DOE–LM/GJ926–2005

# Pinellas Environmental Restoration Project

# Quarterly Progress Report
# 4.5 Acre Site
# April Through June 2005

## July 2005

U.S. Department of Energy

Office of Legacy Management

*Work Performed Under DOE Contract No. DE–AC01–02GJ79491*
*for the U.S. Department of Energy Office of Legacy Management.*
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# Acronyms and Abbreviations

| | |
|---|---|
| bls | below land surface |
| COPC | contaminants of potential concern |
| DCE | dichloroethene |
| DOE | U.S. Department of Energy |
| DPE | dual-phase extraction |
| FDEP | Florida Department of Environmental Protection |
| ft | feet |
| IRA | Interim Remedial Action |
| µg/L | micrograms per liter |
| µmhos/cm | micromhos per centimeter |
| mg/L | milligrams per liter |
| mV | millivolts |
| NGVD | national geodetic vertical datum |
| NTU | Nephelometric Turbidity Units |
| RPD | relative percent difference |
| STAR Center | Young - Rainey Science, Technology, and Research Center |
| TCE | trichloroethene |
| TCOPC | total contaminants of potential concern |
| VC | vinyl chloride |
| VOCs | volatile organic compounds |

# 1.0 Introduction

The *Pinellas Environmental Restoration Project Quarterly Progress Report for the 4.5 Acre Site* describes environmental restoration activities for the Pinellas 4.5 Acre Site located in Pinellas County, Largo, Florida. The former U.S. Department of Energy (DOE) Pinellas Plant facility consisted of the 4.5 Acre Site and the Young - Rainey Science, Technology, and Research Center (STAR Center) (Figure 1). The facility was constructed in the mid-1950s as part of a nationwide nuclear weapons research, development, and production complex. Production of weapons-related components ceased in September 1994. However, as a result of these operations, contamination exists in the surficial ground water beneath the Site.

Administration of DOE activities at the 4.5 Acre Site is the responsibility of the DOE Office of Legacy Management in Grand Junction, Colorado. S.M. Stoller Corporation (Stoller), a prime contractor to DOE's Office of Legacy Management in Grand Junction, provides technical support to DOE for remediation and closure of all active solid-waste management units on site and for the 4.5 Acre Site.

The 4.5 Acre Site is located to the northwest of the STAR Center, northeast quarter of Section 13, Township 30 South, Range 15 East (Figure 2). This parcel was owned by DOE from 1957 to 1972, at which time it was sold to a private landowner. During the period of DOE ownership, the property was used for disposal of drums of waste resins and solvents. As a result of this practice, the surficial aquifer was impacted by volatile organic compounds (VOCs), primarily vinyl chloride (VC), toluene, trichloroethene (TCE), and 1,2-dichloroethene (DCE). DOE completed a source removal in 1985.

An Interim Remedial Action (IRA) consisting of ground water extraction and treatment via air stripping, and a routine ground water monitoring program were initiated in May 1990. In July 1997, a modification of the IRA involving installation of dual-phase extraction (DPE) wells provided a more aggressive system to remove ground water contamination. In November 1999, the DPE/air-stripping system was replaced with an in-situ biosparge treatment system.

Currently, ground water cleanup is proceeding according to provisions in the document *Remediation Agreement for the Four and One-Half Acre Site in Largo, Pinellas County, Florida* (Remediation Agreement) (FDEP 2001), an agreement between DOE and the Florida Department of Environmental Protection (FDEP); and in accordance with applicable portions of "Corrective Actions for Contamination Site Cases," an appendix to FDEP's *Enforcement Manual* (FDEP 1999).

The *4.5 Acre Site Biosparge System Integration Plan* (DOE 2000) was approved by FDEP on January 17, 2001. This plan states that performance monitoring would be undertaken on a quarterly basis. Therefore, in April 2001, performance monitoring of the remedial system through the use of direct push technology was undertaken. However, the biosparge systems were shut off in May 2003 with no plans to restart them and no performance monitoring data have been collected since April 2003. Subsequent monitoring has been adapted to fit the new remediation scenario and performance monitoring as defined in the *Interim Remedial Action Plan for Ground Water Recovery at the 4.5 Acre Site* (DOE 2003).

The IRA Plan for Ground Water Recovery at the 4.5 Acre Site was submitted to FDEP on August 29, 2003, and approved by FDEP on September 19, 2003. Implementation of the IRA Plan commenced on March 8, 2004, when construction activities began on the IRA treatment system. The treatment system consists of an extraction well field (three recovery wells), pumps and associated piping, transmission water pipeline, utility connection, a low profile tray air stripper unit, and effluent piping. The new IRA system began operations on April 26, 2004.

The new IRA system is a temporary measure that was outlined in the *Remedial Action Plan for the Pinellas 4.5 Acre Site* (DOE 2001) as a contingency option in the event that biosparging resulted in extending the contaminant plume.. Currently, the *Pinellas Environmental Restoration Project 4.5 Acre Site Remedial Action Plan Addendum* is being prepared. This document presents a proposed final action for the 4.5 Acre Site that involves closure of the site using the provisions of the recently adopted State of Florida Global Risk Based Corrective Action regulations. This addendum will be submitted to FDEP by April 14, 2005.

This document is the quarterly progress report for the 4.5 Acre Site for April through June 2005, as requested by FDEP. The results of monitoring activities and a summary of ongoing and projected work are provided in this report.

## 1.1 Quarterly Site Activities

Obtained water-level measurements from all monitoring wells on April 5, 2005.

Conducted the annual sampling event (i.e., collected ground water samples from 41 monitoring wells and three recovery wells) in April 2005. All wells were sampled for VOCs and analyzed using U.S. Environmental Protection Agency (EPA) SW-846 Method 8260. Six wells were sampled for arsenic and analyzed using EPA SW-846 Method 6010.

Reported the results of annual sampling events (this document).

# 2.0 Monitoring Data

## 2.1 Ground Water Elevations and Flow

Within an 8-hour period on April 5, 2005, depth-to-water measurements were taken in all monitoring wells at the 4.5 Acre Site as part of the sitewide quarterly sampling event. The depth to water in each well was measured with an electronic water-level indicator. The April ground water elevation data for the 4.5 Acre Site are listed in Table 1. The data and information from deep wells were used to construct contours of water levels in the deep surficial aquifer in Figure 3.

The interpretative contours on Figure 3 show ground water flow generally to the west-northwest. These flow patterns are consistent with those observed at the site during the previous 2 years following shutdown of the biosparging system in May 2003. In addition, capture zones are apparent around the three recovery wells (RW01, RW02, and RW03) at the 4.5 Acre Site. These capture zones indicate that the ground water recovery system at the site is maintaining hydraulic control along the west fence line.

The water table ranged from about 3 to 9.5 feet below land surface (ft bls), with ground water elevations that ranged from a high of 15.35 ft at PIN20–TE01 to a low of 8.99 ft at PIN20−M055. The hydraulic gradient across the site was approximately 0.011 feet per foot. This gradient is similar to that observed the previous 2 years. Using Darcy's Law, along with approximations of 1 ft/day for hydraulic conductivity and 0.3 for effective porosity, ground water at the site is estimated to move about 13 ft/year. This velocity is slightly greater than previously observed velocities of 3 to 10 ft/year.

## 2.2 Ground Water Sampling

Forty-four monitoring and recovery wells were sampled by Stoller personnel in April 2005. All wells were sampled for VOCs and six wells were sampled for arsenic.

All samples were collected in accordance with the *Pinellas Environmental Restoration Project Sampling Procedures for the Young - Rainey STAR Center and 4.5 Acre Site* (DOE 2004) using FDEP procedures. All samples collected were submitted to Accutest Laboratory for analysis. Accutest is accredited by the Florida Department of Health in accordance with the National Environmental Laboratory Accreditation Conference, certification number E83510. VOCs were analyzed using EPA SW-846 Method 8260 and arsenic was analyzed using EPA Method 6010.

All of the monitoring wells were micropurged with dedicated bladder pumps and samples were collected when the field measurements stabilized. Extraction wells were sampled using their associated flowlines with dedicated sampling ports. Table 2 lists measurements of pH, specific conductance, dissolved oxygen, oxidation/reduction potential, turbidity, and temperature recorded at the time each sample was collected. These measurements were collected using a flow cell and multiparameter meter.

## 2.3 Ground Water Analytical Results

Individual contaminants of potential concern (COPC) and total COPCs (TCOPCs) concentrations in samples collected from wells at the 4.5 Acre Site are included in Table 3. Arsenic data are shown on Table 4. The previous four quarters of results are included in Table 3 for comparison. Figure 4 shows the TCOPCs concentrations for October 2004.

No COPCs were detected in samples from the 20 sample locations listed below (results listed in Table 3).

| | | | | |
|---|---|---|---|---|
| PIN20–M003 | PIN20–M012 | PIN20–M025 | PIN20–M055 | PIN20–M40S |
| PIN20–M005 | PIN20–M015 | PIN20–M028 | PIN20–M22D | PIN20–M41D |
| PIN20–M007 | PIN20–M023 | PIN20–M036 | PIN20–M38D | PIN20–MWL5 |
| PIN20–M011 | PIN20–M024 | PIN20–M054 | PIN20–M40D | PIN20–MWL6 |

Samples from 24 sample locations listed below contained COPCs at detectable levels (results listed in Table 3).

| | | | | |
|---|---|---|---|---|
| PIN20–0502 | PIN20–M049 | PIN20–M059 | PIN20–M064 | PIN20–MWL4 |
| PIN20–0503 | PIN20–M053 | PIN20–M060 | PIN20–M18D | PIN20–RW01 |
| PIN20–M001 | PIN20–M056 | PIN20–M061 | PIN20–MWL1 | PIN20–RW02 |
| PIN20–M019 | PIN20–M057 | PIN20–M062 | PIN20–MWL2 | PIN20–RW03 |
| PIN20–M035 | PIN20–M058 | PIN20–M063 | PIN20–MWL3 | |

The maximum TCOPCs value detected was 12,725 micrograms per liter (µg/L) at PIN20−M063. The compound detected at the highest concentration in PIN20−M063 was cis-1,2-DCE at a concentration of 7,230 µg/L. Reported "J" values are not considered in the TCOPC analyte concentrations. The only arsenic detection was in PIN20−0503 at a concentration of 0.0131 milligrams per liter (mg/L).

Laboratory reports for quarterly samples collected in April 2005 are provided in Appendix A. IRA treatment system influent, effluent, and recovery well analytical results are provided in Appendix B.

## 2.4 Quality Assurance/Quality Control

Four duplicate samples were compared to their paired sample and the relative percent differences (RPDs) between the results were calculated. Results of analyses for each duplicate sample are listed in Table 5. From the four duplicate samples, 147 individual compounds were analyzed. All sample duplicate pairs meet the quality control criteria for RPD. All data are considered Class A level, indicating that the data may be appropriately used for quantitative and qualitative purposes.

According to the Stoller Sampling Procedures, duplicate samples should be collected at a frequency of one duplicate for every 20 or less samples. There were 44 VOC samples and four duplicate samples. There were six arsenic samples and one duplicate sample. The duplicate criterion was met.

During the prior sampling event in January 2005, four trip blanks showed positive results for 1,1-DCE ranging from 2.4 to 2.8 µg/L. Stoller investigated the problem but no specific cause for the results could be determined by the laboratory or by the Stoller sampling team. In order to evaluate whether the problem was due to field or laboratory practices, Accutest prepared holding blanks for the April 2005 event. The holding blanks were prepared after receipt of the samples by the laboratory and were analyzed with the samples. None of the seven holding blanks or 22 trip blanks from the April 2005 event showed any contamination. Therefore, it appears that 1,1-DCE contamination only occurred during the January 2005 event and did not recur.

No significant deficiencies were found during validation of the field data collected during the quarterly sampling event. A software module for identifying and tracking anomalous ground water data points within the SEEPro database was used to report which of the COPC values lie outside of historical minimum and maximums for that location. No anomalous concentrations were found in the results from this sampling event. No anomalous results are being tracked from previous events.

# 3.0 Treatment System and Recovery Well Operations

From April 1 through June 30, 2005, the treatment system processed 608,190 gallons of ground water. Figures 5, 6, and 7 present the monthly volume of ground water recovered during April through June 2005 from the 4.5 Acre Site recovery wells.

The treatment system experienced some outages during this quarter due to heavy rainfall. In April, a shutdown was experienced over the weekend of the 9th and 10th due to a failed tank float. Both of the floats in the tank were replaced on April 11th. In May, a shutdown was experienced on the weekend of the 21st and 22nd due to heavy rainfall filling the surge tank and tripping the alarm. In June, there were no shutdowns.

A summary of analytical results for samples collected at the 4.5 Acre Site treatment system during this quarter is provided in Table 6. Treatment system influent and effluent samples were analyzed for VOCs and the effluent discharge volume was recorded to comply with the Pinellas County wastewater permit. In the effluent samples, all volatile organic aromatic concentrations were under the Pinellas County regulatory limit of 50 µg/L.

Table 7 presents the average monthly concentration and the calculated mass of selected analytes processed by the 4.5 Acre Site treatment system for each month of this quarter. These monthly results are based on the measured system influent concentration and ground water flow.

