LMS/PIN/N01307

Pinellas Environmental Restoration Project

Sitewide Environmental Monitoring Semiannual Progress Report for the Young - Rainey STAR Center June through November 2008

December 2008

U.S. DEPARTMENT OF ENERGY | Office of Legacy Management

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Acronyms and Abbreviations

bls	below land surface
°C	degrees Celsius
cDCE	cis-1,2-dichloroethene
CMIP	Corrective Measures Implementation Plan
CMS	Corrective Measures Study
CMT	continuous multi-channel tubing
COPC	contaminants of potential concern
CTL	Cleanup Target Level
DOE	U.S. Department of Energy
EA	environmental assessment
EMS	Environmental Management System
EPA	U.S. Environmental Protection Agency
F.A.C.	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FONSI	Finding of No Significant Impacts
ft	feet
ft/ft	feet per foot
FY	fiscal year
HSWA	Hazardous and Solid Waste Amendments
HRC	Hydrogen Release Compound®
IC	Institutional Control
ICM	interim corrective measure
IRAP	Interim Remedial Action Plan
IWNF	Industrial Wastewater Neutralization Facility
LM	Office of Legacy Management
MCL	maximum contaminant level
MDL	method detection limit
MSL	mean sea level
µmhos/cm	micromhos per centimeter
µg/L	micrograms per liter
mg/L	milligrams per liter
mV	millivolt
NAPL	non-aqueous phase liquid
NEPA	National Environmental Policy Act
NGVD	national geodetic vertical datum
NTU	Nephelometric Turbidity Units
PCIC	Pinellas County Industrial Council
QA/QC	quality assurance/quality control
RBCA	Risk-Based Corrective Action
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RPD	relative percent difference
STAR Center	Young - Rainey Science, Technology, and Research Center
SWMU	solid-waste management unit
TCE	trichloroethene
TCOPC	total contaminants of potential concern
tDCE	trans-1,2-dichloroethene

VC	vinyl chloride
VOCs	volatile organic compounds
WWNA	Wastewater Neutralization Area

1.0 Introduction

The Young - Rainey Science, Technology, and Research Center (STAR Center) is a former U.S. Department of Energy (DOE) facility constructed in the mid-1950s in Pinellas County, Florida. The 99-acre STAR Center is located in Largo, Florida, and lies in the northeast quarter of Section 13, Township 30 South, Range 15 East (Figure 1). While it was owned by DOE, the facility primarily manufactured neutron generators for nuclear weapons. Other products manufactured at the STAR Center have included radioisotopically powered thermoelectric generators, thermal batteries, specialty capacitors, crystal resonators, neutron detectors, lightning-arrestor connectors, and vacuum-switch tubes. In 1987, the U.S. Environmental Protection Agency (EPA) performed a Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) (EPA 1988) at the site to gather information on potential releases of hazardous materials. In February of 1990, EPA issued a Hazardous and Solid Waste Amendments (HSWA) permit to DOE, enabling DOE to investigate and perform remediation activities in those areas designated as solid-waste management units (SWMUs), contaminated by hazardous materials resulting from DOE operations. On March 17, 1995, DOE sold the facility to the Pinellas County Industrial Council (PCIC). The sales contract included clauses to ensure continued compliance with federal, state, and local regulations while DOE remediates the site. On July 1, 1999, the PCIC was disestablished, and ownership of the STAR Center changed to the Pinellas County government. In November 2000, the State of Florida received HSWA authorization from EPA. The Florida Department of Environmental Protection (FDEP) issued a new HSWA permit to DOE in January 2002. The permit was reissued on August 21, 2007, and was modified under the provisions of Section 403.722, Florida Statutes and Chapters 62-4, 62-160, 62-730, 62-777, and 62-780, Florida Administrative Code (F.A.C.), to incorporate the Global Risk Based Corrective Action (RBCA) regulations.

The administration of DOE activities at the facility is the responsibility of the DOE Office of Legacy Management (LM) in Grand Junction, Colorado. S.M. Stoller Corporation (Stoller), a prime contractor to DOE-LM, provides technical support to DOE for remediation and closure of all active SWMUs on site.

The EPA RFA Report and the HSWA permit identified 15 sites at the former DOE facility that may have experienced environmental contamination as a result of past activities. Upon completion of the RCRA Facility Investigation (DOE 1991), 11 of the 15 SWMUs were recommended by DOE and approved by EPA Region IV and FDEP for no further action (DOE 1994b). A twelfth site, the Former Pistol Range Site, was remediated in 1993; it was recommended by DOE, and approved by EPA Region IV and FDEP, for no further action.

Two additional SWMUs, the West Fenceline Site and the Wastewater Neutralization Area/ Building 200 (WWNA/Building 200), were identified after the HSWA permit was issued, bringing the total to 17 SWMUs that have been identified and investigated at the STAR Center. The remediation of the West Fenceline Site was completed in 1997, and DOE recommended—and EPA Region IV and FDEP approved—no further action, for a total of 13 SWMUs remediated. A Corrective Measures Study (CMS)/Corrective Measures Implementation Plan (CMIP) was prepared and submitted in 1997 to EPA Region IV and FDEP to address the contamination at the WWNA/Building 200 Area.

Therefore, there are currently four SWMUs that have contamination in the surficial aquifer groundwater at levels in excess of protective standards. These four SWMUs are the Old Drum Storage Site (PIN06), the Industrial Drain Leaks-Building 100 Area (PIN12), the Northeast Site (PIN15), and the WWNA/Building 200 Area (PIN18). Two SWMUs, PIN06 and PIN12, are collectively known as the Building 100 Area. Figure 2 depicts the location of the four SWMUs.

Regarding the WWNA/Building 200 Area (PIN18) SWMU, on December 20, 2005, DOE received concurrence from FDEP to shut down the groundwater recovery system and begin monitoring to determine a closure approach through FDEP's RBCA regulations. The 1-year closure monitoring program specified by FDEP began in October 2005 and was completed in October 2006. A No Further Action With Controls Proposal was submitted to FDEP on March 14, 2007.

DOE proposes to proceed with closure of the WWNA under RMO II Option IID and to apply the default poor quality arsenic Cleanup Target Level (CTL) of 100 micrograms per liter (μg/L) to on-site groundwater. Soil cleanup was completed in 1999 and approved by FDEP. Therefore, acceptance of this closure proposal by FDEP indicates that both soil and groundwater cleanup are complete.

DOE is working with the landowner (Pinellas County Industrial Development Authority) to establish Institutional Controls (ICs) at the site that will: (1) restrict future land use to industrial purposes; (2) prohibit the installation of shallow wells for groundwater use; and (3) limit the depth of excavations. Once ICs are in place, there will be no potential for current or future exposure to contaminated groundwater. ICs will need to be established and approved by FDEP before a formal No Further Action determination can be made. Currently, DOE is working with the STAR Center in the development of a covenant that incorporates the ICs that will then become part of DOE's Long-Term Surveillance and Maintenance Plan at this site.

Additional background information relative to each SWMU is briefly described below. This document also serves as the semiannual progress report for each of these four SWMUs. The results of monitoring activities and a summary of ongoing and projected work are provided in this report.

1.1 Building 100 Area

The Building 100 Area (PIN06 and PIN12) is located in the southeast portion of the STAR Center. The Old Drum Storage Site is the former location of a concrete storage pad equipped with a drain and containment system used to store hazardous waste including methylene chloride, ignitable liquids, arsenic, and calcium chromate solids (DOE 1987a). Empty drums containing residual waste solvents were also stored in this area (DOE 1987b). The concrete pad was located near the northwest corner of Building 100. The pad was removed in October 1983 in accordance with an FDEP closure permit (DOE 1987a), and a closure report was submitted to FDEP in August 1986 (DOE 1986). The decommissioning of the pad and the cessation of drum storage effectively removed the potential for a future contaminant source at PIN06.

Building 100 is the largest building at the STAR Center and covers approximately 11 acres. In the past, offices, laboratories, and production facilities for DOE were housed in the building.

SWMU PIN12 consists of the liquid waste drainage system that formerly served Building 100. Four individual drainage systems (sanitary, chemical, health physics, and storm water) were present within the building. In 1989, all four drainage systems were investigated, including verifying the system routing and the condition of underground and aboveground piping and ancillary equipment (EMC 1989). As a result of this investigation, the health physics and chemical drainage systems were flushed, grouted, and abandoned (DOE 1997). Some of the chemical drain lines were replaced by an aboveground system currently used by tenants of the building.

A CMS and CMIP were completed and approved for the Building 100 Area because volatile organic compounds (VOCs) concentrations measured in groundwater at the Old Drum Storage Site (PIN06) and one monitoring well located at the northwest corner of Building 100 (PIN12) exceeded the Safe Drinking Water Act and FDEP maximum contaminant levels (MCLs). Subsequent investigations revealed elevated VOCs concentrations under Building 100 and downgradient to the southeast as well. On August 15, 2000, EPA approved the Building 100 CMIP Addendum; FDEP approved the document on November 15, 1999.

In May 2001, DOE began an analysis of the potential remediation strategies for the three Building 100 Area tasks: plume control, source treatment, and dissolved phase treatment. The *Building 100 Area Remediation Technology Screening Report* (DOE 2001) assembled a list of remediation technologies, categorized them into the remediation tasks, and conducted an initial screening of the technologies. This initial screening eliminated the technologies that obviously would not work and recommended technologies that should be retained for detailed evaluation at a later time.

The *Building 100 Area Plume Control Technology Selection Report*, prepared in February 2002, conducted a detailed evaluation of five plume control technologies and recommended that enhanced bioremediation should be implemented for plume control at the Building 100 Area.

In-situ enhanced bioremediation to control the plume of dissolved contaminants at the Building 100 Area began as a pilot study on March 11, 2003. Hydrogen Release Compound® (HRC) was injected through nine injection points surrounding each of three monitoring wells. Groundwater samples were collected from each of the three monitoring wells at approximately 2-month intervals through May 2004 to track the progress of HRC at remediating site contaminants. HRC was selected because it is a proven technology for optimizing degradation rates of chlorinated hydrocarbons dissolved in groundwater. The continuous hydrogen source provided by the HRC can reduce the concentration of dissolved phase chlorinated hydrocarbons by greatly enhancing the reductive dechlorination process that occurs naturally at the Building 100 Area. The *In-Situ Enhanced Bioremediation Technology to Control the Plume of Dissolved Contaminants at the Building 100 Area of the Young - Rainey STAR Center Pilot Test* (Safety and Ecology 2004) final report was received from the subcontractor on April 5, 2004. The results of the pilot test indicate that the injection of HRC had a limited influence in the pilot test area. This conclusion is based on increasing concentrations of the metabolic acids (as produced from HRC) and the decreasing concentrations of sulfate and iron and the observation of ethene at one location. A supplemental sampling event was conducted in May 2004, after which the pilot test was considered complete.

Several years have passed since the Building 100 Area CMS Report (DOE 1994a), the CMIP (DOE 1996a), and the CMIP Addendum (DOE 1998) were written. Therefore, in July 2006, the Building 100 Area CMS Report Addendum was prepared to update site conditions, discuss the regulatory framework, and re-evaluate active remediation alternatives for this SWMU. Based on the recommendations included in this report, FDEP and DOE continue to discuss the closure strategy for this SWMU. One recommendation that FDEP agreed on has already been implemented, with the shutdown of the two recovery wells at Building 100 on August 21, 2006.

1.2 Northeast Site

In the late 1960s, before the construction of the East Pond, drums of waste and construction debris were disposed of in the swampy area of the Northeast Site. The East Pond was excavated in 1968 as a borrow pit. In 1986, an expansion of the East Pond was initiated to create additional storm-water retention capacity. Excavation activities ceased when contamination was detected directly west of the East Pond. EPA identified the Northeast Site as a SWMU (EPA 1992). An Interim Corrective Measures (ICM) Study was developed and submitted to EPA, and approval of this document was received in October 1991. An interim groundwater recovery system for the Northeast Site was installed, and operation commenced in January 1992.

The groundwater treatment system, as initially installed, consisted of four recovery wells equipped with pneumatic recovery pumps, a holding tank, centrifugal transfer pumps, and approximately 2,500 feet (ft) of transfer and secondary containment piping. During 1993, DOE proposed a reconfigured system for the site, consisting of four shallow and three deep recovery wells. After EPA approved the upgrade, the system was reconfigured and became operational on March 1, 1994.

Between August and October 1995, after EPA and FDEP granted their approval, a portion of the Northeast Site was excavated to remove debris and other materials that could inhibit future corrective measures. The location of the areas of excavation was based primarily on the results of a geophysical survey and knowledge of existing utility locations. Detailed descriptions of the debris-removal activities were submitted to EPA and FDEP as part of the *Northeast Site Interim Measures Quarterly Progress Report* (DOE 1996b).

In 1996, DOE submitted a CMIP to EPA Region IV and FDEP. This plan was approved by both regulatory agencies in 1997. As part of the Northeast Site CMS and CMIP, a pump-and-treat system, in conjunction with a subsurface hydrogeologic barrier wall to prevent the migration of the contaminant plume, was identified as the best available technology. A pretreatment system for iron removal, an air-stripper unit, and a tank for holding treated groundwater before discharge to the Pinellas County Publicly Owned Treatment Works were recommended. The treatment system was constructed in early 1997 and became operational by July 1997, with seven Northeast Site recovery wells and two Building 100 recovery wells pumping to the system influent tank. Subsequently several additional recovery wells were installed, and some of the old recovery wells were abandoned.

During 1997, anaerobic bioremediation and rotary steam stripping pilot tests were conducted in the northern and southern portions of the Northeast Site, respectively. These tests were designed by an Innovative Treatment Remediation Demonstration group of regulatory and industry

members to provide remedial options at the STAR Center. At the conclusion of the field tests in July 1997, pump-and-treat technology resumed at the Northeast Site.

An *Interim Measures Work Plan for Remediation of Non-Aqueous Phase Liquids* (NAPLs) *at the Northeast Site* was submitted to FDEP in late November 2001. The purpose of this document was to present the plan for the ICM to remediate non-aqueous phase liquids (NAPLs) at the Northeast Site. An ICM was considered to be warranted because it supported the long-term corrective action to remediate the dissolved phase contamination in the surficial aquifer to FDEP drinking water MCLs. Without this measure, NAPLs would continue to act as a source of dissolved contamination, resulting in contaminant concentrations in groundwater well above the MCLs. FDEP approved this document on January 10, 2002.

Concurrent with the preparation of the ICM Plan, a National Environmental Policy Act (NEPA) Environmental Checklist recommending a Categorical Exclusion was approved by DOE on December 19, 2001. The categorical exclusion of the Area A pilot test activity was approved based on the fact that the NAPL remediation of Area A was a small-scale, short-term cleanup action and the siting, construction, and operation of treatment facilities were temporary and pilot-scale in size. Additionally, activities of this nature were evaluated in the 1995 *Environmental Assessment* (EA) *of Corrective Action at the Northeast Site* (DOE 1995).

A NEPA Action Review was conducted for the interim measure source removal action at Area B in October of 2002. A summary of the review concluded that Area B remediation would impact an area of approximately 38,000 square ft. The footprint of the above-ground treatment system would be about 80 ft by 80 ft, and an estimated 84,000 gallons per day of groundwater would be processed over a 24-week period of operation. The proposed interim measure, although not specifically identified in the 1995 EA, was determined to be within the scope of the proposed actions. The remedial activity would occur within the same physical boundaries and address the same contaminants identified in the EA, but in a more concentrated form. Because the EA provided for "design modifications to reflect technological advances or site-specific conditions," it was determined that the NAPL remediation of Area B was within the scope of the existing EA. However, this flexibility was not mentioned in the Finding of No Significant Impacts (FONSI) document signed in May 1995 (Glass 1995). Therefore, it was determined that the appropriate action under NEPA would require an amendment to the FONSI to include the broader scope of activities from the EA and any additional impacts from the NAPL removal action. The FONSI was amended, reviewed by the DOE-Idaho NEPA Planning Board, and approved by the DOE Grand Junction Office NEPA Compliance Officer on February 24, 2003.

Construction of the NAPL Area A treatment system began in late May 2002, and system startup occurred on September 26, 2002. NAPL treatment was completed on February 28, 2003. Three post-treatment sampling events occurred in March, May, and August 2003. Demobilization activities began in early March and were completed in September 2003. The *Northeast Site Area A NAPL Remediation Final Report* (DOE 2003b), describing thermal remediation of Area A, was sent to stakeholders on September 25, 2003.

At the end of February 2004, a contract was awarded for the remediation of NAPL Area B using the electro-thermal dynamic stripping process. Construction of the NAPL Area B treatment system began in July 2004 and was completed in early August 2005. Operations began on August 16, 2005, and were completed on June 12, 2006. Heating resumed in a focused area from

July 19, 2006, until August 25, 2006, to address groundwater concentrations that exceeded remediation goals at two locations. The treatment system was permanently shut down on August 29, 2006. Approximately 18,000 pounds of contaminants were removed during operations. Confirmatory sampling activities were completed by the end of September 2006. The *Final Report Northeast Site Area B NAPL Remediation Project at the Young - Rainey STAR Center Largo, Pinellas County, Florida* (DOE 2007) describes Area B remediation.

Contaminant source removal is planned to begin in late calendar year 2008 and is briefly described in Section 1.4.

1.3 WWNA/Building 200 Area

The WWNA/Building 200 Area includes the active Industrial Wastewater Neutralization Facility (IWNF), the area around Building 200, and the area south of the neutralization facility. The IWNF refers to the physical treatment facility that currently receives sanitary and industrial wastewater and has been in operation since 1957.

