

Prepared in cooperation with the U.S. Department of the Army Environmental and Natural Resources Management Office of the U.S. Army Signal Center and Fort Gordon

## **Assessment of Hyporheic Zone, Flood-Plain, Soil-Gas, Soil, and Surface-Water Contamination at the Old Incinerator Area, Fort Gordon, Georgia, 2009–2010**



Open-File Report 2011–1201

**Cover photograph.** Location of the Old Incinerator Area, Fort Gordon, Georgia, May 23, 2010 (*Wladimir B. Guimaraes, U.S. Geological Survey*).

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By Wladimir B. Guimaraes, W. Fred Falls, Andral W. Caldwell, W. Hagan Ratliff,  
John B. Wellborn, and James E. Landmeyer

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Open-File Report 2011–1201

**U.S. Department of the Interior**  
**U.S. Geological Survey**

**U.S. Department of the Interior**  
KEN SALAZAR, Secretary

**U.S. Geological Survey**  
Marcia K. McNutt, Director

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## Conversion Factors and Datum

### Inch/Pound to SI

<b>Multiply</b>	<b>By</b>	<b>To obtain</b>
Length		
inch (in.)	2.54	centimeter (cm)
inch (in.)	25.4	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)

Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83).

## Acronyms and Abbreviations

BTEX	Benzene, toluene, ethylbenzene, and xylene (total)
GC/MS	Gas chromatography/mass spectrometry
DCB	Dichlorobenzene
DCE	Dichloroethene
mg/kg	milligram per kilogram
µg	microgram
µg/g	microgram per gram
µg/L	microgram per liter
mL	milliliter
LRL	Laboratory reporting level
MCL	Maximum contaminant level
MDL	Method detection level
MTBE	Methyl <i>tert</i> -butyl ether
NPDWS	National Primary Drinking Water Standard
NSDWS	National Secondary Drinking Water Standard
OIA	Old Incinerator Area
PAH	Polycyclic aromatic hydrocarbon
PCE	Perchloroethylene (also known as tetrachloroethylene)
RCRA	Resource Conservation and Recovery Act
RSL	Regional Screening Level
SCDHEC	South Carolina Department of Health and Environmental Control
SVOC	Semivolatile organic compound
TCE	Trichloroethene
TMB	Trimethylbenzene
TPH	Total petroleum hydrocarbon
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
VOC	Volatile organic compound





# Assessment of Hyporheic Zone, Flood-Plain, Soil-Gas, Soil, and Surface-Water Contamination at the Old Incinerator Area, Fort Gordon, Georgia, 2009–2010

By Wladimir B. Guimaraes,<sup>1</sup> W. Fred Falls,<sup>1</sup> Andral W. Caldwell,<sup>1</sup> W. Hagan Ratliff,<sup>2</sup> John B. Wellborn,<sup>3</sup> and James E. Landmeyer<sup>1</sup>

## Abstract

The U.S. Geological Survey, in cooperation with the U.S. Department of the Army Environmental and Natural Resources Management Office of the U.S. Army Signal Center and Fort Gordon, Georgia, assessed the hyporheic zone, flood plain, soil gas, soil, and surface-water for contaminants at the Old Incinerator Area at Fort Gordon, from October 2009 to September 2010. The assessment included the detection of organic contaminants in the hyporheic zone, flood plain, soil gas, and surface water. In addition, the organic contaminant assessment included the analysis of explosives and chemical agents in selected areas. Inorganic contaminants were assessed in soil and surface-water samples. The assessment was conducted to provide environmental contamination data to the U.S. Army at Fort Gordon pursuant to requirements of the Resource Conservation and Recovery Act Part B Hazardous Waste Permit process.

Total petroleum hydrocarbons were detected above the method detection level in all 13 samplers deployed in the hyporheic zone and flood plain of an unnamed tributary to Spirit Creek. The combined concentrations of benzene, toluene, ethylbenzene, and total xylene were detected at 3 of the 13 samplers. Other organic compounds detected in one sampler included octane and trichloroethylene.

In the passive soil-gas survey, 28 of the 60 samplers detected total petroleum hydrocarbons above the method detection level. Additionally, 11 of the 60 samplers detected the combined masses of benzene, toluene, ethylbenzene, and total xylene above the method detection level. Other compounds detected above the method detection level in the passive soil-gas survey included octane, trimethylbenzene, perchlorethylene, and chloroform.