FeRemede® is being utilized at the new 4.5 Acre Site treatment system to control the deposition of iron and hardness salts in the air stripper. Additionally, sodium hypochlorite is also being utilized as a microbiocide to control biological growth in the air stripper.

# 4.0 Data Interpretation

This data interpretation section is added to the April to June quarterly report each year to aid in evaluating remediation progress. This section consists of plots showing contaminant concentrations trends (Section 4.1), plume maps (Section 4.2), and a discussion of site geochemistry (Section 4.3).

## 4.1 Contaminant Concentration Trends

The entire data set was evaluated and selected wells and COPCs were chosen for presentation as time versus concentration plots to evaluate remediation progress and potential plume movement.

Figure 8 shows the cis-1,2-DCE and VC concentration trends in well PIN20-0502. Concentrations of these two COPCs in this well began increasing during the April 2002 sampling event, likely as a result of subsurface pressurization that occurred during stopping and starting of the biosparging system. The biosparging system was permanently shut down in May 2003. Subsequently, the cis-1,2-DCE concentration in well 0502 stabilized or began to decrease slightly, while VC concentrations continued to increase. The continued increase in VC concentration likely is due to naturally occurring biodegradation of cis-1,2-DCE. Additional evidence of biodegradation is the presence of significant concentrations of ethane and ethene (Table 8), both of which are VC degradation products.

Figure 9 shows increasing trends for TCE, cis- and trans-1,2-DCE, and VC in well M001, located approximately 135 ft south of well 0502. These increasing trends are also likely due to the operation of the biosparging system. These trends likely will stabilize and start to decrease over time due to naturally occurring biodegradation processes. Significant concentrations of ethane and ethene are also present in this well (Table 8), indicating that complete biodegradation is occurring.

Figure 10 shows TCE, cis-1,2-DCE, and VC concentration trends in well PIN20−MWL4. Clearly the concentrations of these three contaminants have decreased significantly over the last few years. The slight increase in cis-1,2-DCE concentration in 2004 likely is due to TCE biodegradation. The biosparging system was shut down in May 2003, but concentrations have continued to decrease, indicating that the biosparging probably was not the cause of the concentration decreases. Based on the associated geochemical data from these wells, as discussed in Section 4.3, it appears likely that naturally occurring reductive dechlorination is the cause of these concentration decreases. A significant concentration of ethene was observed in April 2005 in this well (Table 8).

## 4.2 Plume Maps

Plume maps were generated for TCOPCs (Figure 4) and the individual site COPCs: VC (Figure 11), cis-1,2-DCE (Figure 12), TCE (Figure 13), and benzene (Figure 14). The inferred plume boundaries for the individual compounds are the respective maximum contaminant levels (MCLs) of the compounds. Concentrations that are below the MCL are not included in the individual compound plumes. The TCOPCs map is a summary of the individual compound maps. The plume maps also show the plume boundary from last year to show any changes over the last year.

The VC plume (Figure 11) is slightly smaller than the 2004 plume, based on the lack of VC in wells M055 and M015. The cis-1,2-DCE plume (Figure 12) is slightly larger than the 2004 plume due mainly to the detection cis-1,2-DCE in well M062; this well had not yet been installed when the 2004 plume map was made. The TCE plume for 2005 (Figure 13) is similar in size to the 2004 plume. The benzene plume (Figure 14) is smaller for 2005 relative to 2004, with benzene detected only in well MWL1. The benzene plume was extended into the center of the site in 2004 based on data collected in 2003 using direct push sampling. The 2003 data are 2 years old and all benzene concentrations were very low at that time, near the MCL, so it is unclear whether or not benzene concentrations still exceed the MCL in the center of the site.

In summary, the total plume area at the 4.5 Acre Site is slightly smaller than in 2004, due mainly to lack of VC detections in wells M055 and M015. These decreases in VC concentrations are likely due to both the effect of the recovery wells at removing contaminated ground water and continuing natural biodegradation of the contaminants.

## 4.3 Geochemical Parameters

Geochemical parameters measured in the field in all wells at the 4.5 Acre Site during April 2005 are summarized in Table 2. Conditions across the site generally are reducing as evidenced by the low values of dissolved oxygen and oxygen/reduction potential.

# 5.0 Tasks to be Performed Next Quarter

The following tasks are scheduled during the next quarter (July through September 2005).

Quarterly sampling and analysis of ground water and water level measurements in July.

Continue monitoring of the IRA treatment system for short-term ground water recovery action and monthly sampling and analysis of ground water will continue in order to provide compliance and system operations data.

Address comments from FDEP on the *Pinellas Environmental Restoration Project Remedial Action Plan Addendum*.

# 6.0 References


Florida Department of Environmental Protection (FDEP), 1999. "Corrective Actions for Contamination Site Cases," Appendix to FDEP *Enforcement Manual*, May.

Florida Department of Environmental Protection (FDEP), 2001. *Remediation Agreement for the Four and One-Half Acre Site in Largo, Pinellas County, Florida*, U.S. Department of Energy, Grand Junction Office, Grand Junction, Colorado, January.

DOE (U.S. Department of Energy), 2000. *4.5 Acre Site Biosparge System Integration Plan*, GJO–2000–182–TAR, MAC–PIN 25.5.1.1, prepared by U.S. Department of Energy, Grand Junction Office, Grand Junction, Colorado, December.

DOE (U.S. Department of Energy), 2001. *Remedial Action Plan for the Pinellas 4.5 Acre Site*, U.S. Department of Energy, Grand Junction Office, Grand Junction, Colorado, July.

DOE (U.S. Department of Energy), 2003. *Pinellas Environmental Restoration Project Interim Remedial Action Plan for Ground Water Recovery at the 4.5 Acre Site*, GJO-2003-480-TAC, prepared by U.S. Department of Energy, Grand Junction Office, Grand Junction, Colorado, August.

DOE (U.S. Department of Energy), 2004. *Pinellas Environmental Restoration Project Sampling Procedures for the Young - Rainey STAR Center and 4.5 Acre Site*, DOE-LM/GJ718-2004, prepared by U.S. Department of Energy Office of Legacy Management, Grand Junction, Colorado, September.

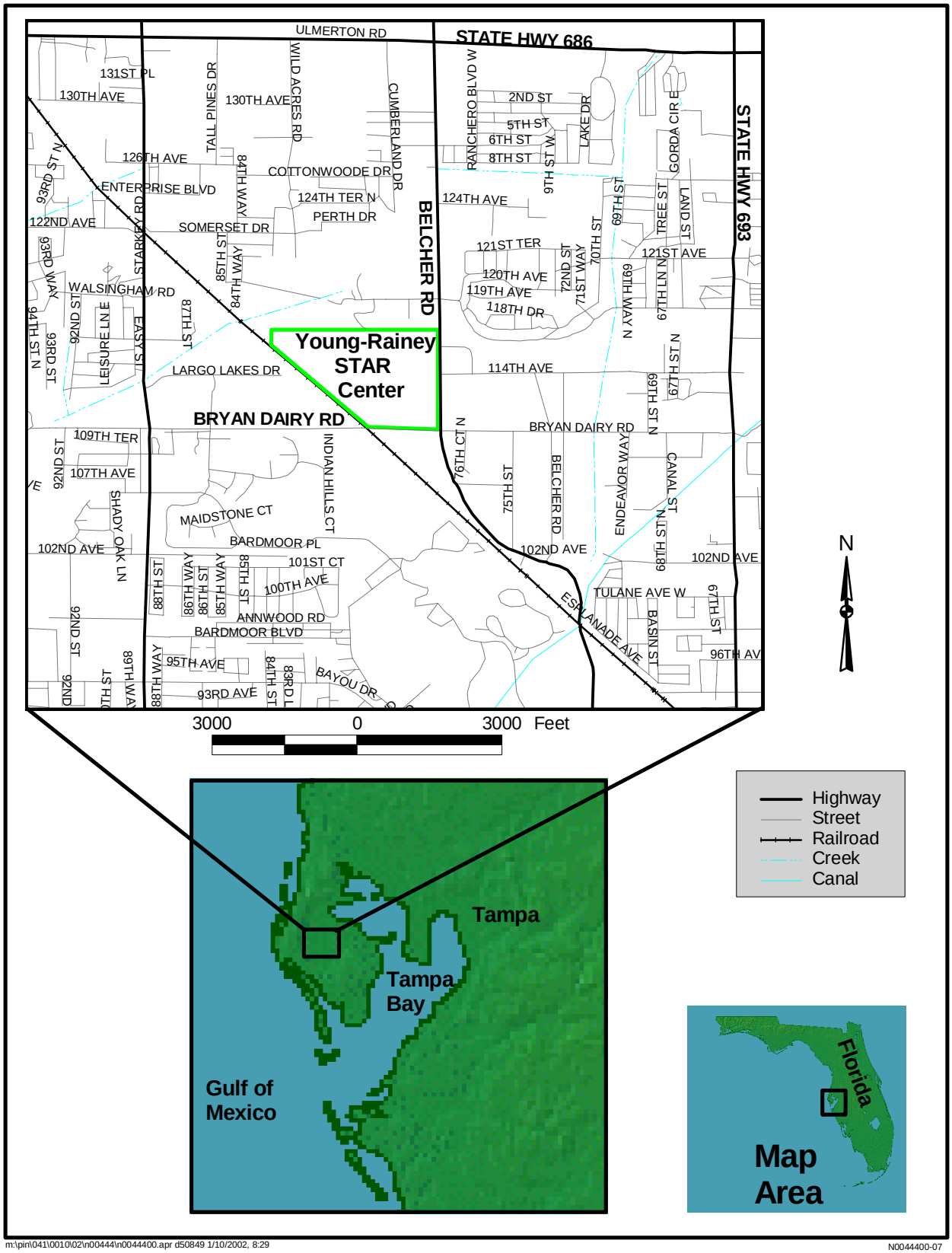


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*Figure 1. Young - Rainey STAR Center Location*

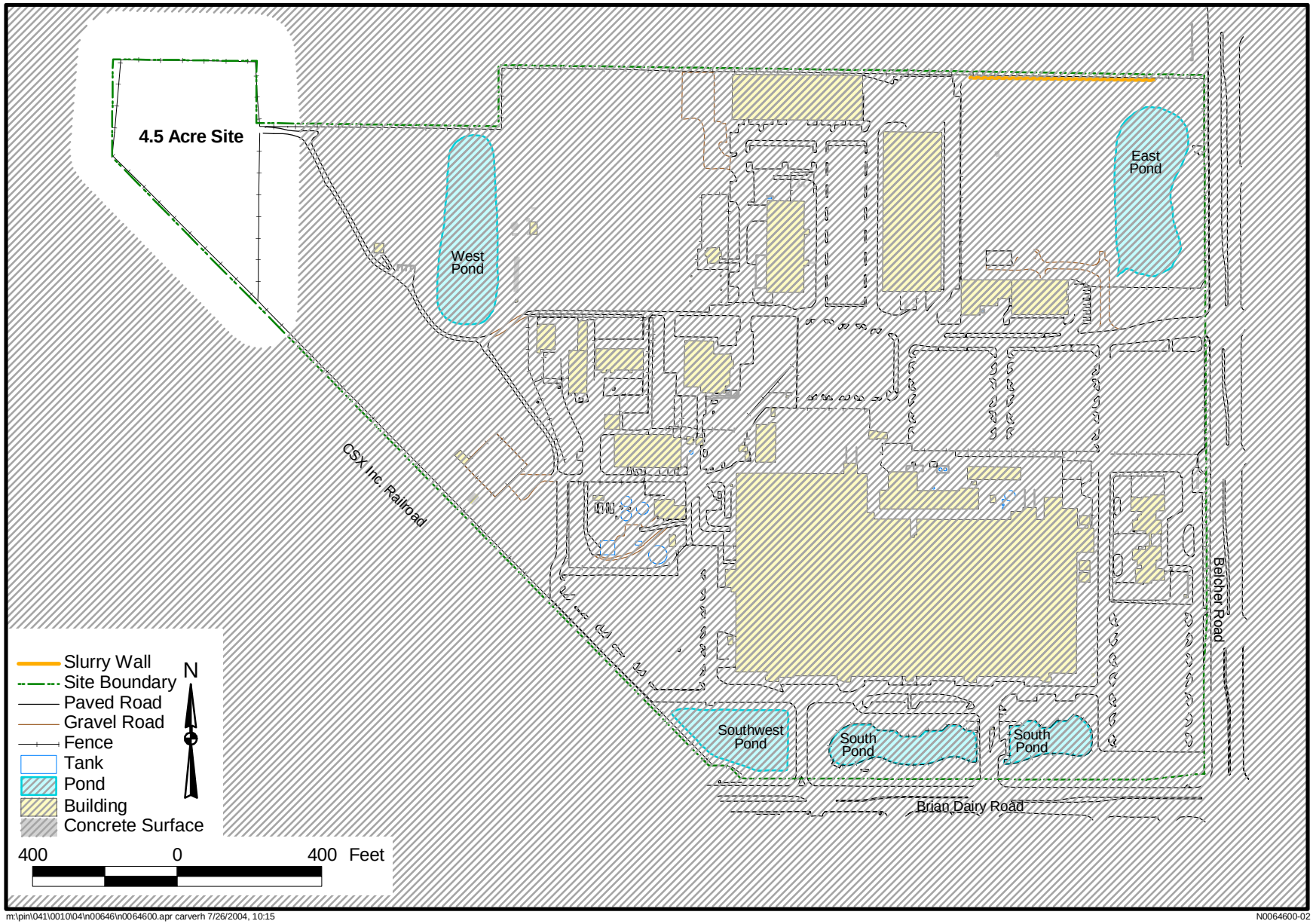


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*Figure 2. 4.5 Acre Site Location*