A CMS Report and CMIP were completed in 1997 for this SWMU because vinyl chloride (VC), trichloroethene (TCE), and arsenic were detected in surficial aquifer groundwater at concentrations above federal and state MCLs. The recommended remediation alternative for the WWNA/Building 200 Area was groundwater recovery with the Building 100 Area wells and an additional recovery well located in the WWNA. The CMIP recommended that recovered water from the additional well be discharged directly to the IWNF. This well was designed to withdraw surficial aquifer groundwater directly from the arsenic plume and thereby reduce the contaminant mass and prevent contaminant migration.

FDEP's response to the CMS/CMIP, concerning arsenic contamination in the upper 2 ft of soil, suggested that a treatment technology, air sparging, was eliminated too early. DOE then proposed a multi-phased Interim Action that included operating the recovery well for 6 months, then pulsing the system, as well as performing geochemical analyses and leaching studies of the site. On January 21, 1999, FDEP approved the proposed interim remedial action.

Additionally, EPA Region IV also approved the interim remedial action and concurred with FDEP's position regarding the arsenic contamination. EPA also requested an addendum or modification to the CMIP that would address DOE's final selection of the remediation technology and include a timeline for the completion of these activities.

In early June 1999, the WWNA recovery well commenced operation. All arsenic concentrations in water from the WWNA recovery well, PIN18−RW01, were below the STAR Center's daily maximum discharge standard for arsenic in wastewater of 0.20 milligrams per liter (mg/L) until shutdown.

Additional details concerning the impacts of groundwater extraction are reported in the WWNA/Building 200 Area CMIP Addendum (DOE 2000b). Modifications to the recovery of groundwater were proposed based on data collected through November 1999 and consisted of the installation of two new recovery wells screened at shallow intervals and the abandonment of RW01. The CMIP Addendum was submitted to the regulators and approved by FDEP and EPA in 2000. A Statement of Basis (DOE 2000a) was issued by DOE in late September 2000. This

document provides a summary of environmental investigations and proposed cleanup alternatives for the WWNA/Building 200 Area. Part of DOE's proposed final action for the WWNA was to shut down the three extraction wells and begin a 1-year monitoring period. Verbal approval for this action was received from FDEP on December 20, 2005, and the wells were shut down that day.

A No Further Action With Controls Proposal for the WWNA/Building 200 Area was submitted to FDEP on March 14, 2007. FDEP approved the No Further Action With Controls Proposal on May 24, 2007, and requested that DOE submit an updated Statement of Basis. Submittal of this document is awaiting finalization of the institutional controls for the WWNA. Currently, DOE is working with the STAR Center to implement the appropriate restrictive covenants necessary to accommodate the proposed remedy for this site.

1.4 Site Update

RBCA rules are currently being evaluated for applicability to assist in expediting closure at some or all of the SWMUs at the STAR Center. Technical discussions regarding RBCA as the proposed final action continued between FDEP and DOE.

Pinellas County is planning a major utility line and road construction effort along Bryan Dairy and Belcher Roads that is scheduled to start in March 2009. DOE has evaluated the effect that the Building 100 Area contaminant plume might have upon road construction activities along the east and south sides of the STAR Center and has chosen to treat groundwater obtained from the County's dewatering contractor. Once brought to the surface through dewatering activities, groundwater will be transported to an onsite air stripper and the treated water will be discharged to the STAR Center's IWNF and subsequently discharged to the publically owned treatment works.

In June and July 2008, DOE investigated the potential presence of soil and groundwater contamination beneath the day care facility east of the Building 100 Area, adjacent to Belcher Road. DOE installed 18 monitoring wells in 6 clusters around the northern, western, and southern boundaries of the day care facility and 10 deep soil borings within the day care fence (including 2 angled borings that extended beneath the day care buildings). At each cluster, three monitoring wells having screened intervals from approximately 3−13, 13−23 and 23−33 ft below land surface (bls), were installed. The analytical results demonstrated that all contaminant concentrations are below any applicable standards, with the exception of arsenic detected in one soil boring at one depth.

An interim remedial action plan (IRAP) is being developed that details the use of groundwater pumping to control the contaminant plume that is moving offsite to the south of the Building 100 Area. One recovery well will be used to capture contaminated groundwater, and the extracted water will be treated at the surface using air stripping. The treated water will be discharged to the STAR Center's IWNF. The IRAP will be sent to FDEP in early 2009.

DOE has conducted four phases of soil sampling at the Northeast Site from August 2007 through June 2008, during which 754 soil samples were collected from 85 soil borings and analyzed for VOCs. The results of this investigation are described in detail in the *Northeast Site Source Characterization Data Report* (DOE 2008a). Concurrent to source area characterization, DOE

conducted a feasibility study (DOE 2008b) and determined the best method for source removal was soil excavation by large diameter auger. An engineering design was developed and a source removal subcontract awarded in 2008. Source removal begins in January 2009 and will be completed in March 2009.

In November 2008, five continuous multi-channel tubing (CMT) monitoring wells were installed south of Building 100 as part of the Building 100 Area plume delineation task. Each of these five CMT wells have screened intervals from approximately 9−18, 20−29, and 31−40 ft bls, making a total of 15 wells. Analytical results from these 15 new wells will be available in December 2008.

A Stormwater Pollution Prevention Plan was prepared and a Notice of Intent Stormwater Permit application was submitted to FDEP on November 14, 2008.

1.5 Waste Minimization and Pollution Prevention

The RCRA HSWA permit (No. 0034170/HH/003), which was reissued to the Site on August 21, 2007 by FDEP, includes requirements for the project, including compliance with waste minimization requirements under 40 CFR 264.73(b)(9) and Section 3005(h) of RCRA, 42 U.S.C. 6925(h). The permit states the following:

"The Permittee must certify, no less than annually, that:

a. The Permittee has a program in place to reduce the volume and toxicity of hazardous waste generated to the degree determined by the Permittee to be economically practicable,

b. The proposed method of treatment, storage or disposal is the most practicable method available to the Permittee, which minimizes the present and future threat to human health and the environment,

c. The Permittee shall maintain copies of certification in the facility operating record as required by 40 CFR 264.73(b) (9), and

d. The DOE LM Pollution Program will meet the requirement of a. and b. of this part."

The Pinellas project maintains the above annual certification in the on-site records. DOE-LM implements the Environmental Management System (EMS) sustainability programs under three documents, the *Environmental Management Systems Manual*, the *Environmental Management System Description*, and the *Environmental Protection Manual*. The EMS program includes a Waste Minimization and Pollution Prevention Plan as part of the EMS Manual which describes the process of implementing and tracking the progress of pollution prevention achieved by decreasing the purchase of hazardous chemicals and replacing them with chemicals that are more environmentally friendly and less toxic. The plan also describes the process of implementing and tracking the progress of waste minimization achieved by establishing mechanisms to recycle or reuse, to the extent feasible, solid waste and hazardous chemicals that result from DOE-LM operations.

The major field activity conducted at the Pinellas project during 2008 was the removal of approximately 60 trees from the 4.5 Acre Site to support the upcoming source removal project.

The trees were recycled as 250,000 pounds of mulch. The following office materials have also been recycled thus far in 2008:

- 345 pounds of paper,
- 153 pounds of cardboard,
- 28 pounds of plastic,
- 5 pounds of glass,
- 10 pounds of aluminum,
- 75 pounds of steel,
- 10 pounds of magazines,
- 1 pound of batteries, and
- 25 pounds of electronics.

1.6 Site Activities

- Water-level measurements were obtained from all accessible monitoring wells, recovery wells, and ponds on September 9, 2008.
- The semiannual sampling event was conducted from September 10 to 17, 2008, and included collection of water samples from 122 wells at the STAR Center.
- The results of the semiannual sampling event were reported (this document).

2.0 Water-Level Elevations

2.1 Work Conducted and Methods

On September 9, 2008, depth-to-water measurements were taken at all accessible monitoring wells, former extraction wells, and ponds at the STAR Center and two off-site ponds. The water levels were measured with an electronic water-level indicator or directly from a staff gauge. Groundwater elevations are listed in Table 1.

2.2 Groundwater Flow

Groundwater and surface-water elevations were used to construct sitewide groundwater contour maps of the shallow and deep surficial aquifers for the September data (Plates 1 and 2, respectively). Individual contour maps were also constructed for the shallow and deep surficial aquifers at the Northeast Site and the Building 100 Area (Figure 3 through Figure 6).

Previously, water levels throughout the STAR Center indicated that the water table was highest in the general area around the West Pond. As groundwater flowed from this discharge area, it dispersed to the west, south, and east. A new pattern was observed in the shallow surficial aquifer around the West Pond and Pond 5 in September 2006, and this new pattern was observed again in June and September 2007 and February and September 2008. As shown on Plates 1 and 2, the West Pond and Pond 5 now act as discharge points for the surficial aquifer. During recent

construction activities at the site, the West Pond was cleaned out, Pond 5 was excavated, and the two ponds were connected by an underground pipe. This construction work seems to have changed the flow pattern in this area of the site to what is now observed. The flow pattern in the deep surficial aquifer is consistent with previously observed flow patterns.

At the Northeast Site, the natural pattern of flow generally to the east was again observed in September 2008. Water-table elevations indicate that the East Pond acted as a discharge point for the shallow surficial aquifer in September 2008 (Figure 3). In the shallow surficial aquifer at the Northeast Site, the hydraulic gradient was about 0.003 feet per foot (ft/ft), with flow toward the east (Plate 1). Calculations using Darcy's Law, along with approximations of 1 ft/day for hydraulic conductivity and 0.3 for effective porosity, indicate that groundwater at the Northeast Site is estimated to move about 3−4 ft/year. This velocity is consistent with the velocities observed since March 2006. Similar flow patterns were observed in the deep surficial aquifer (Plate 2).

At Building 100, the surficial aquifer is no longer influenced by groundwater withdrawals from recovery wells PIN12-RW01 and -RW02 that were shut off in August 2006. For the past 5 years, shallow groundwater beneath Building 100 has been observed to flow to the southeast under a very slight gradient. This flow pattern was observed again in September 2008. The hydraulic gradient at the Building 100 Area was about 0.002 ft/ft. Using the approximations mentioned above, groundwater flow velocity in this area is estimated to be about 2.4 ft/year.

Water-level elevations in the three wells screened in the upper part of the Floridan aquifer are presented in Table 2. The water levels in these wells indicate that the potentiometric surface of the Floridan aquifer at the site was about 0.25 to 0.5 ft higher in September 2008 than in February 2008.

Surface-water elevations were recorded from the East, South, Southwest, and West Ponds, Pond 5, the pond immediately north of the 4.5 Acre Site, and the pond just east of Belcher Road, and they are presented in Table 3. All the ponds are hydraulically connected to the shallow surficial aquifer system (Plate 1).

3.0 Groundwater Sampling and Analytical Results

3.1 Work Performed

During the annual sampling event at the STAR Center in September 2008, groundwater samples were collected from 160 monitoring wells. VOCs analyses were performed on 95 samples using EPA method SW-846 8260B. Aluminum and iron were analyzed in 40 samples from Northeast Site wells using EPA method SW-846 6010B. Analysis for 1,4-dioxane was performed on 28 samples using EPA method 8260C. Laboratory reports are provided in Appendix A.

Four samples were also collected for analysis of the microorganism *Dehalococcoides ethenogenes* (Table 4).

All samples were collected in accordance with the Stoller *Sampling Procedures for the Young - Rainey STAR Center and 4.5 Acre Site* (DOE 2006), using FDEP procedures. All samples except those for microorganism analysis were submitted to TestAmerica, Tampa, Florida, for analysis. The microorganism samples were sent to Sirem, Inc., a specialty laboratory. TestAmerica, Tampa, is accredited by the Florida Department of Health in accordance with the National Environmental Laboratory Accreditation Conference (certification number E84282). All monitoring wells were micropurged using a dedicated bladder pump or peristaltic pump. Sampling was performed when the field measurements stabilized. Table 5 lists field measurements of pH, specific conductance, dissolved oxygen, oxidation-reduction potential, turbidity, and temperature recorded at the time the samples were collected. Measurements were made with a flow cell and a multiparameter instrument.

3.2 Analytical Results

3.2.1 Northeast Site (PIN15)

Concentrations of contaminants of potential concern (COPCs) in samples collected from wells at the Northeast Site (PIN15) are presented in Table 6, which, for comparison purposes, also shows the previous year of data. Figure 7 shows the total COPCs (TCOPCs) concentrations at the Northeast Site. The highest TCOPCs concentration, 16,489 µg/L, was measured in well PIN15−0587. This well also contained the highest concentration for any single analyte, cis-1,2-dichloroethene (cDCE) at 14,000 µg/L.

As described in the Annual Monitoring Plan (DOE 2008c), special sampling was conducted at the Northeast Site to determine the aluminum and iron concentrations remaining following NAPL remediation. Most Northeast Site monitoring wells were sampled and analyzed for aluminum and iron using EPA method 6010B over the four sampling events in 2007 and 2008 (Table 7). This data set was evaluated using the procedure defined in the *Historical Review and Evaluation of Contaminants of Potential Concern* (DOE 2003a), resulting in the determination that iron and aluminum should be considered COPCs at the Northeast Site. With the exception of monitoring wells that will be abandoned as part of the source removal activities in early 2009, all currently active Northeast Site monitoring wells are scheduled for annual sampling for iron and aluminum in fiscal year (FY) 2009.

3.2.2 Building 100 Area (PIN06, PIN09, PIN10, PIN12, and PIN21)

TCOPCs concentrations in samples collected from wells at the Building 100 Area are included in Table 8, which, for comparison purposes, also shows the previous year of data. Figure 8 shows the TCOPCs concentrations, the highest of which was measured in well S35B at 69,200 µg/L. This well also contained the highest concentration for any single analyte, cDCE at 36,000 µg/L.

Groundwater samples collected in September 2008 from two of the daycare area wells, PIN12-0553A and -0554C, contained contaminants that were not detected during the initial June 2008 sampling event. Specifically, well -0553A contained TCE and VC at 3.6 and 1.8 µg/L, respectively. Well -0554C contained VC at 66 µg/L. These wells are to be resampled in late December 2008 to confirm the detections.

As discussed in Section 1.4, 48 new monitoring wells were installed in FY 2008 and are shown on Figure 8. Table 8 includes the COPC concentrations from these new wells. The highest TCOPC concentration from any of these new wells is from 0552-2 at 514 µg/L, with a cDCE concentration of 360 µg/L.

3.3 Quality Assurance/Quality Control

The results from the analytical laboratory, TestAmerica Laboratories Tampa, were checked for quality assurance/quality control (QA/QC) through duplicate samples and trip blanks. Detected analytes for each duplicate sample collected from the STAR Center are listed in Table 9. The duplicate sample results were compared and the relative percent differences (RPDs) between the results were calculated. The duplicate results from location PIN15-0537 for iron and trans-1,2-dichloroethene (tDCE) did not meet EPA recommended laboratory duplicate criteria of less than 20 RPD for results that are greater than 5 times the practical quantitation limit. There were no errors identified that would explain the poor iron and tDCE precision. Because of the magnitude of the difference the results were qualified with a data validation flag of "J" as estimated values. The duplicate results for PIN12-0530 for cDCE and VC also did not meet criteria but were not qualified because the magnitude of the difference was smaller. The aluminum analysis for PIN15-0578 was also flagged as "J" because of a laboratory matix spike failure.

With the exception of the five analyses discussed above, all data passed QA/QC criteria at a Class A level, indicating that the data may be used for quantitative and qualitative purposes.

As specified in the *Sampling Procedures for the Young - Rainey STAR Center and 4.5 Acre Site* (DOE 2006), duplicate samples should be collected at a frequency of one duplicate for every 20 or fewer samples. For the STAR Center and the 4.5 Acre Site, there were 133 samples collected for volatile analysis and 7 duplicates. There were 40 samples collected for metal analysis and 2 duplicates. The duplicate requirements for this sampling event were met. There were 6 trip blanks collected during this event.

A data validation software module for identifying and tracking anomalous groundwater data points within the SEEPro database was used to generate a report of analytical results that fall outside of historical minimum or maximum values. There were no analytical errors associated with these result and the data are acceptable as qualified.

4.0 Data Interpretation

The purpose of this data-interpretation section is to aid in the evaluation of plume stability. Time-versus-concentration plots were generated to aid in the interpretation. Plume maps are included each year in the December−May semiannual reports.

While most of the previous documents for the Pinellas site have compared groundwater contaminant concentrations to drinking water standards (i.e., MCLs), those standards are not the applicable default CTLs for the purpose of evaluating site remediation under RBCA. Based on a comprehensive review of background data for the site (DOE 2003a), it has been determined that

aluminum and iron levels in the shallow groundwater in the site vicinity are naturally elevated and far exceed State of Florida Secondary Drinking Water Standards (Chapter 62-550, F.A.C.). Specifically, the average background concentration of 1.1 mg/L for aluminum exceeds the 0.2 mg/L secondary standard, and the average background concentration for iron (9.3 mg/L) exceeds the 0.3 mg/L secondary standard. The ambient shallow groundwater in the area is therefore designated as "poor quality" as defined in 62-780.200 (35), F.A.C. Thus, the applicable groundwater CTLs are those for groundwater of "low yield/poor quality" provided in Table 1 of Chapter 62-777, F.A.C. In essence, these CTL values are a factor of 10 higher than the MCL values.

4.1 Contaminant Concentration Trends

Monitoring well PIN15-0569 was chosen to evaluate plume stability at the Northeast Site. Well PIN15−0569 is located near the leading edge of the contaminant plume at the Northeast Site (Figure 7). The VC concentration in this well shows an overall decreasing concentration trend (Figure 9), indicating a stable or shrinking contaminant plume in the vicinity of this well.

Monitoring wells PIN21-0512 and PIN12-S73C were chosen to evaluate plume stability at the Building 100 Area. Well 0512 lies along the southern boundary of the STAR Center and well S73C lies along the eastern boundary (Figure 8). Figure 10 shows the VC concentration in well S73C. Well S73C shows a decreasing VC concentration trend from 2002 to late 2003, followed by a relatively stable trend since that time. Well 0512 shows a very slight increasing trend in VC concentrations (Figure 11).