Subsequent to the passive soil-gas survey, six areas determined to have relatively high contaminant mass were selected, and soil-gas samplers were deployed, collected, and analyzed for explosives and chemical agents. No explosives or chemical agents were detected above their method detection levels, but those that were detected were above the nondetection level.

The same six locations that were sampled for explosives and chemical agents were selected for the collection of soil samples. No metals that exceeded the Regional Screening Levels for Industrial Soils as classified by the U.S. Environmental Protection Agency were detected at any of the six Old Incinerator Area locations. The soil samples also were compared to values from the ambient, uncontaminated (background) levels for soils in South Carolina. Because South Carolina is adjacent to Georgia and the soils in the coastal plain are similar, these comparisons are valid. No similar values are available for Georgia to use for comparison purposes. The only metal detected above the ambient background levels for South Carolina was barium.

A surface-water sample collected from a tributary west and north of the Old Incinerator Area was analyzed for volatile organic compounds, semivolatile organic compounds, and inorganic compounds (metals). The only volatile organic and (or) semivolatile organic compound that was detected above the laboratory reporting level was toluene. The compounds 4-isopropyl-1-methylbenzene and isophorone were detected above the nondetection level but below the laboratory reporting level and were estimated. These compounds were detected at levels below the maximum contaminant levels set by the U.S. Environmental Protection Agency National Primary Drinking Water Standard. Iron was the only inorganic compound detected in the surface-water sample that exceeded the maximum contaminant level set by the U.S. Environmental Protection Agency National Secondary Drinking Water Standard. No other inorganic compounds exceeded the maximum contaminant levels for the U.S. Environmental Protection Agency National Primary Drinking Water Standard, National Secondary Drinking Water Standard, or the Georgia In-Stream Water Quality Standard.

<sup>1</sup>U.S. Geological Survey, Columbia, South Carolina.

<sup>2</sup>Environmental Branch, Fort Gordon, Georgia.

<sup>3</sup>Environmental and Natural Resources, Fort Gordon, Georgia.

## Introduction

Fort Gordon is a U.S. Department of the Army facility located in east-central Georgia, approximately 10 miles (mi) southwest of Augusta, Georgia (fig. 1). A cantonment (military housing) area is located at the northwestern boundary of Fort Gordon. An incinerator was operated north-northeast of Mirror Lake near North Range Road at the top of a mostly barren hill. The remainder of the Old Incinerator Area (OIA) is wooded (fig. 1). Little previous information about the OIA is available except that a waste incinerator had previously been located and operated at the site (Hagan Ratliff, Applied Services and Informational Systems, Inc., Installation Restoration Program Manager, oral commun., November 6, 2009). Presently (2011), no physical evidence of the incinerator exists at the site. Because no previous information exists to document the potential for environmental contamination of the soil, groundwater, and surface water in and near the site, a site-wide investigation was conducted. The OIA is located in the outcrop area for the Cretaceous-age aquifer system, which is used for drinking water farther downgradient (Williams, 2007), and groundwater from the OIA site may discharge to streams in the area, enabling potential contaminants to be transported off the OIA site and beyond the boundaries of the Fort Gordon property.

## Purpose and Scope

The purpose of this report is to provide the results of the analyses of samples collected by the U.S. Geological Survey, in cooperation with the U.S. Department of the Army Environmental and Natural Resources Management Office of the U.S. Army Signal Center and Fort Gordon, to assess the hyporheic zone, flood plain, soil gas, soil, and surface water for contaminants at the OIA at Fort Gordon, Georgia, from October 2009 to September 2010. The environmental assessment was conducted to provide contamination data to the U.S. Army at Fort Gordon. The assessment included passive samplers deployed in the hyporheic zone, flood plain, and in the soil in a grid pattern over the generalized extent of the OIA to determine the presence of organic contaminants, explosives, and chemical agents from the OIA. The presence of inorganic compounds was determined from the soil and surface-water samples. The report presents the analytical results for a total of 86 sites.