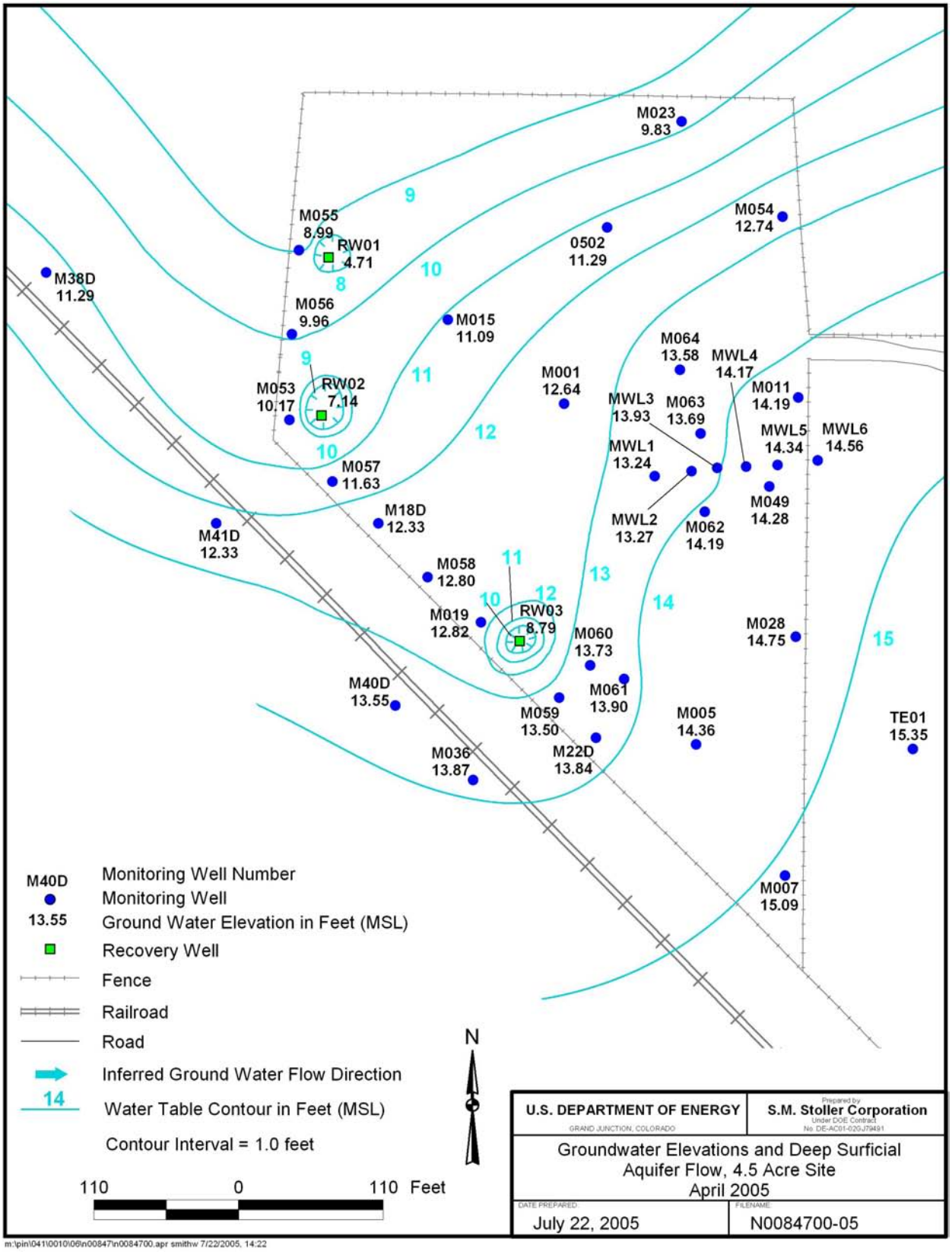


*Figure 3. Ground Water Elevations and Deep Surficial Aquifer Flow, 4.5 Acre Site, April 2005*