Figure 12 shows the TCE, cDCE, tDCE, and VC concentrations in well PIN12−0524, located near the southeast corner of Building 100. The concentration trends in this well suggest that a localized slug of TCE, DCE, and VC is moving through the aquifer. The concentration trends in well 0524, particularly the significant TCE decrease, indicate that the slug is nearly past the well.

4.2 Geochemical Parameters

Geochemical parameters measured in the field in all wells at the STAR Center during September 2008 are summarized in Table 5. Generally, conditions across the STAR Center are reducing as evidenced by the low values of dissolved oxygen and oxygen reduction potential.

5.0 Upcoming Tasks

The following major tasks are planned for the next semiannual period (December 2008 through May 2009):

- Installation of additional monitoring wells south of Bryan Dairy Road.
- Installation of a system to contain and treat groundwater captured during road construction dewatering activities.

- Completion of the Northeast Site source removal action.
- Semiannual sampling and analysis of groundwater and water level measurement in March 2009.

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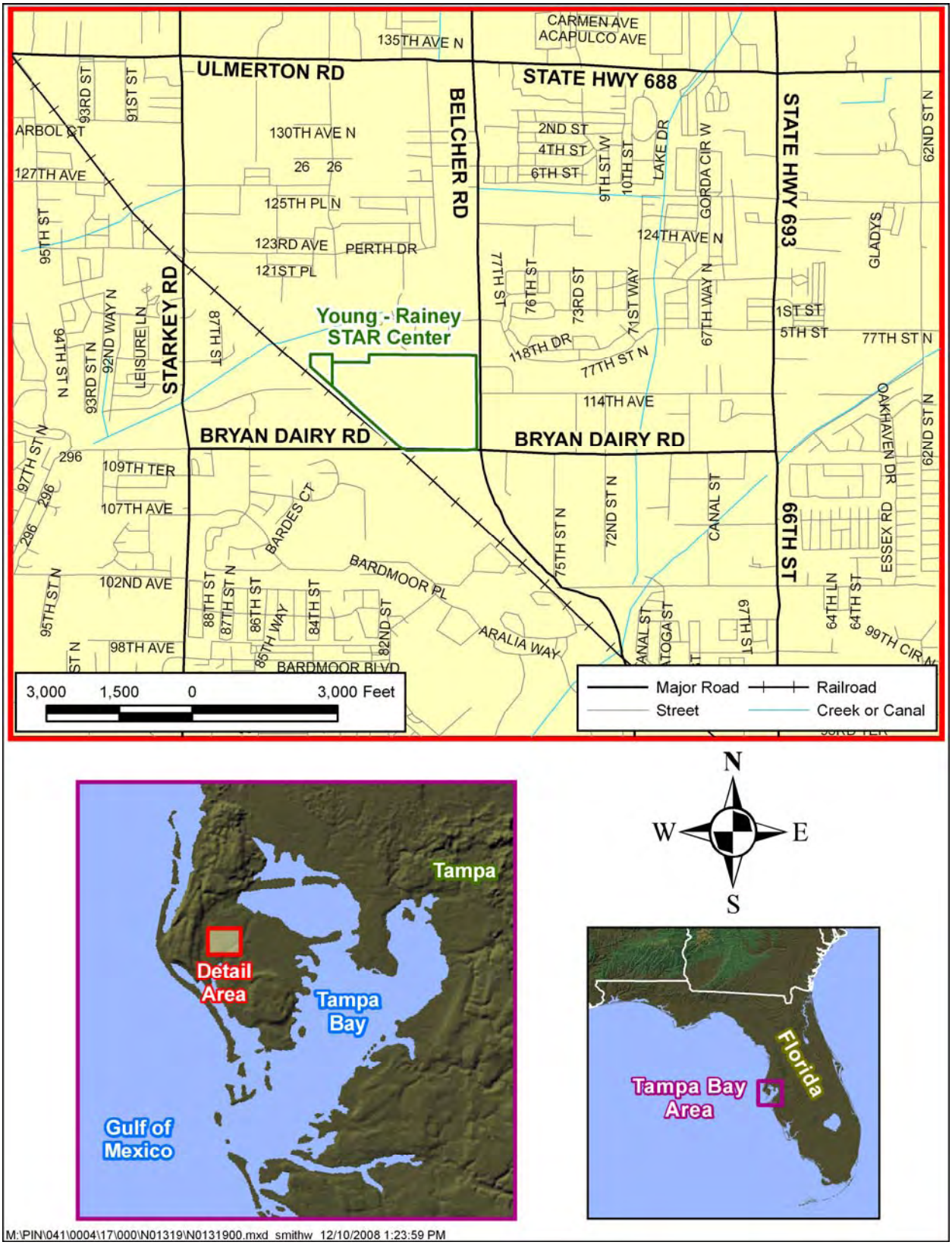

Figure 1. Young - Rainey STAR Center Location

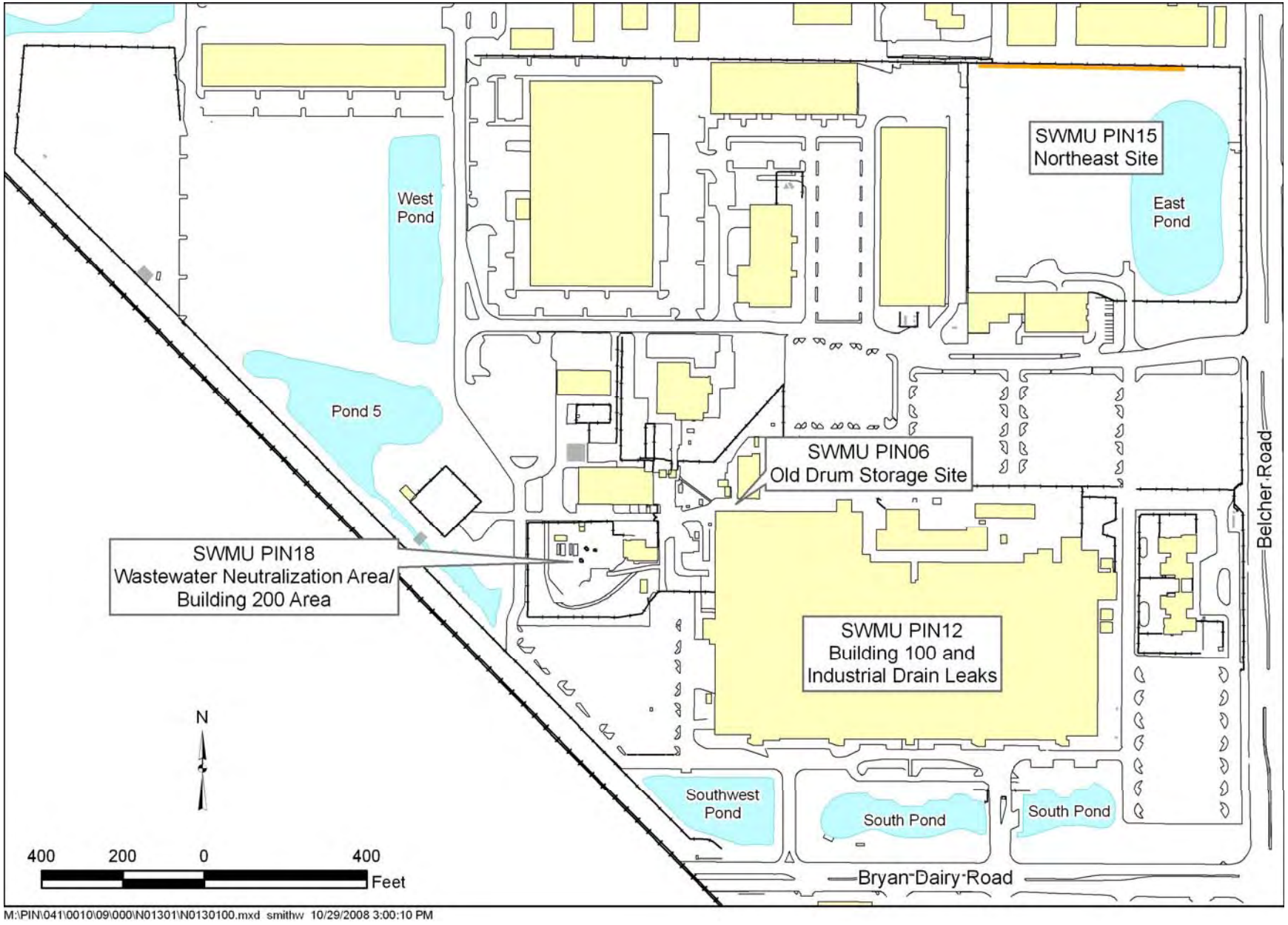

Figure 2. Location of STAR Center Solid Waste Management Units (SWMUs)

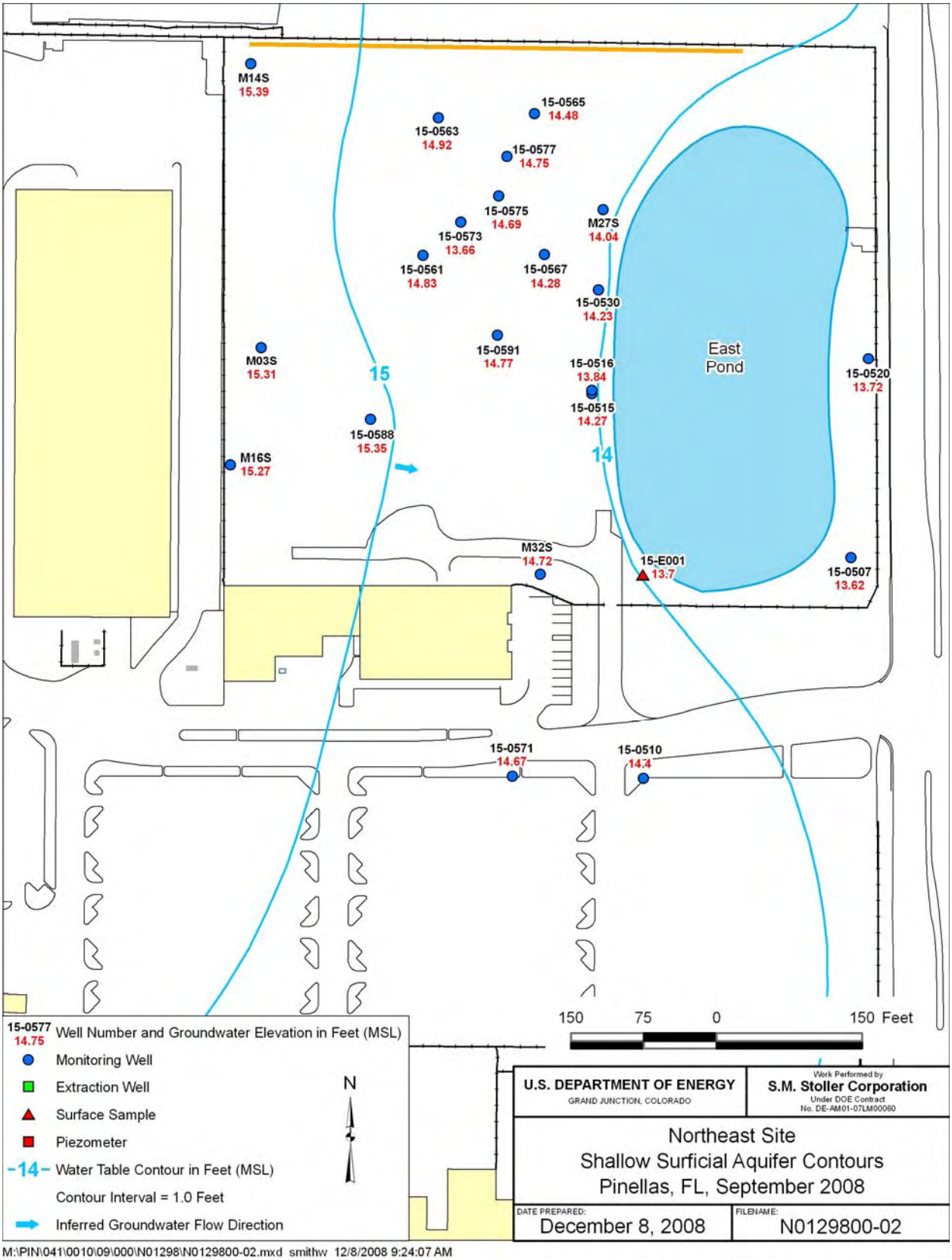

Figure 3. Groundwater Elevations and Shallow Surficial Aquifer Flow, Northeast Site, September 2008

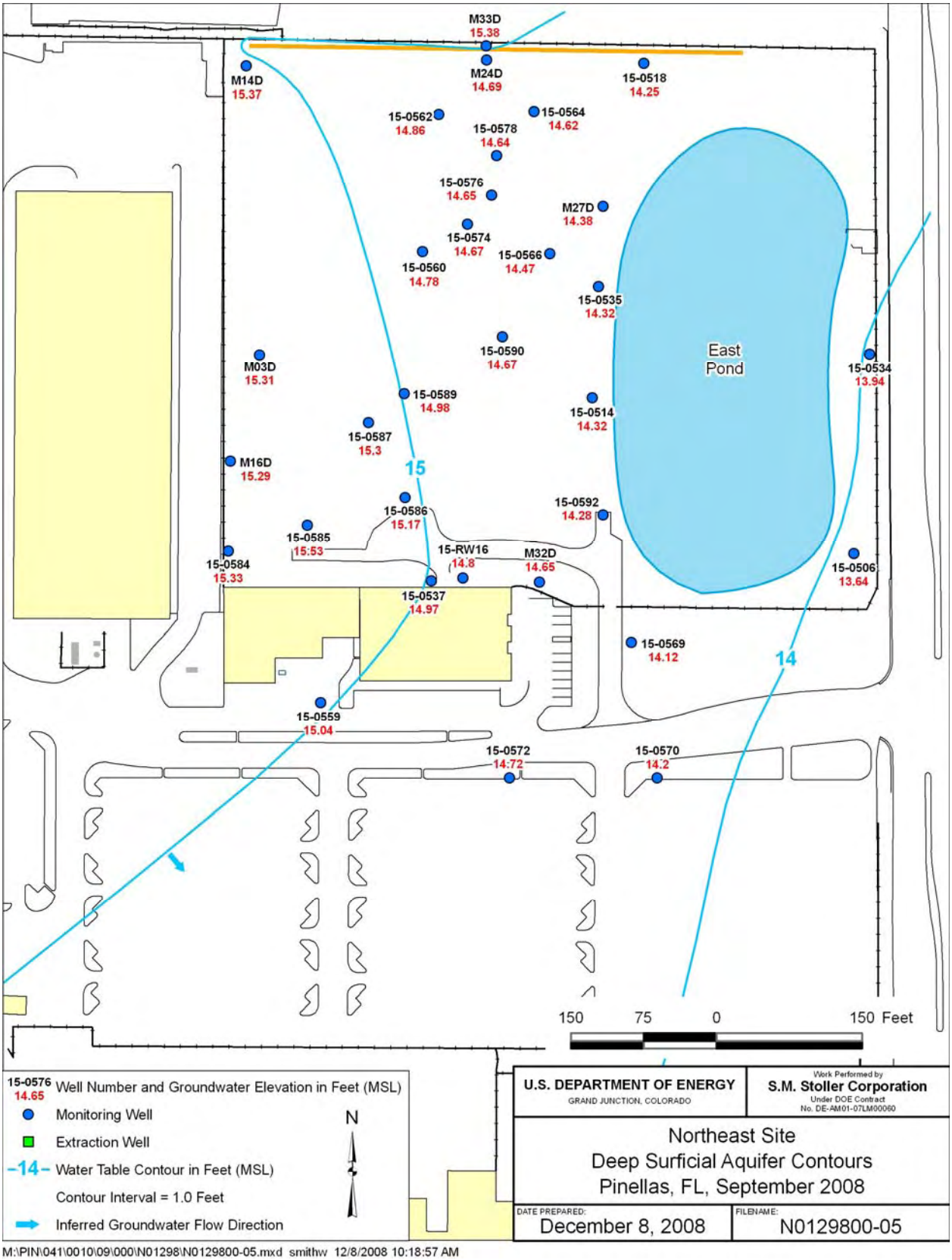

Figure 4. Groundwater Elevations and Deep Surficial Aquifer Flow, Northeast Site, September 2008

