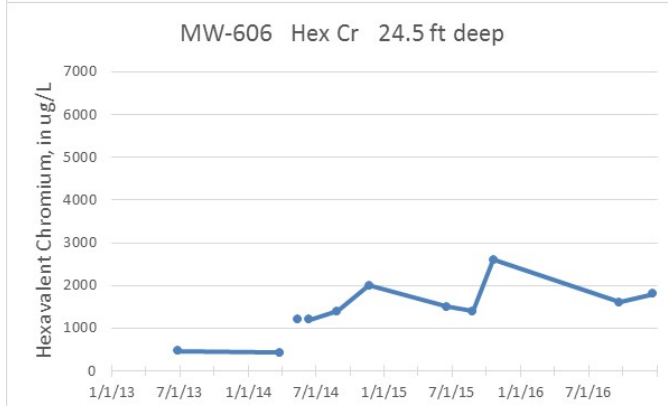
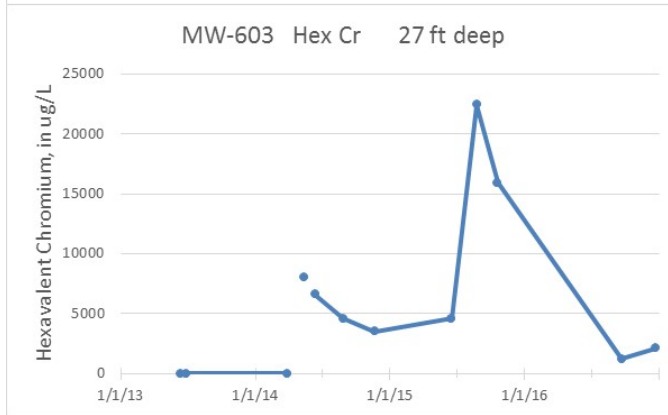
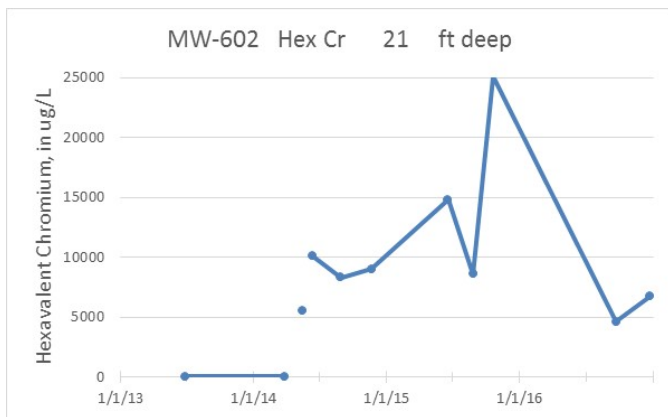


Figure 3







**Table 1: Soil Cleanup Criteria for Selected Parameters (mg/kg)**

Parameter	NJDEP Action Level (6/1/88)
Cadmium	3
Chromium (Total)	100
Copper	170
Cyanide	12
Lead	250
Mercury	1
Nickel	100
Silver	5
Zinc	350
Total VOCs	1
Total SVOCs	10

**Table 2: Groundwater Cleanup Criteria for Selected Parameters (ug/l)**

Parameter	NJ SDWA MCL (1/89)
Cadmium	10
Chromium	50
Lead	50
Mercury	2
Nickel	13.4
Silver	50
Methylene Chloride	2
1,1-DCE	2
1,1,1-TCA	26
PCE	1
TCE	1
Total Xylenes	44