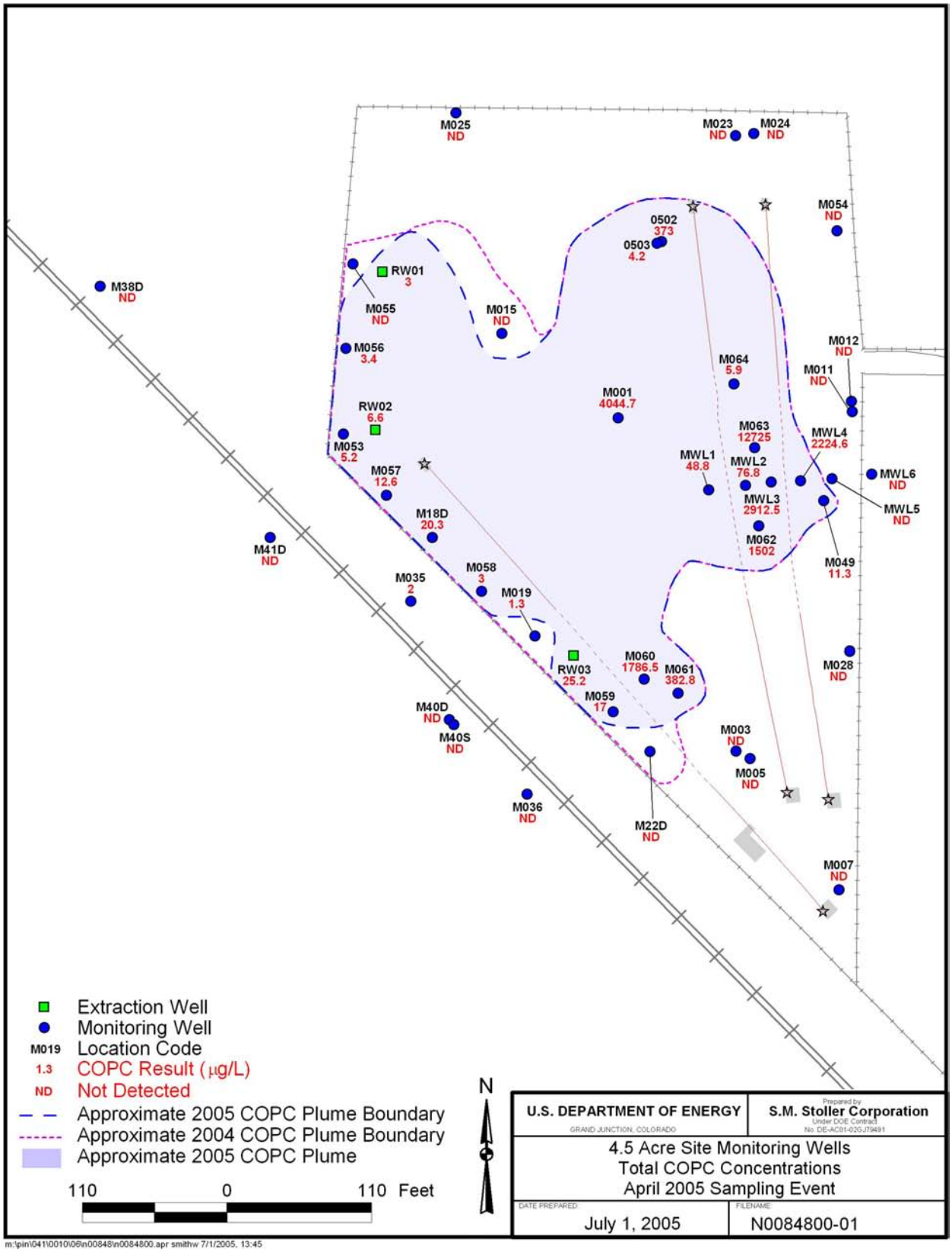


*Figure 4. 4.5 Acre Site TCOPC Concentrations April 2005 Sampling Event*

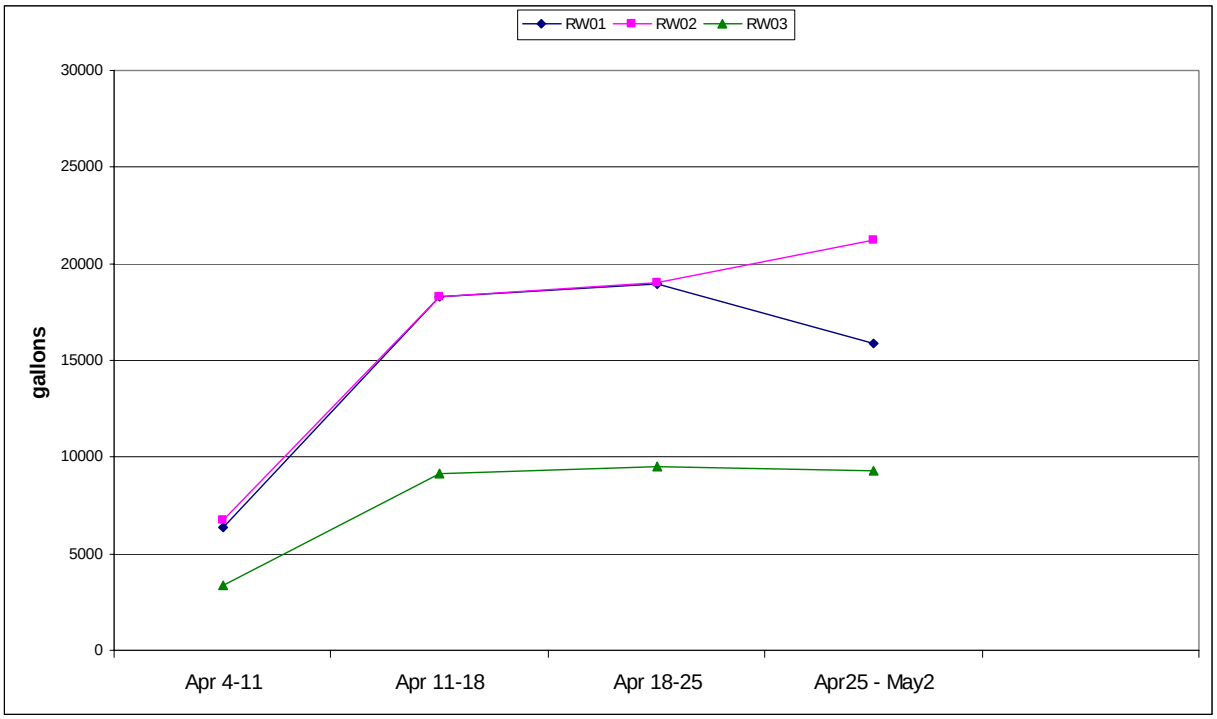


*Figure 5. April 2005 4.5 Acre Site Ground Water Recovery*

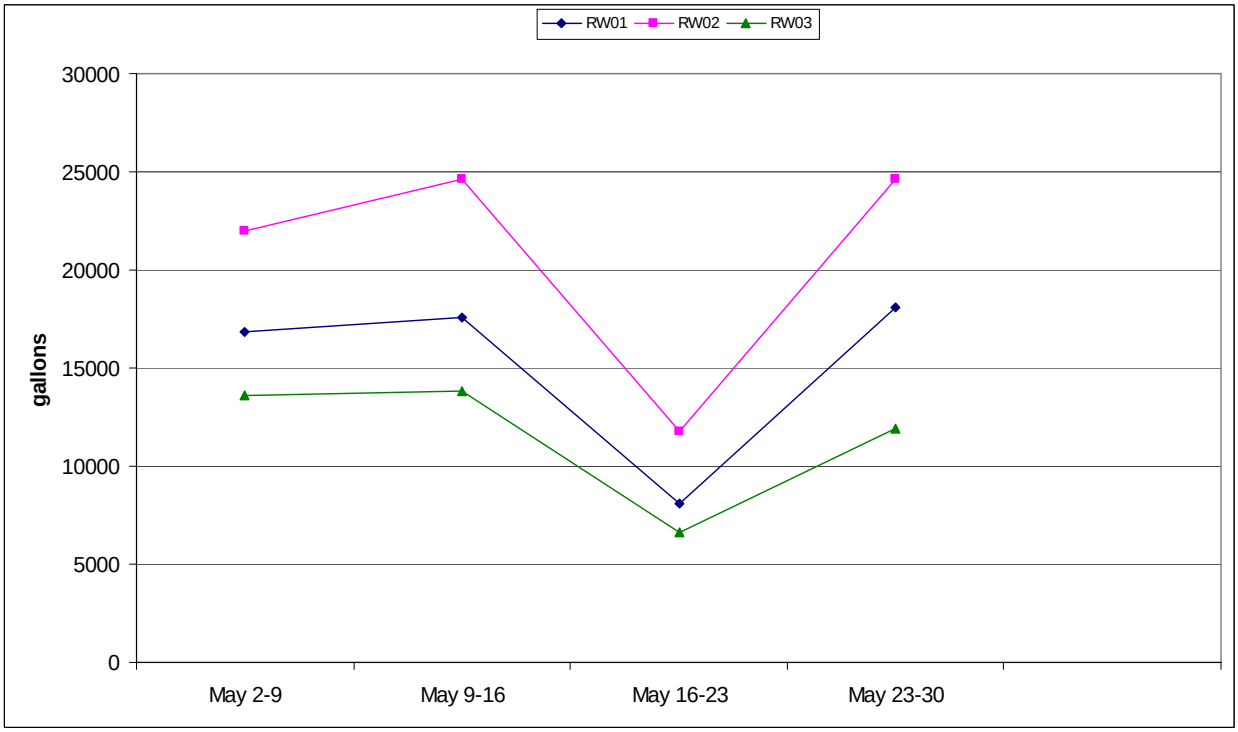


*Figure 6. May 2005 4.5 Acre Site Ground Water Recovery*

*Figure 7. June 2005 4.5 Acre Site Ground Water Recovery*

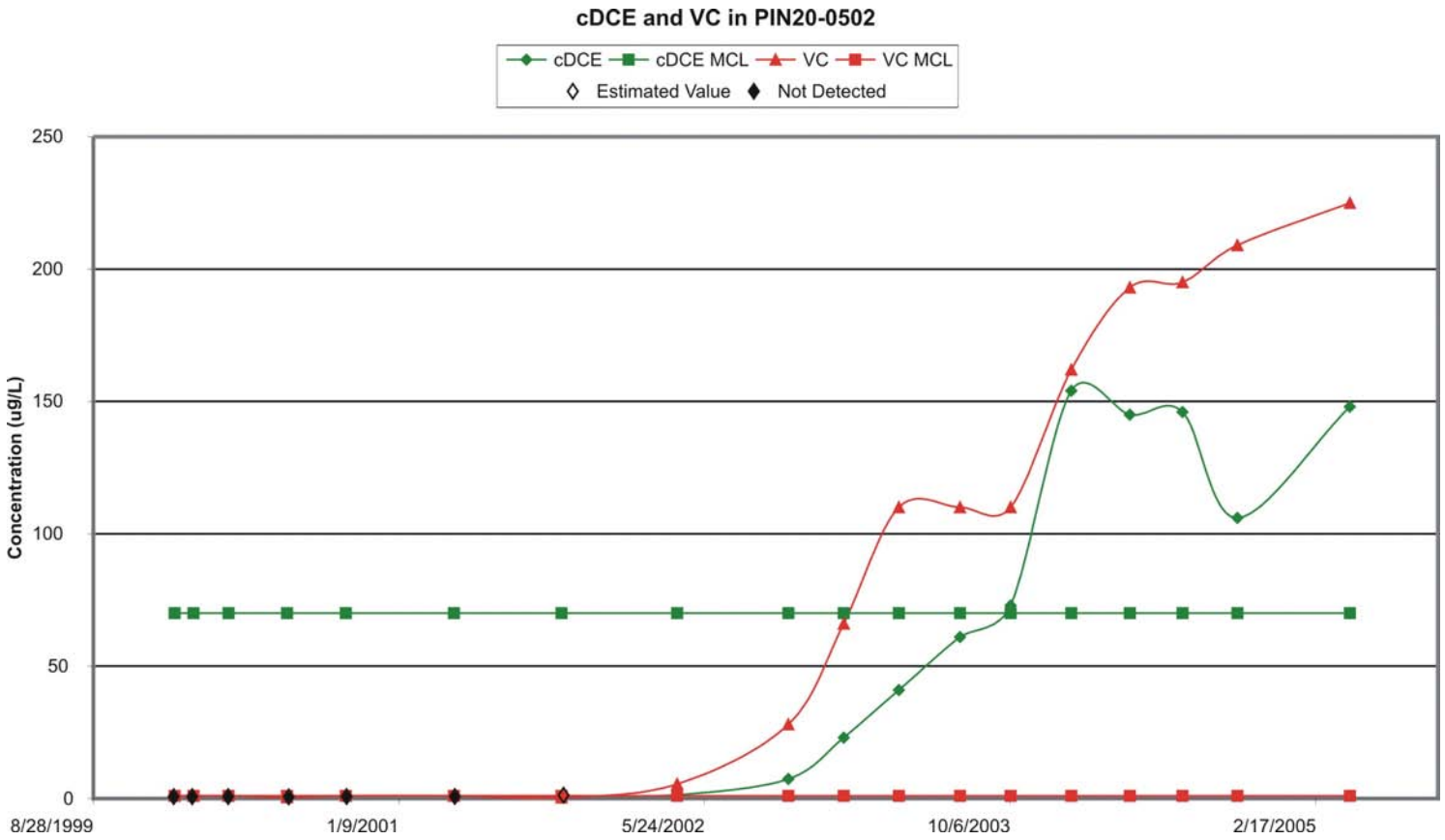


*Figure 8. cis-1,2-DCE and VC Trends in PIN20−0502*

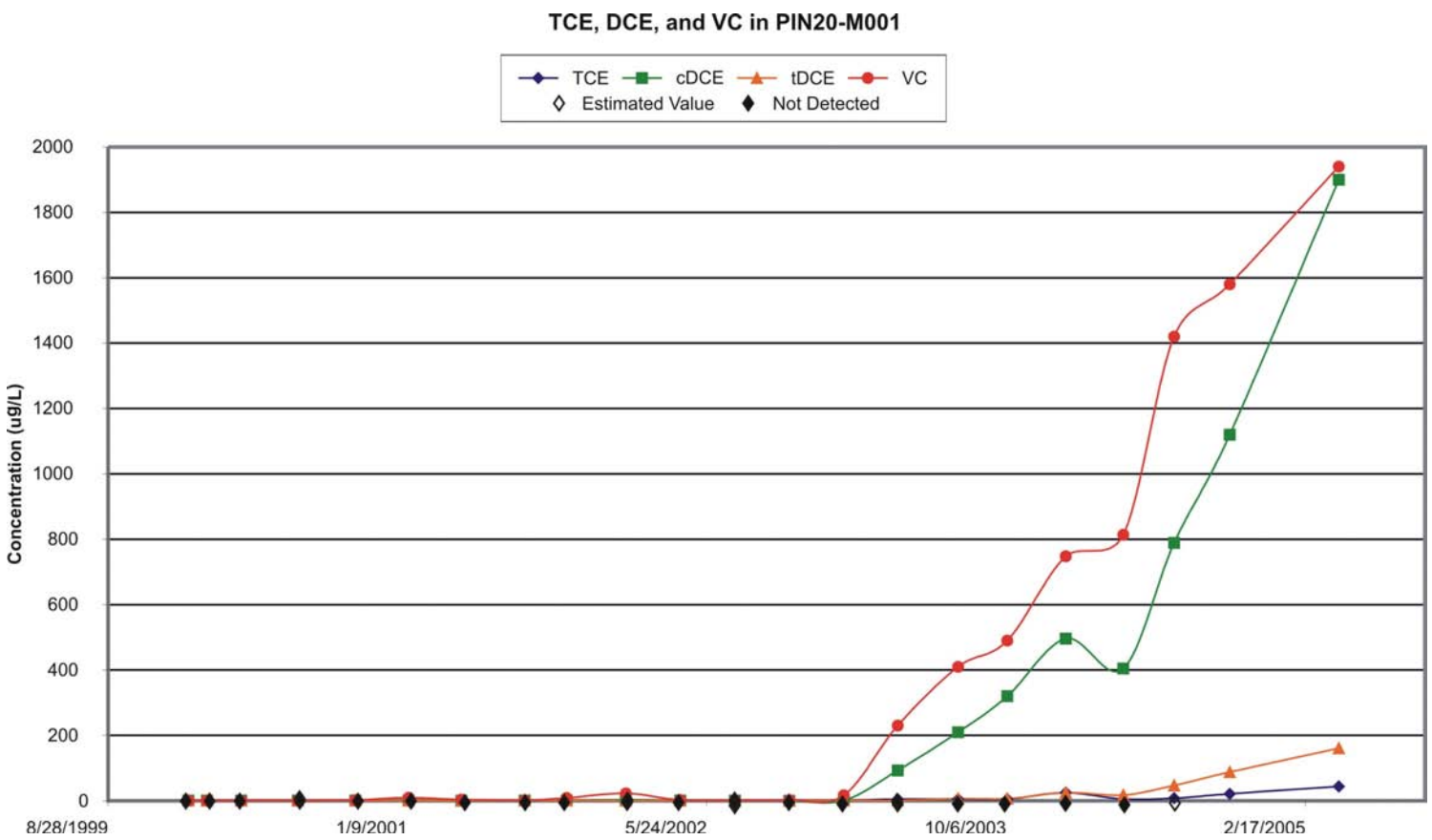


*Figure 9. cis- and trans-1,2-DCE and VC Trends in PIN20−M001*

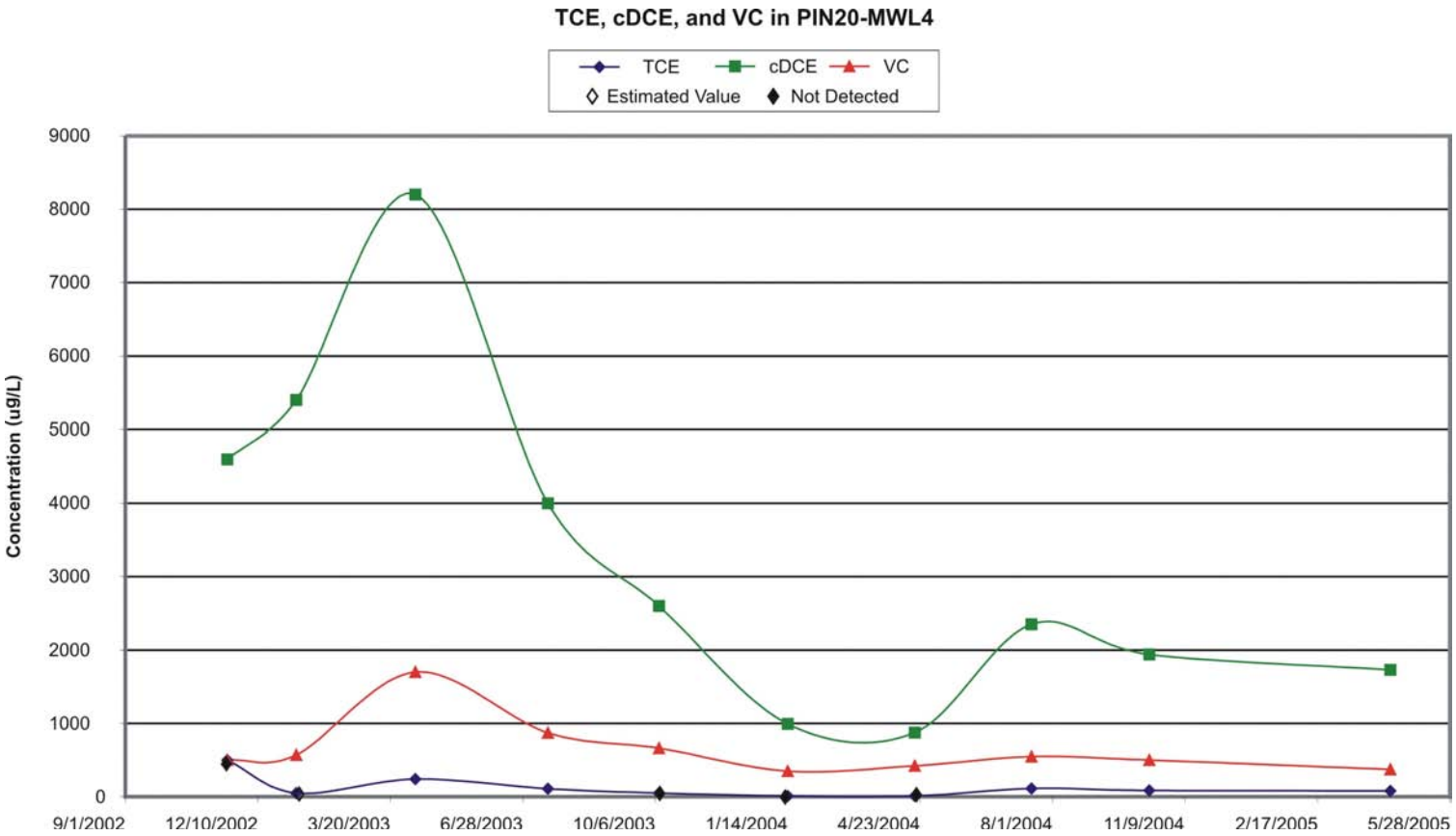


*Figure 10. TCE, cis-1,2-DCE and VC Trends in PIN20−MWL4*

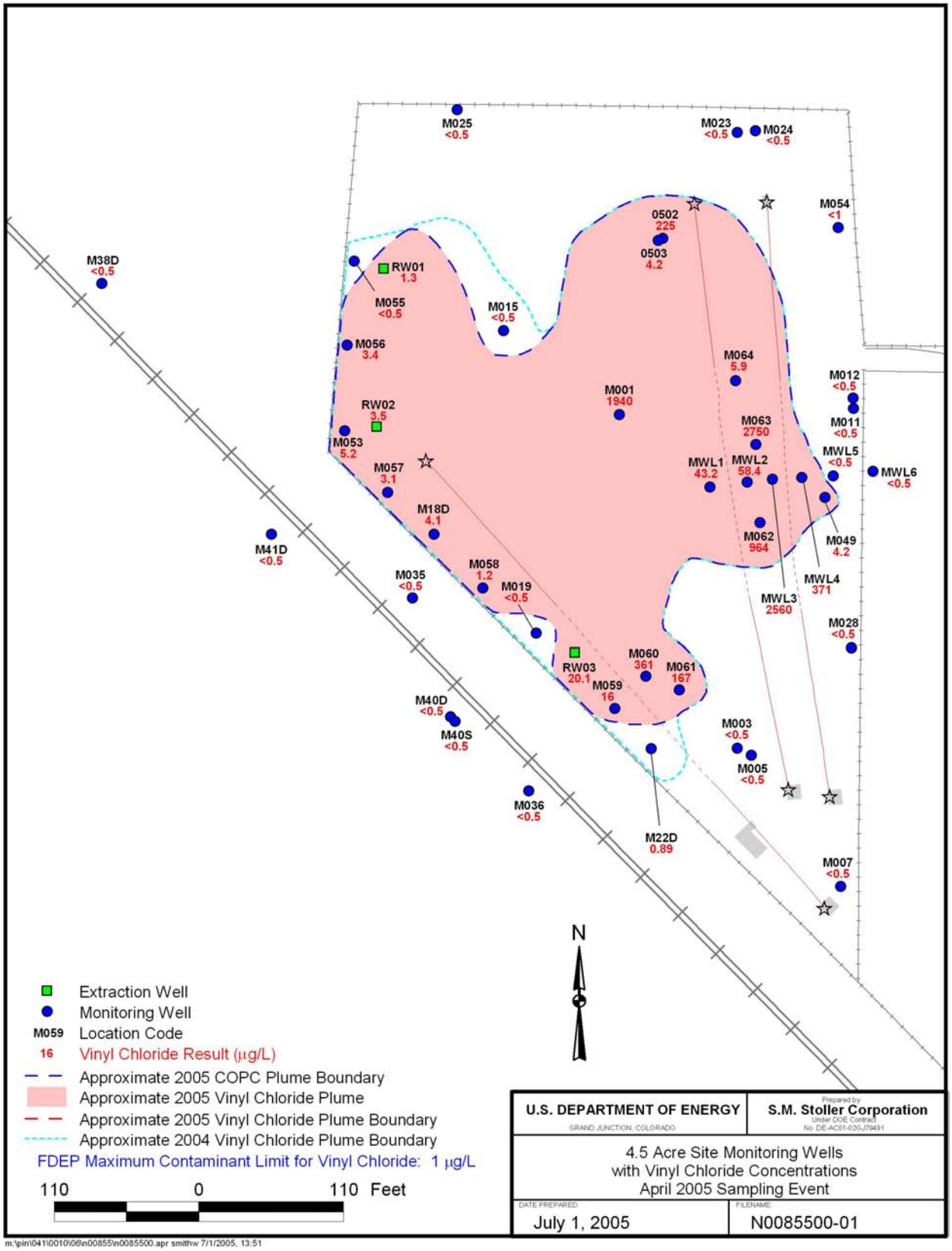


*Figure 11. VC Plume Map*

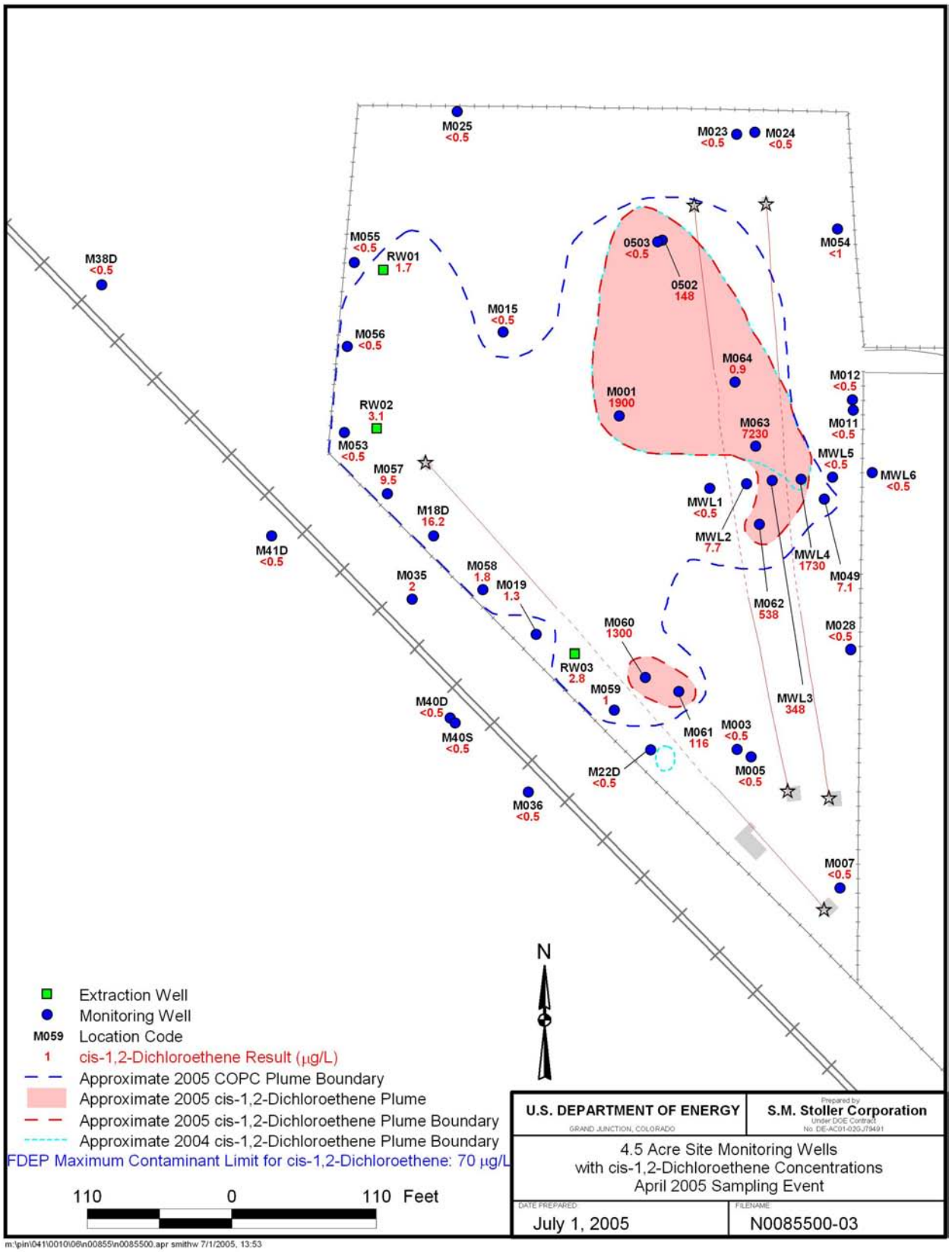


*Figure 12. cis-1,2-DCE Plume Map*

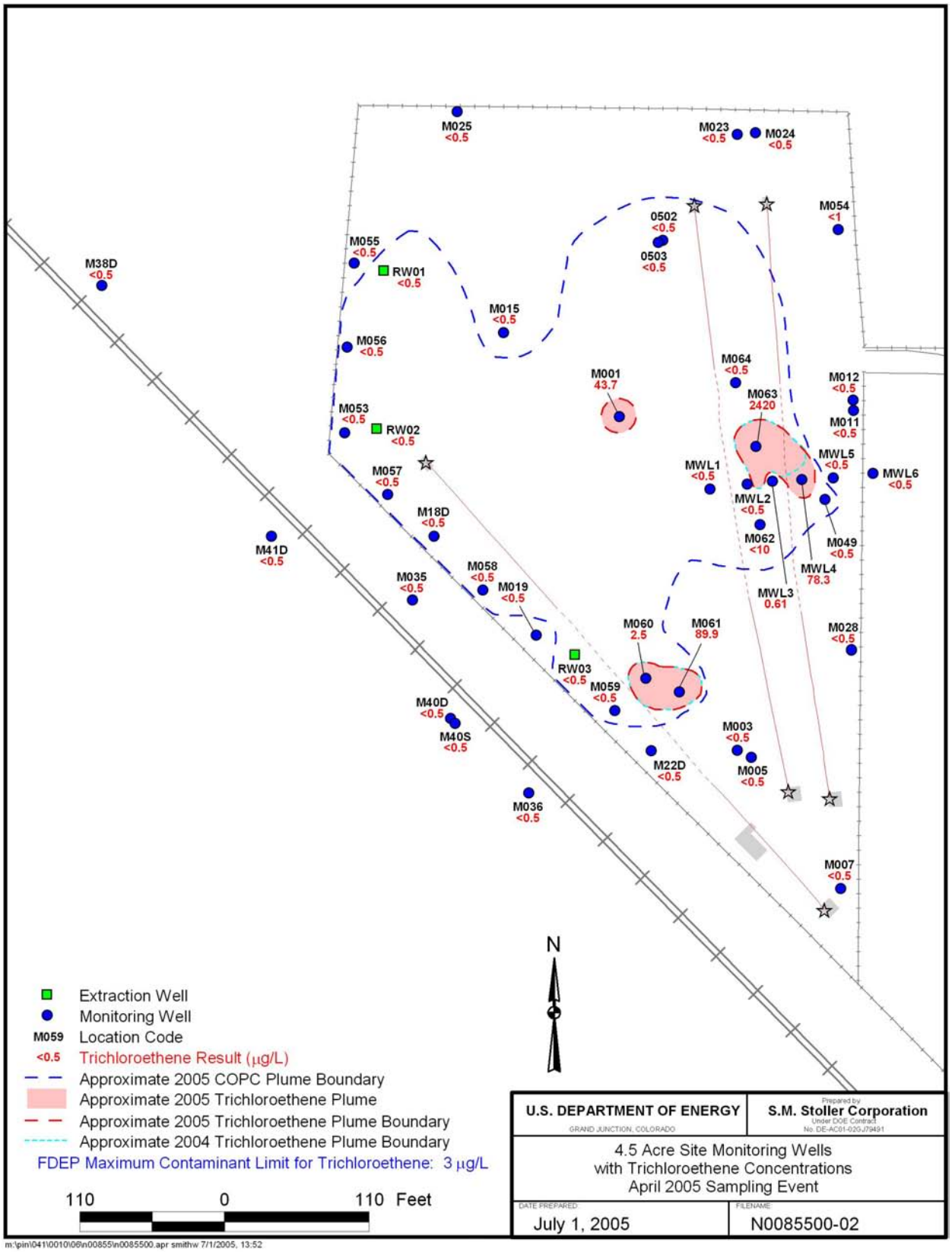


*Figure 13. TCE Plume Map*

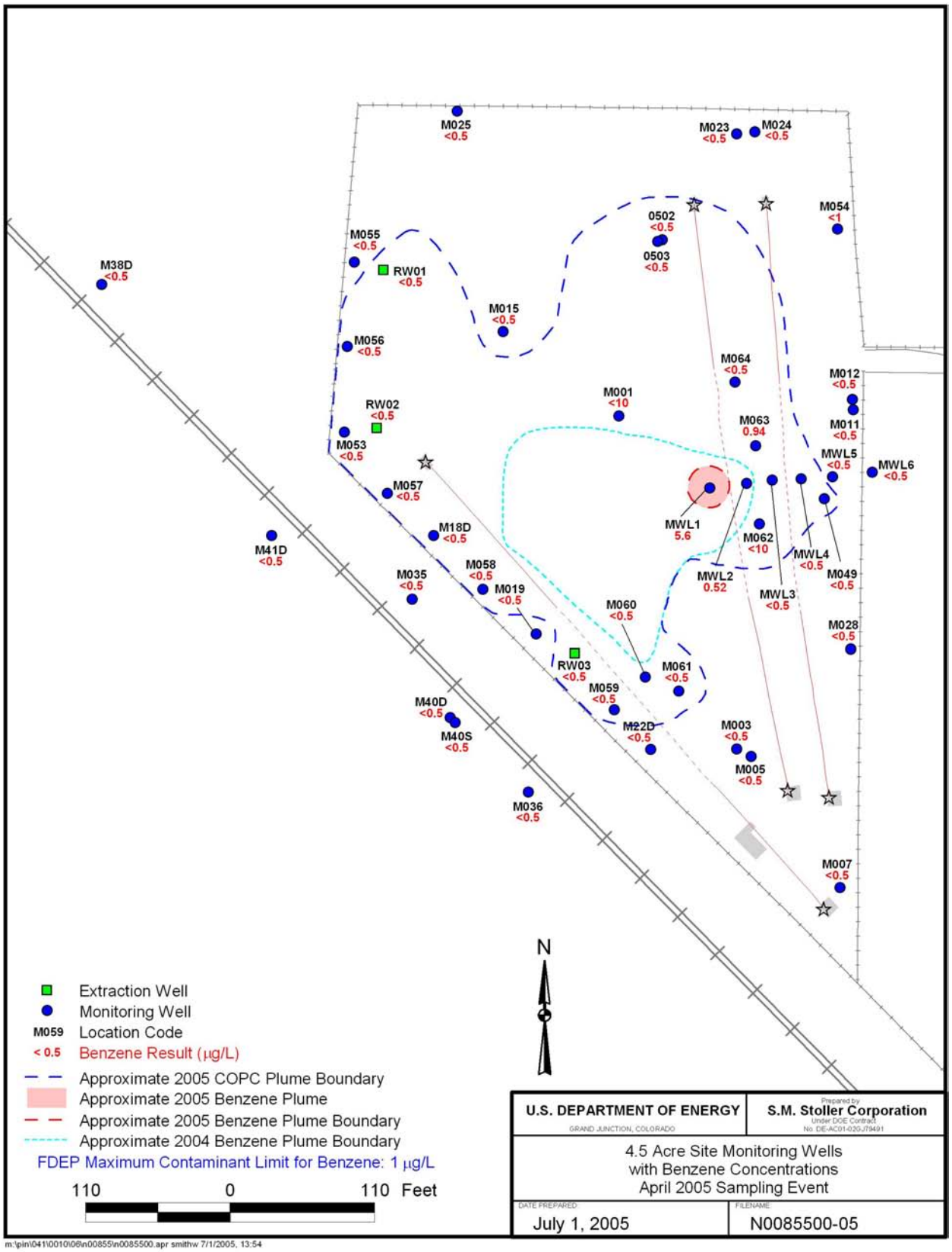


*Figure 14. Benzene Plume Map*

*Table 1. Water-Level Data at the 4.5 Acre Site*

| Location | Measurement | | Water Depth From Land Surface (ft) | Ground Water Elevation (ft NGVD) |
|---|---|---|---|---|
| | Date | Time | | |
| **PIN02** | **West Pond** | | | |
| W004 | 4/5/2005 | 07:50 | | 16.32 |
| **PIN05** | **Trench Site** | | | |
| 0500 | 4/5/2005 | 09:42 | 2.71 | 15.79 |
| **PIN20** | **4.5 Acre Site** | | | |
| 0502 | 4/5/2005 | 08:58 | 6.11 | 11.29 |
| 0503 | 4/5/2005 | 09:00 | 6.1 | 11.3 |
| M001 | 4/5/2005 | 08:55 | 4.96 | 12.64 |
| M003 | 4/5/2005 | 08:13 | 3.69 | 14.51 |
| M005 | 4/5/2005 | 08:16 | 3.94 | 14.36 |
| M007 | 4/5/2005 | 08:18 | 4.36 | 15.09 |
| M011 | 4/5/2005 | 09:30 | 3.91 | 14.19 |
| M012 | 4/5/2005 | 09:32 | 3.6 | 14.4 |
| M015 | 4/5/2005 | 09:21 | 6.41 | 11.09 |
| M019 | 4/5/2005 | 08:04 | 5.18 | 12.82 |
| M023 | 4/5/2005 | 09:11 | 9.64 | 9.83 |
| M024 | 4/5/2005 | 09:09 | 6.76 | 11.04 |
| M025 | 4/5/2005 | 09:15 | 6.55 | 9.75 |
| M028 | 4/5/2005 | 08:20 | 3.45 | 14.75 |
| M035 | 4/5/2005 | 07:49 | 6.07 | 12.73 |
| M036 | 4/5/2005 | 07:44 | 5.43 | 13.87 |
| M049 | 4/5/2005 | 08:24 | 3.52 | 14.28 |