## Description of the Study Area

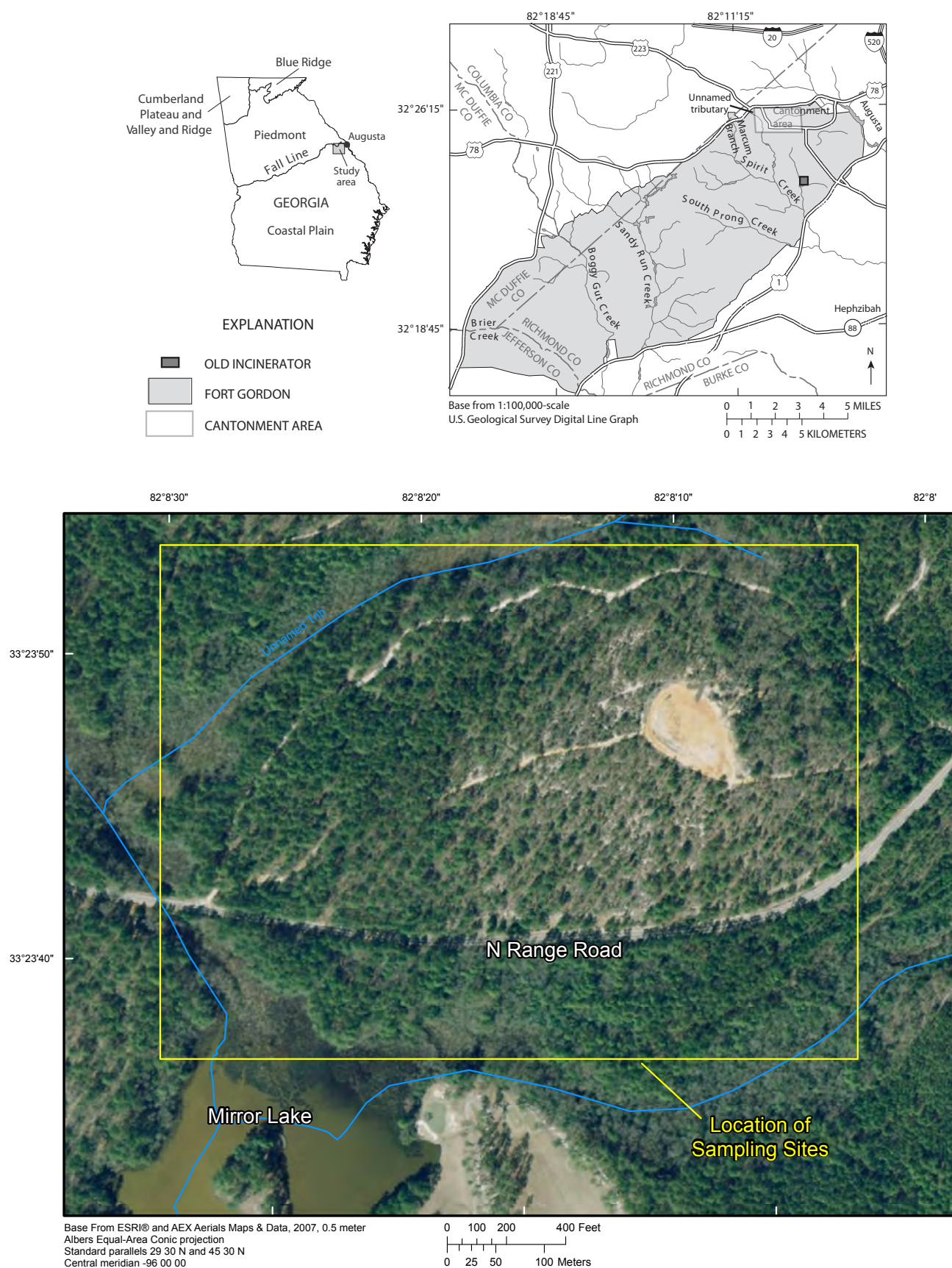
Fort Gordon is a U.S. Army facility located in east-central Georgia, approximately 10 mi southwest of Augusta, Georgia (fig. 1). Fort Gordon lies in the northern part of the Coastal Plain Physiographic Province and south of the Fall Line. Surficial soil and sediments are characterized by unconsolidated sands, indurated sands and semiconsolidated sandstones, and layers of clay that include kaolinite (Gregory and others, 2001).

## Methods

All samples were collected in March, June, August, and September 2010 and were analyzed by using standard laboratory practices (U.S. Geological Survey, variously dated). These analytical methods were selected to provide data to determine the presence or absence of contamination in the hyporheic zone, flood plain, soil gas, soil, and surface water at the OIA.

