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Pinellas Environmental Restoration Project

Sitewide Environmental Monitoring Quarterly Progress Report for the Young - Rainey STAR Center October through December 2004

January 2005

U.S. Department of Energy

Office of Legacy Management

Work Performed Under DOE Contract No. DE–AC01–02GJ79491
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Acronyms and Abbreviations

bls	below land surface
°C	degrees Celsius
CMS	Corrective Measures Study
CMIP	Corrective Measures Implementation Plan
COPC	contaminant of potential concern
CRDL	contract required detection limit
DCE	dichloroethene
DOE	U.S. Department of Energy
EA	environmental assessment
EPA	U.S. Environmental Protection Agency
FDEP	Florida Department of Environmental Protection
FONSI	Finding of No Significant Impacts
ft	feet
ft/ft	feet per foot
gpm	gallons per minute
HSWA	Hazardous and Solid Waste Amendment
HRC	Hydrogen Release Compound®
ICM	interim corrective measures
IDL	instrument detection limit
IMW	Interim Measures Work (Plan)
IWNF	Industrial Wastewater Neutralization Facility
MCL	maximum contaminant level
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 contaminant of potential concern
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). The STAR Center, while owned by DOE, 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) at the site to gather information on potential releases of hazardous materials. In February of 1990, EPA issued a Hazardous and Solid Waste Amendment (HSWA) permit to DOE, enabling DOE to investigate and perform remediation activities in those areas 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 the EPA. The Florida Department of Environmental Protection (FDEP) issued a new HSWA Permit to DOE in January 2002.

Administration of DOE activities at the facility 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 (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, 11 of the 15 SWMUs were recommended by DOE and approved by EPA Region IV and the FDEP for no further action (DOE 1994).
A twelfth site, the Former Pistol Range Site, was remediated in 1993 and recommended by DOE and approved by EPA Region IV and the 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. Remediation of the West Fenceline Site was completed in 1997 and DOE recommended, and EPA Region IV and FDEP approved, no further action. 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 sites that have contamination in the surficial aquifer ground water at levels in excess of protective standards. These four SWMUs, 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), are undergoing remediation activities. Two SWMUs, PIN06 and PIN12, are currently being remediated together because of their similar ground water

contamination and proximity. These two SWMUs are collectively known as the Building 100 Area. Figure 2 depicts the location of the four SWMUs.

Additional background information relative to each SWMU is briefly described below. This document also serves as the quarterly progress report for each of these four SWMUs. The results of monitoring activities, a summary of the treatment system performance, 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 dichloromethane (also known as 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 the 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 the DOE were housed in the building. SWMU PIN12 consists of the liquid waste drainage system serving 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 above-ground 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 above-ground 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 ground water 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 this same document on November 15, 1999.

Commencing 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) was prepared and 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 final technology for each task will be identified at a later date.

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

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 around three ground water monitoring wells through nine injection points surrounding each monitoring well. Ground water samples have been 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 in the subsurface. HRC was selected because it is an effective technology for optimizing degradation rates of chlorinated hydrocarbons dissolved in ground water. The continuous hydrogen source provided by the HRC can reduce the concentration of dissolved phase chlorinated hydrocarbons by greatly enhancing the reductive declorination 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* 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. Stoller is continuing to assess the factors that potentially limit the biodegradation process.

1.2 Northeast Site

In the late 1960s, before 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. An Interim Corrective Measures (ICM) Study was developed and submitted to EPA and approval of this document was received in October 1991. An interim ground water recovery system for the Northeast Site was installed, and operation commenced in January 1992. The implementation of this ICM system at this site is consistent with the regulatory goals of the EPA's RCRA Corrective Actions (Subpart S).

The ICM 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 system upgrade, the system was reconfigured and became operational on March 1, 1994.

Between August and October 1995, after EPA and FDEP approval, a portion of the Northeast Site was excavated to remove debris and other materials that could inhibit future corrective measures. 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 1996).

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

Concurrent with the preparation of the IMW Plan, a National Environmental Policy Act (NEPA)Environmental Checklist recommending a Categorical Exclusion was prepared and approved by DOE on December 19, 2001. Categorically excluding the Area A pilot test activity was approved based upon 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 of Corrective Action at the Northeast Site* (EA).

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 ground water 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. 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 partially complete on January 31, 2003, and totally finished 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. The *Northeast Site Area A NAPL Remediation Final Report* (DOE 2003), 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 Electro-Thermal Dynamic Stripping Process. Construction of the NAPL Area B treatment system began in July 2004, and system startup is scheduled for mid-2005. Significant events associated with NAPL remediation during this reporting period are presented in the *Northeast Site Non-Aqueous Phase Liquids Interim Measures Progress Report July through September 2004* (DOE 2004a).

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, trichloroethene (TCE), and arsenic were detected in surficial aquifer ground water at concentrations above Federal and State MCLs. The recommended remediation alternative for the WWNA/Building 200 Area was ground water 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 and that the recovery well in the WWNA/Building 200 Area will withdraw surficial aquifer ground water directly from the arsenic plume and thereby reduce the contaminant mass and prevent contaminant migration.

FDEP response to the CMS/CMIP concerning arsenic soil contamination in the upper 2 ft 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 the FDEP's position regarding the arsenic contamination. EPA also requested an addendum or modification to the CMIP that addresses DOE's final selection of the remediation technology and a timeline for the completion of these activities.

In early June 1999, the WWNA recovery well commenced operation. All arsenic concentrations 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 ground water extraction are reported in the WWNA/Building 200 Area CMIP Addendum (DOE 2000b). Modifications to the recovery of ground water were proposed based on data collected through November 1999 and consisted of the installation of two new recovery wells screened at shallow intervals. The CMIP Addendum was submitted to the regulators and approved by FDEP and EPA. 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. Current activities at the WWNA include ground water extraction from three recovery wells, PIN18−RW02, −RW03, and −RW0501, that discharge to the STAR Center's wastewater system. Table 1 lists the results of the analysis of arsenic in ground water that is being recovered from these three wells.

1.4 Site Update

With the exception of the Northeast Site NAPL Area B construction activities and normal operations of the Building 100 recovery wells and air stripper and WWNA recovery wells, no other work is being performed at the STAR Center. Significant events associated with NAPL remediation during this reporting period are presented in the *Northeast Site Non Aqueous Phase Liquids Interim Measures Progress Report October through December 2004* (DOE 2004a). Additionally, selected geochemical parameters to support the bioremediation baseline sampling have been collected and are presented in Table 2.

Risk Based Corrective Action (RBCA) legislation is currently being evaluated for applicability to assist in expediting closure at some or all of the SWMUs at the STAR Center. A meeting with the regulators to discuss viable options under RBCA is scheduled for early January 2005.

1.5 Waste Minimization and Pollution Prevention

Based on the Federal Pollution Prevention Act and requirements in the HSWA Operations Permit, waste minimization efforts at the STAR Center are documented and reported annually. For 2004, several significant waste minimization and pollution prevention activities were successful. The majority of these activities resulted from the removal of the ground water treatment system at the Northeast Site and abandonment and removal of several associated recovery wells, and include the following:

- Used hydraulic oil was recycled,
- Empty plastic 55-gallon drums (19) were recycled,
- 2.6 tons of steel was recycled as scrap metal,
- 283 tons of concrete was recycled.

In addition, much of the treated water from the Building 100 and the 4.5 Acre Site ground water treatment systems is diverted to the STAR Center's cooling system to be used as recirculating cooling water.

1.6 Quarterly Site Activities

Stoller personnel conducted the following tasks at the STAR Center to fulfill the requirements of the scope of work for quarterly sampling:

- Obtained water-level measurements from all accessible monitoring wells, recovery wells, and ponds on October 6, 2004.
- Conducted the quarterly sampling event in October 2004. The sampling event included collecting water samples from 59 monitoring and recovery wells. VOCs samples were collected at 23 wells and arsenic was sampled at 32 wells.
- Ten locations were sampled for enhanced bioremediation parameters.
- Reported the results of quarterly sampling events (this document).
- Performed Florida Petroleum Range Organic sampling on the 15 monitor wells located inside remediated NAPL Area A. The sampling was performed to compare pre- and post-remediation contaminant levels.

2.0 Water-Level Elevations

2.1 Work Conducted and Methods

Within a 9-hour period on October 6, 2004, depth-to-water measurements were taken at all accessible monitoring wells and extraction wells at the STAR Center. The water levels were measured with an electronic water-level indicator with the exception of some of the ponds, which are measured with gauging stations. Ground water and surface-water elevations are listed in Table 3.

2.2 Ground Water Flow

Ground water and surface-water elevations were used to construct sitewide ground water contour maps of the shallow and deep surficial aquifers (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, respectively).

The water levels throughout the STAR Center indicate that the water table is highest in the north-central parts of the site (Plates 1 and 2). As ground water flows from this recharge area, it disperses to the west, south, and east. These flow patterns are similar for both the shallow and deep surficial aquifers, and are consistent with previously observed flow patterns.

Along the northern boundary of the Northeast Site, the contours near the slurry wall for the past several years have indicated that the wall has been a significant barrier to ground water flow. This pattern was observed again in October 2004. As seen on Figure 4, in October 2004 there

was a differential of about 0.7 ft between the downgradient and upgradient sides of the wall as measured in monitoring wells PIN15−M24D and −M33D. As in July 2004, this differential is less than the historical range of about 2 to 5 ft, and is believed to be the result of currently not withdrawing ground water at the Northeast Site due to NAPL treatment activities. This has in turn resulted in a return to more natural ground water flow patterns for the surficial aquifer, with flow primarily to the east. Water-table elevations indicate that the shallow surficial aquifer was slightly recharging the East Pond in October 2004 (Figure 3). This recharge pattern is similar to that observed the previous two quarters.

In the shallow surficial aquifer at the Northeast Site, the hydraulic gradient was approximately 0.006 feet per foot (ft/ft), with a general component of flow to the east (Plate 1). This flow pattern is similar to previously observed flow patterns under static, non-pumping conditions. Using Darcy's Law, along with approximations of 1 ft/day for hydraulic conductivity and 0.3 for effective porosity, ground water at the Northeast Site is estimated to move about 7 ft/year. This velocity is slightly less than previous estimates of 17 and 22 ft/year, but similar to that observed in July 2004. In October 2004, similar flow patterns were observed in the deep surficial aquifer (Plate 2).

In the south-central part of the STAR Center, surficial aquifer flow is influenced by ground water withdrawals from recovery wells PIN18−RW02, −RW03, and –RW0501 at the WWNA, and recovery wells PIN12−RW01 and –RW02 at Building 100 (Figures 5 and 6). During the previous six quarters, shallow ground water beneath Building 100 was observed to flow to the southeast under a very slight gradient. In October 2004, the overall general component of ground water flow was again to the southeast. The hydraulic gradient beyond the influence of pumping at the Building 100 Area was about 0.001 ft/ft. Using the approximations mentioned above, ground water flow velocity in these areas is estimated to be less than 2 ft/year. Shallow ground water at the WWNA flows to the southeast, except where affected by recovery well withdrawals.

Water-level elevations in the three wells screened in the upper part of the Floridan aquifer are presented in Table 4. The elevations in these wells indicate that the potentiometric surface of the Floridan aquifer at the site was about 1.3 ft higher in October 2004 than in July 2004.

A downward vertical hydraulic differential of approximately 7.1 ft existed between the surficial aquifer wells and Floridan aquifer wells at the Northeast Site. Table 5 illustrates the vertical hydraulic differential. This differential is consistent with the historical range of 5 to 9 ft.

Surface-water elevations were recorded from the East, South, West, and Southwest Ponds at the site and are presented in Table 6. The ponds are hydraulically connected to the shallow surficial aquifer system (Plate 1). The South and Southwest Ponds elevations have always been essentially the same. The West Pond elevation was read from a new staff gauge that was installed on June 9, 2004.

3.0 Ground Water Sampling and Analytical Results

3.1 Work Performed

During quarterly sampling in October 2004, ground water samples were collected from 59 monitoring and recovery wells. VOCs analyses were performed on 23 samples using EPA Method SW-8260. Arsenic was analyzed in 32 samples using EPA SW-846 Method 8260. Ten locations were analyzed for enhanced bioremediation parameters. Twenty-one wells were sampled for Florida Petroleum Range Organics. Laboratory reports are provided in Appendix A.

During the period of October 1 to December 30, 2004, VOCs, SVOCs, iron, and hardness (as $CaCO_3$) were measured for the Building 100 treatment system and results are provided in Appendix B. Laboratory reports for the three recovery wells and the two effluent samples from the WWNA are provided in Appendix C.

All samples were collected in accordance with the Stoller *Sampling Procedures for the Young - Rainey STAR Center and 4.5 Acre Site* (DOE 2004b), using FDEP procedures. All samples collected were submitted to Accutest Laboratories for analysis. Accutest is accredited by the Florida Department of Health in accordance with the National Environmental Laboratory Accreditation Conference, certification number E83510. All but seven of the monitoring wells were micropurged using a dedicated bladder pump, and sampling was performed when the field measurements stabilized. The remaining wells were conventionally purged with a peristaltic pump or a 2-inch diameter stainless-steel submersible pump; purging was considered complete once field measurements had stabilized. Extraction wells were sampled using their associated flowlines with dedicated sampling ports. Table 7 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)

Table 8 shows the results of arsenic sampling at seven Northeast Site wells. Arsenic concentrations ranged from nondetect to 0.138 mg/L in PIN15−M14S.

Table 9 shows the results of petroleum hydrocarbon samples collected from inside and bordering the former NAPL Area A. Concentrations ranged from nondetect to 4.61 milligrams per liter (mg/L) in PIN15−0575.

Concentrations of contaminants of potential concern (COPCs) in samples collected from wells at the Northeast Site (PIN15) are included in Table 10, which also shows the previous four quarters of data for comparison purposes. Figure 7 shows the total COPCs (TCOPCs) concentrations.

No COPCs were detected in the seven monitoring wells listed below:

PIN15–0560	PIN15–0562	PIN15–0565	PIN15–M31S
PIN15–0561	PIN15–0564	PIN15–M29S	

The 14 monitoring wells listed below contained detectable COPCs:

PIN15–0557	PIN15–0567	PIN15–0575	PIN15–0578	PIN15–M30S
PIN15–0563	PIN15–0573	PIN15–0576	PIN15–M29D	PIN15–M31D
PIN15–0566	PIN15–0574	PIN15–0577	PIN15–M30D	

TCOPCs concentrations ranged from below detection limit to 2,620 µg/L. Well PIN15−M30D contained the highest TCOPC value, and the COPC compound detected at the highest concentration was vinyl chloride at 2,120 µg/L.

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

Table 8 shows the results of arsenic sampling in the Building 100 Area. Arsenic values ranged from nondetect to 0.0615 mg/L in PIN12−S68B.

TCOPCs concentrations in samples collected from the two recovery wells sampled at the Building 100 Area are included in Table 11, which also shows the previous four quarters of data for comparison purposes. Figure 8 shows the TCOPCs concentrations.

Both recovery wells contained COPCs at detectable levels. The wells are:

PIN12–RW01	PIN12–RW02

TCOPCs concentrations ranged from 6,750 to 1,070.7 µg/L. The COPC compound detected at the highest concentration was TCE at 4,200 µg/L in PIN12−RW01.

3.2.3 Wastewater Neutralization Area (PIN18)

The volatile COPC at the WWNA is vinyl chloride. It was not analyzed this quarter in any PIN18 wells during quarterly sampling.

Arsenic samples were collected from seven monitoring wells and three recovery wells. Results of arsenic samples from the three recovery wells that are sampled monthly are presented in Table 1. Concentrations of COPCs from quarterly sampling are listed in Table 12 and TCOPCs (arsenic and vinyl chloride) are shown in Figure 9.

No arsenic was detected in the three wells listed below.

PIN18–0521	PIN18–0522	PIN18–0523

The seven monitoring and recovery wells listed below had detectable arsenic concentrations.

PIN18–0500	PIN18–0524	PIN18−RW02	PIN18−RW0501
PIN18–0502	PIN18–0525	PIN18−RW03	

The highest concentration of arsenic detected was 116 µg/L in PIN18−RW0501 (note that the units for arsenic are converted from mg/L to µg/L so that TCOPCs for this area could be calculated using consistent units).

3.3 Quality Assurance/Quality Control

The analytical results from the analytical laboratory, Accutest, were checked for quality assurance/quality control (QA/QC) through duplicate samples and trip blanks. Detected analytes (VOCs and arsenic) for each duplicate sample are listed in Table 13. The duplicate sample results were compared and the relative percent differences (RPDs) between the results were calculated. There were two duplicates analyzed for VOCs during quarterly sampling, and two duplicates analyzed for arsenic.