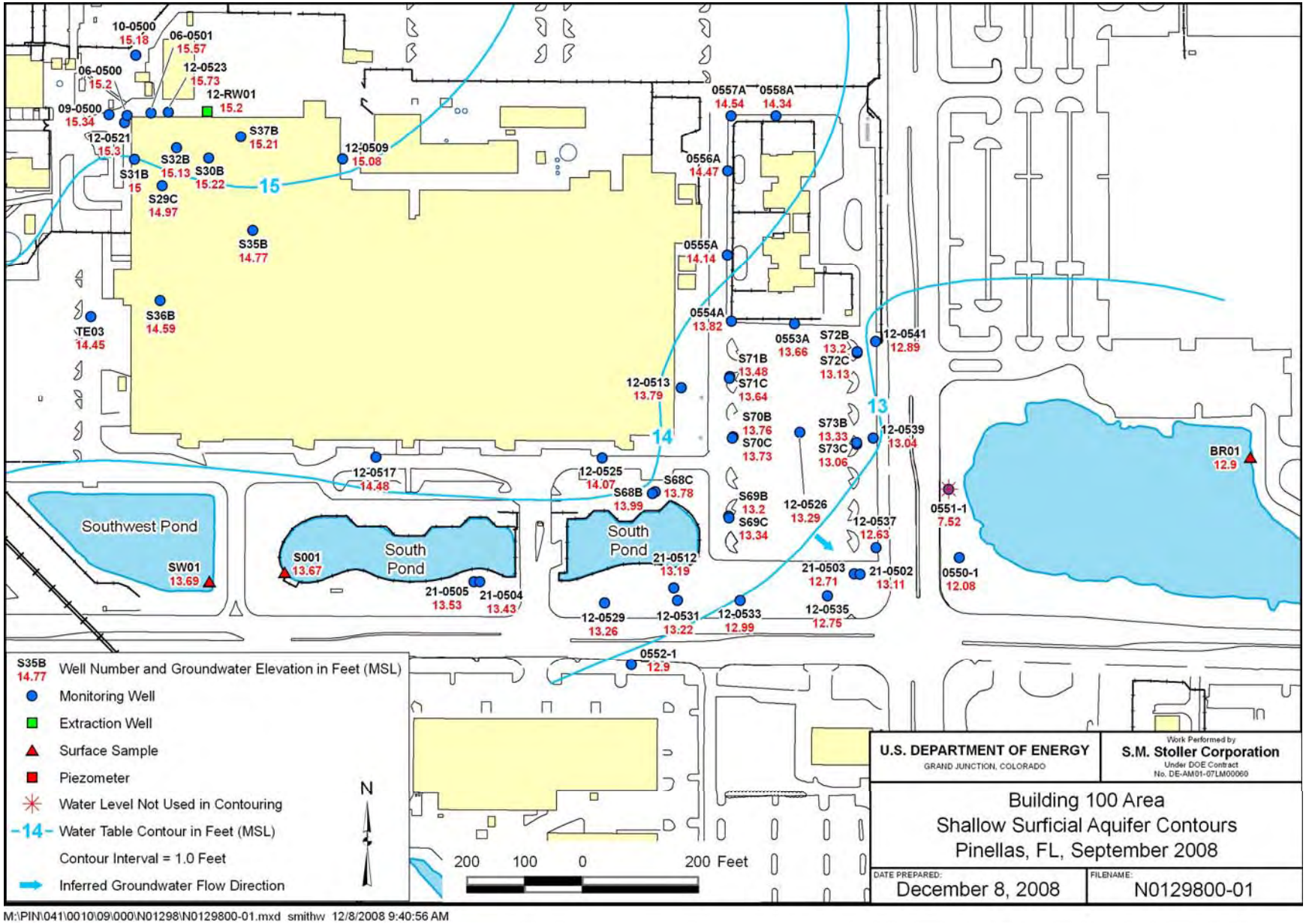

Figure 5. Groundwater Elevations and Shallow Surficial Aquifer Flow, Building 100 Area, September 2008

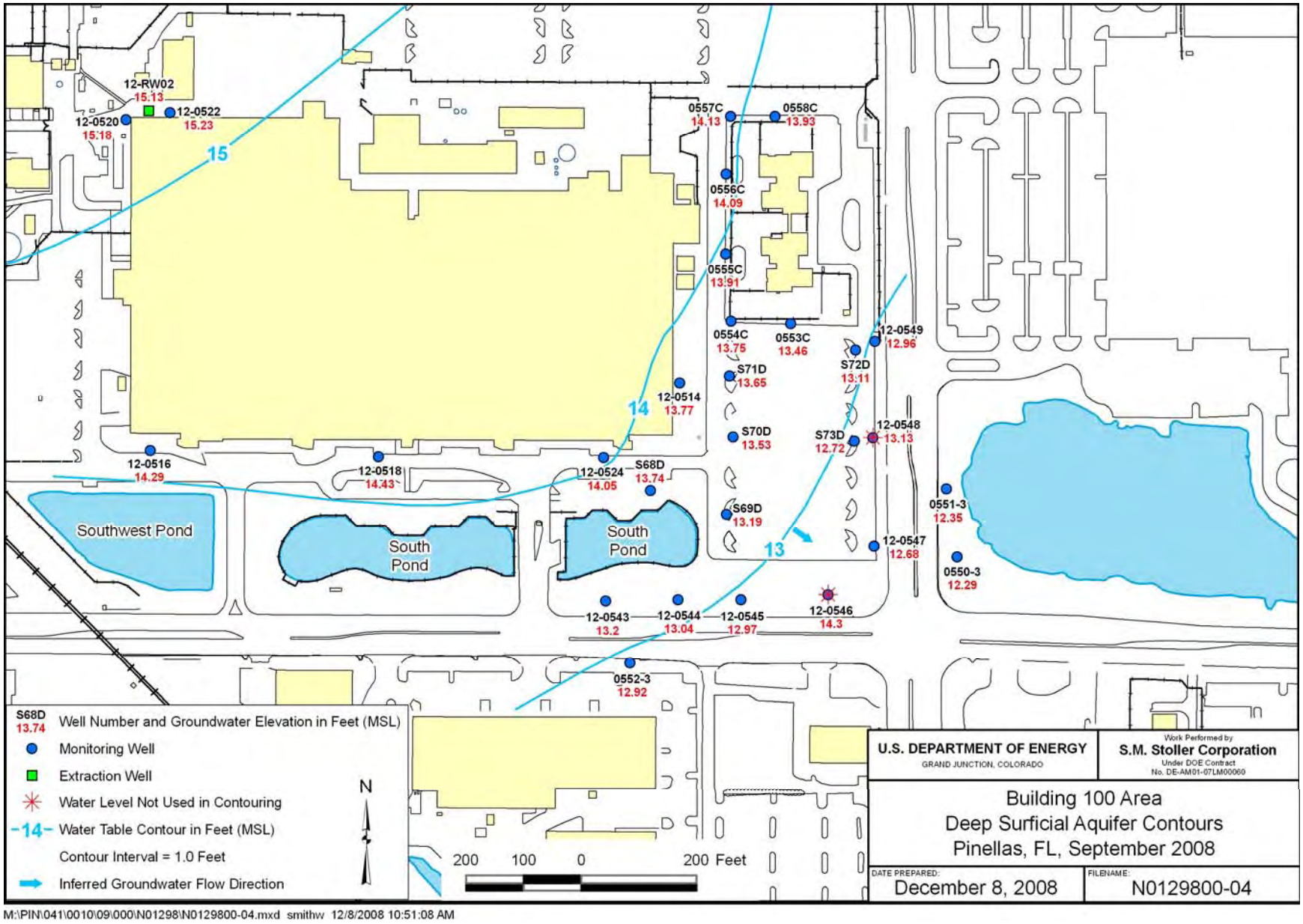

Figure 6. Groundwater Elevations and Deep Surficial Aquifer Flow, Building 100 Area, September 2008

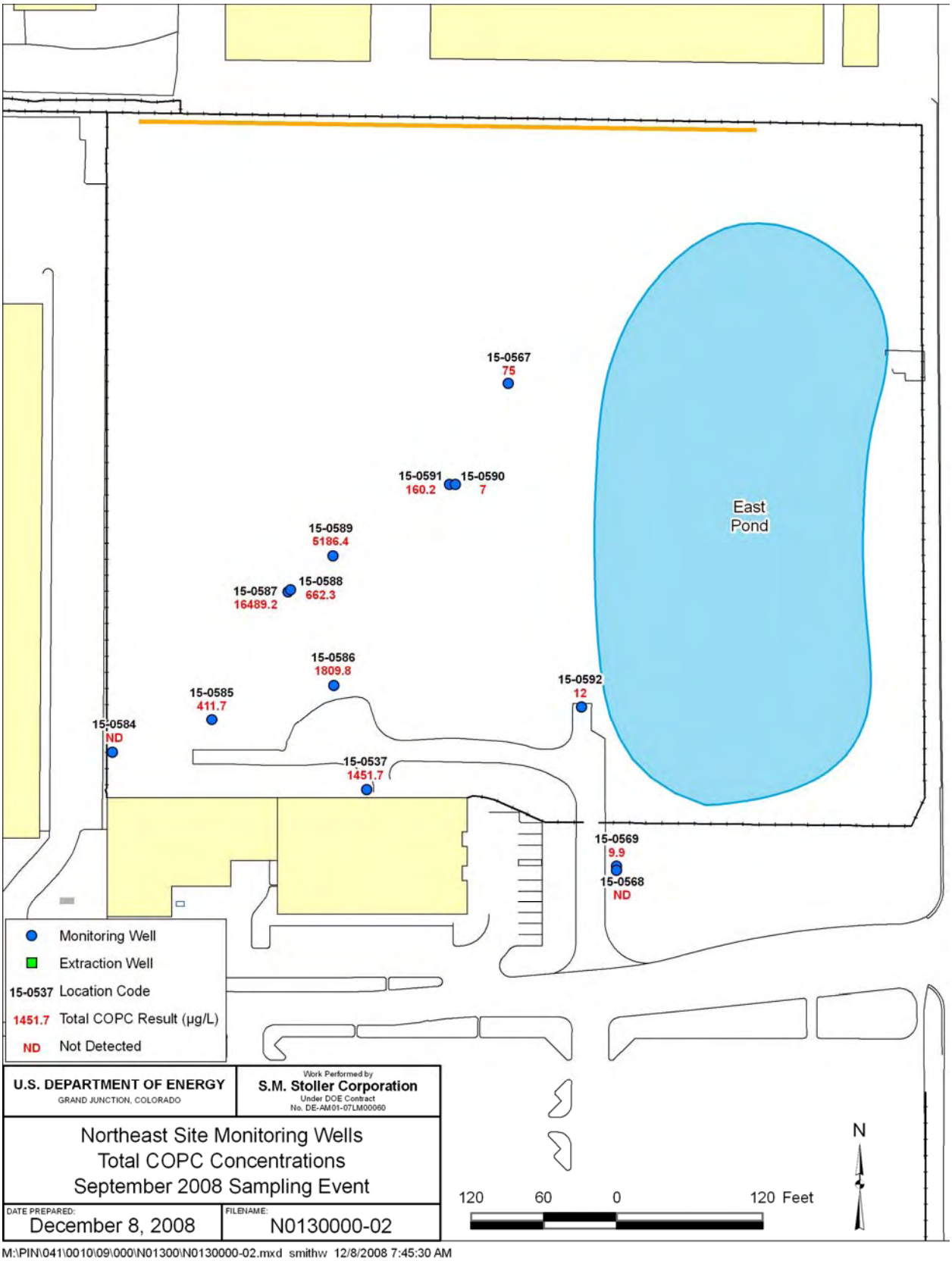

Figure 7. Northeast Site Total COPC Concentrations September 2008 Sampling Event

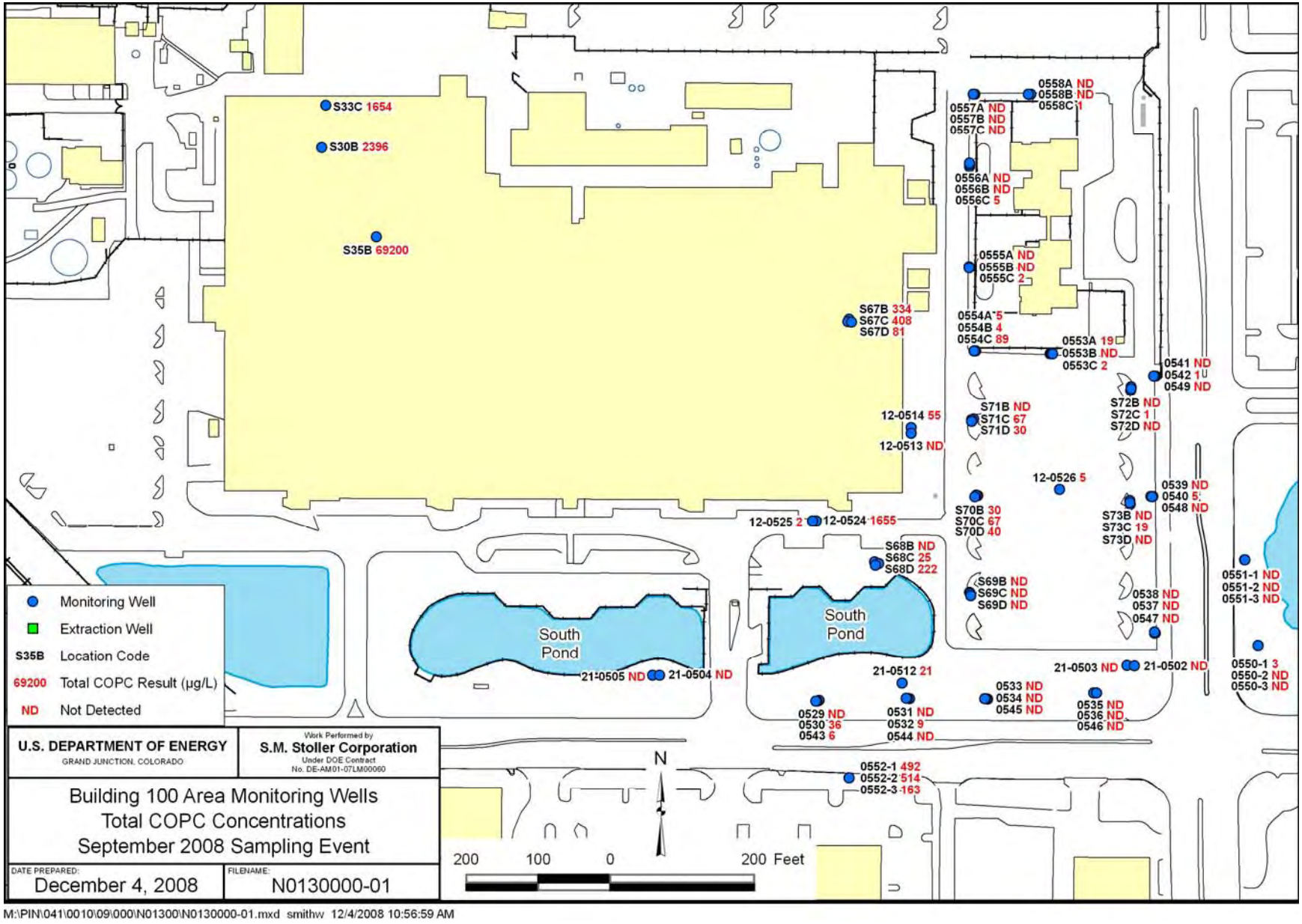

Figure 8. Building 100 Area Total COPC Concentrations September 2008 Sampling Event