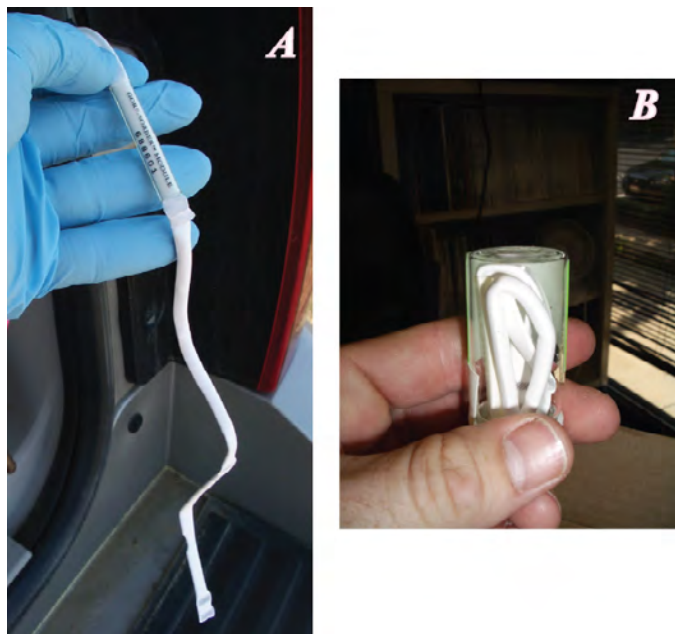
## Passive Survey

The passive survey was conducted by using the GORE™ Module, a commercially available passive diffusion sampler based on GORE-TEX® membrane technology (U.S. Environmental Protection Agency, 1998; W.L. Gore and Associates, Inc., 2004; American Society for Testing and Materials, 2006). The module consisted of an adsorbent material placed inside a shoestring-shaped GORE-TEX® tube (fig. 2A). The adsorbent material can adsorb a wide variety of volatile organic compounds (VOC), including solvents such as perchloroethylene (PCE; also known as tetrachloroethylene); trichloroethylene (TCE); benzene, toluene, ethylbenzene, and total xylenes (collectively referred to as BTEX); methyl *tert*-butyl ether (MTBE); semivolatile organic compounds (SVOC); total petroleum hydrocarbons (TPH); and polycyclic aromatic hydrocarbons (PAH) such as naphthalene. The modules were deployed into the area of interest and then removed after a specified time period. For the hyporheic zone and flood-plain survey, the modules were inserted into water, which was just below the sediments. For the soil-gas and the explosives and chemical agents surveys, the modules were tied to a string, attached to a cork plug to prevent the entrance of surface water and ambient surface sources of contamination, inserted into a shallow borehole, and later removed. Modules that were deployed in water were removed after 1 to 4 hours, whereas, modules deployed in the soil were removed after 5 to 10 days. After the modules were removed from water or soil, they were placed in their original 20-milliliter (mL) gas-tight vials (fig. 2B) and sent to a commercial laboratory (W.L. Gore and Associates, Inc.) for analysis by gas chromatography/mass spectrometry using a modification of U.S. Environmental Protection Agency (USEPA) method 8260/8270 to include thermal desorption of the sample. The laboratory is in compliance with Good Laboratory Practices and ISO Guide 25 (International Organization for Standardization, 1990).



**Figure 1.** Location of the Old Incinerator Area, Fort Gordon, Georgia.





**Figure 2.** The soil-gas sampler (A) prior to being installed in a shallow borehole and (B) following retrieval from a borehole and prior to shipping to the laboratory for analysis.

## Passive Hyporheic Zone and Flood-Plain Survey

Thirteen modules were installed in the hyporheic zone and (or) flood-plain sediments of an unnamed tributary to Spirit Creek located to the west and north of and downgradient from the OIA on March 22, 2010 (fig. 3). The modules were deployed inside stainless-steel drive points with screened openings that allowed the drive point to act as a well (fig. 4A). The water inside the drive points (well) was groundwater, and therefore, the module was exposed to groundwater contamination. The drive points provide passive sampling of the groundwater without installing a conventional monitoring well. The drive points were installed by hand no more than 1 foot (ft) into the water, just below the hyporheic zone or flood-plain sediments (fig. 4B). Because the module was placed in water, the retrieval time was between 1 and 4 hours. Three additional samplers were used as trip blanks, and one sampler was used as a method blank; these samplers were not deployed. The results of the passive hyporheic zone and flood-plain survey are expressed in concentrations of contaminant in micrograms per liter.