A total of 76 duplicate analyses for individual analytes were performed. One sample duplicate pair failed to meet the guidance criteria for relative percent difference for Florida petroleum range organics. The second sample duplicate pair failed for methylene choride. This is a failure rate of 2.6 percent. All data passed QA/QC criteria at a Class A level, indicating that all data may be used for quantitative and qualitative purposes.

Duplicate samples should be collected at a frequency of one duplicate for every 20 or fewer samples. There were 23 ground water samples analyzed for VOCs, with two duplicate VOC samples collected. There were 32 ground water samples analyzed for arsenic, with two duplicate samples. The duplicate requirements for this sampling event were met for VOCs and arsenic.

During the quarterly sampling event, two trip blanks and one equipment blank were submitted for analysis. The equipment blank showed 1.2 µg/L of methylene chloride. This is believed to be contamination from the analyte-free rinse water supplied by the laboratory, which noted a problem with methylene chloride in the laboratory make-up water during this sampling event.

Data validation showed a problem with methylene chloride contamination from the laboratory in both Sitewide and 4.5 Acre Site samples. The problem was noted in two trip blanks and one equipment blank that were positive for methylene chloride at concentrations between 1.1 and 1.2 µg/L. The laboratory indicated that the problem was in the make-up water. All positive methylene chloride results were then evaluated to determine if any additional problems existed. Two 4.5 Acre Site samples (PIN20−0502 and –M001) appeared to have been contaminated by methylene chloride during dilution, so both analysis were “R” qualified in the SEEPro database. One duplicate sample for location PIN15−M29S showed 13.5 µg/L methylene chloride while the original sample was nondetect. This location has had methylene chloride detections of this magnitude in the past, but not within the last 5 years. Since this discrepancy cannot be clearly identified as a contamination problem, the results from this location will be monitored over the next several sampling periods to determine what action, if any, should be taken.

The laboratory also had a problem with arsenic being present in the method blank. Six samples were affected by this problem and the data were "B" qualified by the laboratory.

A data validation software module for identifying and tracking anomalous ground water data points within the SEEPro database was used this quarter. The software prints a report of analytical results that fall outside of historical minimum or maximum values. Location PIN12−S73B is being tracked from the January and April events because toluene was detected in a well where it had not previously been present. No toluene was detected in this well during the October event. Tracking of toluene in this well will continue. During the August monthly sampling, the Building 100 Area treatment system influent sample showed methylene chloride at 66.2 µg/L. Methylene chloride has not previously been detected in the influent sample and is not present in samples from monitoring wells at the site. The monthly influent samples from September, October, and December showed that methylene chloride was nondetect. The November event showed methylene chloride at 16.1 µg/L but the laboratory notes that it is believed to be a laboratory contaminant. The influent will continue to be monitored on a monthly basis to determine if the methylene chloride is actually present or if it is a laboratory or sampling contaminant.

The laboratory has been requested to provide information on how long the methylene chloride contamination problem has been present and what they have done to remedy the situation.

4.0 Treatment System and Recovery Well Performance

4.1 Northeast Site and Building 100

The new treatment system began treating ground water from the Building 100 Area recovery wells on May 5, 2004. The system and wells were operated for just a few hours to allow for sampling of the effluent and they were shut down after the sample was collected. This allowed time to review the analytical results to verify the air stripper was operating efficiently and within regulatory limits of the STAR Center's Wastewater Discharge Permit.

Based on the treatment system's effluent analytical results (Table 14), which are under the Discharge Permit limits, the new system and wells began continuous operations on Monday May 10, 2004.

The treatment system is a small skid-mounted assembly that contains a low-profile air stripper, a blower, and two transfer pumps. The air stripper contains four shallow trays to strip the VOCs from the ground water. The treatment system and a surge tank reside on a concrete containment pad.

FeRemede® is being utilized at the new Building 100 Area treatment system to control the deposition of iron and hardness salts in the air striper. Additionally, sodium hypochlorite is also being utilized as a microbiocide to control biological growth in the air stripper.

From October 1 through December 31, 2004, 589,242 gallons of ground water were processed by the Building 100 treatment system from the Building 100 Area recovery wells. Figures 10, 11,

and 12 present the monthly volume of ground water recovered during this quarter from the Building 100 recovery wells.

Since startup of the Building 100 treatment system, a summary of ground water recovery volume from the Building 100 Area recovery wells is shown in Table 15.

Table 16 presents the calculated mass of selected analytes recovered with the Building 100 Area treatment system for each month of this reporting period. These monthly results are based on the influent ground water concentration and flow.

4.2 Wastewater Neutralization Area

Two WWNA recovery wells (PIN18−RW02 and −RW03) are targeted to each produce approximately 2.5 gallons per minute (gpm) continuously with an electrical submersible pump set in each well at approximately 12 ft below land surface (bls). During this quarter, it was necessary to decrease the pumping rate at these wells due to falling ground water levels.

The third recovery well, PIN18−RW0501 is operating at approximately 0.8 gpm with a submersible electric pump installed at 15 ft below top of casing. Ground water recovery from PIN18−RW0501 was started on June 11, 2003. To date, there have been no exceedances of the WWNA discharge permit limits for arsenic.

The effluent ground water from each well is combined into a common header pipe and discharged into the industrial wastewater-receiving tank at the IWNF. During this quarter, 578,478 gallons of ground water were recovered from the subsurface.

5.0 Conclusions

The following conclusions are based on the quarterly sampling conducted in October 2004.

- The surficial ground water flow rate and flow direction throughout the site were similar to those observed in previous quarters.
- The highest concentration of COPCs was detected at the Building 100 Area in recovery well PIN12−RW01.

6.0 Tasks to be Performed Next Quarter

The following tasks are expected to be conducted during the next quarterly period (January through March 2005):

- The next scheduled quarterly sampling event will occur in January 2005.
- Monthly sampling and analysis of ground water will continue in order to provide compliance and system operations data.
- Utilization of the dedicated bladder pumps for quarterly sampling using the micropurging technique will continue.

7.0 References

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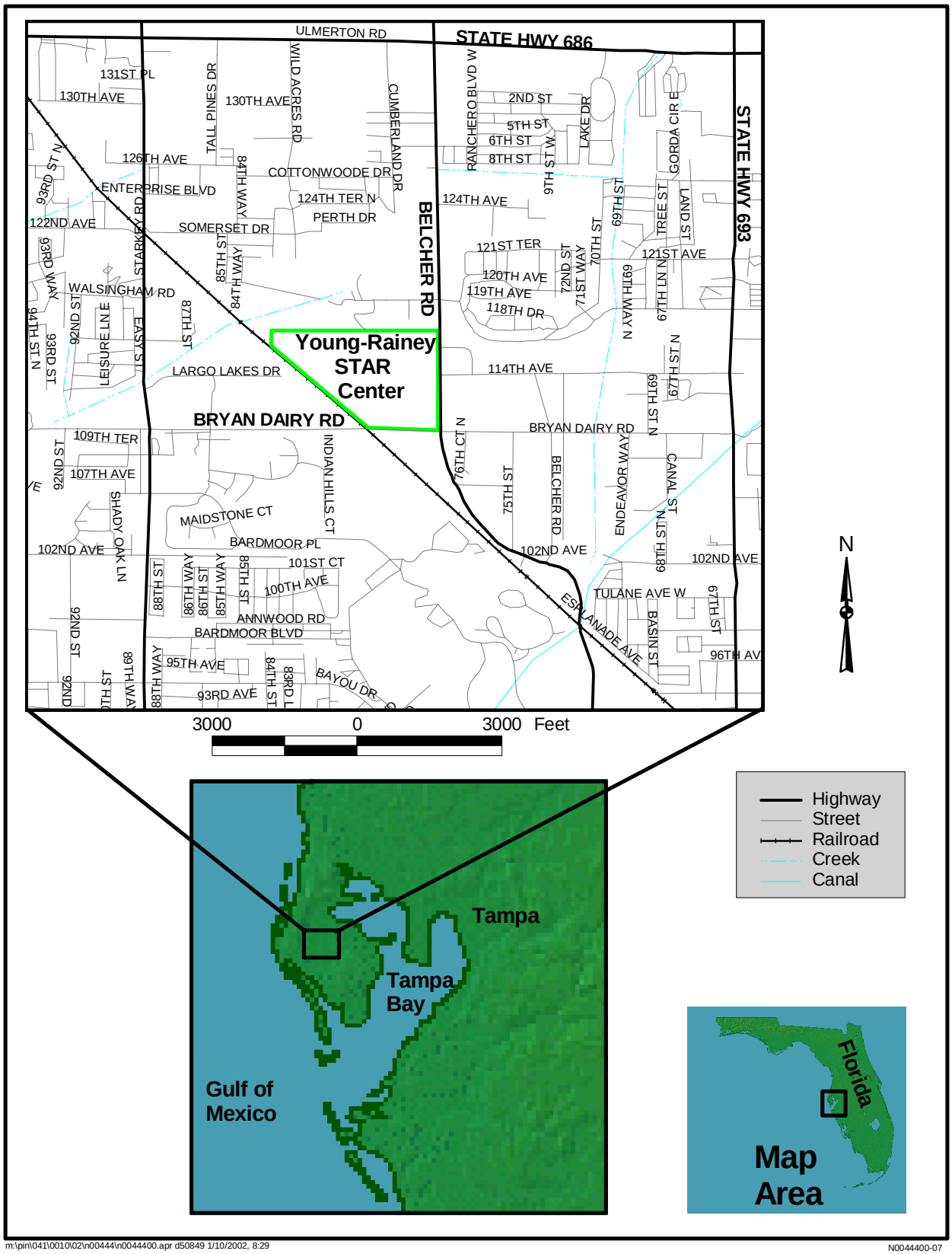

Figure 1. Young - Rainey STAR Center Location

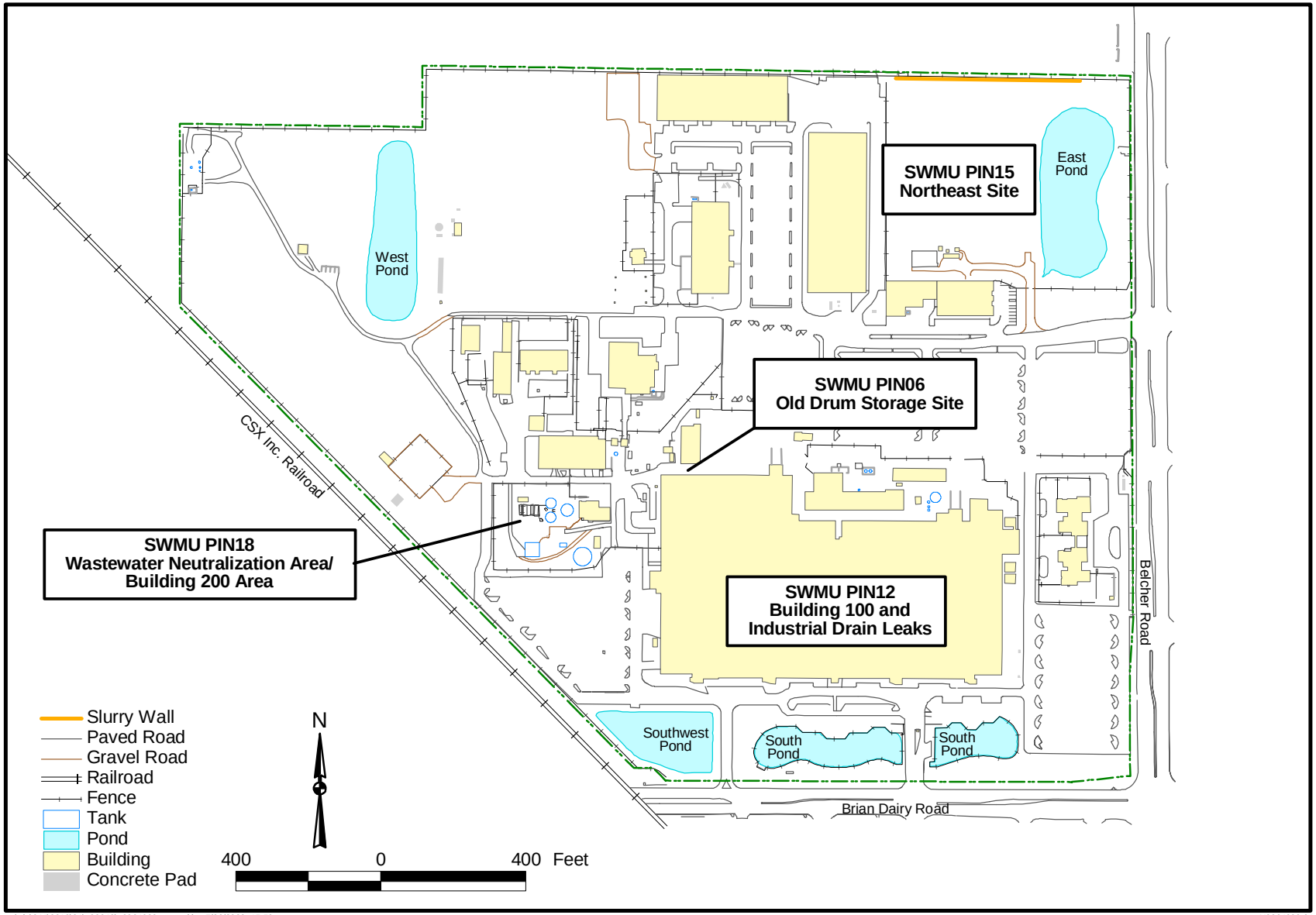

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Figure 2. Location of STAR Center Solid Waste Management Units (SWMUs)

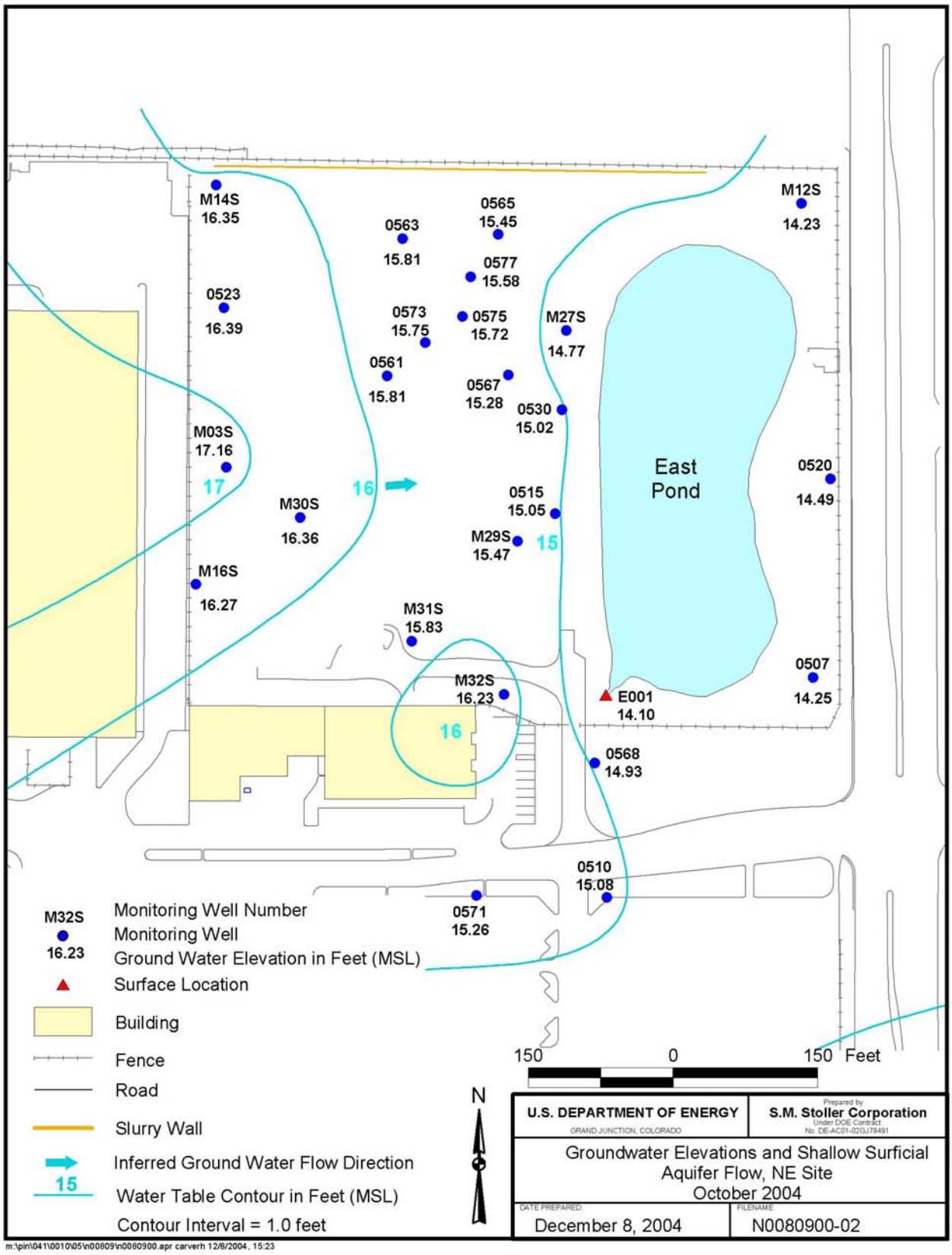


Figure 3. Ground Water Elevations and Shallow Surficial Aquifer Flow, Northeast Site, October 2004