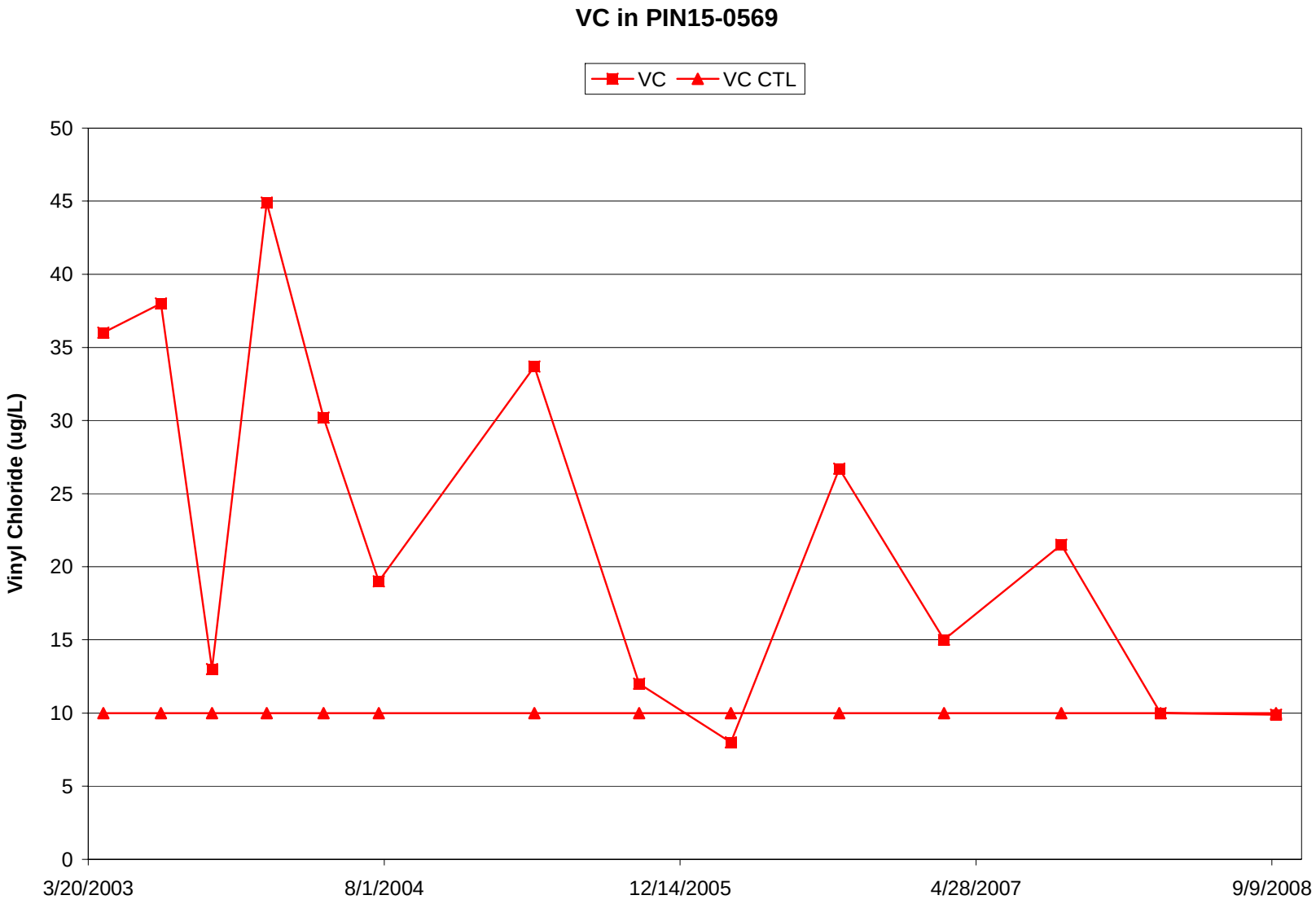

Figure 9. VC in PIN15-0569, Northeast Site

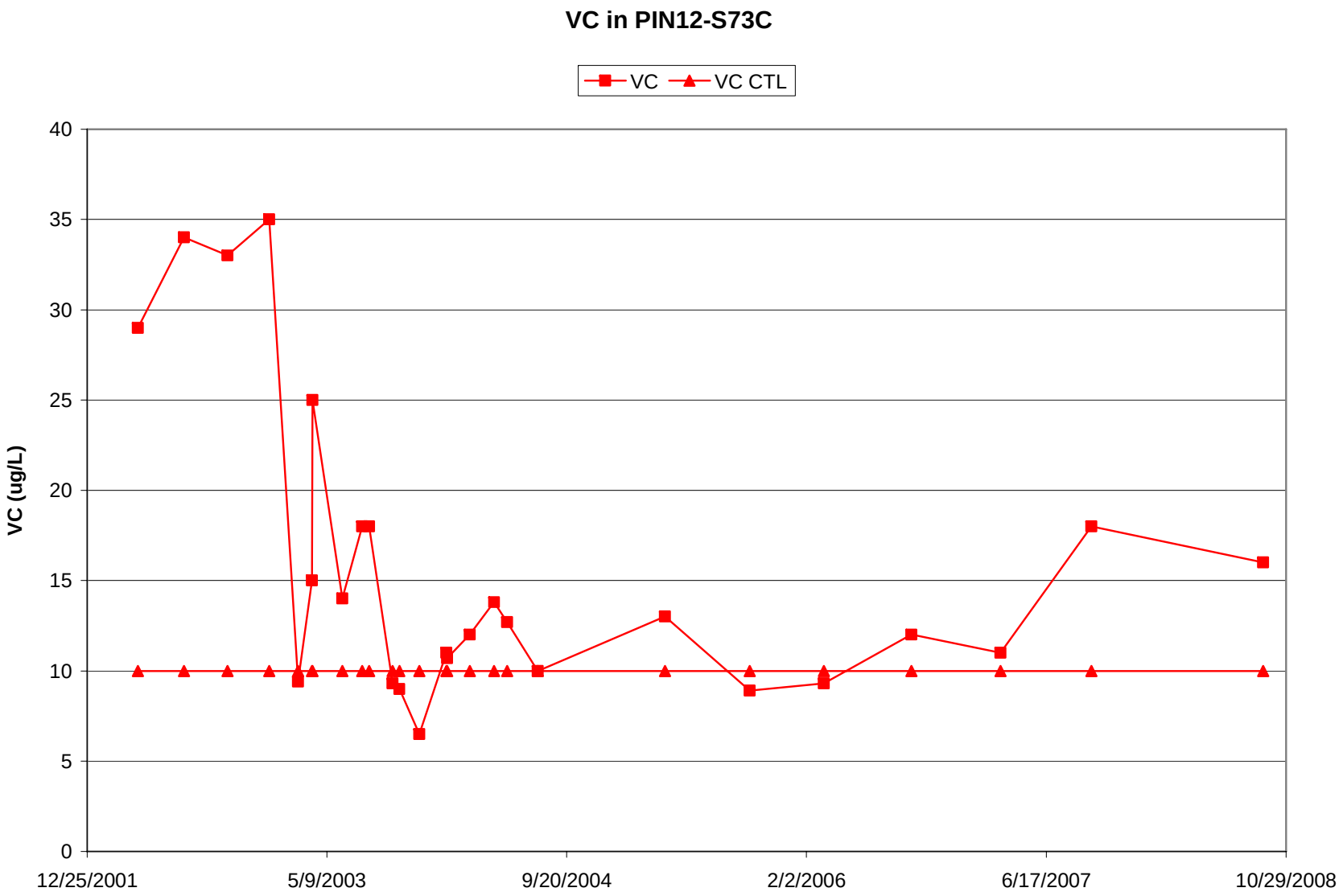

Figure 10. VC in PIN12-S73C, Building 100 Area

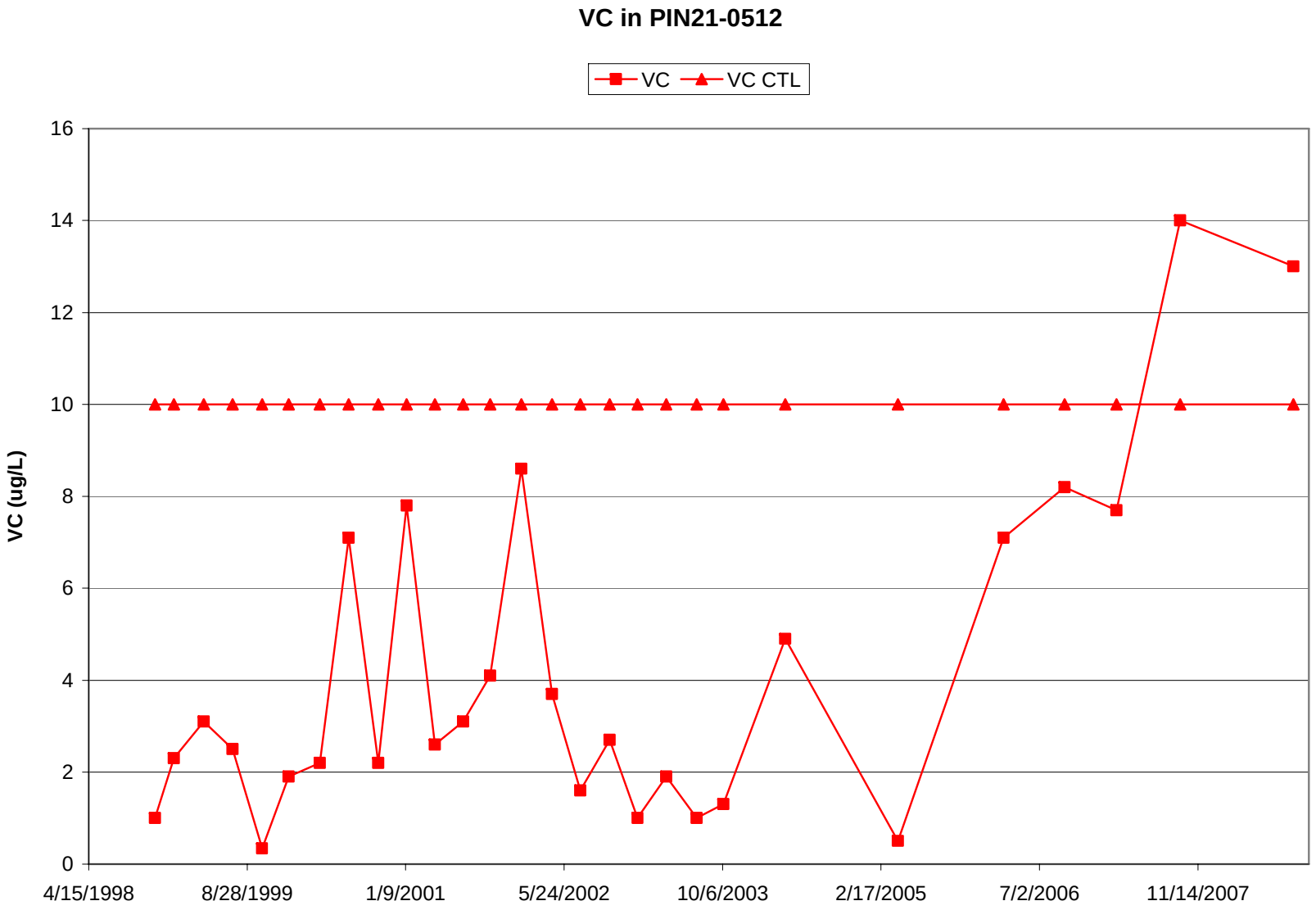

Figure 11. VC in PIN21-0512

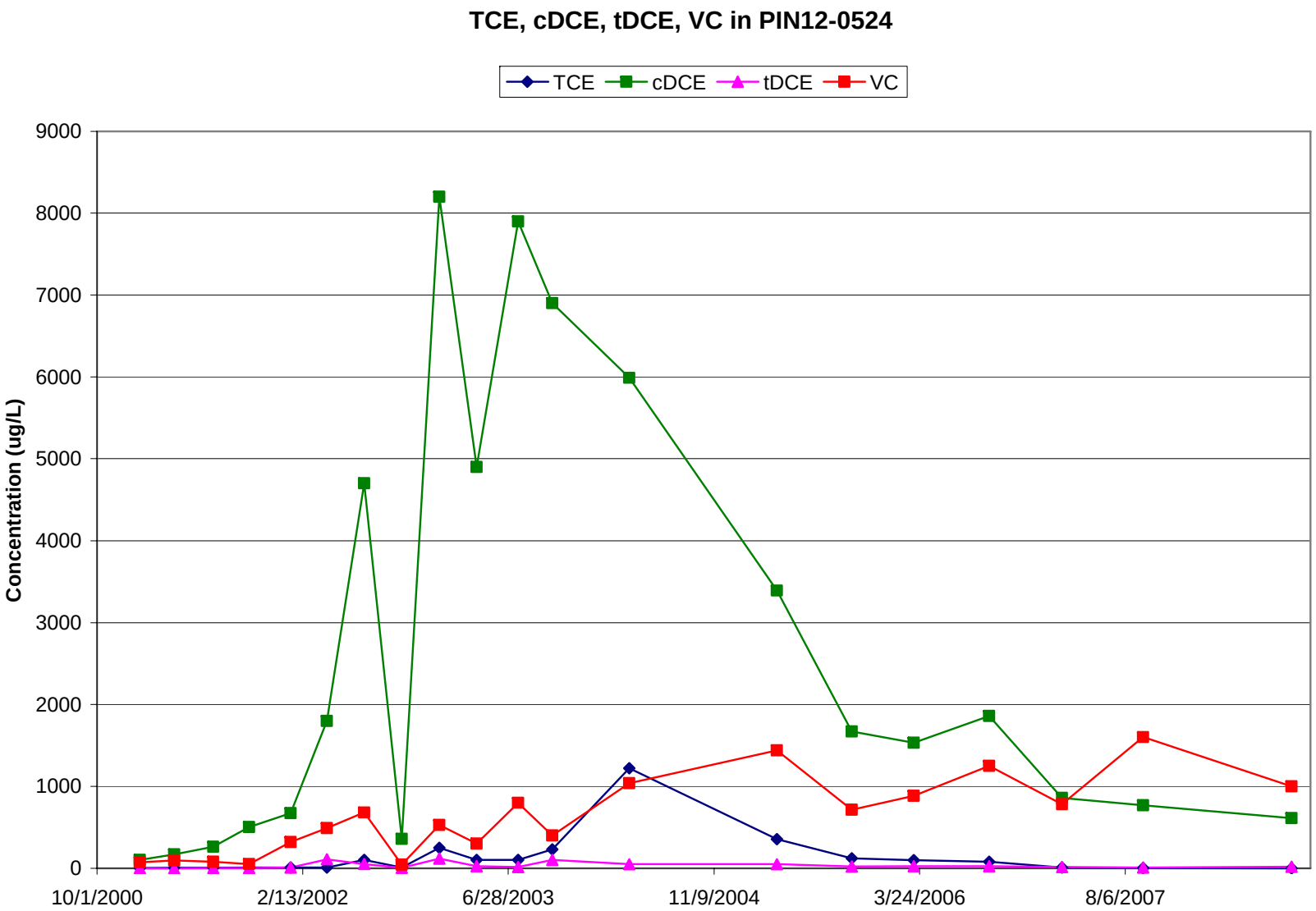

Figure 12. TCE, cDCE, tDCE, VC in PIN12-0524, Building 100 Area

Table 1. Water-Level Data at the STAR Center

Location	Measurement		Water Depth From Land Surface (ft)	Groundwater Elevation (ft NGVD)
	Date	Time		
PIN02	**Sitewide Piezometers**			
PZ03	9/9/08	13:56	4.24	15.46
PZ04	9/9/08	14:05	2.55	15.65
PZ05	9/9/08	14:12	2.96	15.14
PZ08	9/9/08	23:20	3.84	14.56
PZ09	9/9/08	14:47	3.51	14.49
PIN06				
0500	9/9/08	14:07	2.80	15.20
0501	9/9/08	14:13	2.73	15.57
PIN09				
0500	9/9/08	14:01	2.63	15.34
PIN10				
0500	9/9/08	01:59	2.72	15.18
PIN12				
0509	9/9/08	14:18	2.96	15.08
0513	9/9/08	16:14	4.71	13.79
0514	9/9/08	16:17	4.73	13.77
0515	9/9/08	14:51	3.81	14.09
0516	9/9/08	14:56	3.71	14.29
0517	9/9/08	15:44	3.42	14.48
0518	9/9/08	15:41	3.51	14.43
0520	9/9/08	14:07	2.83	15.18
0521	9/9/08	14:03	2.75	15.30
0522	9/9/08	14:12	2.97	15.23
0523	9/9/08	14:08	2.43	15.73
0524	9/9/08	15:50	3.36	14.05
0525	9/9/08	15:46	3.35	14.07
0526	9/9/08	04:09	3.53	13.29
0527	9/9/08	13:47	11.09	6.98
0528	9/9/08	14:44	10.76	6.84
0529	9/9/08	15:27	3.54	13.26
0530	9/9/08	15:27	3.64	13.16
0531	9/9/08	14:51	2.78	13.22
0532	9/9/08	14:50	2.90	13.10
0533	9/9/08	14:38	2.51	12.99
0534	9/9/08	14:37	2.52	12.98
0535	9/9/08	11:19	2.55	12.75
0536	9/9/08	11:09	2.58	12.72
0537	9/9/08	16:00	2.93	12.63
0538	9/9/08	15:42	2.90	12.66
0539	9/9/08	15:40	3.39	13.04
0540	9/9/08	15:39	3.45	12.98

Table 1 (continued). Water-Level Data at the STAR Center

Location	Measurement		Water Depth From Land Surface (ft)	Groundwater Elevation (ft NGVD)
	Date	Time		
0541	9/9/08	15:05	4.77	12.89
0542	9/9/08	14:57	4.73	12.93
0543	9/9/08	14:52	3.73	13.20
0544	9/9/08	14:44	2.92	13.04
0545	9/9/08	14:20	2.53	12.97
0546	9/9/08	11:02	0.99	14.30
0547	9/9/08	16:01	2.96	12.68
0548	9/9/08	15:23	3.31	13.13
0549	9/9/08	15:02	4.70	12.96
0550-1	9/9/08	15:23	2.62	12.08
0550-2	9/9/08	15:26	2.48	12.22
0550-3	9/9/08	15:27	2.41	12.29
0551-1	9/9/08	14:57	7.88	7.52
0551-2	9/9/08	15:10	3.14	12.26
0551-3	9/9/08	15:22	3.05	12.35
0552-1	9/9/08	15:34	3.80	12.90
0552-2	9/9/08	15:45	3.76	12.94
0552-3	9/9/08	15:46	3.78	12.92
0553A	9/9/08	14:32	4.45	13.66
0553B	9/9/08	14:37	4.65	13.46
0553C	9/9/08	14:39	4.65	13.46
0554A	9/9/08	14:25	4.42	13.82
0554B	9/9/08	14:30	4.49	13.75
0554C	9/9/08	14:31	4.49	13.75
0555A	9/9/08	14:18	3.75	14.14
0555B	9/9/08	14:24	3.98	13.91
0555C	9/9/08	14:24	3.98	13.91
0556A	9/9/08	14:11	3.54	14.47
0556B	9/9/08	14:17	3.85	14.16
0556C	9/9/08	14:18	3.92	14.09
0557A	9/9/08	14:10	3.58	14.54
0557B	9/9/08	14:09	3.98	14.14
0557C	9/9/08	14:05	3.99	14.13
0558A	9/9/08	14:03	3.87	14.34
0558B	9/9/08	14:04	4.25	13.96
0558C	9/9/08	13:53	4.28	13.93
RW01	9/9/08	14:16	3.05	15.20
RW02	9/9/08	14:14	3.20	15.13
S29C	9/9/08	09:22	3.54	14.97
S30B	9/9/08	09:32	3.29	15.22
S31B	9/9/08	10:00	3.51	15.00
S32B	9/9/08	09:53	3.38	15.13
S33C	9/9/08	09:45	3.30	15.21

Table 1 (continued). Water-Level Data at the STAR Center

Location	Measurement		Water Depth From Land Surface (ft)	Groundwater Elevation (ft NGVD)
	Date	Time		
S35B	9/9/08	10:04	3.74	14.77
S36B	9/9/08	09:18	3.92	14.59
S37B	9/9/08	09:37	3.30	15.21
S67B	9/15/08	13:35	4.72	13.75
S67C	9/15/08	14:15	4.12	14.35
S67D	9/15/08	14:55	4.33	14.15
S68B	9/9/08	15:52	3.91	13.99
S68C	9/9/08	15:59	4.12	13.78
S68D	9/9/08	15:58	4.16	13.74
S69B	9/9/08	16:11	2.80	13.20
S69C	9/9/08	16:10	2.66	13.34
S69D	9/9/08	16:02	2.81	13.19
S70B	9/9/08	16:12	2.94	13.76
S70C	9/9/08	16:11	2.97	13.73
S70D	9/9/08	16:08	3.17	13.53
S71B	9/9/08	15:46	4.92	13.48
S71C	9/9/08	16:10	4.76	13.64
S71D	9/9/08	16:13	4.75	13.65
S72B	9/9/08	14:40	5.00	13.20
S72C	9/9/08	14:53	5.07	13.13
S72D	9/9/08	14:55	5.09	13.11
S73B	9/9/08	15:06	3.67	13.33
S73C	9/9/08	15:16	3.94	13.06
S73D	9/9/08	15:18	4.28	12.72
TE03	9/9/08	14:39	2.55	14.45
PIN15	**Northeast Site**			
0506	9/9/08	09:21	3.36	13.64
0507	9/9/08	09:25	3.38	13.62
0510	9/9/08	13:32	3.12	14.40
0513	9/9/08	09:11	11.02	6.58
0514	9/9/08	10:50	3.18	14.32
0515	9/9/08	10:54	3.23	14.27
0516	9/9/08	10:55	3.56	13.84
0518	9/9/08	09:09	3.55	14.25
0520	9/9/08	09:20	3.48	13.72
0530	9/9/08	11:00	3.17	14.23
0534	9/9/08	09:17	3.36	13.94
0535	9/9/08	11:04	3.28	14.32
0537	9/9/08	09:44	3.63	14.97
0559	9/9/08	11:31	3.75	15.04
0560	9/9/08	10:16	3.22	14.78
0561	9/9/08	10:27	3.17	14.83
0562	9/9/08	08:56	2.94	14.86