## Passive Soil-Gas Survey

Sixty modules were deployed in a grid pattern to cover the generalized extent of the OIA (fig. 3). Three additional samplers were used as trip blanks, and three samplers were used as method blanks; these samplers were not deployed. Each sampler was placed in a borehole that was 0.5 inches (in.) in diameter, 15 in. deep, and created by a stainless-steel

ship auger attached to a cordless drill. This depth is similar to what is recommended by the USEPA for soil-gas investigations (U.S. Environmental Protection Agency, 1998). The auger was cleaned with a paper towel prior to drilling of each borehole. The 60 modules were installed on June 23, 2010, and were retrieved on June 29, 2010. The soil-gas contaminant results are expressed as mass of contaminant in micrograms.

## Explosives and Chemical Agents

Subsequent to the passive soil-gas survey, six locations with elevated contaminant mass were selected as sampling sites for organic compounds classified as explosives and chemical agents (fig. 5). On September 16, 2010, six soil-gas samplers were deployed at the OIA at those selected locations and removed on September 22, 2010. These soil-gas samplers were installed and retrieved, as previously described in the passive soil-gas survey section of this report, and analyzed for organic compounds classified as explosives and chemical agents. The results of the passive survey of the explosives and chemical agents are expressed in mass of contaminant in micrograms.

## Soil Samples

Soil samples were collected at the same six locations that were sampled for explosives and chemical agents. Composite soil samples were collected on August 30, 2010, from land surface to 6 in. below land surface at the six locations (fig. 5). The samples were analyzed for 37 metals, including 6 of the 8 Resource Conservation and Recovery Act (RCRA) metals (selenium and mercury were excluded). Soil-sample metal concentrations were compared to the USEPA Regional Screening Levels (RSL) for Industrial Soils (U.S. Environmental Protection Agency, 2009a) to determine the extent of contamination. Soil-sample metal concentrations also were compared to values for ambient, uncontaminated (background) levels for soils across the adjacent State of South Carolina (South Carolina Department of Health and Environmental Control, 2002), because no similar values were available for Georgia. The comparison remains valid, because Georgia and South Carolina are located in similar physiographic provinces. Soil samples were analyzed for inorganic compounds using methods described by Briggs and Meier (2002).

## Surface-Water Sample

A surface-water sample was collected on September 8, 2010, from an unnamed tributary to Spirit Creek to the west and north of the OIA (fig. 5). The water sample was collected after the results of the passive soil-gas survey were received. The surface-water sample represents the discharge of locally recharged groundwater or runoff that may have been in contact with the material beneath or at land surface of the OIA. The water sample was analyzed for 85 VOCs, using methods