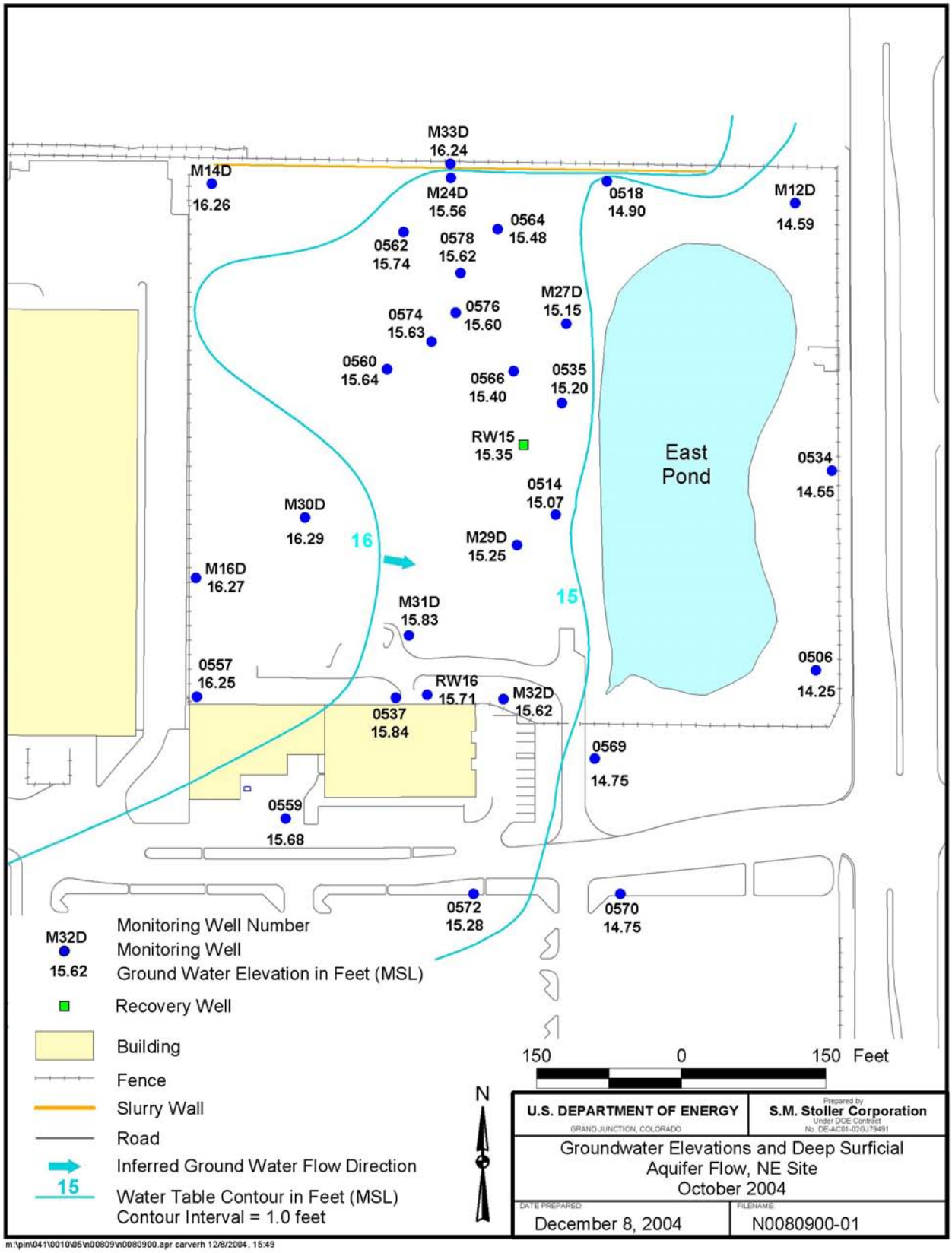


Figure 4. Ground Water Elevations and Deep Surficial Aquifer Flow, Northeast Site, October 2004

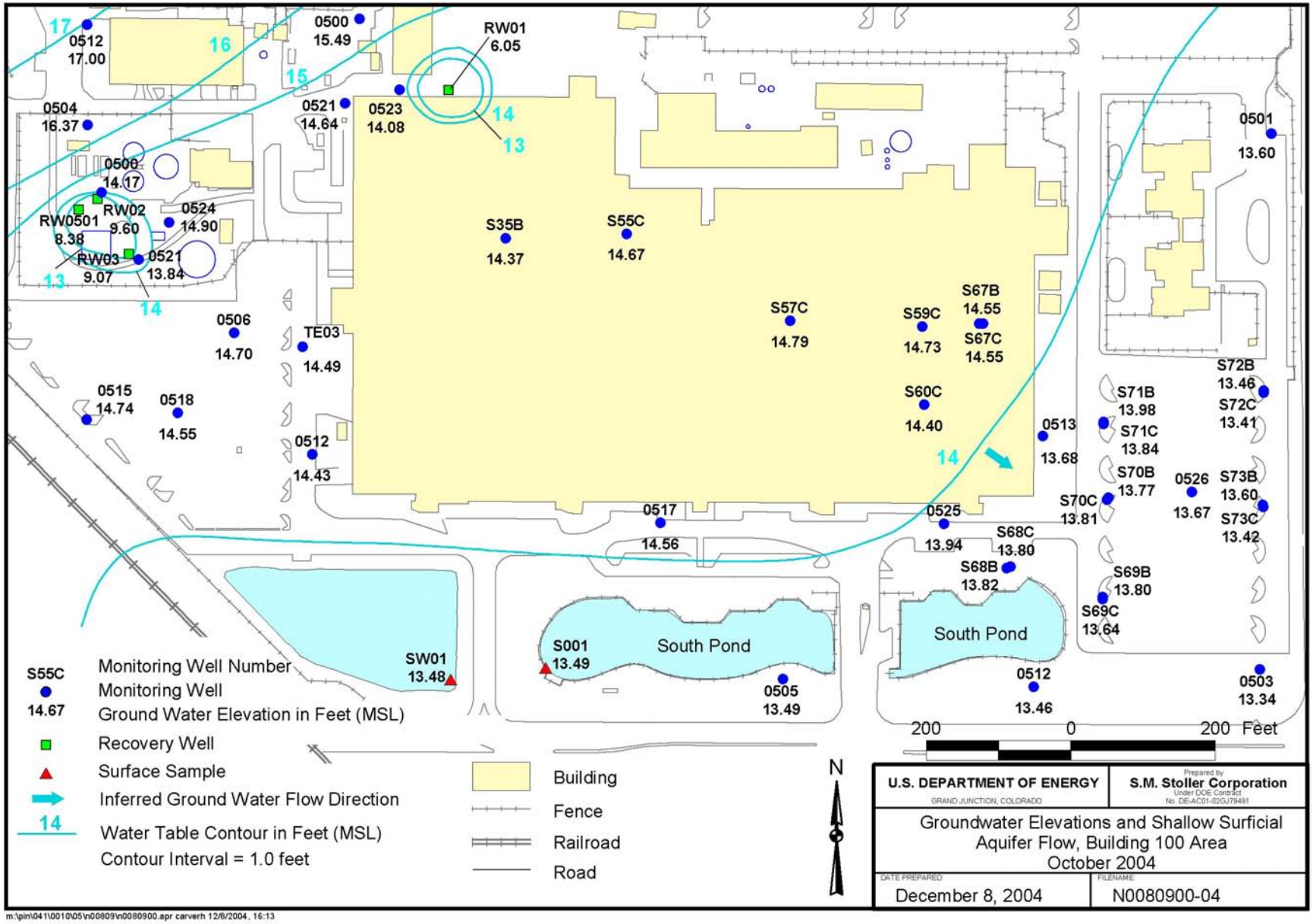


Figure 5. Ground Water Elevations and Shallow Surficial Aquifer Flow, Building 100 Area, October 2004

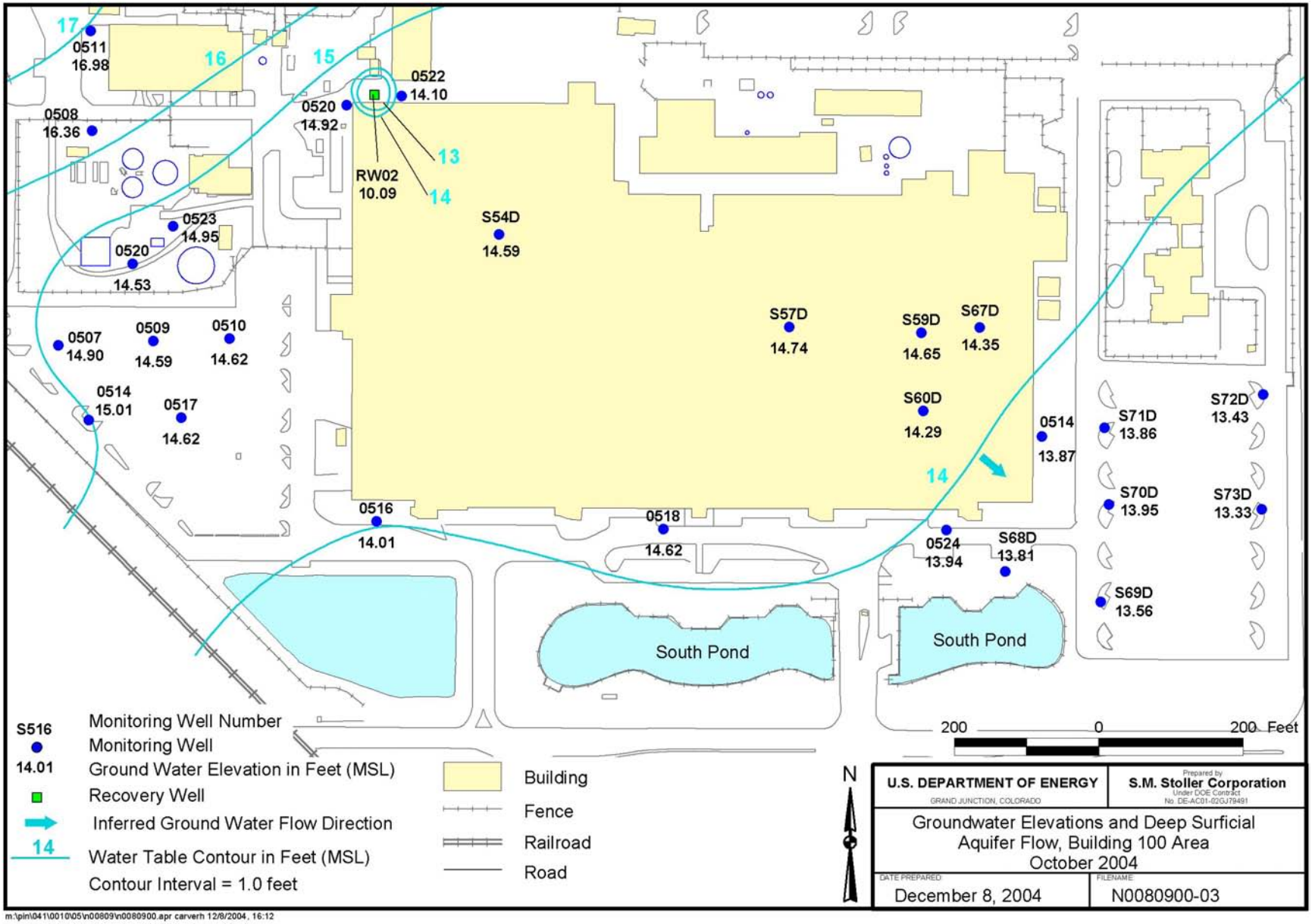


Figure 6. Ground Water Elevations and Deep Surficial Aquifer Flow, Building 100 Area, October 2004