Table 1 (continued). Water-Level Data at the STAR Center

Location	Measurement		Water Depth From Land Surface (ft)	Groundwater Elevation (ft NGVD)
	Date	Time		
0563	9/9/08	08:51	2.88	14.92
0564	9/9/08	09:07	2.58	14.62
0565	9/9/08	09:03	2.72	14.48
0566	9/9/08	11:09	3.03	14.47
0567	9/9/08	11:06	3.22	14.28
0569	9/9/08	13:17	4.26	14.12
0570	9/9/08	13:36	3.78	14.20
0571	9/9/08	13:37	2.80	14.67
0572	9/9/08	13:44	2.79	14.72
0573	9/9/08	11:30	4.72	13.66
0574	9/9/08	11:24	3.75	14.67
0575	9/9/08	11:13	3.15	14.69
0576	9/9/08	11:18	2.83	14.65
0577	9/9/08	11:20	2.89	14.75
0578	9/9/08	11:23	2.88	14.64
0584	9/9/08	09:57	3.37	15.33
0585	9/9/08	09:52	2.77	15.53
0586	9/9/08	09:46	3.03	15.17
0587	9/9/08	10:40	3.40	15.30
0588	9/9/08	10:35	3.35	15.35
0589	9/9/08	10:28	3.52	14.98
0590	9/9/08	10:47	3.03	14.67
0591	9/9/08	10:42	3.13	14.77
0592	9/9/08	10:55	3.42	14.28
M03D	9/9/08	10:11	2.79	15.31
M03S	9/9/08	10:07	2.79	15.31
M14D	9/9/08	08:41	2.63	15.37
M14S	9/9/08	08:47	2.61	15.39
M16D	9/9/08	10:06	2.91	15.29
M16S	9/9/08	10:04	2.93	15.27
M24D	9/9/08	08:57	3.11	14.69
M27D	9/9/08	11:12	3.22	14.38
M27S	9/9/08	11:10	3.56	14.04
M32D	9/9/08	09:37	3.15	14.65
M32S	9/9/08	09:39	3.08	14.72
M33D	9/9/08	08:59	2.22	15.38
RW16	9/9/08	09:40	3.20	14.80
PIN18	**Wastewater Neutralization Area**			
0500	9/9/08	13:41	4.79	15.31
0500	9/9/08	13:43	4.60	15.50
0502	9/9/08	13:25	4.66	15.34
0503	9/9/08	14:34	2.75	14.93
0504	9/9/08	13:20	3.96	15.64

Table 1 (continued). Water-Level Data at the STAR Center

Location	Measurement		Water Depth From Land Surface (ft)	Groundwater Elevation (ft NGVD)
	Date	Time		
0507	9/9/08	14:30	2.83	14.90
0507	9/9/08	14:33	2.98	14.75
0508	9/9/08	13:24	3.95	15.55
0509	9/9/08	14:34	3.02	14.81
0519	9/9/08	14:41	3.52	14.76
0520	9/9/08	13:49	2.82	15.18
0521	9/9/08	13:50	2.99	15.11
0522	9/9/08	13:47	2.86	15.24
0523	9/9/08	13:56	4.22	15.18
0524	9/9/08	13:55	3.75	15.25
0525	9/9/08	13:53	3.32	15.58
0526	9/9/08	14:22	4.07	14.53
RW02	9/9/08	13:42	4.71	15.39
RW03	9/9/08	13:46	3.03	15.27
RW0501	9/9/08	13:40	4.65	15.35
RW0501	9/9/08	13:41	4.65	15.35
PIN21	**Perimeter Monitoring Wells**			
0502	9/9/08	10:16	2.09	13.11
0503	9/9/08	11:02	2.49	12.71
0504	9/9/08	15:28	4.17	13.43
0505	9/9/08	15:34	3.87	13.53
0512	9/9/08	14:38	4.11	13.19

Table 2. Floridan Aquifer Monitoring Well Water Elevations

Well Identification	February 2008 Water Level Elevation (ft, MSL)	September 2008 Water Level Elevation (ft, MSL)
PIN12-0527	6.46	6.98
PIN12-0528	6.28	6.84
PIN15-0513	6.34	6.58

Table 3. Surface Water Elevations

Sitewide Surface Water Elevations			
Location	Measurement		Surface Water Elevation (ft NGVD)
	Date	Time	
PIN01	**Pond 5**		
P501	9/9/08	11:23	12.90
P502	9/9/08	11:14	13.80
PIN02	**West Pond**		
W005	9/9/08	14:17	14.25
PIN12	**Industrial Drain Leaks Bldg 100**		
BR01	9/9/08	15:27	12.90
PIN15	**Northeast Site**		
E001	9/9/08	9:25	13.70
PIN20	**4.5 Acre Site**		
BP01	9/9/08	13:24	15.24
PIN23	**Southwest Pond**		
SW01	9/9/08	15:39	13.69
PIN37	**South Pond**		
S001	9/9/08	15:37	13.67

Table 4. Dehalococcoides ethenogenes

Location		Date Sampled	*Dehalococcoides ethenogenes* (copy numbers/L)
Northeast Site			
PIN15	0537	11-Sep-08	700,000
PIN15	0585	11-Sep-08	<7,000
PIN15	0587	11-Sep-08	<7,000
PIN15	0588	11-Sep-08	<7,000

"<" values are method detection limits.

Table 5. Field Measurements of Samples Collected at the STAR Center

Location	Screen Depth (ft bls)	Temperature (°C)	Specific Conductance (µmhos/cm)[a]	Turbidity (NTU)	pH	Oxidation Reduction Potential (mV)	Dissolved Oxygen (mg/L)
PIN12	**Industrial Drain Leaks Bldg. 100**						
0513	15–25	25.25	781	8.1	6.71	-227.2	0.93
0514	30–40	25.42	1,481	259	6.52	-282.7	0.33
0524	27–37	27.39	1,519	3.4	6.59	-21.1	0.61
0525	12–22	28.45	771	5.5	6.8	-52.9	0.63
0526	19.5–29.5	30.66	1,763	3.42	6.5	-151.3	0.4
0529	10–20	27.03	592	10.1	6.78	89.6	1.09
0530	19.5–29.5	26.43	1,002	19.7	6.71	-57.8	0.95
0531	10–20	27.74	1,048	601	6.73	-80.8	0.86
0532	20–30	27.22	998	23.3	6.74	-70	1.02
0533	10–20	26.89	980	13.6	6.75	-74.8	0.72
0534	20–30	26.53	1,124	10.8	6.72	-37.1	0.99
0535	10–20	25.81	705	12.7	6.88	-80.9	0.22
0536	20–30	27.07	706	141	6.82	-74.3	0.93
0537	10–20	29.78	790	6.96	6.65	-90.7	0.92
0538	20–30	29.4	1,003	5.28	6.58	-73.4	1.15
0539	9.5–19.5	30.4	559	11.5	6.73	-80	0.17
0540	20–30	29.28	1,897	11.47	6.47	-68.1	0.08
0541	10–20	30.21	590	6.6	6.61	-77.5	0.98
0542	20–30	29.81	738	7.41	6.6	-74.3	0.96
0543	28–38	26.56	1,502	4.3	6.74	-18.2	1.24
0544	30–40	27.11	1,499	11.2	6.75	-36.3	1.28
0545	29.5–39.5	26.82	1,536	10.2	6.75	-25.5	0.94
0546	29.5–39.5	27.62	1,328	13.4	6.77	-52.9	0.9
0547	29.5–39.5	29.52	1,297	52.9	6.57	-61.4	0.99
0548	30–40	29.8	1,750	469	6.7	-70.1	0.26
0549	30–40	29.5	1,314	7.93	6.59	-63.2	1.07
0550-1	9–18	26.97	1,212	74.4	6.66	-80.6	0.38
0550-2	20–29	26.39	1,223	6.54	6.69	-79.2	0.32
0550-3	31–40	27.85	1,384	36.2	6.88	-86.3	0.88
0551-1	9–18	27.14	1,087	5.12	6.7	-58.4	0.36
0551-2	20–29	26.23	1,159	9.79	6.71	-91.8	0.26
0551-3	31–40	26.61	1,376	14.1	6.84	-79.6	0.29
0552-1	9–18	27.6	1,144	60.8	6.73	-109.2	0.35
0552-2	20–29	26.63	1,086	40.1	6.72	-72.2	0.6
0552-3	31–40	27.46	1,432	16.5	6.84	-105.4	0.63
0553A	3–13	29.17	1,075	11	6.54	51.8	1.39
0553B	13–23	27.82	1,157	7.09	6.53	-58.8	0.31
0553C	23–33	27.55	781	7.93	6.78	-99.6	0.61
0554A	3–13	28.39	816	12.2	6.52	-58.9	1.03
0554B	13–23	27.18	813	6.6	6.65	-58.7	0.95
0554C	23–33	27	880	6.33	6.77	-79.7	0.41
0555A	2.5–12.5	28.41	403	7.42	6.72	-86.9	0.74

Table 5 (continued). Field Measurements of Samples Collected at the STAR Center

Location	Screen Depth (ft bls)	Temperature (°C)	Specific Conductance (µmhos/cm)[a]	Turbidity (NTU)	pH	Oxidation Reduction Potential (mV)	Dissolved Oxygen (mg/L)
0555B	13–23	26.91	381	8.98	7.02	-93.9	0.37
0555C	23–33	26.92	604	10.8	6.81	-80.9	0.56
0556A	3–13	29.39	862	12.1	6.35	-134.6	0.81
0556B	13–23	28.1	819	15.8	6.62	-109.8	0.7
0556C	23–33	27.81	809	8.4	6.63	-82.2	0.69
0557A	3–13	31.41	989	7.04	6.52	-15.5	0.74
0557B	13–23	30.42	792	8.05	6.58	-87.1	0.9
0557C	23–33	29.76	1,064	3.24	6.57	-96.6	0.74
0558A	3–13	29.59	959	14.5	6.4	62.9	1.46
0558B	13–23	27.83	1,104	1.98	6.55	-101.1	0.75
0558C	23–33	28.38	1,081	7.13	6.58	-84	0.65
S30B	5–15	22.7	1,348	3.3	6.66	-61.3	0.47
S33C	11–21	23.18	916	59.4	6.72	-85.9	0.19
S35B	5–15	22.56	1,712	12.2	6.5	-43.2	0.39
S67B	10–19.83	22.81	1,223	29	6.7	-50.2	0.55
S67C	20–29.83	22.64	998	15.2	6.78	-65.1	0.46
S67D	30–39.83	22.94	1,098	90.4	6.76	-64.4	0.57
S68B	10–20	27.83	844	5.5	6.16	30.6	2.69
S68C	18–28	27.66	1,038	18.5	6.64	-14.3	1.88
S68D	30–40	27.59	1,412	3.5	6.62	-27.2	1.88
S69B	10–20	30.7	624	13.6	6.85	-83.4	1.58
S69C	20–30	30.52	806	10.1	6.75	-47.8	1.65
S69D	30–40	31.04	1,586	5	6.71	-26.7	2.07
S70B	10–20	30.61	1,221	54.5	6.69	-17	0.95
S70C	20–30	30.43	1,473	230	6.58	-54	0.68
S70D	30–40	31.39	1,558	12.2	6.58	-40.3	0.77
S71B	10–20	30.25	1,279	35.7	6.65	-81	1.95
S71C	20–30	29.6	1,507	196	6.6	-67.5	2.01
S71D	30–40	30.06	1,463	93.2	6.61	6.2	0.9
S72B	10–20	30.83	1,862	13.8	6.06	-23.2	0.73
S72C	20–30	30.5	783	12.5	6.63	-75.9	0.7
S72D	30–40	30.1	1,441	17.1	6.65	-25.3	0.67
S73B	10–20	30.77	988	47.3	6.37	-280.8	7.7
S73C	20–30	30.24	1,991	215	6.31	-102.9	1.75
S73D	30–40	30.68	2,636	126	6.32	-106.2	1.15
PIN15	**Northeast Site**						
0506	12–21.5	26.41	1,245	16.8	6.67	-93	0.61
0507	5–14.5	26.68	743	10.1	6.69	-120	0.49
0510	4–13.5	30.67	263	14.9	7.1	13.2	0.92
0513	135–149.6	25.12	1,345	0.87	6.87	-194	4.5
0514	15.5–25.5	26.98	1,577	15.3	6.49	-93.7	0.68
0515	7.6–17.6	26.86	763	1.34	6.64	-85.2	0.61
0516	0.3–10.3	28.19	1,133	0.48	6.69	-100	9.53

Table 5 (continued). Field Measurements of Samples Collected at the STAR Center

Location	Screen Depth (ft bls)	Temperature (°C)	Specific Conductance (µmhos/cm)[a]	Turbidity (NTU)	pH	Oxidation Reduction Potential (mV)	Dissolved Oxygen (mg/L)
0520	5–14.5	28.58	564	3.18	6.57	-66.9	1.02
0530	5–14.5	26.46	1,106	13.9	6.33	-89.1	0.62
0534	19.5–29	27.5	1,741	23.1	6.58	-22.6	0.75
0535	20.5–30	25.77	1,619	18.4	6.57	-144.4	0.46
0537	17.5–30	25.11	964	2.17	6.66	-69	0.61
0559	22–31.5	29.08	1,333	11.2	6.58	-100	0.32
0560	19–28.5	26.09	889	3.34	6.52	-77	0.55
0561	5–14.5	26.77	1,234	2.97	6.47	-56.2	0.78
0566	19–28.5	27.67	1,318	64.6	6.68	-90.6	0.83
0567	5–14.5	27.7	1,234	3.24	6.51	-86.6	0.71
0568	10–20	28.12	972	30.9	6.69	-56.8	0.49
0569	20–30	27.19	1,525	65.2	6.51	-67.6	0.58
0570	20–30	30.01	1,697	93.4	6.54	-111.5	0.48
0573	5–15	28.94	1,791	4.54	6.64	-107.9	0.66
0574	18–28	28.49	911	2.52	6.58	-120	0.58
0575	5–15	28.23	2,236	5.27	6.88	-202.5	0.53
0576	20–30	28.47	1,194	5.2	6.76	-212.3	0.33
0577	5–15	27.7	1,548	9.8	6.73	-202.6	0.57
0578	20–30	27.42	1,080	13.4	5.72	-254.6	0
0584	20–30	29.55	1,027	79.5	6.64	-107.2	0.47
0585	20–30	35.04	1,351	36.7	7.02	-308.6	0.59
0586	20–30	34.65	1,958	439	6.84	-154	0.36
0587	20–30	35.92	1,487	34.4	6.44	-254.6	0.82
0588	5–15	32.49	2,521	6	6.9	-283.3	0.89
0589	20–30	33.62	1,662	26	6.25	-144.1	0.54
0590	20–30	33.94	1,499	36.9	6.59	-177.8	0.3
0591	5–15	31.8	1,661	13.6	6.68	-141.5	0.37
0592	20–30	25.62	1,741	33.4	6.34	-91.4	0.39
M16D	18.5–28.5	27.72	1,047	2.39	6.61	-81.5	0.62
M27D	21–31	25.95	1,646	8.46	6.43	-90	0.72
M27S	6–16	26.91	1,064	0.76	6.49	-74.4	0.56
M32D	14–24	26.14	973	3.99	6.61	-68.8	0.48
PIN21	**Perimeter Monitoring Wells**						
0502	7–17	27.37	1,292	2.5	6.67	-41.5	0.63
0503	20–28	26.92	754	20.4	6.72	-79.5	0.53
0504	7–17	26.47	672		6.83	-74.1	0.53
0505	20–28	25.45	874	5.59	6.71	-40.5	0.5
0512	20–29.5	25.63	908	9.21	6.68	-8.4	1.88

[a]Temperature corrected to 25 °C.