| M053 | 4/5/2005 | 07:56 | 7.03 | 10.17 |
| M054 | 4/5/2005 | 09:04 | 4.96 | 12.74 |
| M055 | 4/5/2005 | 09:19 | 8.41 | 8.99 |
| M056 | 4/5/2005 | 09:54 | 7.14 | 9.96 |
| M057 | 4/5/2005 | 07:59 | 6.27 | 11.63 |
| M058 | 4/5/2005 | 08:02 | 4.9 | 12.8 |
| M059 | 4/5/2005 | 08:06 | 4.3 | 13.5 |
| M060 | 4/5/2005 | 08:08 | 3.6 | 13.73 |
| M061 | 4/5/2005 | 15:03 | 3.38 | 13.9 |
| M062 | 4/5/2005 | 08:44 | 3.64 | 14.19 |
| M063 | 4/5/2005 | 08:47 | 4.41 | 13.69 |
| M064 | 4/5/2005 | 08:51 | 4.13 | 13.58 |
| M18D | 4/5/2005 | 08:00 | 5.37 | 12.33 |
| M22D | 4/5/2005 | 08:11 | 3.96 | 13.84 |
| M38D | 4/5/2005 | 07:30 | 7.21 | 11.29 |
| M40D | 4/5/2005 | 07:41 | 5.85 | 13.55 |
| M40S | 4/5/2005 | 07:39 | 5.23 | 13.97 |
| M41D | 4/5/2005 | 07:35 | 6.77 | 12.33 |
| MWL1 | 4/5/2005 | 08:45 | 5 | 13.24 |
| MWL2 | 4/5/2005 | 08:41 | 4.5 | 13.27 |
| MWL3 | 4/5/2005 | 08:39 | 3.77 | 13.93 |
| MWL4 | 4/5/2005 | 08:37 | 3.57 | 14.17 |
| MWL5 | 4/5/2005 | 08:29 | 4.23 | 14.34 |

*Table 1 (continued). Water-Level Data at the 4.5 Acre Site*

| Location | Measurement | | Water Depth From Land Surface (ft) | Ground Water Elevation (ft NGVD) |
|---|---|---|---|---|
| | Date | Time | | |
| MWL6 | 4/5/2005 | 09:36 | 3.89 | 14.56 |
| RW01 | 4/5/2005 | 14:56 | 12.89 | 4.71 |
| RW02 | 4/5/2005 | 14:58 | 9.96 | 7.14 |
| RW03 | 4/5/2005 | 15:00 | 8.81 | 8.79 |
| TE01 | 4/5/2005 | 09:52 | 2.75 | 15.35 |

*Table 2. Field Measurements of Samples Collected at the 4.5 Acre Site*

| Location | Screen Depth (ft bls) | Temperature (°C) | Specific Conductance (µmhos/cm)[a] | Turbidity (NTU) | pH | Oxidation Reduction Potential (mV) | Dissolved Oxygen (mg/L) |
|---|---|---|---|---|---|---|---|
| **PIN20** | **4.5 Acre Site** | | | | | | |
| 0502 | 21.2–31.2 | 24.57 | 1,431 | 3.94 | 6.71 | -74 | 0.57 |
| 0503 | 13.2–23.2 | 24.39 | 1,586 | 16.8 | 6.63 | -- | 0.15 |
| M001 | 20–25 | 24.07 | 1,336 | 8.77 | 6.6 | -94.2 | 0.84 |
| M003 | 9–14 | 22.83 | 975 | 1.59 | 6.51 | 35.4 | 0.33 |
| M005 | 25.8–30.7 | 24.07 | 1,172 | 4.9 | 6.71 | -40.4 | 0.15 |
| M007 | 25.3–30.3 | 24.32 | 859 | 1.59 | 6.83 | -92.8 | 1.01 |