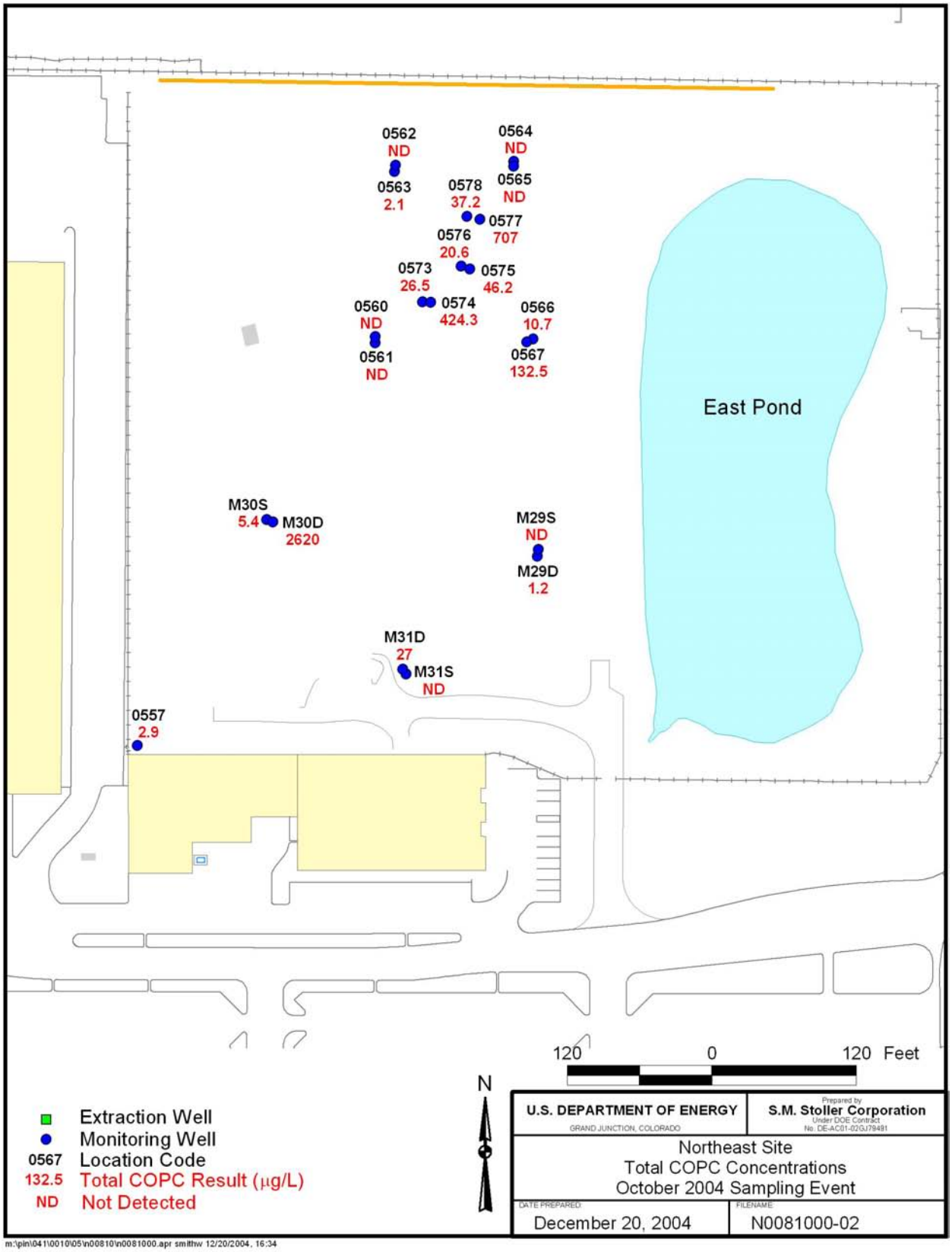


Figure 7. Northeast Site Total COPC Concentrations October 2004 Sampling Event

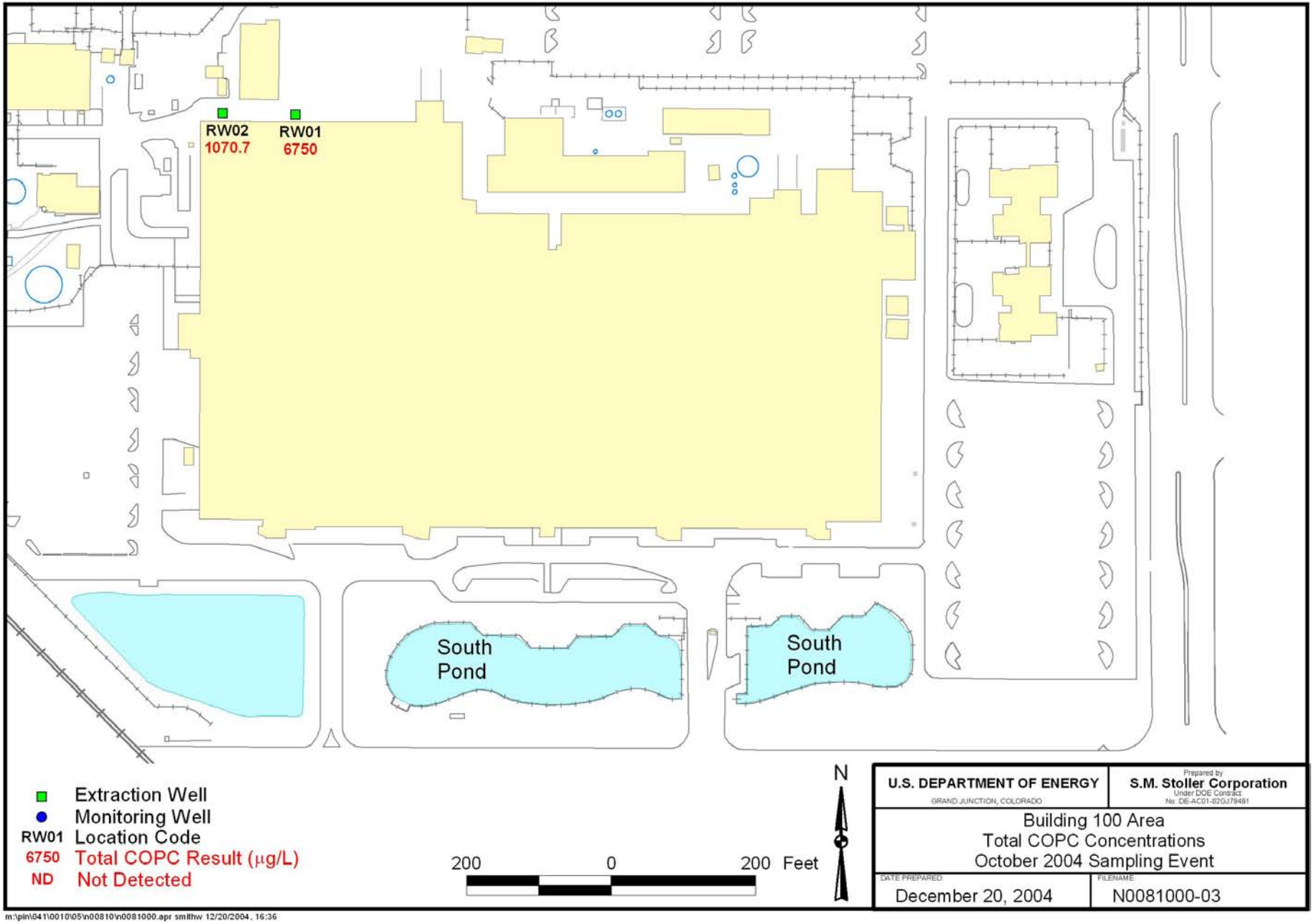


Figure 8. Building 100 Area Total COPC Concentrations October 2004 Sampling Event

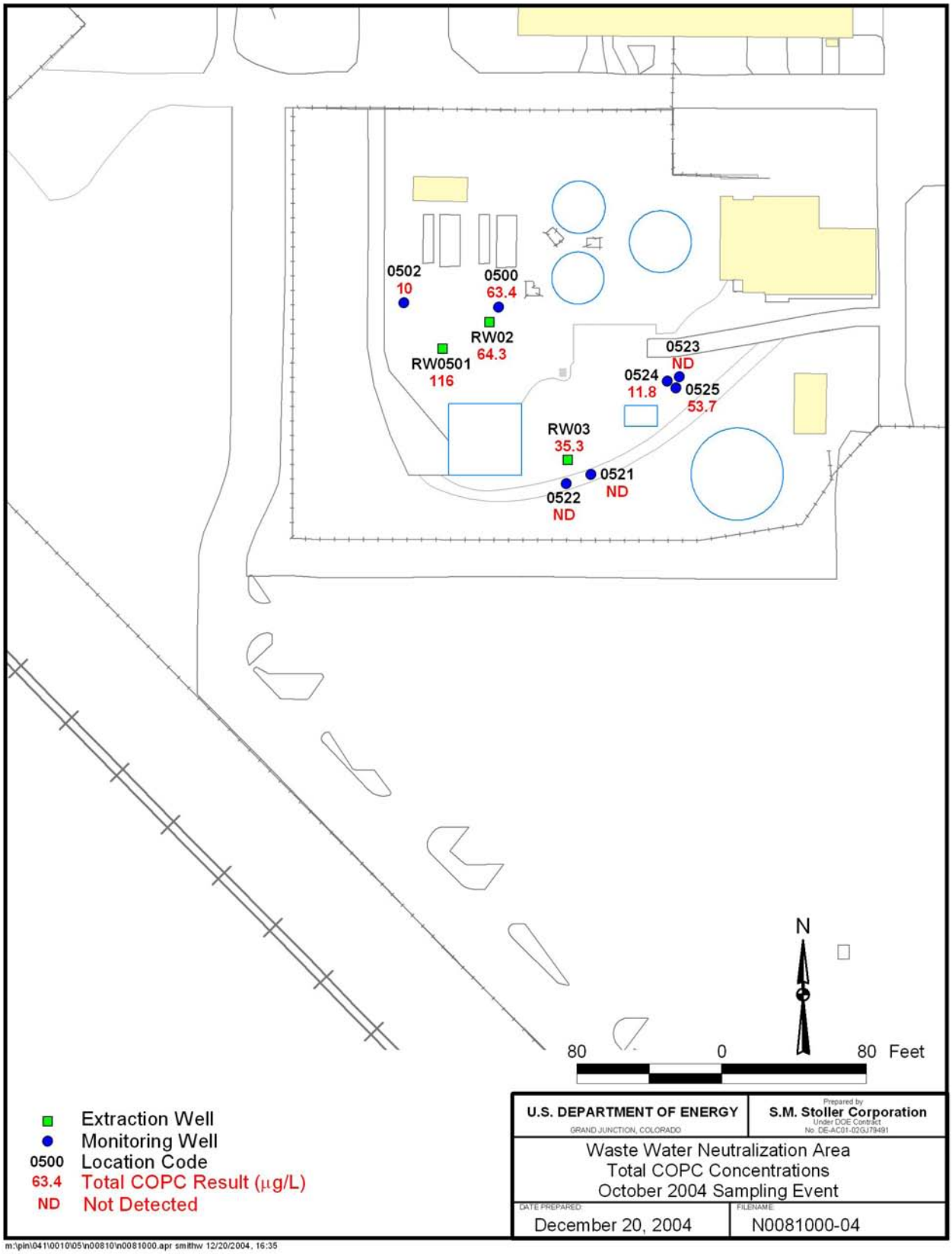


Figure 9. WWNA Total COPC Concentrations October 2004 Sampling Event

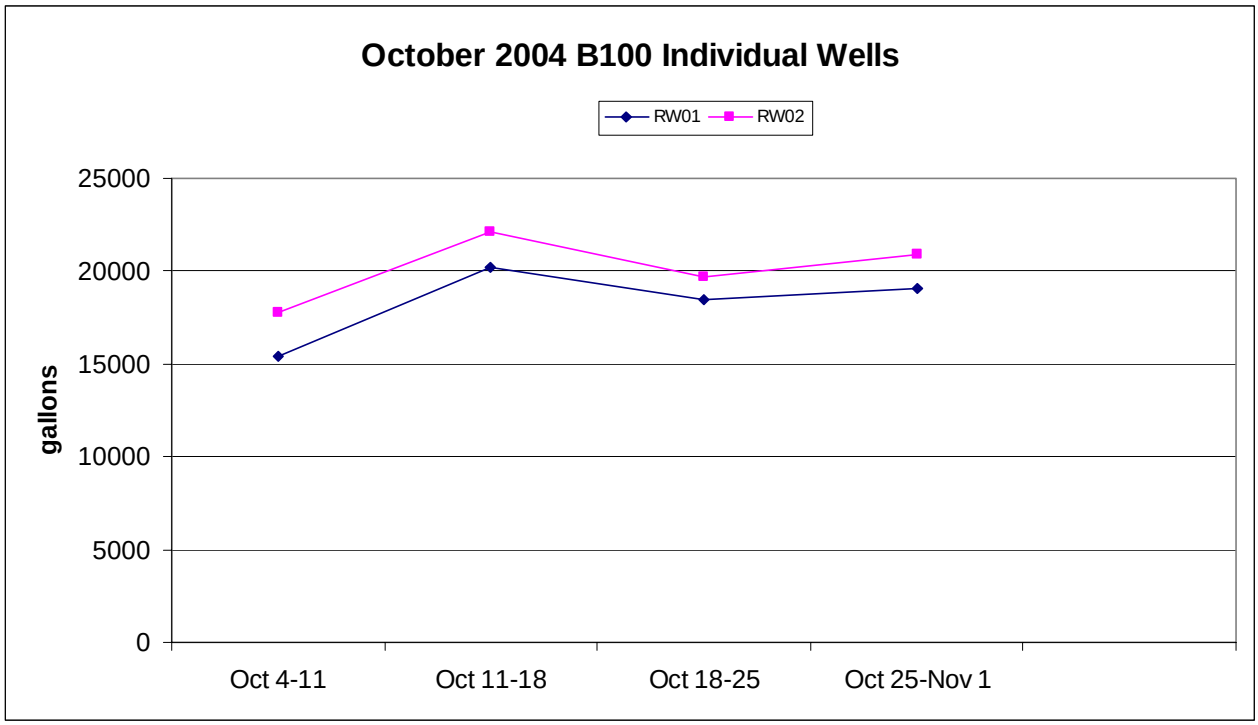


Figure 10. October 2004 Building 100 Ground Water Recovery

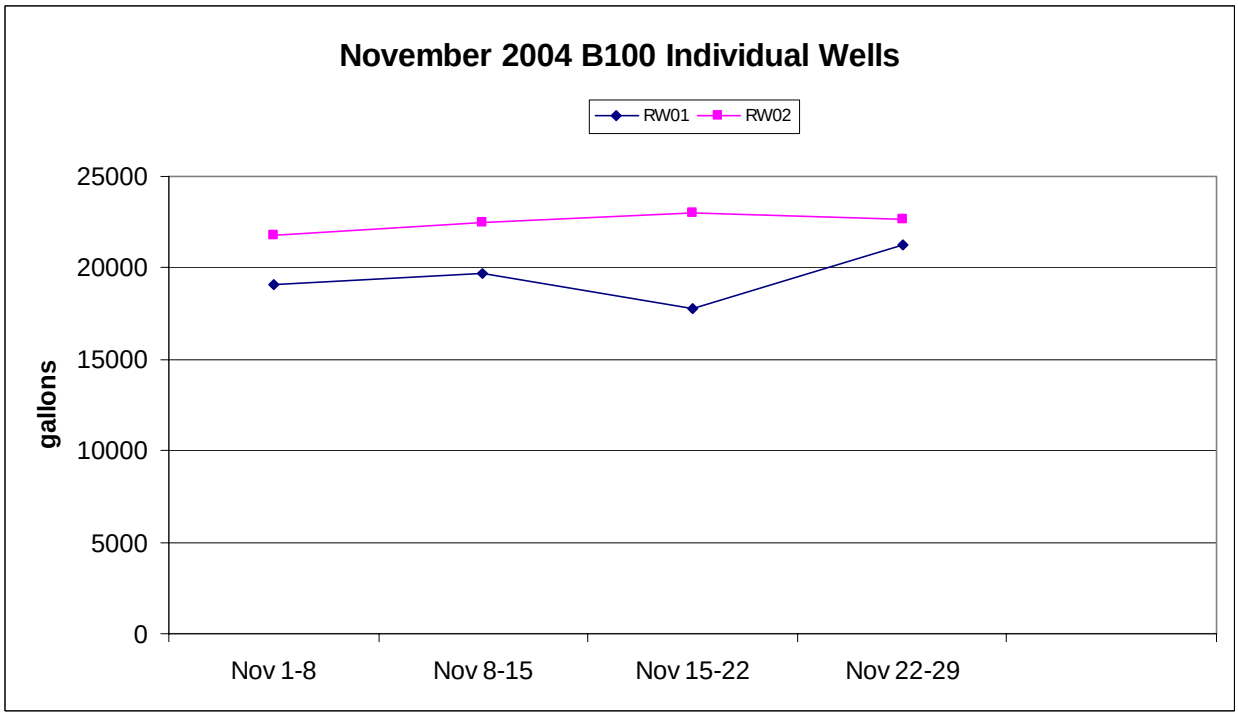


Figure 11. November 2004 Building 100 Ground Water Recovery

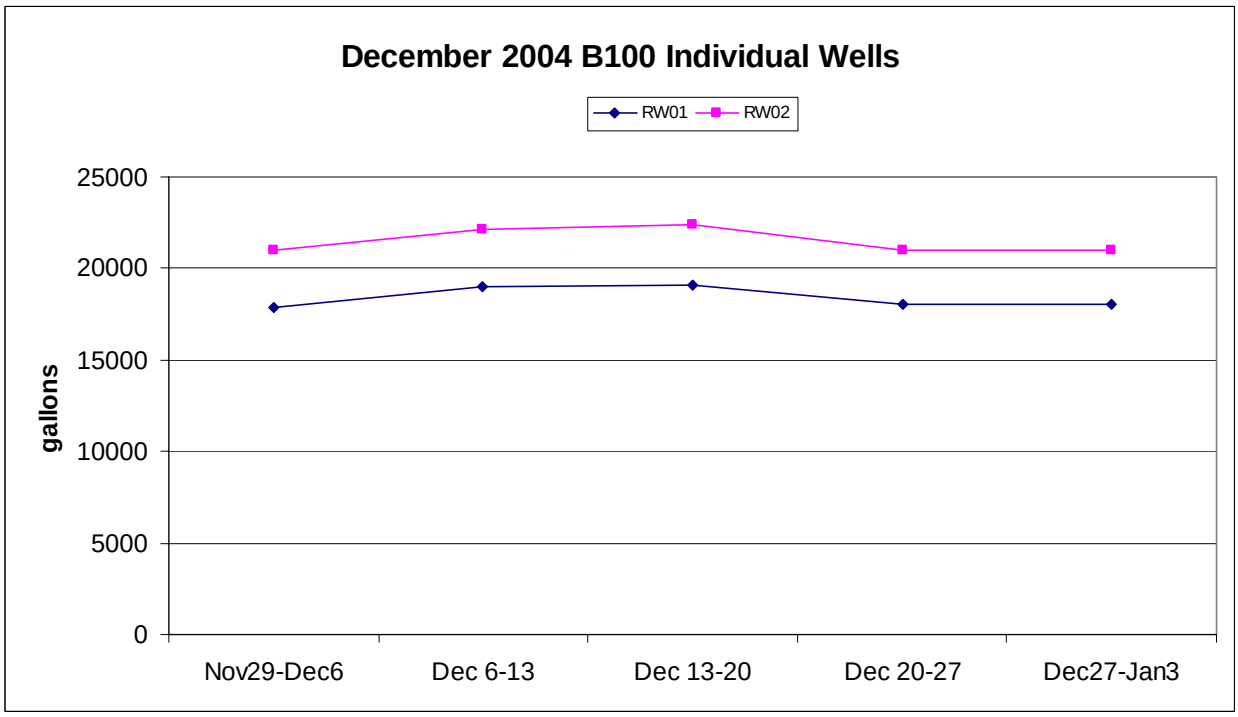


Figure 12. December 2004 Building 100 Ground Water Recovery

Table 1. WWNA Recovery Well Arsenic Concentrations
(reported in milligrams per liter)