Table 6. COPC Concentrations at the Northeast Site
(reported in micrograms per liter)[a]

Location	Screen Depth (ft)	Date Sampled	TCE	cis-1,2-DCE	Total 1,2-DCE[b]	Vinyl chloride	Methylene chloride	Benzene	Toluene	Total COPC[c]
FDEP MCL			**3**	**70**	**63**	**1**	**5**	**1**	**1,000**	
PIN15	**Northeast Site**									
0506	12–21.5	2/27/08	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0507	5–14.5	2/27/08	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0510	4–13.5	3/5/08	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0513	135–149.6	2/27/08	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0514	15.5–25.5	2/27/08	<0.5	<0.65	3	2	<4	<0.5	<0.51	5
0515	7.6–17.6	2/27/08	<0.5	<0.65	ND	4.3	<4	<0.5	<0.51	4.3
0516	0.3–10.3	2/28/08	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0520	5–14.5	2/27/08	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0530	5–14.5	2/27/08	<0.5	<0.65	ND	3.2	<4	<0.5	<0.51	3.2
0534	19.5–29	2/27/08	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0535	20.5–30	2/27/08	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0537	17.5–30	9/12/07	<0.5	120	120	450	<4	3.2	<0.51	573.2
		3/3/08	<0.5	240	241.8	600	<4	4	<0.51	845.8
		9/11/08	0.73J	510	517.9	930	<4	3.8	<0.51	1,451.7
0559	22–31.5	3/5/08	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0560	19–28.5	2/29/08	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0561	5–14.5	2/29/08	<0.5	<0.65	ND	0.62J	<4	<0.5	<0.51	ND
0566	19–28.5	2/29/08	5.4	13	23	5.3	<4	<0.5	<0.51	33.7
0567	5–14.5	2/29/08	1.2	26	34.8	31	<4	1.4	<0.51	68.4
		9/12/08	0.63J	20	26.6	47	<4	1.4	<0.51	75
0568	10–20	9/19/07	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
		3/5/08	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
		9/16/08	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0569	20–30	9/19/07	<0.5	<0.65	ND	21	<4	<0.5	<0.51	21
		3/5/08	<0.5	<0.65	ND	10	<4	<0.5	0.69J	10
		9/16/08	<0.5	<0.65	ND	9.9	<4	<0.5	<0.51	9.9
0570	20–30	3/5/08	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
0573	5–15	2/28/08	<0.5	<0.65	0.5J	2.8	<4	0.64J	<0.51	2.8
0574	18–28	2/28/08	3.9	3	3	3	<4	<0.5	<0.51	9.9
0575	5–15	2/28/08	<0.5	1.4	1.4	0.73J	<4	0.85J	<0.51	1.4
0576	20–30	2/28/08	<0.5	1.7	1.7	14	<4	<0.5	<0.51	15.7
0577	5–15	2/28/08	<0.5	<0.65	0.56J	1.1	<4	2.4	<0.51	3.5
0578	20–30	2/28/08	<0.5	0.68J	0.68J	<0.5	<4	<0.5	<0.51	ND
0584	20–30	9/12/07	<0.5	<0.65	ND	1.8	<4	<0.5	<0.51	1.8
		3/4/08	<0.5	<0.65	ND	0.59J	<4	<0.5	<0.51	ND
		9/12/08	<0.5	<0.65	ND	0.74J	<4	<0.5	<0.51	ND
0585	20–30	9/13/07	180	140	140	28	<4	0.86J	9	357
		3/4/08	250	140	140	20	<4	0.76J	5.7	415.7
		9/11/08	8.6	370	371.4	28	<4	0.75J	3.7	411.7

Table 6 (continued). COPC Concentrations at the Northeast Site (reported in micrograms per liter)[a]

Location	Screen Depth (ft)	Date Sampled	TCE	cis-1,2-DCE	Total 1,2-DCE[b]	Vinyl chloride	Methylene chloride	Benzene	Toluene	Total COPC[c]
FDEP MCL			**3**	**70**	**63**	**1**	**5**	**1**	**1,000**	
0586	20–30	9/13/07	430	1,400	1,400	490	<20	3J	28	2,348
		3/4/08	120	2,000	2,008	640	<4	5.2	14	2,787.2
		9/16/08	120	1,100	1,135	540	<4	2.8	12	1,809.8
0587	20–30	9/14/07	1,700	8,200	8,200	300	<200	<25	1,700	11,900
		3/3/08	3,900	16,000	16,000	<120	<1,000	<120	1,300	21,200
		9/11/08	890	14,000	14,110	180	<4	9.2	1,300	16,489.2
0588	5–15	9/13/07	1.1	170	171.1	8.8	<4	1.8	9	191.8
		3/3/08	<25	1,800	1,800	<25	<200	<25	<26	1,800
		9/11/08	0.66J	630	635	19	<4	2.4	5.9	662.3
0589	20–30	9/14/07	18	630	632.5	440	<4	49	430	1,569.5
		3/4/08	29	1,400	1,406	520	<4	59	100	2,114
		9/15/08	8.4	1,100	1,130	2,400	<4	48	1,600	5,186.4
0590	20–30	9/17/07	2.6	17	17	<0.5	<4	2.2	<0.51	21.8
		2/29/08	11	240	246	26	<4	0.96J	2.1	285.1
		9/15/08	<0.5	<0.65	ND	1.8	<4	5.2	0.56J	7
0591	5–15	9/17/07	40	410	418.2	28	<8	1.3J	4.2	490.4
		3/4/08	<0.5	3.3	3.3	0.52J	<4	3.4	1.5	8.2
		9/15/08	0.94J	130	133.2	27	<4	0.59J	<0.51	160.2
0592	20–30	9/13/07	<0.5	<0.65	ND	<0.5	<4	29	0.94J	29
		3/4/08	<0.5	<0.65	ND	<0.5	<4	26	0.94J	26
		9/16/08	<0.5	<0.65	ND	<0.5	<4	12	<0.51	12
M16D	18.5–28.5	3/4/08	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
M27D	21–31	2/29/08	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
M27S	6–16	2/29/08	<0.5	3.7	5.4	3.5	<4	<0.5	<0.51	8.9
M32D	14–24	3/4/08	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND
M32S	3–13	3/4/08	<0.5	<0.65	ND	<0.5	<4	<0.5	<0.51	ND

[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 cDCE and tDCE.
[c]Total COPC is the sum of the individual COPC concentrations. The cDCE and tDCE 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.
Arsenic, while a COPC, is not included in this table, nor in the total COPC value.

Table 7. Aluminum and Iron Concentrations Measured at the Northeast Site (reported in µg/L)

Well	Date Sampled	Aluminum	Iron
Cleanup Target Level:		**2,000**	**3,000**
PIN15	**Northeast Site**		
0506	3/7/07	3,400	2,100
	9/18/07	3,800	2,000
	2/27/08	3,000	1,500
	9/10/08	72 B	3,000
0507	3/8/07	700	930
	9/18/07	1,700	1,100
	2/27/08	2,800	1,100
	9/10/08	380	660
0510	3/6/07	350	1,700
	9/19/07	320	4,600
	3/5/08	350	1,300
	9/16/08	370	1,300
0513	3/5/07	88 B	84
	2/27/08	<70	<22
	9/10/08	<50	<50
0514	3/8/07	3,100	2,100
	9/13/07	2,300	1,700
	2/27/08	3,700	2,300
	9/10/08	1,300	1,800
0515	3/8/07	110 B	910
	9/13/07	81 B	1,000
	2/27/08	130 B	1,400
	9/10/08	70 B	1,500
0516	3/8/07	430	8,500
	9/13/07	140 B	6,700
	2/28/08	340	3,000
	9/10/08	81 B	4,700
0518	3/5/07	370	700
	9/18/07	980	1,000
0520	3/7/07	280	570
	9/18/07	150 B	760
	2/27/08	350	880
	9/10/08	260	720
0530	3/8/07	2,100	2,300
	9/13/07	1,100	2,300
	2/27/08	1,800	2,900
	9/11/08	970	3,300
0534	3/7/07	1,700	740
	9/18/07	1,900	650
	2/27/08	3,100	770
	9/10/08	620	340

Table 7 (continued). Aluminum and Iron Concentrations Measured at the Northeast Site (reported in µg/L)

Well	Date Sampled	Aluminum	Iron
Cleanup Target Level:		**2,000**	**3,000**
0535	3/5/07	11,100	3,600
	9/13/07	5,000	1,800
	2/27/08	7,100	2,300
	9/11/08	1,800	650
0537	3/2/07	230	2,400
	9/12/07	<70	3,200
	3/3/08	<70	7,500
	9/11/08	100 B	2,900
0559	3/6/07	5,100	1,300
	9/19/07	1,800	440
	3/5/08	1,900	640
	9/16/08	450	180 B
0560	3/12/07	650	7,200
	9/14/07	200 B	5,700
	2/29/08	430	6,100
	9/12/08	300	5,000
0561	3/12/07	85 B	920
	9/14/07	280	1,200
	2/29/08	86 B	3,000
	9/12/08	170 B	1,800
0562	3/8/07	510	5,800
	9/18/07	1,200 NJ	4,900
0563	3/8/07	490	2,100
	9/18/07	350	8,600
0564	3/5/07	660 NJ	1,200
	9/14/07	480	730
0565	3/5/07	140 B	610
	9/14/07	1,100	9,700
0566	3/12/07	34,400	12,400
	9/14/07	31,000	11,000
	2/29/08	44,000	17,000
	9/12/08	6,000	2,200
0567	3/12/07	<70	5,100
	9/14/07	390	15,000
	2/29/08	1,300	11,000
	9/12/08	220	2,900
0568	3/5/07	1,800	1,600
	9/19/07	940	1,200
	3/5/08	2,700	1,600
	9/16/08	570	900
0569	3/5/07	500	3,200
	9/19/07	1,500	3,200
	3/5/08	630	3,000
	9/16/08	3,600	3,600

Table 7 (continued). Aluminum and Iron Concentrations Measured at the Northeast Site (reported in µg/L)

Well	Date Sampled	Aluminum	Iron
Cleanup Target Level:		**2,000**	**3,000**
0570	3/6/07	5,500	1,200
	9/19/07	9,400	1,600
	3/5/08	5,000	1,200
	9/16/08	5,400	1,400
0571	3/6/07	2,200	2,400
	9/19/07	1,100	3,400
0572	3/6/07	2,500	880
	9/19/07	2,300	960
0573	3/12/07	72 B	1,700
	9/17/07	120 B	1,100
	2/28/08	150 B	2,700
	9/15/08	110 B	1,300
0574	3/13/07	120 B	1,800
	9/17/07	120 B	2,400
	2/28/08	72 B	1,300
	9/15/08	73 B	3,500
0575	3/13/07	230	11,700
	9/17/07	230	8,100
	2/28/08	99 B	3,900
	9/15/08	68 B	2,000
0576	3/13/07	540	1,400
	9/17/07	1,200	1,300
	2/28/08	570	590
	9/15/08	75 B	570
0577	3/8/07	270	12,000
	9/17/07	190 B	9,400
	2/28/08	320	7,300
	9/15/08	220	8,600
0578	3/8/07	440	940
	9/17/07	510 NJ	790
	2/28/08	200	130
	9/15/08	370J	570
0584	3/7/07	13,300	12,400
	9/12/07	67,000	38,000
	3/4/08	8,800	6,300
	9/12/08	4,200	3,200
0585	3/3/07	4,600	3,500
	9/13/07	10,000	6,600
	3/4/08	6,100	5,300
	9/11/08	1,900	1,300
0586	3/7/07	5,300	8,600
	9/13/07	18,000	16,000
	3/4/08	8,300	12,000
	9/16/08	8,500	11,000

Table 7 (continued). Aluminum and Iron Concentrations Measured at the Northeast Site (reported in µg/L)

Well	Date Sampled	Aluminum	Iron
Cleanup Target Level:		**2,000**	**3,000**
0587	3/3/07	3,100	22,300
	9/14/07	2,700	36,000
	3/3/08	43,000	56,000
	9/11/08	1,300	30,000
0588	3/3/07	740	9,900
	9/13/07	840	3,300
	3/3/08	220	690
	9/11/08	130 B	540
0589	3/7/07	7,200	19,700
	9/14/07	9,900	17,000
	3/4/08	6,700	12,000
	9/15/08	4,600	10,000
0590	3/8/07	1,700	3,000
	9/17/07	2,500	1,900
	2/29/08	1,700	2,900
	9/15/08	1,300	770
0591	9/17/07	6,400	9,200
	3/4/08	2,000	1,400
	9/15/08	310	1,800
0592	3/8/07	3,000	7,600
	9/13/07	27,000	17,000
	3/4/08	25,000	18,000
	9/16/08	1,100	3,000
M03D	3/6/07	4,300	6,100
	9/12/07	4,200	6,500
M03S	3/6/07	160 B	6,200
	9/12/07	5,100	41,000
M14D	3/7/07	5,600	5,700
	9/18/07	6,100	5,800
M14S	3/7/07	110 B	5,300
	9/18/07	310	13,000
M16D	3/6/07	1,600	4,000
	9/12/07	470	3,000
	3/4/08	230	2,200
	9/12/08	230	1,300
M16S	3/6/07	960	750
	9/12/07	1,400	3,500
M24D	3/5/07	6,200	820
	9/18/07	8,600	1,100
M27D	3/5/07	1,600	1,100
	9/13/07	690	900
	2/29/08	1,800	1,100
	9/10/08	490	700

Table 7 (continued). Aluminum and Iron Concentrations Measured at the Northeast Site (reported in µg/L)

Well	Date Sampled	Aluminum	Iron
Cleanup Target Level:		**2,000**	**3,000**
M27S	3/5/07	320	2,200
	9/13/07	<70	1,900
	2/29/08	<70	3,600
	9/10/08	70 B	2,500
M32D	3/7/07	670	8,200
	9/12/07	230	5,300
	3/4/08	180 B	11,000
	9/12/08	490	3,700
M32S	3/7/07	250	9,300
	9/12/07	600	3,600
	3/4/08	140 B	4,400
	9/12/08	260	1,900
M33D	3/5/07	2,300	1,500
	9/18/07	6,900	2,000
RW16	3/7/07	<200	2,200
	9/12/07	<70	3,900

< = not detected
B= estimated value metals
J=estimated
N=spike sample recovery not within control limits inorganics.

Table 8. COPC Concentrations at the Building 100 Area
(reported in micrograms per liter)[a]

Location	Screen Depth (ft)	Date Sampled	TCE	cis-1,2-DCE	trans-1,2-DCE	Total 1,2-DCE[b]	1,1-DCE	Vinyl chloride	Total COPC[c]
FDEP MCL			**3**	**70**	**100**	**63**	**7**	**1**	
Industrial Drain Leaks Bldg, 100/Old Drum Storage Site									
PIN06									
0500	3–13	9/18/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		2/27/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0501	3–13	9/18/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
PIN09									
0500	3–13	9/12/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
PIN10									
0500	3–13	9/12/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
PIN12									
0509	3–13	9/18/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		3/4/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0510	3–13	9/18/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0513	15–25	9/19/07	<0.5	<0.65	0.59J	0.59J	<0.45	<0.5	ND
		3/4/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/13/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0514	30–40	9/19/07	<0.5	5.8	15	20.8	<0.45	42	62.8
		3/4/08	<0.5	<0.65	12	12	<0.45	<0.5	12
		9/13/08	<0.5	5.6	16	21.6	<0.45	33	54.6
0515	15–25	3/1/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0516	30–40	3/1/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0517	15–25	9/18/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		3/1/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0518	30–40	9/18/07	<0.5	<0.65	<0.44	ND	<0.45	1.9	1.9
		3/1/08	<0.5	<0.65	<0.44	ND	<0.45	1.1	1.1
0520	36–46	9/18/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0521	19.5–29.5	9/12/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		2/27/08	<0.5	<0.65	<0.44	ND	<0.45	1.1	1.1
0522	32–42	9/18/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0523	18–28	9/18/07	1	32	22	54	<0.45	20	75
0524	27–37	9/18/07	4.3	770	10	780	29	1,600	2,413.3
		3/1/08	<5	820	12	832	41	1,300	2,173
		9/13/08	<0.5	610	18	628	27	1,000	1,655
0525	12–22	9/18/07	<0.5	1.6	<0.44	1.6	<0.45	0.66J	1.6
		3/1/08	<0.5	0.91J	<0.44	0.91J	<0.45	<0.5	ND
		9/13/08	<0.5	2.2	<0.44	2.2	<0.45	0.88J	2.2
0526	19.5–29.5	9/19/07	<0.5	1.9	1.3	3.2	<0.45	3	6.2
		3/1/08	<0.5	<0.65	1.4	1.4	<0.45	1.9	3.3
		9/11/08	<0.5	0.83J	1.1	1.1	<0.45	3.8	4.9
0527	118–137.9	3/4/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0528	127–146.9	3/1/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0529	10–20	10/15/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		1/2/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/16/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND

Table 8 (continued). COPC Concentrations at the Building 100 Area (reported in micrograms per liter)[a]

Location	Screen Depth (ft)	Date Sampled	TCE	cis-1,2-DCE	trans-1,2-DCE	Total 1,2-DCE[b]	1,1-DCE	Vinyl chloride	Total COPC[c]
FDEP MCL			**3**	**70**	**100**	**63**	**7**	**1**	
0530	19.5–29.5	10/15/07	<0.5	170	2.9	172.9	12	72	256.9
		1/2/08	<0.5	110	1.2	111.2	5.9	28	145.1
		9/16/08	<0.5	30J	0.68J	30	1.4	4.6J	36
0531	10–20	10/15/07	<0.5	3.4	<0.44	3.4	<0.45	<0.5	3.4
		1/2/08	<0.5	1.3	<0.44	1.3	<0.45	<0.5	1.3
		9/16/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0532	20–30	10/15/07	<0.5	7.3	<0.44	7.3	<0.45	14	21.3
		1/3/08	<0.5	5.4	<0.44	5.4	<0.45	9.4	14.8
		9/16/08	<0.5	<0.65	<0.44	ND	<0.45	9	9
0533	10–20	10/16/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		1/3/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/16/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0534	20–30	10/16/07	<0.5	3	<0.44	3	<0.45	<0.5	3
		1/3/08	<0.5	0.67	<0.44	0.67	<0.45	<0.5	0.67
		9/17/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0535	10–20	10/16/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		1/4/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/16/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0536	20–30	10/16/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		1/4/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/17/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0537	10–20	10/16/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		1/5/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/14/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0538	20–30	10/16/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		1/5/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/14/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0539	9.5–19.5	10/17/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		1/5/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/16/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0540	20–30	10/17/07	<0.5	<0.65	4.7	4.7	<0.45	37	41.7
		1/7/08	<0.5	<0.65	5	5	<0.45	100	105
		9/16/08	<0.5	<0.65	<0.44	ND	<0.45	4.9	4.9
0541	10–20	10/17/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		1/7/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/14/08	<0.5	0.68J	<0.44	0.68J	<0.45	<0.5	ND
0542	20–30	10/17/07	<0.5	3.3	<0.44	3.3	<0.45	<0.5	3.3
		1/7/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/14/08	<0.5	1.3	<0.44	1.3	<0.45	<0.5	1.3
0543	28–38	1/2/08	<0.5	10	<0.44	10	<0.45	2.5	12.5
		9/16/08	<0.5	3.1	<0.44	3.1	<0.45	2.7	5.8
0544	30–40	1/3/08	<0.5	<0.65	<0.44	ND	<0.45	0.76J	ND
		9/16/08	<0.5	<0.65	<0.44	ND	<0.45	0.66J	ND