| M011 | 23.7–28.7 | 23.85 | 915 | 4.92 | 6.61 | -81.2 | 0.26 |
| M012 | 8.6–13.6 | 22.33 | 775 | 13.9 | 6.51 | -5 | 0.27 |
| M015 | 20.8–25.8 | 23.56 | 731 | 5.56 | 6.77 | -101.5 | 0.47 |
| M019 | 22–27 | 22.96 | 1,474 | 6.09 | 6.76 | -84.2 | 0.38 |
| M023 | 19.8–24.8 | 24.03 | 809 | 13 | 6.78 | -- | 0.22 |
| M024 | 8.7–13.7 | 22.95 | 778 | 8.44 | 6.68 | -- | 0.56 |
| M025 | 8.6–13.6 | 22.98 | 1,723 | 10.2 | 6.59 | -- | 0.55 |
| M028 | 22–27 | 23.52 | 882 | 12.4 | 6.74 | 98.1 | 0.57 |
| M035 | 9–14 | 22.72 | 1,370 | 19.7 | 6.8 | -72.7 | 0.99 |
| M036 | 25–30 | 23.36 | 880 | 0.91 | 6.69 | -- | 0.19 |
| M049 | 20–30 | 23.55 | 1,142 | 19.8 | 6.59 | -85 | 0.21 |
| M053 | 20–30 | 23.89 | 1,066 | 11.6 | 6.87 | -113 | 0.42 |
| M054 | 20–30 | 23.26 | 1,182 | 65.1 | 6.68 | -- | 0.2 |
| M055 | 21–31 | 24.72 | 1,172 | 19.5 | 6.72 | -- | 0.11 |
| M056 | 19–29 | 24.52 | 1,107 | 9.79 | 6.7 | -93.9 | 0.16 |
| M057 | 20–30 | 23.84 | 1,028 | 19.3 | 6.71 | -98.1 | 0.22 |
| M058 | 18–28 | 24.25 | 1,171 | 19.5 | 6.72 | -92.1 | 0.2 |
| M059 | 19–29 | 23.68 | 1,080 | 38.6 | 6.72 | -98.1 | 0.21 |
| M060 | 18–28 | 23.49 | 955 | 195 | 6.84 | -111.5 | 0.3 |
| M061 | 20–30 | 24.18 | 850 | 753 | 6.84 | -117.3 | 0.24 |
| M062 | 20–30 | 22.88 | 2,403 | 174 | 6.49 | -90.5 | 0.14 |
| M063 | 19.5–29.5 | 24.59 | 2,196 | 26.2 | 6.62 | -96.6 | 0.54 |
| M064 | 15–25 | 22.88 | 2,942 | 28.1 | 6.45 | -85.9 | 0.4 |
| M18D | 20–30 | 23.88 | 1,599 | 15.5 | 6.82 | -98 | 0.42 |
| M22D | 20–30 | 23.9 | 1,949 | 5.82 | 6.59 | -89.6 | 0.19 |
| M38D | 20–30 | 23.33 | 748 | 3.28 | 6.99 | -93.6 | 1.15 |
| M40D | 18–28 | 23.18 | 958 | 18.9 | 6.75 | -- | 0.14 |
| M40S | 4–14 | 21.53 | 391 | 3.09 | 6.03 | -- | 1.08 |
| M41D | 16–26 | 23.24 | 1,744 | 13.5 | 6.75 | -89.2 | 0.99 |
| MWL1 | 21–26 | 23.03 | 2,889 | 11.8 | 6.02 | -57.5 | 0.22 |
| MWL2 | 21–26 | 22.92 | 2,909 | 10.7 | 6.47 | -94.9 | 0.2 |
| MWL3 | 21–26 | 22.7 | 1,927 | 10.8 | 6.51 | -75.3 | 0.47 |
| MWL4 | 20.8–25.8 | 22.95 | 924 | 2.22 | 6.77 | -88 | 0.32 |
| MWL5 | 20.8–25.8 | 23.98 | 882 | 2.91 | 6.61 | -79 | 0.28 |
| MWL6 | 21.5–26.5 | 23.49 | 977 | 4.72 | 6.68 | -84.4 | 0.37 |