Sample Date	RW02	RW03	RW0501[a]	RW02/RW03/RW0501 combined effluent
2/26/2001	0.08	0.1		0.095
2/27/2001	0.074	0.1		0.091
2/28/2001	0.074	0.091		0.074
3/1/2001	0.084	0.096		0.088
3/2/2001	0.088	0.095		0.089
3/5/2001	0.13	0.22		0.1
3/12/2001	0.37	0.11		0.13
3/19/2001	0.42	0.12		0.12
3/26/2001	0.15	0.16		0.8
4/2/2001	0.18	0.12		0.13
4/16/2001	0.18	0.17		0.13
5/1/2001	0.16	0.071		0.1
5/15/2001	0.14	0.15		0.093
5/30/2001	0.13	0.07		0.16
6/11/2001	0.11	0.068		0.083
6/26/2001	0.13	0.067		0.096
7/9/2001	0.14	0.054		0.087
7/23/2001	0.14	0.25		0.074
8/6/2001	0.11	0.2		0.18
8/21/2001	0.13	0.074		0.084
9/5/2001	0.13	0.054		0.091
10/8/2001	0.11	0.14		0.07
11/6/2001	0.095	0.053		0.076
12/7/2001	0.13	0.081		0.084
1/10/2002	0.11	0.081		0.076
2/5/2002	0.11	0.055		0.075
3/6/2002	0.12	0.05		0.076
4/2/2002	0.084	0.055		0.069
4/15/2002	--	0.049		--
4/16/2002	0.078	--		--
5/8/2002	0.11	0.048		0.071
6/4/2002	0.095	0.078		0.058
7/3/2002	0.16	0.056		0.074
7/15/2002	0.098	0.057		--
8/8/2002	0.0036J	0.11		0.065
9/10/2002	0.12	0.097		0.07
10/3/2002	0.097	0.054		0.071
11/22/2002	0.11	0.067		0.057
12/11/2002	0.11	0.056		0.07

Table 1 (continued). WWNA Recovery Well Arsenic Concentrations
(reported in milligrams per liter)

Sample Date	RW02	RW03	RW0501[a]	RW02/RW03/RW0501 combined effluent
1/2/2003	0.097	0.049		0.064
1/13/2003	0.082	0.061		--
2/4/2003	0.12	0.047		0.063
3/4/2003	0.079	0.19		0.059
4/7/2003	0.081	0.071		0.054
5/5/2003	0.074	0.038		0.052
6/3/2003	0.089	0.042		0.054
6/11/2003	0.07	0.044	0.42	0.073
6/12/2003	0.074	0.048	0.32	0.066
6/13/2003	0.072	0.075	0.21	0.066
6/16/2003	0.071	0.3	0.28	0.063
6/17/2003	0.068	0.11	0.26	0.066
6/24/2003	0.07	0.039	0.18	0.071
7/1/2003	0.059	0.038	0.18	0.064
7/10/2003	0.062	0.04	0.17	0.058
7/11/2003	0.056	0.034	0.24	0.054
7/14/2003	0.15	0.04	0.16	0.065
7/15/2003	0.071	0.038	0.19	0.055
7/16/2003	0.11	0.038	0.18	0.051
7/22/2003	0.15	0.041	0.16	0.054
7/31/2003	0.056	0.036	0.17	0.059
8/6/2003	0.069	0.041	0.16	0.062
9/3/2003	0.092	0.041	0.19	0.054
10/2/2003	0.13	0.032	0.14	0.054
11/5/2003	0.054	0.053	0.18	0.056
12/3/2003	0.076	0.044	0.18	0.062
1/7/2004	0.0363	0.0374	0.131	0.0467
2/3/2004	0.0433	0.0665	1.02	0.0481
3/3/2004	0.169	0.0435	0.142	0.0429
4/6/2004	0.0507	0.0483	0.147	0.0404
5/5/2004	0.0309	0.437	0.536	0.0706
6/1/2004	0.0541	0.23	3.13	0.0434
7/6/2004	0.564	0.698	0.123	0.0498
8/10/2004	0.049	0.0479	0.158	0.0339
9/9/2004	0.0427	0.0422	0.199	0.047
10/5/2004	0.0643	0.0353	0.116	0.0404
11/9/2004	0.0382	0.0385	0.137	0.036
12/7/2004	0.046	0.0341	0.0997	0.036

[a]Recovery well RW0501 was brought online on June 11, 2003.
-- = Not Measured.
J = Estimated value, result is between the reporting limit and the method detection limit.

Table 2. Bioremediation Baseline Sampling Analytical Results

	Alkalinity, Total (As CaCO3) (mg/L)	Ammonia Total as N (mg/L)	Biochemical Oxygen Demand (mg/L)	Carbon Dioxide (mg/L)	Chemical Oxygen Demand (mg/L)	Chloride (mg/L)	Ethane (ug/L)	Ethene (ug/L)	Field Ferrous Iron (mg/L)	Field Total Iron (mg/L)	Hydrogen (nmol/L)	Methane (ug/L)	Nitrate as Nitrogen (mg/L)	Nitrite as Nitrogen (mg/L)	ortho-Phosphate (mg/L)	Phosphorus (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Organic Carbon (mg/L)
PIN12	**Industrial Drain Leaks Bldg 100**																			
0523	281	1.1	<2	46	59.7	8.7	0.019	0.0058	2.7	3.4	1.1	54	<0.05	<0.05	0.12	0.08B	57.1	<1	1.9	18
0524	380	0.36	2.8	160	171	206	0.45	28	3.1	2.6	1	4,300	<0.05	<0.05	0.06B	0.13	5.7	<1	1.6	63.7
0526	480	0.33	11	290	187	309	<0.005	<0.005	1.2	0.2	1.6	6,200	<0.05	<0.05	0.082B	0.16	170	3.3	1.7	39.1
S35B	462	1.4	4.1	180	308	303	120	2,100	16	18	1.1	3,800	<0.05	<0.05	0.15	0.065B	40.7	<1	2.6	69.6
S67C	265	0.75	2.7	67	98.7	88.7	6.5	9.2	2.2	2.6	1.1	420	0.12	<0.05	0.087B	0.11	--	<1	1.6	24.2
PIN15	**Northeast Site**																			
0537	451	5	5	140	112	37.7	610	34	3.2	3.4	1.1	2,000	<0.05	<0.05	0.089B	0.093B	95.2	<1	4.5	68
0562	407	0.93	<2	150	79.5	24	0.046	<0.005	1.7	2.6	1.3	1,200	<0.05	<0.05	0.29	0.071B	109	<1	1.5	24.8
0569	449	0.93	12.7	170	236	164	1,300	<0.005	1.6	3.1	1	3,400	<0.05	<0.05	0.18	0.19	122	<1	2.2	73.8
0574	--	3	<2	270	205	64.2	0.36	1.6	--	--	2.4	980	0.14	<0.05	0.18	0.11	63.2	1.7	3.9	58.6
0577	--	19.1	14.8	260	410	46.7	0.51	780	--	--	3.2	9,400	<0.05	<0.05	0.24	0.48	54.6	<1	22.6	111

-- = Not measured

Table 3. Water-Level Data at the STAR Center

Location	Measurement		Water Depth From Land Surface (ft)	Ground Water Elevation (ft NGVD)
	Date	Time		
PIN06			**Old Drum Storage Site**	
0500	10/6/2004	10:14	2.83	15.17
0501	10/6/2004	10:20	3.29	15.01
PIN09			**Incinerator Site**	
0500	10/6/2004	10:15	2.67	15.3
PIN10			**Incinerator Ditch**	
0500	10/6/2004	14:02	2.41	15.49
PIN12			**Industrial Drain Leaks Bldg 100**	
0508	10/6/2004	10:38	3.11	15.25
0509	10/6/2004	10:35	3.09	14.95
0510	10/6/2004	10:29	3.31	14.75
0511	10/6/2004	09:36	3.19	14.61
0512	10/6/2004	09:39	2.38	14.43
0513	10/6/2004	11:03	4.82	13.68
0514	10/6/2004	11:04	4.63	13.87
0516	10/6/2004	09:59	3.99	14.01
0517	10/6/2004	10:15	3.34	14.56
0518	10/6/2004	10:15	3.32	14.62
0520	10/6/2004	10:16	3.09	14.92
0521	10/6/2004	10:15	3.41	14.64
0522	10/6/2004	10:23	4.1	14.1
0523	10/6/2004	10:24	4.08	14.08
0524	10/6/2004	10:21	3.47	13.94
0525	10/6/2004	10:22	3.48	13.94
0526	10/6/2004	10:48	3.15	13.67
0527	10/6/2004	09:40	10.52	7.55
0528	10/6/2004	09:54	10.19	7.41
RW01	10/6/2004	10:27	12.2	6.05
RW02	10/6/2004	10:20	8.24	10.09
S30B	10/6/2004	09:59	4.03	14.48
S31B	10/6/2004	09:45	3.66	14.85
S32B	10/6/2004	09:58	3.84	14.67
S33C	10/6/2004	09:52	3.95	14.56
S35B	10/6/2004	10:08	4.14	14.37
S36B	10/6/2004	09:42	4.07	14.44
S37B	10/6/2004	09:56	3.9	14.61
S54D	10/6/2004	10:10	3.92	14.59
S55B	10/6/2004	10:15	3.87	14.64
S55C	10/6/2004	10:16	3.84	14.67
S57B	10/6/2004	10:19	3.79	14.72
S57C	10/6/2004	10:20	3.72	14.79
S57D	10/6/2004	10:20	3.77	14.74
S59B	10/6/2004	09:30	3.9	14.61
S59C	10/6/2004	09:30	3.78	14.73

Table 3 (continued). Water-Level Data at the STAR Center

Location	Measurement		Water Depth From Land Surface (ft)	Ground Water Elevation (ft NGVD)
	Date	Time		
S59D	10/6/2004	09:31	3.86	14.65
S60B	10/6/2004	09:25	4.15	14.36
S60C	10/6/2004	09:26	4.11	14.4
S60D	10/6/2004	09:26	4.22	14.29
S67B	10/6/2004	09:17	3.92	14.55
S67C	10/6/2004	09:18	3.92	14.55
S67D	10/6/2004	09:19	4.13	14.35
S68B	10/6/2004	10:25	4.08	13.82
S68C	10/6/2004	10:24	4.1	13.8
S68D	10/6/2004	10:26	4.09	13.81
S69B	10/6/2004	13:16	2.2	13.8
S69C	10/6/2004	13:18	2.36	13.64
S69D	10/6/2004	13:19	2.44	13.56
S70B	10/6/2004	13:24	2.93	13.77
S70C	10/6/2004	13:26	2.89	13.81
S70D	10/6/2004	13:28	2.75	13.95
S71B	10/6/2004	13:33	4.42	13.98
S71C	10/6/2004	13:35	4.56	13.84
S71D	10/6/2004	13:37	4.54	13.86
S72B	10/6/2004	12:53	4.74	13.46
S72C	10/6/2004	12:50	4.79	13.41
S72D	10/6/2004	12:45	4.77	13.43
S73B	10/6/2004	13:09	3.4	13.6
S73C	10/6/2004	13:07	3.58	13.42
S73D	10/6/2004	13:05	3.67	13.33
TE03	10/6/2004	09:37	2.51	14.49
PIN15			**Northeast Site**	
0506	10/6/2004	08:05	2.75	14.25
0507	10/6/2004	08:03	2.75	14.25
0510	10/6/2004	11:02	2.44	15.08
0513	10/6/2004	09:05	10.16	7.44
0514	10/6/2004	07:50	2.43	15.07
0515	10/6/2004	07:50	2.45	15.05
0516	10/6/2004	07:49	2.58	14.82
0518	10/6/2004	09:01	2.9	14.9
0520	10/6/2004	08:09	2.71	14.49
0523	10/6/2004	09:15	1.61	16.39
0530	10/6/2004	08:19	2.38	15.02
0534	10/6/2004	08:08	2.75	14.55
0535	10/6/2004	08:19	2.4	15.2
0537	10/6/2004	07:58	2.76	15.84
0557	10/6/2004	07:40	2.85	16.25
0559	10/6/2004	09:25	3.11	15.68
0560	10/6/2004	08:23	2.36	15.64
0561	10/6/2004	08:23	2.19	15.81

Table 3 (continued). Water-Level Data at the STAR Center

Location	Measurement		Water Depth From Land Surface (ft)	Ground Water Elevation (ft NGVD)
	Date	Time		
0562	10/6/2004	09:11	2.06	15.74
0563	10/6/2004	09:11	1.99	15.81
0564	10/6/2004	08:58	1.72	15.48
0565	10/6/2004	08:58	1.75	15.45
0566	10/6/2004	08:16	2.1	15.4
0567	10/6/2004	08:16	2.22	15.28
0568	10/6/2004	09:30	3.57	14.93
0569	10/6/2004	09:30	3.63	14.75
0570	10/6/2004	11:01	3.23	14.75
0571	10/6/2004	09:37	2.21	15.26
0572	10/6/2004	09:35	2.23	15.28
0573	10/6/2004	08:47	2.63	15.75
0574	10/6/2004	08:48	2.79	15.63
0575	10/6/2004	08:45	2.12	15.72
0576	10/6/2004	08:45	1.88	15.6
0577	10/6/2004	08:53	2.06	15.58
0578	10/6/2004	08:51	1.9	15.62
E001	10/6/2004		1.92	14.1
M03S	10/6/2004	07:34	0.94	17.16
M12D	10/6/2004	09:03	2.61	14.59
M12S	10/6/2004	09:02	3.27	14.23
M14D	10/6/2004	09:13	1.74	16.26
M14S	10/6/2004	09:13	1.65	16.35
M16D	10/6/2004	07:38	1.93	16.27
M16S	10/6/2004	07:37	1.93	16.27
M24D	10/6/2004	09:09	2.24	15.56
M27D	10/6/2004	08:21	2.45	15.15
M27S	10/6/2004	08:21	2.83	14.77
M29D	10/6/2004	07:52	2.35	15.25
M29S	10/6/2004	07:52	2.13	15.47
M30D	10/6/2004	07:44	1.61	16.29
M30S	10/6/2004	07:43	1.44	16.36
M31D	10/6/2004	07:55	2.17	15.83
M31S	10/6/2004	07:55	2.17	15.83
M32D	10/6/2004	07:59	2.18	15.62
M32S	10/6/2004	07:59	1.57	16.23
M33D	10/6/2004	09:08	1.36	16.24
RW15	10/6/2004	07:46	1.85	15.35
RW16	10/6/2004	07:57	2.29	15.71
PIN18			**Wastewater Neutralization Area**	
0500	10/6/2004	09:54	5.93	14.17
0502	10/6/2004	09:57	4.58	15.42
0503	10/6/2004	09:27	2.79	14.89
0504	10/6/2004	10:00	3.23	16.37
0505	10/6/2004	09:30	3.12	14.76

Table 3 (continued). Water-Level Data at the STAR Center

Location	Measurement		Water Depth From Land Surface (ft)	Ground Water Elevation (ft NGVD)
	Date	Time		
0506	10/6/2004	09:33	3.01	14.7
0507	10/6/2004	09:26	2.83	14.9
0508	10/6/2004	10:05	3.14	16.36
0509	10/6/2004	09:29	3.24	14.59
0510	10/6/2004	09:32	3.14	14.62
0511	10/6/2004	09:19	1.82	16.98
0512	10/6/2004	09:17	1.6	17
0513	10/6/2004	09:16	1.78	17.02
0514	10/6/2004	09:45	2.77	15.01
0515	10/6/2004	09:44	3.67	14.74
0516	10/6/2004	09:44	3.73	14.68
0517	10/6/2004	09:41	3.63	14.62
0518	10/6/2004	09:41	3.65	14.55
0519	10/6/2004	09:40	3.77	14.51
0520	10/6/2004	09:50	3.47	14.53
0521	10/6/2004	09:50	4.26	13.84
0522	10/6/2004	09:51	4.27	13.83
0523	10/6/2004	09:45	4.45	14.95
0524	10/6/2004	09:46	4.1	14.9
0525	10/6/2004	09:48	3.89	15.01
0526	10/6/2004	09:21	1.92	16.68
RW02	10/6/2004	09:53	10.5	9.6
RW03	10/6/2004	09:52	9.23	9.07
RW0501	10/6/2004	09:56	11.62	8.38
PIN21			**Perimeter Monitoring Wells**	
0500	10/6/2004	10:50	4.34	13.76
0501	10/6/2004	10:50	4.4	13.6
0502	10/6/2004	10:58	1.73	13.47
0503	10/6/2004	10:57	1.86	13.34
0504	10/6/2004	10:43	4.12	13.48
0505	10/6/2004	10:42	3.91	13.49
0512	10/6/2004	10:39	3.84	13.46
PIN23			**Southwest Pond**	
SW01	10/6/2004	10:01		13.48
PIN37			**South Pond**	
S001	10/6/2004	10:02		13.49