Table 8 (continued). COPC Concentrations at the Building 100 Area (reported in micrograms per liter)[a]

Location	Screen Depth (ft)	Date Sampled	TCE	cis-1,2-DCE	trans-1,2-DCE	Total 1,2-DCE[b]	1,1-DCE	Vinyl chloride	Total COPC[c]
FDEP MCL			**3**	**70**	**100**	**63**	**7**	**1**	
0545	29.5–39.5	1/4/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/17/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0546	29.5–39.5	1/4/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/17/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0547	29.5–39.5	1/5/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/14/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0548	30–40	1/7/08	<0.5	<0.65	<0.44	ND	<0.45	2.6	2.6
		9/16/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0549	30–40	1/7/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/14/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0550-1	9–18	2/20/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/14/08	<0.5	2.7	<0.44	2.7	<0.45	<0.5	2.7
0550-2	20–29	2/20/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/14/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0550-3	31–40	2/21/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/15/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0551-1	9–18	2/21/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/16/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0551-2	20–29	2/21/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/16/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0551-3	31–40	2/21/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/16/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0552-1	9–18	2/22/08	<0.5	100	1.1	101.1	5.9	13	120
		3/18/08	<0.5	270J	4.6J	274.6	21J	62J	357.6
		9/14/08	0.87J	380	5.8	385.8	24	82	491.8
0552-2	20–29	2/22/08	<0.5	210	2.4	212.4	12	27	251.4
		3/18/08	<0.5	310	4.7	314.7	23	61	398.7
		9/14/08	<0.5	360	9	369	35	110	514
0552-3	31–40	2/22/08	0.85J	82	0.81J	82	5.6	10	97.6
		3/18/08	<0.5	79	0.95J	79	4.4	15	98.4
		9/14/08	<0.5	120	1.7	121.7	8.3	33	163
0553A	3–13	6/16/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/13/08	3.6	11	2.2	13.2	<0.45	1.8	18.6
0553B	13–23	6/16/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/13/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0553C	23–33	7/1/08	<0.5	0.7J	<0.44	0.7J	<0.45	<0.5	ND
		9/13/08	<0.5	1.6	<0.44	1.6	<0.45	0.52J	1.6
0554A	3–13	6/2/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/13/08	1.6	3.5	0.71J	3.5	<0.45	0.64J	5.1
0554B	13–23	6/3/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/13/08	1.2	2.5	0.65J	2.5	<0.45	0.74J	3.7
0554C	23–33	6/3/08	<0.5	14	<0.44	14	2.6	<0.5	16.6
		9/13/08	<0.5	17	1.5	18.5	4.3	66	88.8

Table 8 (continued). COPC Concentrations at the Building 100 Area (reported in micrograms per liter)[a]

Location	Screen Depth (ft)	Date Sampled	TCE	cis-1,2-DCE	trans-1,2-DCE	Total 1,2-DCE[b]	1,1-DCE	Vinyl chloride	Total COPC[c]
FDEP MCL			**3**	**70**	**100**	**63**	**7**	**1**	
0555A	2.5–12.5	6/13/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/13/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0555B	13–23	6/12/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/13/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0555C	23–33	6/13/08	<0.5	2.1	1.2	3.3	<0.45	<0.5	3.3
		9/13/08	<0.5	1.6	<0.44	1.6	<0.45	<0.5	1.6
0556A	3–13	7/1/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/13/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0556B	13–23	6/11/08	<0.5	1.6	<0.44	1.6	<0.45	<0.5	1.6
		9/13/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0556C	23–33	6/10/08	<0.5	5.1	2	7.1	<0.45	<0.5	7.1
		9/13/08	<0.5	3.9	1.5	5.4	<0.45	<0.5	5.4
0557A	3–13	6/10/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/13/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0557B	13–23	6/10/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/13/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0557C	23–33	6/11/08	<0.5	1.6	<0.44	1.6	<0.45	<0.5	1.6
		9/13/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0558A	3–13	6/12/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/13/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0558B	13–23	6/30/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/13/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0558C	23–33	6/12/08	<0.5	2	<0.44	2	<0.45	<0.5	2
		9/13/08	<0.5	1.2	<0.44	1.2	<0.45	<0.5	1.2
S29C	14–24	9/13/07	<0.5	<0.65	<0.44	ND	<0.45	4.8	4.8
S30B	5–15	9/13/07	350	6,000	330	6,330	120	2,100	8,900
		2/29/08	62	2,900	190	3,090	66	980	4,198
		9/12/08	53	1,700	98J	1,700	43	600	2,396
S31B	5–15	9/13/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
S32B	5.5–15.5	9/13/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
S33C	11–21	9/13/07	43	1,700	29	1,729	110	1,100	2,982
		2/29/08	200	5,100	91	5,191	430	1,300	7,121
		9/12/08	61	870	30	900	93	600	1,654
S35B	5–15	9/13/07	7,500	14,000	3,300	17,300	90	9,300	34,190
		2/29/08	14,000	37,000	7,900	44,900	<220	17,000	75,900
		9/12/08	9,700	36,000	6,500	42,500	<220	17,000	69,200
S36B	5–15	9/13/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		2/29/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
S37B	5–15	9/13/07	<0.5	3.7	<0.44	3.7	<0.45	3.4	7.1
S67B	10–19.83	9/17/07	<0.5	24	5.4	29.4	<0.45	450	479.4
		2/27/08	<0.5	19	4.9	23.9	<0.45	430	453.9
		9/15/08	<0.5	19	4.7	23.7	<0.45	310	333.7

Table 8 (continued). COPC Concentrations at the Building 100 Area (reported in micrograms per liter)[a]

Location	Screen Depth (ft)	Date Sampled	TCE	cis-1,2-DCE	trans-1,2-DCE	Total 1,2-DCE[b]	1,1-DCE	Vinyl chloride	Total COPC[c]
FDEP MCL			**3**	**70**	**100**	**63**	**7**	**1**	
S67C	20–29.83	9/17/07	<0.5	190	39	229	2.8	130	361.8
		2/27/08	<0.5	270	49	319	4.3	100	423.3
		9/15/08	<0.5	210	35	245	2.5	160	407.5
S67D	30–39.83	9/17/07	<0.5	65	12	77	1	69	147
		2/27/08	<0.5	39	9.6	48.6	0.78J	40	88.6
		9/15/08	<0.5	29	7.8	36.8	0.53J	44	80.8
S68B	10–20	9/19/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		3/5/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/10/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
S68C	18–28	9/19/07	<0.5	4.2	<0.44	4.2	<0.45	10	14.2
		3/5/08	<0.5	7	<0.44	7	<0.45	10	17
		9/10/08	<0.5	10	<0.44	10	<0.45	15	25
S68D	30–40	9/19/07	<0.5	56	1.1	57.1	1	80	138.1
		3/5/08	<0.5	90	1.7	91.7	0.56JJ	75	166.7
		9/10/08	<0.5	110	1.8	111.8	<0.45	110	221.8
S69B	10–20	9/20/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		3/5/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/10/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
S69C	20–30	9/20/07	<0.5	<0.65	<0.44	ND	<0.45	1	1
		3/5/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/11/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
S69D	30–40	9/20/07	<0.5	<0.65	<0.44	ND	<0.45	0.54J	ND
		3/5/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/11/08	<0.5	0.83J	<0.44	0.83J	<0.45	0.74J	ND
S70B	10–20	9/20/07	<0.5	16	0.61J	16	<0.45	22	38
		3/1/08	1.3	19	0.72J	19	<0.45	13	33.3
		9/13/08	<0.5	15	0.79J	15	<0.45	15	30
S70C	20–30	9/20/07	<0.5	25	11	36	1.5	35	72.5
		3/1/08	2.3	34	18	52	<0.45	23	77.3
		9/13/08	<0.5	26	14	40	0.83J	27	67
S70D	30–40	9/20/07	<0.5	17	7.4	24.4	1.6	19	45
		3/1/08	8	35	11	46	<0.45	12	66
		9/13/08	<0.5	17	8.5	25.5	0.72J	15	40.5
S71B	10–20	9/19/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		3/1/08	0.52J	3.1	<0.44	3.1	<0.45	<0.5	3.1
		9/11/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
S71C	20–30	9/19/07	<0.5	20	14	34	1.3	45	80.3
		3/1/08	0.7J	28	23	51	<0.45	34	85
		9/11/08	<0.5	21	13	34	<0.45	33	67
S71D	30–40	9/19/07	<0.5	7.7	4.8	12.5	1	19	32.5
		3/1/08	0.88J	10	7.2	17.2	<0.45	13	30.2
		9/13/08	<0.5	8.8	5.2	14	<0.45	16	30

Table 8 (continued). COPC Concentrations at the Building 100 Area (reported in micrograms per liter)[a]

Location	Screen Depth (ft)	Date Sampled	TCE	cis-1,2-DCE	trans-1,2-DCE	Total 1,2-DCE[b]	1,1-DCE	Vinyl chloride	Total COPC[c]
FDEP MCL			**3**	**70**	**100**	**63**	**7**	**1**	
S72B	10–20	9/19/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		3/5/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/15/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
S72C	20–30	9/19/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		3/5/08	<0.5	0.82J	<0.44	0.82J	0.53J	<0.5	ND
		9/15/08	<0.5	1.2	<0.44	1.2	0.5J	<0.5	1.2
S72D	30–40	9/19/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		3/5/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/15/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
S73B	10–20	9/19/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		3/4/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/11/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
S73C	20–30	9/19/07	<0.5	<0.65	3.9	3.9	<0.45	18	21.9
		3/4/08	<0.5	<0.65	4.8	4.8	<0.45	18	22.8
		9/11/08	<0.5	<0.65	3.2	3.2	<0.45	16	19.2
S73D	30–40	9/19/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		3/4/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/11/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
PIN21	**Perimeter Monitoring Wells**								
0502	7–17	9/19/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		3/4/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/16/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0503	20–28	9/19/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		3/4/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/15/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0504	7–17	9/18/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		3/1/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/16/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0505	20–28	9/18/07	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		3/1/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
		9/16/08	<0.5	<0.65	<0.44	ND	<0.45	<0.5	ND
0512	20–29.5	9/19/07	<0.5	5.9	<0.44	5.9	<0.45	14	19.9
		9/10/08	<0.5	7.6	<0.44	7.6	<0.45	13	20.6

[a]"<" values are reporting limits.
[b]Total 1,2-DCE is the sum of cDCE and tDCE
[c]Total COPC is the sum of the individual COPC concentrations. The cDCE and tDCE 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.
Arsenic, while a COPC, is not included in this table, nor in the total COPC value.

Table 9. Relative Percent Difference (RPD) for Duplicate Samples

Sample	Duplicate Sample	Analyte	Duplicate Result	Units	Qualifier	MDL	Sample Result	Qualifier	RPD
PIN12-0524	PIN24-0504	1,1-Dichloroethane	0.53	µg/L	J	0.52	0.52	U	
		1,1-Dichloroethylene	28	µg/L		0.45	27		3.64
		Benzene	1.2	µg/L		0.5	1.2		
		cis-1,2-Dichloroethylene	600	µg/L		6.5	610		1.65
		trans-1,2-Dichloroethylene	18	µg/L		0.44	18		0
		Vinyl chloride	970	µg/L		5	1000		3.05
PIN12-0530	PIN24-0503	1,1-Dichloroethane	1.1	µg/L		0.52	0.52	U	
		1,1-Dichloroethylene	9.9	µg/L		0.45	1.4		
		cis-1,2-Dichloroethylene	160	µg/L		3.2	30		136.84
		trans-1,2-Dichloroethylene	2.6	µg/L		0.44	0.68	J	
		Vinyl chloride	43	µg/L		0.5	4.6		161.34
PIN15-0537	PIN24-0506	1,1-Dichloroethylene	1.9	µg/L		0.45	2		
		Aluminum	0.77	mg/L		0.05	0.1	B	
		Benzene	4	µg/L		0.5	3.8		5.13
		cis-1,2-Dichloroethylene	450	µg/L		16	510		12.50
		Iron	1.5	mg/L		0.05	2.9		63.64
		trans-1,2-Dichloroethylene	5.6	µg/L		0.44	7.9		34.07
		Trichloroethylene	0.61	µg/L	J	0.5	0.73	J	
		Vinyl chloride	1000	µg/L		12	930		7.25
PIN15-0567	PIN24-0507	1,4-Dioxane	4.2	µg/L		0.54	3.7		12.66
		Aluminum	0.24	mg/L		0.05	0.22		
		Benzene	1.3	µg/L		0.5	1.4		
		cis-1,2-Dichloroethylene	19	µg/L		0.65	20		5.13
		Iron	2.7	mg/L		0.05	2.9		7.14
		trans-1,2-Dichloroethylene	6.4	µg/L		0.44	6.6		3.08
		Trichloroethylene	0.52	µg/L	J	0.5	0.63	J	
		Vinyl chloride	44	µg/L		0.5	47		6.59

MDL = method detection limit
U = not detected
J = Estimated value, result is between the reporting limit and the method detection limit.

BP01 15.24
20-M025 14.9
20-M024 11.05
20-RW01 14.84
20-0503 15.14
20-M012 15.78
20-RW02 14.99
20-M035 15.26
20-RW03 15.2
M40S 15.28
20-M003 15.08
PZ03 15.46
02-PZ04 15.65
M14S 15.39
15-0563 14.92
15-0565 14.48
15-0577 14.75
15-0575 14.69
15-0573 13.66
M27S 14.04
15-0561 14.83
15-0567 14.28
15-0530 14.23
M03S 15.31
15-0591 14.77
15-0516 13.84
15-0515 14.27
15-0520 13.72
15-0588 15.35
M16S 15.27
East Pond
West Pond
M32S 14.72
15-E001 13.7
15-0507 13.62
W005 14.25
02-PZ05 15.14
15-0571 14.67
15-0510 14.4
Pond 5
P502 13.8
PZ08 14.56
10-0500 15.18
06-0500 15.2
09-0500 15.34
06-0501 15.57
12-0523 15.73
12-RW01 15.2
12-0521 15.3
S37B 15.21
S31B 15
S32B 15.13
S30B 15.22
12-0509 15.08
18-0504 15.64
18-0502 15.34
18-0500 15.5
18-RW02 15.39
RW0501 15.35
18-0524 15.25
18-0525 15.58
18-RW03 15.27
18-0521 15.11
18-0522 15.24
18-0526 14.53
P501 12.9
S29C 14.97
S35B 14.77
S36B 14.59
TE03 14.45
02-PZ09 14.49
0557A 14.54
0558A 14.34
0556A 14.47
0555A 14.14
0554A 13.82
0553A 13.66
S72B 13.2
S72C 13.13
12-0541 12.89
S71B 13.48
S71C 13.64
12-0513 13.79
S70B 13.76
S70C 13.73
12-0526 13.29
S73B 13.33
S73C 13.06
12-0539 13.04
12-0517 14.48
12-0525 14.07
S68C 13.78
S68B 13.99
S69B 13.2
S69C 13.34
12-0537 12.63
Southwest Pond
South Pond
South Pond
S001 13.67
SW01 13.69
21-0505 13.53
21-0504 13.43
21-0512 13.19
12-0529 13.26
12-0531 13.22
12-0533 12.99
21-0503 12.71
21-0502 13.11
12-0535 12.75
0552-1 12.9
0551-1 7.52
0550-1 12.08
BR01 12.9

S35B 14.77 Well Number and Groundwater Elevation in Feet (MSL)
Monitoring Well
Extraction Well
Surface Sample
Piezometer
Water Level Not Used in Contouring
14 Water Table Contour in Feet (MSL)
Contour Interval = 1.0 Feet
Inferred Groundwater Flow Direction
Slurrywall
Fence
Road
Railroad
Tank
Concrete
Building
Pond

N

120 60 0 120 240 360 Feet

U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION, COLORADO

Prepared by S.M. Stoller Corporation
UNDER CONTRACT No. DE-AC01-07LM00004

Plate 1: Sitewide Shallow Surficial Aquifer Contours
Pinellas, Florida, September 2008

DATE PREPARED: December 5, 2008
G.T. NUMBER: N0129900-01

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West Pond
East Pond
Pond 5
Southwest Pond
South Pond
N
120 60 0 120 240 360 Feet
M40D 15.21 Well Number and Groundwater Elevation in Feet (MSL)
Monitoring Well
Extraction Well
Water Level Not Used in Contouring
14 Water Table Contour in Feet (MSL)
Inferred Contour
Contour Interval = 1.0 Feet
Inferred Groundwater Flow Direction
Slurrywall
Fence
Road
Railroad
Tank
Concrete
Building
Pond
U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION, COLORADO
Prepared by
S.M. Stoller Corporation
Under DOE Contract
No. DE-AC01-07LM00060
Plate 1: Sitewide Deep Surficial Aquifer Contours
Pinellas, Florida, September 2008
DATE PREPARED:
December 8, 2008
FILENAME:
N0129900-02