[a]Temperature corrected to 25°C
-- Not measured

*Table 3. COPC Concentrations from Wells at the 4.5 Acre Site[a]*
*(reported in micrograms per liter)*

| Location | Screen Depth (ft) | Date Sampled | TCE | cis-1,2-DCE | trans-1,2-DCE | Total 1,2-DCE[b] | Vinyl chloride | Benzene | Total COPC[c] |
|---|---|---|---|---|---|---|---|---|---|
| **FDEP MCL** | | | **3** | **70** | **100** | **63** | **1** | **1** | |
| **PIN20** | **4.5 Acre Site** | | | | | | | | |
| 0502 | 21.2–31.2 | 4/19/2004 | <2.5 | 145 | <2.5 | 145 | 193 | <2.5 | 338 |
| | | 7/14/2004 | <2.5 | 146 | <2.5 | 146 | 195 | <2.5 | 341 |
| | | 10/12/2004 | <2.5 | 106 | <2.5 | 106 | 209 | <2.5 | 315 |
| | | 4/14/2005 | <0.5 | 148 | <0.5 | 148 | 225 | <0.5 | 373 |
| 0503 | 13.2–23.2 | 4/20/2004 | <0.5 | <0.5 | <0.5 | ND | 0.55J | <0.5 | ND |
| | | 7/20/2004 | <0.5 | <0.5 | <0.5 | ND | 0.95J | <0.5 | ND |
| | | 10/12/2004 | <0.5 | <0.5 | <0.5 | ND | 3.2 | <0.5 | 3.2 |
| | | 4/6/2005 | <0.5 | <0.5 | <0.5 | ND | 4.2 | <0.5 | 4.2 |
| M001 | 20–25 | 4/19/2004 | <5 | 405 | 17.4 | 422.4 | 814 | <5 | 1,236.4 |
| | | 7/13/2004 | 8J | 789 | 47 | 836 | 1,420 | <5 | 2,256 |
| | | 10/14/2004 | 21.4 | 1,120 | 87.7 | 1,207.7 | 1,580 | <10 | 2,809.1 |
| | | 4/14/2005 | 43.7 | 1,900 | 161 | 2,061 | 1,940 | <10 | 4,044.7 |
| M003 | 9–14 | 4/21/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 4/7/2005 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| M005 | 25.8–30.7 | 4/21/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 4/7/2005 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| M007 | 25.3–30.3 | 4/20/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 7/15/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 4/12/2005 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| M011 | 23.7–28.7 | 4/21/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 7/16/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 4/8/2005 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| M012 | 8.6–13.6 | 4/21/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 7/16/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 4/8/2005 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| M015 | 20.8–25.8 | 4/21/2004 | <0.5 | <0.5 | <0.5 | ND | 2.2 | <0.5 | 2.2 |
| | | 7/13/2004 | <0.5 | <0.5 | <0.5 | ND | 1.3 | <0.5 | 1.3 |
| | | 10/15/2004 | <0.5 | <0.5 | <0.5 | ND | 0.8J | <0.5 | ND |
| | | 4/11/2005 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| M019 | 22–27 | 4/21/2004 | <0.5 | <0.5 | <0.5 | ND | 2.3 | <0.5 | 2.3 |
| | | 7/15/2004 | <0.5 | 0.74J | <0.5 | 0.74J | 1.9 | <0.5 | 1.9 |
| | | 10/14/2004 | <0.5 | 1.3 | <0.5 | 1.3 | 1.4 | <0.5 | 2.7 |
| | | 1/13/2005 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 4/11/2005 | <0.5 | 1.3 | <0.5 | 1.3 | <0.5 | <0.5 | 1.3 |
| M023 | 19.8–24.8 | 4/20/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 7/15/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 10/12/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 4/6/2005 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |

*Table 3 (continued). COPC Concentrations from Wells at the 4.5 Acre Site (reported in micrograms per liter)*

| Location | Screen Depth (ft) | Date Sampled | TCE | cis-1,2-DCE | trans-1,2-DCE | Total 1,2-DCE[b] | Vinyl chloride | Benzene | Total COPC[c] |
|---|---|---|---|---|---|---|---|---|---|
| **FDEP MCL** | | | **3** | **70** | **100** | **63** | **1** | **1** | |
| M024 | 8.7–13.7 | 4/20/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 7/15/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 10/13/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 4/6/2005 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| M025 | 8.6–13.6 | 4/20/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 7/16/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 10/12/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 4/6/2005 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| M028 | 22–27 | 4/19/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 7/15/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 4/13/2005 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| M035 | 9–14 | 4/16/2004 | <0.5 | 0.61J | <0.5 | 0.61J | <0.5 | <0.5 | ND |
| | | 7/20/2004 | 1.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | 1.5 |
| | | 10/7/2004 | <0.5 | 1.4 | <0.5 | 1.4 | <0.5 | <0.5 | 1.4 |
| | | 1/12/2005 | <0.5 | 2.9 | <0.5 | 2.9 | <0.5 | <0.5 | 2.9 |
| | | 4/7/2005 | <0.5 | 2 | <0.5 | 2 | <0.5 | <0.5 | 2 |
| M036 | 25–30 | 4/16/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 7/20/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 10/7/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 4/7/2005 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| M049 | 20–30 | 4/21/2004 | <0.5 | 17.5 | 1.7 | 19.2 | 9.1 | <0.5 | 28.3 |
| | | 7/21/2004 | <0.5 | 9.6 | 1.1 | 10.7 | 6.3 | <0.5 | 17 |
| | | 10/14/2004 | <0.5 | 7.7 | 0.69J | 7.7 | 4.8 | <0.5 | 12.5 |
| | | 4/8/2005 | <0.5 | 7.1 | 0.61J | 7.1 | 4.2 | <0.5 | 11.3 |
| M053 | 20–30 | 4/20/2004 | <0.5 | <0.5 | <0.5 | ND | 1.8 | <0.5 | 1.8 |
| | | 7/14/2004 | <0.5 | <0.5 | <0.5 | ND | 2.7 | <0.5 | 2.7 |
| | | 10/14/2004 | <0.5 | <0.5 | <0.5 | ND | 5.1 | <0.5 | 5.1 |
| | | 1/12/2005 | <0.5 | <0.5 | <0.5 | ND | 5 | <0.5 | 5 |
| | | 4/14/2005 | <0.5 | <0.5 | <0.5 | ND | 5.2 | <0.5 | 5.2 |
| M054 | 20–30 | 4/20/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 7/16/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 4/6/2005 | <1 | <1 | <1 | ND | <1 | <1 | ND |
| M055 | 21–31 | 4/21/2004 | <0.5 | 1.5 | <0.5 | 1.5 | 9.9 | <0.5 | 11.4 |
| | | 7/16/2004 | <0.5 | <0.5 | <0.5 | ND | 2.2 | <0.5 | 2.2 |
| | | 10/13/2004 | <0.5 | <0.5 | <0.5 | ND | 0.8J | <0.5 | ND |
| | | 1/12/2005 | <0.5 | <0.5 | <0.5 | ND | 0.56J | <0.5 | ND |
| | | 4/6/2005 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| M056 | 19–29 | 4/21/2004 | <0.5 | <0.5 | <0.5 | ND | 9.6 | <0.5 | 9.6 |
| | | 7/15/2004 | <0.5 | <0.5 | <0.5 | ND | 5.4 | <0.5 | 5.4 |
| | | 10/14/2004 | <0.5 | <0.5 | <0.5 | ND | 5.5 | <0.5 | 5.5 |
| | | 1/12/2005 | <0.5 | <0.5 | <0.5 | ND | 3 | <0.5 | 3 |
| | | 4/7/2005 | <0.5 | <0.5 | <0.5 | ND | 3.4 | <0.5 | 3.4 |

*Table 3 (continued). COPC Concentrations from Wells at the 4.5 Acre Site (reported in micrograms per liter)*

| Location | Screen Depth (ft) | Date Sampled | TCE | cis-1,2-DCE | trans-1,2-DCE | Total 1,2-DCE[b] | Vinyl chloride | Benzene | Total COPC[c] |
|---|---|---|---|---|---|---|---|---|---|
| **FDEP MCL** | | | **3** | **70** | **100** | **63** | **1** | **1** | |
| M057 | 20–30 | 4/21/2004 | <0.5 | 3.8 | <0.5 | 3.8 | 3.8 | <0.5 | 7.6 |
| | | 7/20/2004 | <0.5 | 1.7 | <0.5 | 1.7 | 4.5 | <0.5 | 6.2 |
| | | 10/14/2004 | <0.5 | 8.4 | <0.5 | 8.4 | 4.6 | <0.5 | 13 |
| | | 1/12/2005 | <0.5 | 11.4 | <0.5 | 11.4 | 3.5 | <0.5 | 14.9 |
| | | 4/7/2005 | <0.5 | 9.5 | <0.5 | 9.5 | 3.1 | <0.5 | 12.6 |
| M058 | 18–28 | 4/21/2004 | <0.5 | 5.6 | 0.69J | 5.6 | 3.7 | <0.5 | 9.3 |
| | | 7/15/2004 | <0.5 | 2 | <0.5 | 2 | 1.4 | <0.5 | 3.4 |
| | | 10/14/2004 | <0.5 | 2.9 | <0.5 | 2.9 | 2.3 | <0.5 | 5.2 |
| | | 1/12/2005 | <0.5 | 1.9 | <0.5 | 1.9 | 1 | <0.5 | 2.9 |
| | | 4/7/2005 | <0.5 | 1.8 | <0.5 | 1.8 | 1.2 | <0.5 | 3 |
| M059 | 19–29 | 4/21/2004 | <0.5 | <0.5 | <0.5 | ND | 8.3 | <0.5 | 8.3 |
| | | 7/14/2004 | <0.5 | <0.5 | <0.5 | ND | 44.1 | <0.5 | 44.1 |
| | | 10/14/2004 | <0.5 | 6.1 | 0.99J | 6.1 | 47.3 | <0.5 | 53.4 |
| | | 1/12/2005 | <0.5 | 2.8 | 0.64J | 2.8 | 27.7 | <0.5 | 30.5 |
| | | 4/7/2005 | <0.5 | 1 | <0.5 | 1 | 16 | <0.5 | 17 |
| M060 | 18–28 | 7/16/2004 | 7.9 | 63.5 | 31.9 | 95.4 | 339 | <0.5 | 442.3 |
| | | 10/13/2004 | 1.7 | 76.7 | 27 | 103.7 | 455 | <0.5 | 560.4 |
| | | 1/13/2005 | 2.4 | 977 | 136 | 1,113 | 745 | <0.5 | 1,860.4 |
| | | 4/14/2005 | 2.5 | 1,300 | 123 | 1,423 | 361 | <0.5 | 1,786.5 |
| M061 | 20–30 | 7/15/2004 | 242 | 353 | 49.5 | 402.5 | 647 | <5 | 1,291.5 |
| | | 10/13/2004 | 14.3 | 37.9 | 19 | 56.9 | 520 | <0.5 | 591.2 |
| | | 1/13/2005 | 18.5 | 28.4 | 6.7J | 28.4 | 253 | <5 | 299.9 |
| | | 4/13/2005 | 89.9 | 116 | 9.9 | 125.9 | 167 | <0.5 | 382.8 |
| M062 | 20–30 | 7/21/2004 | <25 | 1,810 | <25 | 1,810 | 2,310 | <25 | 4,120 |
| | | 10/15/2004 | <0.5 | 1,190 | 9.9 | 1,199.9 | 2,310 | 1.2 | 3,511.1 |
| | | 1/13/2005 | <0.5 | 2,840 | 11.8 | 2,851.8 | 4,480 | 1.5 | 7,333.3 |
| | | 4/8/2005 | <10 | 538 | <10 | 538 | 964 | <10 | 1,502 |
| M063 | 19.5–29.5 | 7/19/2004 | 4,880 | 12,600 | 612 | 13,212 | 3,580 | <100 | 21,672 |
| | | 10/13/2004 | 5,930 | 8,160 | 562 | 8,722 | 3,100 | 1.2 | 17,753.2 |
| | | 1/13/2005 | 4,290 | 9,610 | 486 | 10,096 | 3,450 | <50 | 17,836 |
| | | 4/13/2005 | 2,420 | 7,230 | 325 | 7,555 | 2,750 | 0.94J | 12,725 |
| M064 | 15–25 | 7/16/2004 | <0.5 | 10.3 | <0.5 | 10.3 | 45.2 | <0.5 | 55.5 |
| | | 10/14/2004 | <0.5 | 1 | <0.5 | 1 | 9.4 | <0.5 | 10.4 |
| | | 1/13/2005 | <0.5 | 3.5 | <0.5 | 3.5 | 14.2 | <0.5 | 17.7 |
| | | 4/14/2005 | <0.5 | 0.9J | <0.5 | 0.9J | 5.9 | <0.5 | 5.9 |
| M18D | 20–30 | 4/20/2004 | <0.5 | 10.2 | <0.5 | 10.2 | 5.7 | <0.5 | 15.9 |
| | | 7/14/2004 | <0.5 | 11.1 | <0.5 | 11.1 | 5.6 | <0.5 | 16.7 |
| | | 10/14/2004 | <0.5 | 13.3 | <0.5 | 13.3 | 6.9 | <0.5 | 20.2 |
| | | 1/12/2005 | <0.5 | 15 | <0.5 | 15 | 5.8 | <0.5 | 20.8 |
| | | 4/13/2005 | <0.5 | 16.2 | <0.5 | 16.2 | 4.1 | <0.5 | 20.3 |