Table 4. Floridan Aquifer Monitoring Well Water Elevations

Well Identification	October 2004 Water Level Elevation (ft, MSL)	Current Water Level Elevation (ft, MSL)
PIN15−0513	6.05	7.44
PIN12−0527	6.28	7.55
PIN12−0528	6.13	7.41

Table 5. Vertical Hydraulic Differential

Water Level Measured From	Well Identification	Water Level Elevation (ft, MSL)
Deep Surficial Aquifer	PIN15−M12D	14.59
Floridan Aquifer	PIN15−0513	7.44

Table 6. Surface Water Elevations

Pond Location	October 2004 Water Level Elevation (ft, MSL)	Current Water Level Elevation (ft, MSL)
East Pond	13.80	14.10
South Pond	13.38	13.49
West Pond	15.32	18.23
Southwest Pond	13.34	13.48

Table 7. 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)
PIN06		**Old Drum Storage Site**					
0500	3–13	29.02	603	0.7	6.59	-121	0.18
0501	3–13	27.73	747	1.52	6.78	41.3	0.24
PIN09		**Incinerator Site**					
0500	3–13	28.55	646	1.7	6.88	-89	0.17
PIN10		**Incinerator Ditch**					
0500	3–13	26.24	661	2.48	6.61	-58	0.18
PIN12		**Industrial Drain Leaks Bldg 100**					
0510	3–13	28.18	1,407	17.9	6.07	96.4	0.29
0523	18–28	26.53	709	12.9	6.82	-101	0.15
0524	27–37	26.84	1,406	13.2	6.57	-110	0.38
0525	12–22	27.85	814	9.61	6.79	-79	0.3
0526	19.5–29.5	30.84	2,232	5.17	6.46	-244	0.86
S31B	5–15	25.12	655	25.2	6.48	102	0.67
S32B	5.5–15.5	22.92	1,618	3.26	6.71	94.4	0.2
S33C	11–21	23.94	1,376	40.2	6.64	-148	0.14
S35B	5–15	22.67	1,762	19.3	6.41	-39	0.12
S37B	5–15	22.75	927	18.6	6.7	-109	0.12
S67C	20–29.83	22.63	1,171	245	6.67	-104	0.5
S68B	10–20	26.76	936	14.4	5.98	3	0.91
S69B	10–20	30.07	711	18.7	6.76	-117	0.82
S73B	10–20	31.19	1,026	361	6.49	-121	1.61
S73D	30–40	30.31	2,121	>1,000	6.25	-113	0.72
PIN15		**Northeast Site**					
0530	5–14.5	26.41	614	13.1	6.69	-82.5	0.58
0537	17.5–30	24.92	1,137	2.61	6.64	-97	0.36
0557	21–31	25.09	1,041	193	6.56	-168.4	0.66
0560	19–28.5	27.55	1,066	19.8	6.56	-119.4	
0561	5–14.5	27.33	1,518	2.07	6.56	-86.3	1.55
0562	20–29.5	29.56	1,020	20.2	6.66	-141.2	0.16
0563	5–14.5	30.34	2,041	2.18	6.51	-97.8	0.99
0564	20–29.5	28.05	1,542	3.83	6.65	-70.3	0.61
0565	5–14.5	27.55	1,013	33.5	6.65	-49.5	0.95
0566	19–28.5	33.69	1,241	>1,000	6.58	-149	0.6
0567	5–14.5	32.7	1,250	4.81	6.53	-82.1	0.62
0569	20–30	26.92	1,528	17	6.52	-120	1.45
0570	20–30	26	2,325	13.5	6.48	-108.4	1.04
0573	5–15	34.03	2,483	19.3	6.81	-165.9	1.36
0574	18–28	38.87	1,291	5.91	6.62	-137.5	1.42
0575	5–15	36.04	2,471	10.3	7.16	-144.6	1.2
0576	20–30	43.91	1,451	365	6.53	-118.8	1.5
0577	5–15	35.12	1,888	6.33	6.88	-167	0.84
0578	20–30	39.12	1,360	1.32	7.06	-155.7	0.92

Table 7 (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)
M03S	2.5–12	26.56	892	1.93	6.69	-104.3	1.13
M14S	4–14	27.61	1,104	17	6.67	-103.5	1.13
M29D	20–30	25.4	1,383	0.32	6.63	-128	0.17
M29S	5–15	27.13	902	6.29	6.86	-13.3	0.22
M30D	20.5–30.5	26.58	1,313	11.2	6.3	-90.9	1.05
M30S	5.5–15.5	27.96	1,148	2.02	6.52	-113.9	0.95
M31D	19.5–29.5	26.26	1,519	7.01	6.46	-157	0.13
M31S	4.5–14.5	26.78	1,310	2.51	6.78	-126	0.17
M32S	3–13	26.69	861	5.32	6.81	-102	0.42
PIN18		**Wastewater Neutralization Area**					
0500	11–16	26.8	435	11.8	7.14	-151.1	2.22
0502	11–16	27.2	685	5.6	6.61	-84.3	4.32
0521	20–30	25.7	840	0.9	6.76	-109.4	3.48
0522	5–15	27.4	560	7.4	6.65	-29.4	4.82
0523	32.5–42.5	25.5	1,182	25.5	6.8	-112.1	3.06
0524	20–30	25.9	699	5.6	6.84	-12	2.71
0525	5–15	27.5	439	6.8	6.66	-1.4	2.74

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

Table 8. Sitewide Arsenic Measurements

Location	Sample Date	Concentration (mg/L)
PIN06	**Old Drum Storage Site**	
0500	10/12/2004	0.0072B
0501	10/12/2004	0.0118
PIN09	**Incinerator Site**	
0500	10/12/2004	0.0155
PIN10	**Incinerator Ditch**	
0500	10/12/2004	0.0079B
PIN12	**Industrial Drain Leaks Bldg 100**	
0510	10/12/2004	<0.0035
0525	10/10/2004	0.025
S31B	10/7/2004	0.0607
S32B	10/7/2004	0.0152
S33C	10/7/2004	0.0065B
S35B	10/8/2004	0.0249
S37B	10/8/2004	0.0057B
S68B	10/11/2004	0.0615
S69B	10/10/2004	0.0069B
S73B	10/10/2004	0.0056B
S73D	10/10/2004	0.0062B
PIN15	**Northeast Site**	
0530	10/12/2004	<0.0035
0567	10/12/2004	<0.0035
0570	10/8/2004	<0.0035
M03S	10/11/2004	0.0155
M14S	10/6/2004	0.138
M29S	10/8/2004	<0.0035
M32S	10/11/2004	0.0081B
PIN18	**Wastewater Neutralization Area**	
0500	10/13/2004	0.0634
0502	10/13/2004	0.01
0521	10/12/2004	<0.0035
0522	10/12/2004	0.0082B
0523	10/12/2004	<0.0035
0524	10/12/2004	0.0118
0525	10/12/2004	0.0537
RW02	10/5/2004	0.0643
RW03	10/5/2004	0.0353
RW0501	10/5/2004	0.116

B = Inorganic result is between the IDL and CRDL
"<" values are method detection limits.

Table 9. Northeast Site Florida Petroleum Range Organics Measurements

Location	Sample Date	Concentration (mg/L)
PIN15	**Northeast Site**	
0562	10/6/2004	<0.16
0577	10/6/2004	2.86
0574	10/7/2004	0.619
0576	10/7/2004	0.859
0557	10/8/2004	0.302
M30D	10/8/2004	0.429
M31D	10/8/2004	1.35
M31S	10/8/2004	0.539
M30S	10/8/2004	0.201J
M29S	10/8/2004	0.334
0563	10/8/2004	0.587
M29D	10/8/2004	0.43
0573	10/11/2004	1.76
0575	10/11/2004	4.61
0578	10/11/2004	1.16
0560	10/12/2004	0.513
0561	10/12/2004	0.424
0564	10/12/2004	0.415
0565	10/12/2004	0.271
0566	10/12/2004	0.947
0567	10/12/2004	0.558

J Estimated value, result is between the reporting limit and the method detection limit.
"<" values are method detection limits.

Table 10. 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	10/13/2003	<1	<1	ND	<1	<5	<1	<1	ND
		4/16/2004	<0.5	<0.5	ND	<0.5	1.3	<0.5	<0.5	1.3
0507	5–14.5	10/13/2003	<1	<1	ND	<1	<5	<1	<1	ND
		4/16/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
0510	4–13.5	4/21/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
0513	135–149.6	4/15/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
0514	15.5–25.5	10/14/2003	<1	<1	ND	<1	<5	7.9	<1	7.9
		4/15/2004	<2.5	<2.5	ND	<2.5	<5	79.1	4.1J	79.1
0515	7.6–17.6	10/14/2003	<1	<1	ND	<1	<5	<1	<1	ND
		4/15/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
0516	0.3–10.3	10/14/2003	<1	<1	ND	<1	<5	<1	<1	ND
		4/15/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
0518	23–28	4/15/2004	<2.5	<2.5	ND	<2.5	<5	<2.5	<2.5	ND
0520	5–14.5	10/13/2003	<1	<1	ND	<1	<5	<1	<1	ND
		4/16/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
0523	5–14.5	4/16/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
0530	5–14.5	10/14/2003	<1	<1	ND	<1	<5	<1	<1	ND
		4/15/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
0534	19.5–29	10/13/2003	<1	<1	ND	<1	<5	<1	<1	ND
		4/16/2004	<2.5	<2.5	ND	<2.5	<5	<2.5	<2.5	ND
0535	20.5–30	10/14/2003	<1	<1	ND	<1	<5	3.5	<1	3.5
		4/15/2004	<0.5	<0.5	ND	<0.5	<1	2.6	<0.5	2.6
0537	17.5–30	10/13/2003	<2.5	7.2	7.2	76	<12	8	<2.5	91.2
		1/15/2004	364	1,340	1,340	668	<5	6	<2.5	2,378
		4/15/2004	16J	795	795	943	<20	<10	<10	1,738
		7/13/2004	<5	33.3	33.3	522	<10	<5	<5	555.3
0557	21–31	10/10/2003	<1	<1	ND	0.31J	<5	<1	<1	ND
		4/16/2004	<0.5	<0.5	ND	2.9	<1	<0.5	<0.5	2.9
		10/8/2004	<0.5	<0.5	ND	2.9	<1	<0.5	<0.5	2.9
0559	22–31.5	10/15/2003	<1	<1	ND	<1	<5	<1	<1	ND
		4/17/2004	<0.5	<0.5	ND	<0.5	<1	0.61J	<0.5	ND
0560	19–28.5	10/14/2003	<1	<1	ND	<1	<5	<1	<1	ND
		4/16/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
		10/12/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
0561	5–14.5	10/14/2003	<1	<1	ND	<1	<5	<1	<1	ND
		4/16/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
		10/12/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
0562	20–29.5	10/14/2003	<1	<1	ND	<1	<5	<1	<1	ND
		4/15/2004	<2.5	<2.5	ND	<2.5	<5	<2.5	<2.5	ND
		10/7/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND

Table 10 (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**	
0563	5–14.5	10/14/2003	3.5	<1	ND	<1	<5	0.1J	<1	3.5
		4/15/2004	2.8J	4J	4J	<2.5	<5	<2.5	<2.5	ND
		10/8/2004	<0.5	2.1	2.1	<0.5	<1	<0.5	<0.5	2.1
0564	20–29.5	10/15/2003	<1	<1	ND	<1	<5	<1	<1	ND
		4/15/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
		10/12/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
0565	5–14.5	10/14/2003	<1	<1	ND	<1	<5	<1	<1	ND
		4/15/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
		10/12/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
0566	19–28.5	10/15/2003	<1	<1	ND	<1	<5	1	<1	1
		4/16/2004	<0.5	0.62J	0.62J	1.2	<1	0.55J	<0.5	1.2
		10/12/2004	<0.5	4.7	4.7	4.5	<1	1.5	<0.5	10.7
0567	5–14.5	10/15/2003	<1	<1	ND	<1	<5	<1	<1	ND
		4/16/2004	0.73J	28.4	35.4	19.9	<1	3.5	<0.5	58.8
		10/12/2004	1.8	68	83.4	34.5	<1	12.8	<0.5	132.5
0568	10–20	10/15/2003	<1	<1	ND	<1	<5	<1	<1	ND
		1/15/2004	<2.5	<2.5	ND	<2.5	<5	<2.5	<2.5	ND
		4/21/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
		7/23/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
0569	20–30	10/15/2003	<1	<1	ND	13	<5	1.8	<1	14.8
		1/16/2004	<1	<1	ND	44.9	<2	3.4	<1	48.3
		4/21/2004	<0.5	<0.5	ND	30.2	<1	1.9	<0.5	32.1
		7/23/2004	<0.5	<0.5	ND	19	<1	0.68J	<0.5	19
0570	20–30	10/15/2003	<1	<1	ND	<1	<5	<1	<1	ND
		1/15/2004	<5	<5	ND	<5	<10	<5	<5	ND
		4/21/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
		7/22/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
0571	10–20	10/15/2003	<1	<1	ND	<1	<5	<1	<1	ND
		1/15/2004	<2.5	<2.5	ND	<2.5	<5	<2.5	<2.5	ND
		4/21/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
		7/23/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
0572	20–30	10/15/2003	<1	<1	ND	<1	<5	<1	<1	ND
		1/15/2004	<5	<5	ND	<5	<10	<5	<5	ND
		4/21/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
		7/23/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
0573	5–15	7/13/2004	<2.5	63.3	63.3	<2.5	<5	<2.5	<2.5	63.3
		10/11/2004	<0.5	12.6	12.6	12.7	<1	0.66J	1.2	26.5
0574	18–28	7/13/2004	6.6	351	351	210	<5	<2.5	<2.5	567.6
		10/7/2004	35.4	330	330	58.9	<1	0.96J	0.81J	424.3
0575	5–15	7/23/2004	<0.5	1.5	5.4	77.1	<1	<0.5	4.5	87
		10/11/2004	<0.5	4.4	6.3	35.9	<1	2.1	1.9	46.2
0576	20–30	7/23/2004	<0.5	3	4	<0.5	<1	0.85J	0.6J	4
		10/7/2004	<0.5	14.1	14.1	6.5	<1	0.63J	<0.5	20.6

Table 10 (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**	
0577	5–15	7/23/2004	<0.5	<0.5	23.1	339	<1	<0.5	394	756.1
		10/7/2004	<5	<5	32	441	<10	6.3J	234	707
0578	20–30	7/23/2004	<0.5	5.7	8.3	24.4	<1	<0.5	1.7	34.4
		10/11/2004	<0.5	10.2	12	25.2	<1	<0.5	0.91J	37.2
M03D	15–25	10/10/2003	<1	<1	ND	<1	<5	<1	<1	ND
		4/17/2004	<2.5	<2.5	ND	<2.5	<5	<2.5	<2.5	ND
M03S	2.5–12	10/10/2003	<1	<1	ND	<1	<5	<1	<1	ND
		4/17/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
M12D	22.5–32.5	4/15/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
M12S	5–14.5	4/15/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
M14D	18.5–28.5	4/15/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
M14S	4–14	4/15/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
M16D	18.5–28.5	4/17/2004	<0.5	<0.5	ND	0.58J	<1	<0.5	<0.5	ND
M16S	5–14.5	4/17/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
M24D	20–30	4/15/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
M27D	21–31	10/13/2003	<1	<1	ND	<1	<5	4.8	<1	4.8
		4/15/2004	<0.5	<0.5	ND	<0.5	<1	1.6	<0.5	1.6
M27S	6–16	10/13/2003	<1	<1	ND	<1	<5	<1	<1	ND
		4/15/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
M29D	20–30	10/15/2003	<25	<25	ND	<25	<120	<25	<25	ND
		4/16/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
		10/8/2004	<0.5	<0.5	ND	<0.5	1.2	<0.5	<0.5	1.2
M29S	5–15	10/15/2003	<25	<25	ND	<25	<120	<25	<25	ND
		4/16/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
		10/8/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
M30D	20.5–30.5	10/10/2003	<5	<5	ND	390	<25	<5	<5	390
		4/16/2004	<100	8,550	8,550	2,740	<200	<100	<100	11,290
		10/8/2004	<25	500	500	2,120	<50	<25	<25	2,620
M30S	5.5–15.5	10/10/2003	<1	<1	ND	<1	<5	<1	<1	ND
		4/16/2004	<0.5	<0.5	ND	27.7	<1	<0.5	<0.5	27.7
		10/8/2004	<0.5	1.1	1.1	4.3	<1	<0.5	<0.5	5.4
M31D	19.5–29.5	10/15/2003	<1	<1	ND	12	<5	8.4	<1	20.4
		1/15/2004	<2.5	<2.5	ND	<2.5	<5	6	<2.5	6
		4/16/2004	<2.5	<2.5	ND	21.3	<5	13	<2.5	34.3
		7/13/2004	<0.5	<0.5	ND	19.3	<1	17.9	1.8	39
		10/8/2004	<0.5	<0.5	ND	3	1.4	19.8	2.8	27
M31S	4.5–14.5	10/15/2003	<1	<1	ND	<1	<5	<1	<1	ND
		1/15/2004	<2.5	<2.5	ND	<2.5	<5	<2.5	<2.5	ND
		4/16/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
		7/13/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
		10/8/2004	<0.5	<0.5	ND	0.99J	<1	<0.5	<0.5	ND
M32D	14–24	10/13/2003	<1	<1	ND	<1	<5	<1	<1	ND
		4/16/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND

Table 10 (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**	
M32S	3–13	10/13/2003	<1	<1	ND	<1	<5	<1	<1	ND
		4/16/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
M33D	20–30	4/15/2004	<0.5	<0.5	ND	<0.5	<1	<0.5	<0.5	ND
RW16	20–30	10/15/2003	<25	340	340	890	<120	<25	<25	1,230
		1/16/2004	<5	451	451	925	<10	6.4J	<5	1,376
		4/16/2004	<2.5	65.6	65.6	388	<5	3.3J	<2.5	453.6
		7/13/2004	<10	373	373	968	<20	<10	<10	1,341

[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 value is 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.

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

Table 11. 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**	
PIN06		**Old Drum Storage Site**							
0500	3–13	10/14/2003	<1	<1	<1	ND	<1	<1	ND
		4/22/2004	<0.5	0.82J	<0.5	0.82J	<0.5	<0.5	ND
0501	3–13	10/15/2003	<1	<1	<1	ND	<1	<1	ND
		4/23/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
PIN09		**Incinerator Site**							
0500	3–13	4/22/2004	<0.5	1	<0.5	1	<0.5	<0.5	1
PIN10		**Incinerator Ditch**							
0500	3–13	4/22/2004	0.74J	3	<0.5	3	<0.5	0.61J	3
PIN12		**Industrial Drain Leaks Bldg 100**							
0508	3–13	4/22/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
0509	3–13	10/15/2003	<1	<1	<1	ND	<1	<1	ND
		4/22/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
0510	3–13	10/15/2003	<1	<1	<1	ND	<1	<1	ND
		4/23/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
0511	3–13	4/22/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
0512	3–13	4/17/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
0513	15–25	10/13/2003	<1	<1	1.5	1.5	<1	1.4	2.9
		1/15/2004	<2.5	<2.5	<2.5	ND	<2.5	<2.5	ND
		4/18/2004	<0.5	0.76J	2	2	<0.5	3.7	5.7
		7/21/2004	<0.5	2.8	2.1	4.9	<0.5	9.1	14
0514	30–40	10/13/2003	<1	7.2	45	52.2	<1	32	84.2
		1/13/2004	<1	8.7	31	39.7	<1	22	61.7
		1/15/2004	<2.5	13.9	32.9	46.8	<2.5	37.7	84.5
		4/18/2004	<0.5	12.4	40.3	52.7	<0.5	54.5	107.2
		7/21/2004	<0.5	14.6	36.3	50.9	<0.5	71.8	122.7
0515	15–25	4/17/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
0516	30–40	4/17/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
0517	15–25	10/13/2003	<1	<1	<1	ND	<1	<1	ND
		4/17/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
0518	30–40	10/13/2003	<1	<1	<1	ND	<1	<1	ND
		4/17/2004	<2.5	<2.5	<2.5	ND	<2.5	<2.5	ND
0520	36–46	10/14/2003	<1	<1	<1	ND	<1	32	32
		4/22/2004	<0.5	<0.5	<0.5	ND	<0.5	21.1	21.1
0521	19.5–29.5	10/15/2003	0.66J	0.98J	0.23J	1.21J	<1	0.5J	ND
		4/22/2004	1.7	2.2	<0.5	2.2	<0.5	1.9	5.8
0522	32–42	10/15/2003	<1	<1	<1	ND	<1	<1	ND
		4/23/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
0523	18–28	10/15/2003	<1	<1	<1	ND	<1	<1	ND
		4/23/2004	<0.5	0.79J	<0.5	0.79J	<0.5	0.61J	ND
0524	27–37	10/13/2003	230	6,900	<100	6,900	<100	400	7,530
		4/17/2004	1,220	5,990	<50	5,990	207	1,040	8,457

Table 11 (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**	
0525	12–22	10/13/2003	<1	0.48J	<1	0.48J	<1	<1	ND
		4/17/2004	<0.5	2.3	<0.5	2.3	<0.5	<0.5	2.3
0526	19.5–29.5	10/10/2003	<1	4.4	2.1	6.5	<1	1.2	7.7
		1/13/2004	<1	9.4	3.4	12.8	<1	3	15.8
		1/15/2004	<2.5	12.9	3.7J	12.9	<2.5	<2.5	12.9
		4/17/2004	<0.5	2.5	1.3	3.8	<0.5	1.6	5.4
		7/22/2004	<0.5	2.8	1.2	4	<0.5	1.1	5.1
0527	118–137.9	4/21/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
0528	127–146.9	4/18/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
RW01	19–29	10/2/2003	6,800	4,200	<100	4,200	<100	650	11,650
		1/7/2004	5,840	3,360	50.4	3,410.4	36.2	727	10,013.6
		4/6/2004	6,130	2,940	70.2	3,010.2	51.8	845	10,037
		7/6/2004	4,840	2,950	<50	2,950	<50	874	8,664
		10/5/2004	4,200	2,000	<50	2,000	<50	550	6,750
RW02	25–35	10/2/2003	530	840	76	916	<25	75	1,521
		1/7/2004	778	888	68.4	956.4	25.2	136	1,895.6
		4/6/2004	499	674	74.3	748.3	25.7	92.1	1,365.1
		7/6/2004	538	765	60.4	825.4	21.9	95.9	1,481.2
		10/5/2004	349	590	48.9	638.9	16.8	66	1,070.7
S29C	14–24	10/8/2003	<1	19	6.4	25.4	<1	48	73.4
		3/31/2004	<0.5	9.8	7.1	16.9	<0.5	52.3	69.2
S30B	5–15	10/8/2003	160J	11,000	370	11,370	<250	1,600	12,970
		3/31/2004	77.3	2,600	120	2,720	<25	40.9J	2,797.3
S31B	5–15	10/8/2003	<1	<1	<1	ND	<1	<1	ND
		3/31/2004	<0.5	0.59J	<0.5	0.59J	<0.5	<0.5	ND
S32B	5.5–15.5	10/8/2003	<1	<1	<1	ND	<1	<1	ND
		3/31/2004	<0.5	4.6	<0.5	4.6	<0.5	1.4	6
S33C	11–21	10/8/2003	<25	1,300	90	1,390	<25	2,400	3,790
		3/31/2004	13.4	233	163	396	6.7	1,920	2,336.1
S35B	5–15	10/8/2003	16,000	68,000	4,500	72,500	<1,000	13,000	101,500
		3/31/2004	15,700	62,900	6,200	69,100	<500	17,800	102,600
S36B	5–15	3/31/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
S37B	5–15	3/31/2004	<5	379	<5	379	<5	191	570
S54D	36–41	4/1/2004	11,000	33,600	280J	33,600	596	4,100	49,296
S55B	10–19.8	4/1/2004	<10	1,130	16.1J	1,130	<10	8,910	10,040
S55C	20.5–30.3	4/1/2004	<25	4,940	47.3J	4,940	<25	1,390	6,330
S56B	10–19.8	4/1/2004	31	199	2.3	201.3	2.7	29.1	264.1
S56C	20.5–30.3	4/1/2004	23.9	125	1.9	126.9	2	16.7	169.5
S56D	31–40.8	4/1/2004	32.8	157	2.2	159.2	2.4	17.6	212
S57B	10–19.8	4/1/2004	<1	3.1	<1	3.1	<1	1.5J	3.1
S57C	20.5–30.3	4/1/2004	10,900	21,200	<250	21,200	1,020	11,000	44,120
S57D	31.5–41.3	4/1/2004	48.5	438	6.9J	438	16.9	407	910.4

Table 11 (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**	
S59B	10–19.8	4/15/2004	<0.5	0.58J	<0.5	0.58J	<0.5	1.1	1.1
S59C	20.5–30.3	4/15/2004	<0.5	7.1	<0.5	7.1	<0.5	17.3	24.4
S59D	31–40.8	4/15/2004	<2.5	<2.5	<2.5	ND	<2.5	<2.5	ND
S60B	10–19.8	4/15/2004	<0.5	4.9	<0.5	4.9	0.74J	1.9	6.8
S60C	20.5–30.3	4/15/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
S60D	31–40.8	4/15/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
S67B	10–19.83	4/15/2004	<0.5	33.2	5.3	38.5	<0.5	518	556.5
S67C	20–29.83	4/15/2004	<5	519	104	623	<5	415	1,038
S67D	30–39.83	4/15/2004	<0.5	105	23.1	128.1	1.3	91.6	221
S68B	10–20	10/13/2003	<1	<1	<1	ND	<1	<1	ND
		4/22/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
S68C	18–28	10/13/2003	<1	4.3	<1	4.3	<1	5.7	10
		4/22/2004	<0.5	4	<0.5	4	<0.5	5.3	9.3
S68D	30–40	10/13/2003	<1	84	3.4	87.4	<1	77	164.4
		4/22/2004	<0.5	58.9	1.1	60	<0.5	55.7	115.7
S69B	10–20	10/10/2003	<1	<1	<1	ND	<1	<1	ND
		4/22/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
S69C	20–30	10/10/2003	<1	<1	<1	ND	<1	<1	ND
		4/22/2004	<0.5	0.91J	<0.5	0.91J	<0.5	1.1	1.1
S69D	30–40	10/10/2003	<1	<1	<1	ND	<1	<1	ND
		4/22/2004	<0.5	1.6	<0.5	1.6	<0.5	<0.5	1.6
S70B	10–20	10/10/2003	<1	29	<1	29	<1	24	53
		4/18/2004	<0.5	27.4	0.6J	27.4	<0.5	33.7	61.1
S70C	20–30	10/10/2003	<1	29	8.1	37.1	<1	11	48.1
		4/18/2004	<0.5	24.3	8	32.3	0.79J	17.1	49.4
S70D	30–40	10/10/2003	<1	13	2.5	15.5	<1	0.26J	15.5
		4/18/2004	<0.5	11.2	4.2	15.4	<0.5	5.8	21.2
S71B	10–20	10/10/2003	<1	10	3	13	<1	0.33J	13
		4/22/2004	<0.5	2.4	1.4	3.8	<0.5	<0.5	3.8
S71C	20–30	10/10/2003	<2.5	120	52	172	<2.5	160	332
		4/22/2004	<0.5	67.5	35.3	102.8	1.7	59.3	163.8
S71D	30–40	10/10/2003	<1	3.4	<1	3.4	<1	<1	3.4
		4/22/2004	<0.5	6.1	1.6	7.7	<0.5	2	9.7
S72B	10–20	10/9/2003	<1	<1	<1	ND	<1	<1	ND
		4/22/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
S72C	20–30	10/9/2003	<1	<1	<1	ND	<1	<1	ND
		4/22/2004	<0.5	0.81J	<0.5	0.81J	<0.5	<0.5	ND
S72D	30–40	10/9/2003	<1	<1	<1	ND	<1	<1	ND
		4/22/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
S73B	10–20	10/9/2003	<1	<1	<1	ND	<1	<1	ND
		1/15/2004	<2.5	<2.5	<2.5	ND	<2.5	<2.5	ND
		4/22/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
		7/22/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND

Table 11 (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**	
S73C	20–30	10/7/2003	<1	26	11	37	<1	9	46
		1/13/2004	<1	20	8.9	28.9	0.39J	11	39.9
		1/15/2004	<2.5	20.7	9.6	30.3	<2.5	10.7	41
		4/22/2004	<0.5	14	10.1	24.1	<0.5	13.8	37.9
		7/22/2004	<0.5	6.6	5.2	11.8	<0.5	10	21.8
S73D	30–40	10/7/2003	<1	<1	<1	ND	<1	<1	ND
		1/15/2004	<2.5	<2.5	<2.5	ND	<2.5	<2.5	ND
		4/22/2004	<0.5	1.7	0.65J	1.7	<0.5	<0.5	1.7
		7/22/2004	<0.5	0.66J	<0.5	0.66J	<0.5	<0.5	ND
TE03	–	4/17/2004	<2.5	<2.5	<2.5	ND	<2.5	9	9
PIN21		**Perimeter Monitoring Wells**							
0500	7–17	4/20/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
0501	20–28	4/20/2004	<0.5	2.4	<0.5	2.4	<0.5	<0.5	2.4
0502	7–17	10/9/2003	<1	<1	<1	ND	<1	<1	ND
		4/21/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
0503	20–28	10/9/2003	5.2	8.7	<1	8.7	<1	<1	13.9
		4/21/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
0504	7–17	10/13/2003	<1	<1	<1	ND	<1	<1	ND
		4/22/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
0505	20–28	10/13/2003	<1	<1	<1	ND	<1	<1	ND
		4/22/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
0512	20–29.5	10/9/2003	<1	<1	<1	ND	<1	1.3	1.3
		4/21/2004	<0.5	3	<0.5	3	<0.5	4.9	7.9

[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 12. COPC Concentrations at the Wastewater Neutralization Area (reported in micrograms per liter)[a]

Location	Screen Depth (ft)	Date Sampled	Vinyl chloride	Arsenic	Total COPC[b]
FDEP MCL			**1**	**50**	
PIN18		**Wastewater Neutralization Area**			
0500	11–16	10/14/2003	--	93	93
		1/16/2004	--	76.4	76.4
		4/21/2004	<0.5	68.1	68.1
		7/21/2004	--	68.1	68.1
		10/13/2004	--	63.4	63.4
0502	11–16	10/14/2003	--	84	84
		1/16/2004	--	30.4	30.4
		4/21/2004	<0.5	28.7	28.7
		7/21/2004	--	41	41
		10/13/2004	--	10	10
0503	10–20	10/11/2003	--	<10	ND
		4/17/2004	<0.5	<3.5	ND
0504	13–22	10/14/2003	--	<10	ND
		4/21/2004	<0.5	<3.5	ND
0505	10.5–20.5	10/11/2003	--	<10	ND
		4/17/2004	<0.5	<3.5	ND
0506	12–22	10/11/2003	--	<10	ND
		4/17/2004	<0.5	<3.5	ND
0507	27–37	10/11/2003	--	<10	ND
		4/17/2004	<0.5	<3.5	ND
0508	31–41	10/14/2003	--	<10	ND
		4/20/2004	<0.5	<3.5	ND
0509	27.5–37.5	10/11/2003	--	<10	ND
		4/17/2004	<0.5	<3.5	ND
0510	27.5–37.5	10/11/2003	--	<10	ND
		4/17/2004	0.52J	<3.5	ND
0511	32–42	4/21/2004	<0.5	<3.5	ND
0512	21–31	4/21/2004	<0.5	<3.5	ND
0513	12–22	4/21/2004	<0.5	<3.5	ND
0514	32.5–42.5	4/17/2004	<0.5	<3.5	ND
0515	22.5–32.5	4/17/2004	<0.5	<3.5	ND
0516	12.5–22	4/17/2004	<0.5	<3.5	ND
0517	31.5–41.5	4/17/2004	<0.5	<3.5	ND
0518	22.5–32.5	4/17/2004	<0.5	<3.5	ND
0519	12.5–22.5	4/17/2004	4.9	<3.5	4.9
0520	32.5–42.5	4/19/2004	<0.5	<3.5	ND
0521	20–30	10/14/2003	--	6.4J	ND
		1/16/2004	--	<3.5	ND
		4/19/2004	<0.5	6.4B	ND
		7/21/2004	--	6.5B	ND
		10/12/2004	--	<3.5	ND