*Table 3 (continued). COPC Concentrations from Wells at the 4.5 Acre Site (reported in micrograms per liter)*

| Location | Screen Depth (ft) | Date Sampled | TCE | cis-1,2-DCE | trans-1,2-DCE | Total 1,2-DCE[b] | Vinyl chloride | Benzene | Total COPC[c] |
|---|---|---|---|---|---|---|---|---|---|
| **FDEP MCL** | | | **3** | **70** | **100** | **63** | **1** | **1** | |
| M22D | 20–30 | 4/20/2004 | <0.5 | <0.5 | <0.5 | ND | 1.9 | <0.5 | 1.9 |
| | | 7/14/2004 | <0.5 | <0.5 | <0.5 | ND | 1.6 | <0.5 | 1.6 |
| | | 10/14/2004 | <0.5 | <0.5 | <0.5 | ND | 1.4 | <0.5 | 1.4 |
| | | 1/12/2005 | <0.5 | <0.5 | <0.5 | ND | 1.3 | <0.5 | 1.3 |
| | | 4/7/2005 | <0.5 | <0.5 | <0.5 | ND | 0.89J | <0.5 | ND |
| M38D | 20–30 | 4/16/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 7/20/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 10/7/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 4/7/2005 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| M40D | 18–28 | 4/16/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 7/20/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 10/7/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 4/7/2005 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| M40S | 4–14 | 4/16/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 7/20/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 10/7/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 4/7/2005 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| M41D | 16–26 | 4/16/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 7/20/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 10/7/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 4/7/2005 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| MWL1 | 21–26 | 4/21/2004 | <0.5 | <0.5 | <0.5 | ND | 4 | 9.2 | 13.2 |
| | | 7/21/2004 | <0.5 | <0.5 | <0.5 | ND | 6.8 | 3.6 | 10.4 |
| | | 10/15/2004 | <0.5 | <0.5 | <0.5 | ND | 5.4 | 6.1 | 11.5 |
| | | 4/8/2005 | <0.5 | <0.5 | <0.5 | ND | 43.2 | 5.6 | 48.8 |
| MWL2 | 21–26 | 4/19/2004 | 0.91J | 16.1 | 14.7 | 30.8 | 99.3 | 1.6 | 131.7 |
| | | 7/21/2004 | <1 | 11.8 | 17.5 | 29.3 | 110 | <1 | 139.3 |
| | | 10/14/2004 | <0.5 | 23.7 | 23.8 | 47.5 | 124 | 0.74J | 171.5 |
| | | 4/8/2005 | <0.5 | 7.7 | 10.7 | 18.4 | 58.4 | 0.52J | 76.8 |
| MWL3 | 21–26 | 4/19/2004 | <0.5 | 0.54J | <0.5 | 0.54J | 735 | <0.5 | 735 |
| | | 7/16/2004 | <0.5 | 8.9 | <0.5 | 8.9 | 2,180 | <0.5 | 2,188.9 |
| | | 10/13/2004 | <0.5 | 224 | 1.7 | 225.7 | 2,820 | <0.5 | 3,045.7 |
| | | 4/13/2005 | 0.61J | 348 | 4.5 | 352.5 | 2,560 | <0.5 | 2,912.5 |
| MWL4 | 20.8–25.8 | 4/19/2004 | <10 | 873 | 19.8J | 873 | 422 | <10 | 1,295 |
| | | 7/16/2004 | 113 | 2,350 | 63.3 | 2,413.3 | 546 | <0.5 | 3,072.3 |
| | | 10/13/2004 | 84.5 | 1,940 | 75.9 | 2,015.9 | 498 | <0.5 | 2,598.4 |
| | | 4/13/2005 | 78.3 | 1,730 | 45.3 | 1,775.3 | 371 | <0.5 | 2,224.6 |
| MWL5 | 20.8–25.8 | 4/21/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 7/21/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 10/14/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 4/8/2005 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |

*Table 3 (continued). COPC Concentrations from Wells at the 4.5 Acre Site (reported in micrograms per liter)*

| Location | Screen Depth (ft) | Date Sampled | TCE | cis-1,2-DCE | trans-1,2-DCE | Total 1,2-DCE[b] | Vinyl chloride | Benzene | Total COPC[c] |
|---|---|---|---|---|---|---|---|---|---|
| **FDEP MCL** | | | **3** | **70** | **100** | **63** | **1** | **1** | |
| MWL6 | 21.5–26.5 | 4/22/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 7/20/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 10/15/2004 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| | | 4/11/2005 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND |
| RW01 | 10–30 | 4/20/2004 | <0.5 | 1.2 | <0.5 | 1.2 | 7.4 | <0.5 | 8.6 |
| | | 7/6/2004 | <0.5 | 2.9 | <0.5 | 2.9 | 4.7 | <0.5 | 7.6 |
| | | 10/5/2004 | <0.5 | 2 | <0.5 | 2 | 1.3 | <0.5 | 3.3 |
| | | 1/6/2005 | <0.5 | 2.1 | <0.5 | 2.1 | 1.3 | <0.5 | 3.4 |
| | | 4/6/2005 | <0.5 | 1.7 | <0.5 | 1.7 | 1.3 | <0.5 | 3 |
| RW02 | 8–28 | 4/20/2004 | <0.5 | <0.5 | <0.5 | ND | 1.2 | <0.5 | 1.2 |
| | | 7/6/2004 | <0.5 | 1.1 | <0.5 | 1.1 | 4.6 | <0.5 | 5.7 |
| | | 10/5/2004 | <0.5 | 2.3 | <0.5 | 2.3 | 3.2 | <0.5 | 5.5 |
| | | 1/6/2005 | <0.5 | 3.3 | <0.5 | 3.3 | 2.6 | <0.5 | 5.9 |
| | | 4/6/2005 | <0.5 | 3.1 | <0.5 | 3.1 | 3.5 | <0.5 | 6.6 |
| RW03 | 8–28 | 4/20/2004 | <0.5 | <0.5 | <0.5 | ND | 4.9 | <0.5 | 4.9 |
| | | 7/6/2004 | <0.5 | 0.57J | 1.3 | 1.3 | 7.3 | <0.5 | 8.6 |
| | | 10/5/2004 | <0.5 | 1.8 | 1.4 | 3.2 | 9.5 | <0.5 | 12.7 |
| | | 1/6/2005 | <0.5 | 2.5 | 1.9 | 4.4 | 9.2 | <0.5 | 13.6 |
| | | 4/6/2005 | <0.5 | 2.8 | 2.3 | 5.1 | 20.1 | <0.5 | 25.2 |

[a]Before December 18, 2003, "<" values are reporting limits. On or after December 18, 2003, "<" values are method detection limits.
[b]Total 1,2–DCE is the sum of cis–1,2–DCE and trans–1,2–DCE.
[c]Total COPC is the sum of the individual COPC concentrations. The cis–1,2–DCE and trans–1,2–DCE values are not part of the total COPC value because these values are included in the total 1,2–DCE value. "J" values are not included in the total COPC value.
ND = Not detected.
J = Estimated value, result is between the reporting limit and the method detection limit.

*Table 4. Arsenic Concentrations from Wells at the 4.5 Acre Site*

| Location | Sample Date | Concentration (mg/L) |
|---|---|---|
| **PIN20** | **4.5 Acre Site** | |
| 0502 | 4/14/2005 | <0.0035 |
| 0503 | 4/6/2005 | 0.0131 |
| MWL2 | 4/8/2005 | <0.0035 |
| MWL3 | 4/13/2005 | <0.0035 |
| MWL4 | 4/13/2005 | <0.0035 |
| MWL6 | 4/11/2005 | <0.0035 |

"<" values are method detection limits.

*Table 5. RPD for Duplicate Samples, 4.5 Acre Site*

| Sample ID | Duplicate ID | Case Number | Constituent | S[a] | D[b] | RPD Value | 5 times DL[c] | Fail[d] |
|---|---|---|---|---|---|---|---|---|
| PIN20−M023 | PIN20−0553 | F30887 | nondetect for VOCs | | | | | |
| PIN20−M053 | PIN20−0550 | F31184 | Vinyl chloride | 5.2 | 5.1 | 1.9 | 2.5 | |
| PIN20−M055 | PIN20−0551 | F30966 | nondetect for VOCs | | | | | |
| PIN20−MWL2 | PIN20−0552 | F30974 | 1,1-Dichloroethene | 0.55 | 0.58 | 5.3 | 2.5 | |
| | | | Benzene | 0.52 | 0.53 | 1.9 | 2.5 | |
| | | | cis-1,2-Dichloroethene | 7.7 | 7.7 | 0.0 | 2.5 | |
| | | | trans-1,2-Dichloroethene | 10.7 | 11.3 | 5.5 | 2.5 | |
| | | | Vinyl chloride | 58.4 | 62.3 | 6.5 | 2.5 | |
| | | | Arsenic | 0.00175 | 0.0035 | NA | 0.0175 | |

[a]S = Original sample (N001), VOC concentration in ∝g/L.
[b]D = Duplicate sample (N002), VOC concentration in ∝g/L.
[c]DL = Detection limit.
[d]Fail is an RPD greater than ±30% and an original or duplicate sample more than 5 times the detection limit.

*Table 6. Summary of Analytical Results for the 4.5 Acre Site Treatment System (reported in micrograms per liter unless otherwise noted)*[a]

| Location[b] | Date Sampled | TCE | cis-1,2-DCE | trans-1,2-DCE | Total 1,2-DCE[c] | Vinyl chloride | Benzene | Total COPC[d] | $CaCO_3$ mg/L | Fe mg/L |
|---|---|---|---|---|---|---|---|---|---|---|
| **PIN20** | **4.5 Acre Site** | | | | | | | | | |
| TRTI | 4/6/2005 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND | 962 | 6.85 |
| | 5/6/2005 | <0.5 | 1.6 | <0.5 | 1.6 | <0.5 | <0.5 | 1.6 | 948 | 6.88 |
| | 6/6/2005 | <0.5 | 2.4 | <0.5 | 2.4 | 2.8 | <0.5 | 5.2 | 933 | 7.19 |
| TRTE | 4/6/2005 | <0.5 | 2 | <0.5 | 2 | 3.5 | <0.5 | 5.5 | 978 | 6.76 |
| | 5/6/2005 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND | 912 | 6.61 |
| | 6/6/2005 | <0.5 | <0.5 | <0.5 | ND | <0.5 | <0.5 | ND | 939 | 7.32 |

[a]"<" values are method detection limits.
[b]TRTI is the system influent and TRTE is the system effluent.
[c]Total 1,2-DCE is the sum of cis-1,2-DCE and trans-1,2-DCE.
[d]Total COPC is the sum of the individual COPC concentrations. The cis-1,2-DCE and trans-1,2-DCE values are not part of the total COPC value because this value is included in the total 1,2-DCE value. "J" values are not included in the total COPC value.

J = Estimated value, result is between the reporting limit and the method detection limit.
ND = Not detected.

*Table 7. Estimated Mass of VOCs Recovered from the 4.5 Acre Site Recovery Wells During April, May, and June 2005*

| Month | Volume Treated (gallons) | Concentration[a] | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | cis–1,2–DCE (µg/L) | trans–1,2–DCE (µg/L) | Toluene (µg/L) | TCE (µg/L) | Methylene Chloride (µg/L) | Vinyl Chloride (µg/L) | Total VOCs (µg/L) |
| April 2005 | 187,975 | 0.25 | 0.25 | 0.25 | 0.25 | 0.5 | 0.25 | 1.75 |
| May 2005 | 211,919 | 1.6 | 0.25 | 0.25 | 0.25 | 0.5 | 0.25 | 3.1 |
| June 2005 | 208,296 | 2.4 | 0.25 | 0.25 | 0.25 | 0.5 | 2.8 | 6.45 |

| Month | Volume Treated (gallons) | Mass Recovered[b] | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | cis–1,2–DCE (lbs) | trans–1,2–DCE (lbs) | Toluene (lbs) | TCE (lbs) | Methylene Chloride (lbs) | Vinyl Chloride (lbs) | Total VOCs (lbs) |
| April 2005 | 187,975 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| May 2005 | 211,919 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| June 2005 | 208,296 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |

[a]These concentrations represent the average of monthly sampling results.
[b]Includes "J" (estimated) values. For any detection of "<", which indicates the laboratory could not detect that analyte, 50 percent of the "<" value was used for the calculation of recovery.

*Table 8. Dissolved Gas for the 4.5 Acre Site*

| Location | | Date Sampled | Ethane µg/L | Ethene µg/L | Hydrogen nmol/L | Methane µg/L | Carbon dioxide mg/L |
|---|---|---|---|---|---|---|---|
| PIN20 | 0502 | 4/14/2005 | 26 | 3 | 0.68 | 1,100 | 82 |
| | M001 | 4/14/2005 | 66 | 45 | 0.93 | 1,200 | 88 |
| | M007 | 4/12/2005 | <0.005 | <0.005 | 2.6 | 2,800 | 65 |
| | M028 | 4/13/2005 | <0.005 | <0.005 | 0.67 | 1,700 | 73 |
| | M053 | 4/14/2005 | <0.005 | 0.031 | 0.88 | 1,500 | 55 |
| | M060 | 4/14/2005 | 14 | 17 | 1 | 1,500 | 40 |
| | M061 | 4/13/2005 | 0.015 | 9.6 | 1.8 | 1,500 | 44 |
| | M063 | 4/14/2005 | 67 | 97 | 0.86 | 730 | 90 |
| | M064 | 4/14/2005 | 1.5 | 0.13 | 0.86 | 360 | 100 |
| | M18D | 4/13/2005 | 0.011 | 0.049 | 1.2 | 410 | 30 |
| | MWL3 | 4/13/2005 | 19 | 77 | 0.72 | 180 | 110 |
| | MWL4 | 4/13/2005 | 0.068 | 12 | 0.9 | 350 | 72 |

"<"=not detected above the associated value.