Table 12 (continued). COPC Concentrations at the Wastewater Neutralization Area (reported in micrograms per liter)[a]

Location	Screen Depth (ft)	Date Sampled	Vinyl chloride	Arsenic	Total COPC[b]
FDEP MCL			**1**	**50**	
0522	5–15	10/14/2003	--	13	13
		1/16/2004	--	26.9	26.9
		4/19/2004	<0.5	9.6B	ND
		7/21/2004	--	9.8B	ND
		10/12/2004	--	8.2B	ND
0523	32.5–42.5	10/14/2003	--	<10	ND
		1/16/2004	--	<3.5	ND
		4/19/2004	<0.5	<3.5	ND
		7/21/2004	--	<3.5	ND
		10/12/2004	--	<3.5	ND
0524	20–30	10/14/2003	--	26	26
		1/16/2004	--	27.6	27.6
		4/19/2004	<0.5	19.4	19.4
		7/21/2004	--	10.9	10.9
		10/12/2004	--	11.8	11.8
0525	5–15	10/14/2003	--	66	66
		1/16/2004	--	112	112
		4/19/2004	<0.5	117	117
		7/21/2004	--	130	130
		10/12/2004	--	53.7	53.7
0526	19.5–29	4/21/2004	<0.5	<3.5	ND
RW02	10–20	10/2/2003	<1	130	130
		1/7/2004	--	36.3	36.3
		1/16/2004	<0.5	--	ND
		4/6/2004	<0.5	50.7	50.7
		7/6/2004	<0.5	564	564
		10/5/2004	--	64.3	64.3
RW03	9–24	10/2/2003	<1	32	32
		1/7/2004	--	37.4	37.4
		1/16/2004	<0.5	--	ND
		4/6/2004	<0.5	48.3	48.3
		7/6/2004	<0.5	698	698
		10/5/2004	--	35.3	35.3
RW0501	11–16	10/2/2003	<1	140	140
		1/7/2004	--	131	131
		1/16/2004	<0.5	--	ND
		4/6/2004	<0.5	147	147
		7/6/2004	<0.5	123	123
		10/5/2004	--	116	116

[a]Before December 18, 2003 "<" values are reporting limits. On or after December 18, 2003 "<" values are method detection limits.
[b]Total COPC is the sum of the individual COPC concentrations. "J" values or "B"-qualified arsenic values are not included in the total COPC value.

ND = Not detected
-- = Not measured
J = Estimated value, result is between the reporting limit and the method detection limit.
B = For inorganics: result is between the instrument detection limit and the reporting limit.

Table 13. Relative Percent Difference (RPD) for Duplicate Samples

Sample ID	Duplicate ID	Case Number	Constituent	S[a]	D[b]	RPD Value	5 times RL[c]	Fail[d]
PIN15−0567	PIN15−0611	F27357	1,1-Dichloroethene	0.72	0.77	6.7	2.5	
			Benzene	12.8	12.9	0.8	2.5	
			cis-1,2-Dichloroethene	68	67.6	0.6	2.5	
			Florida Petroleum Range Organics	0.558	1.36	83.6	0.85	Fail
			trans-1,2-Dichloroethene	15.4	15.7	1.9	2.5	
			Trichloroethene	1.8	1.8	0.0	2.5	
			Vinyl chloride	34.5	36.6	5.9	2.5	
PIN15−M29S	PIN15−0612	F27325	Florida Petroleum Range Organics	0.334	0.193	53.5	0.8	
			Methylene chloride	0.5	13.5	185.7	5	Fail

[a]S = Original sample (N001), VOC concentrations in µg/L and metals in mg/L.
[b]D = Duplicate sample (N002), VOC concentrations in µg/L and metals in mg/L.
[c]RL = Reporting limit.
[d]Fail

Volatiles "Fail" when the RPD is greater than ± 30% and the concentration is more than 5 times the reporting limit. Metals "Fail" when the samples are more than 5 times the reporting limit and the RPD is greater than 20%. For metals samples that are less than 5 times the reporting limit the difference must be less than ± the reporting limit (this includes the case when only one of the duplicate/sample values is less than 5 times the reporting limit).

Table 14. Summary of Analytical Results for the Building 100 Area 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]	1,1-DCE	Vinyl chloride	Total COPC[d]	$CaCO_3$ mg/L	Fe mg/L
PIN12		**Industrial Drain Leaks Bldg. 100**								
TRTI	10/5/2004	1,140	1,360	31	1,391	<10	144	2,675	374	4.96
	11/2/2004	576	971	10.9	981.9	<5	210	1,767.9	2,370	36.5
	11/17/2004	443	392	8.9J	392	<5	54.4	889.4		
	12/7/2004	955	1,020	32	1,052	16.1	153	2,176.1	347	4.1
TRTE	10/5/2004	<0.5	<0.5	<0.5	ND	<0.5	<0.5	ND	374	4.98
	11/2/2004	2.3	4.5	<0.5	4.5	<0.5	<0.5	6.8	2,460	47.8
	11/17/2004	0.54J	1.1	<0.5	1.1	<0.5	<0.5	1.1		
	12/7/2004	<10	44.2	<10	44.2	<10	61.7	105.9	359	4.15

[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 15. Historical Summary of Ground Water Recovery from the Building 100 Recovery Wells

Report Date	Quarterly (gallons)	Cumulative Total To Date (gallons)
April−June 2004	188,490	188,490
July−September 2004	410,734	599,224
October−December 2004	589,242	1,188,466

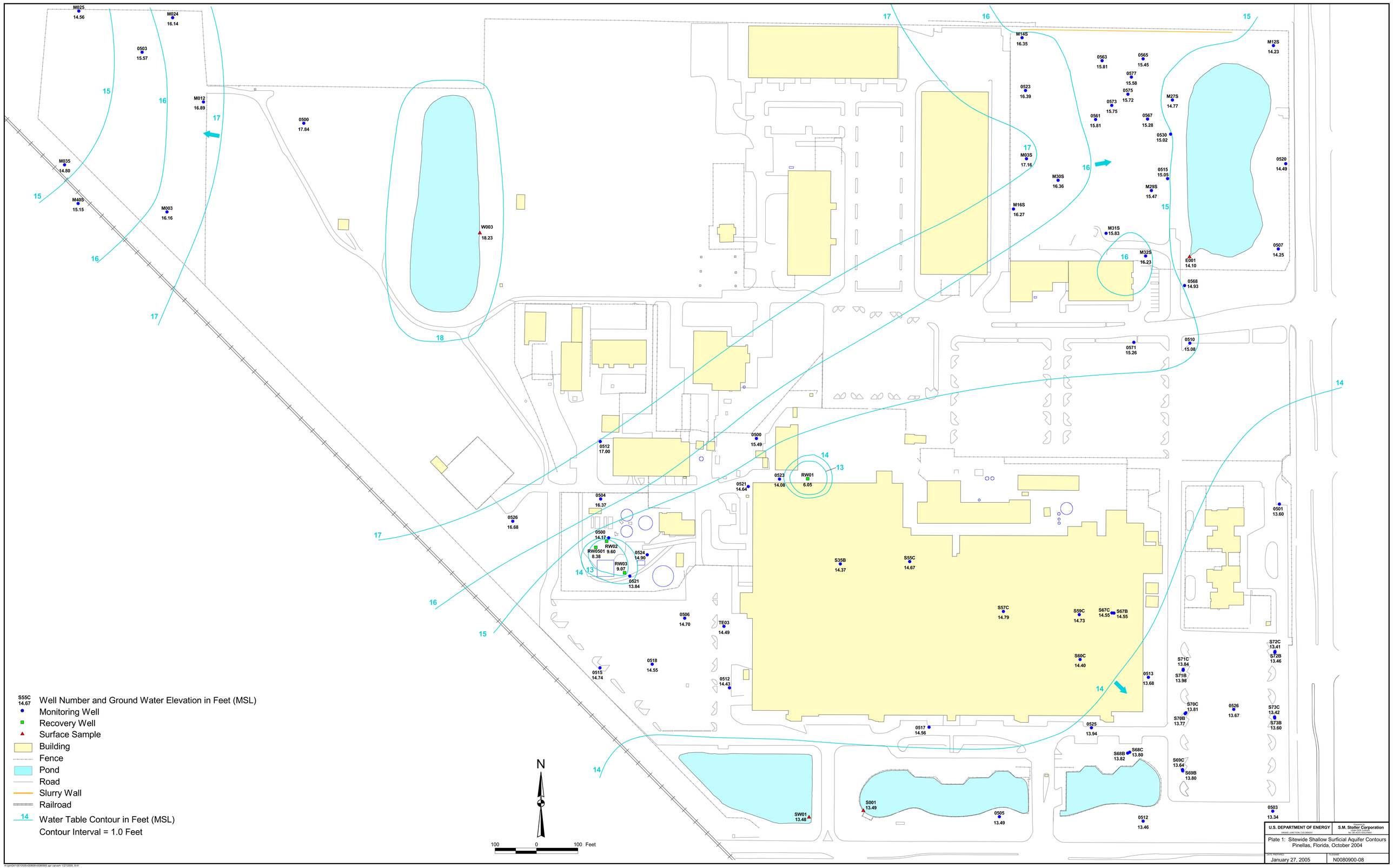
Note: The Building 100 Ground Water Treatment System started operations in May 2004.

Table 16. Estimated Mass of VOCs Recovered from the Building 100 Recovery Wells During October, November, and December 2004

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)
October 2004	190,422	1,360.0	31.0	5.0	1,140.0	10.0	144.0	2,690
November 2004	206,648	681.5	9.9	47.9	509.5	67.1	132.2	1,448
December 2004	192,172	1,020.0	32.0	1.2	955.0	0.5	153.0	2,161

Month	Volume Treated (gallons)	Recovery[b]						
		cis-1,2-DCE (lbs)	trans-1,2-DCE (lbs)	Toluene (lbs)	TCE (lbs)	Methylene Chloride (lbs)	Vinyl Chloride (lbs)	Total VOCs (lbs)
October 2004	190,422	2.16	0.05	0.01	1.81	0.02	0.23	4.27
November 2004	206,648	1.18	0.02	0.08	0.88	0.12	0.23	2.50
December 2004	192,172	1.64	0.05	0.00	1.53	0.00	0.25	3.47

[a]These concentrations represent the average of weekly 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.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M14S 16.35
0563 15.81
0565 15.45
0577 15.58
0575 15.72
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0567 15.28
0523 16.39
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0530 15.02
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M30S 16.36
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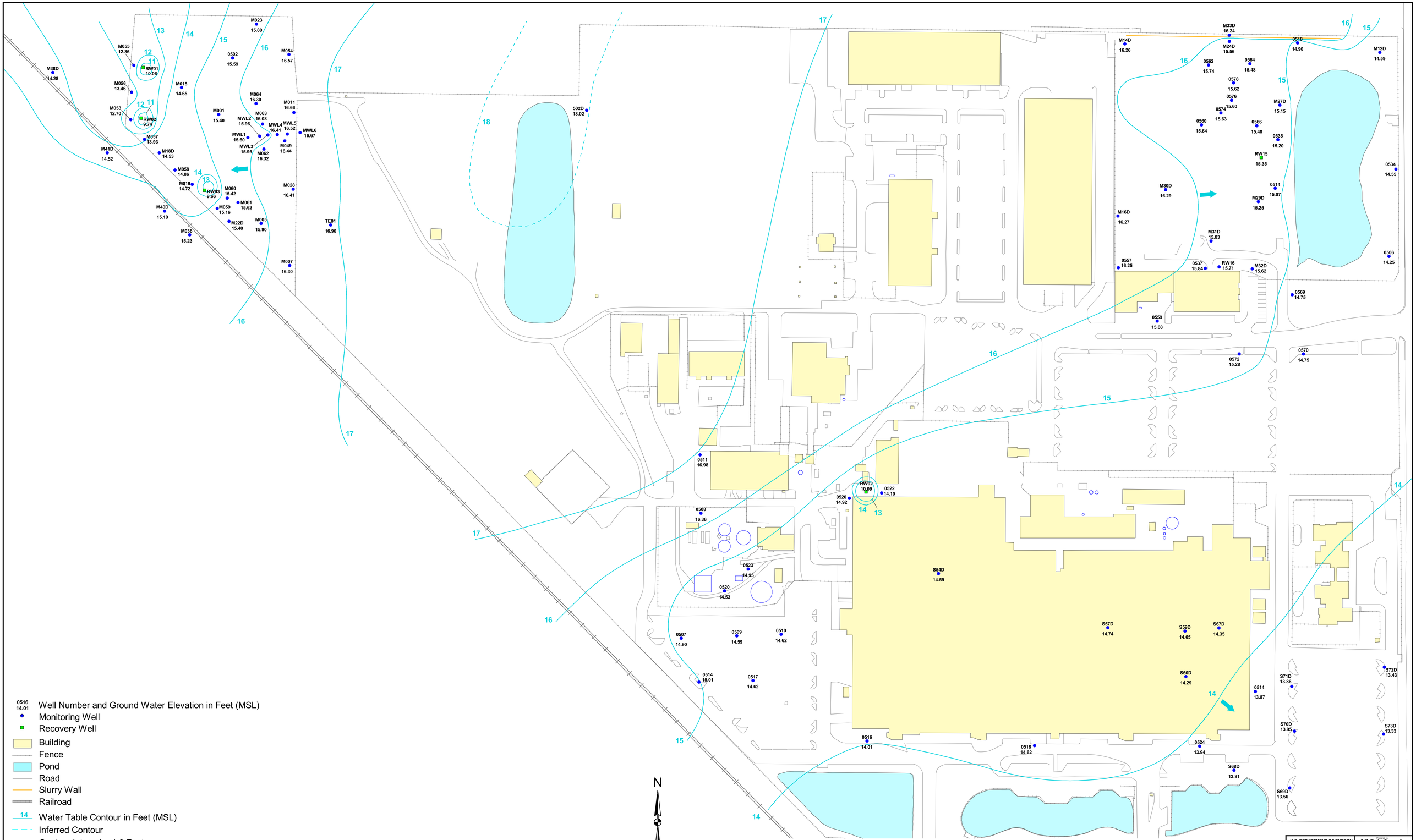
M29S 15.47
M16S 16.27
0520 14.49
M31S 15.83
M32S 16.23
E001 14.10
0507 14.25
0568 14.93
0571 15.26
0510 15.08
0512 17.00
0500 15.49
0523 14.08
RW01 6.05
0521 14.64
0504 16.37
0526 16.68
0500 14.72
RW02 RW0501 9.60 8.38
RW03 9.07
0524 14.90
0521 13.84
0501 13.60
S35B 14.37
S55C 14.67
S57C 14.79
S59C 14.73
S67C 14.55
S67B 14.55
0506 14.70
TE03 14.49
S60C 14.40
S72C 13.41
S72B 13.46
S71C 13.84
S71B 13.98
0515 14.74
0518 14.55
0512 14.43
0513 13.68
S70C 13.81
S70B 13.77
0526 13.67
S73C 13.42
S73B 13.60
0517 14.56
0525 13.94
S68C 13.80
S68B 13.82
S69C 13.64
S69B 13.80
SW01 13.48
S001 13.49
0505 13.49
0512 13.46
0503 13.34
N
100 0 100 Feet
S55C 14.67 Well Number and Ground Water Elevation in Feet (MSL)
Monitoring Well
Recovery Well
Surface Sample
Building
Fence
Pond
Road
Slurry Wall
Railroad
14 Water Table Contour in Feet (MSL)
Contour Interval = 1.0 Feet
U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION, COLORADO
S.M. Stoller Corporation
INSTALLATION CONTRACTOR
Plate 1: Sitewide Shallow Surficial Aquifer Contours
Pinellas, Florida, October 2004
DATE PREPARED: January 27, 2005
FILENAME: N0080900-08



U.S. DEPARTMENT OF ENERGY	S.M. Stoller Corporation
GRAND JUNCTION, COLORADO	GRAND JUNCTION, COLORADO No. DE-ACI01-02GJ79491

Plate 2: Sitewide Deep Surficial Aquifer Contours
Pinellas, Florida, October 2004

DATE PREPARED	FILENAME
January 27, 2005	N0080900-07