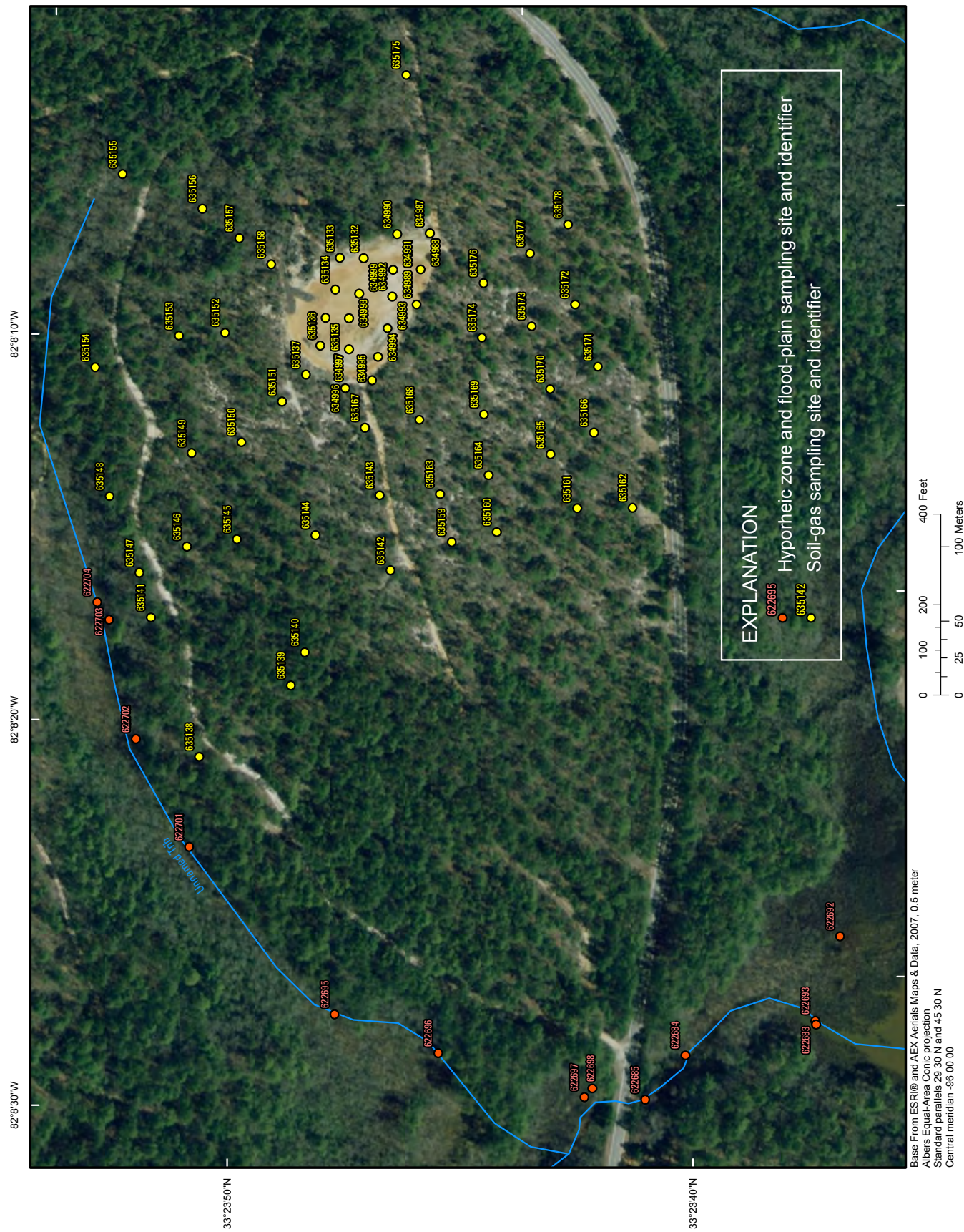


Figure 3. Locations of hyporheic zone, flood-plain, and soil-gas sampling sites, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.





**Figure 4.** Stainless-steel drive points (A) prior to being deployed and (B) after being deployed in the hyporheic zone of an unnamed tributary to Spirit Creek, Fort Gordon, Georgia.

described by Connor and others (1997), and 56 SVOCs (including PAHs), using methods described by Fishman (1993). The water sample also was analyzed for inorganic compounds (metals) by using methods described by Fishman and Friedman (1989), Hoffman and others (1996), Garbarino and Struzeski (1998), Garbarino and Damrau (2001), and Garbarino and others (2006). The surface-water sample was analyzed for inorganic compounds including seven of the eight RCRA metals (mercury was excluded). Seven compounds were determined using both VOC and SVOC methods, including naphthalene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2,4-trichlorobenzene, hexachloroethane, and hexachlorobutadiene. The VOCs and SVOCs were compared to the maximum contaminant level (MCL) set by the USEPA National Primary Drinking Water Standard (NPDWS; U.S. Environmental Protection Agency, 2009b). The inorganic compounds (metals) were compared to the MCL of the USEPA NPDWS, the National Secondary Drinking Water Standard (NSDWS; U.S. Environmental Protection Agency, 2009b), and the Georgia In-Stream Water-Quality Standard (ISWQS; Georgia Environmental Protection Division, 2005).

Handling censored data appropriately is necessary when laboratories report quantitative, estimated, and censored results. The results above a laboratory reporting level (LRL) are reported as a quantitative value, the results below the LRL and above the nondetection level are estimated (because the values are considered semiquantitative) and are reported with the remark code (E), and the results below the nondetection level are reported as censored data and are reported as less than the LRL (Childress and others, 1999).

## Results

The results of the multiple passive surveys, and soil and surface-water samples are presented in this section of the report. Passive survey results can indicate the presence of particular contaminants. The results do not, however, reveal if the detection was derived from a free product, a residual-phase adsorbed material or vapors in the unsaturated zone, or the dissolved phase in shallow or deep groundwater (unless the module was placed in water). In general, higher mass in a sample tends to be related to the presence of residual contamination or free product that is close to land surface where the sampler is located. If the source material is located at greater depths, however, the contaminant mass will generally be lower. A lower value near known contaminant sources can be caused by various attenuation processes that affect the contaminant mass prior to detection. In both cases, the modules help to rapidly indicate the presence or absence of contaminants. The passive approach was approved for use at OIA by the Hazardous Waste Management Branch, Georgia Environmental Protection Department (William Powell, P.E., Environmental Engineer, Department of Defense Remediation Unit, oral commun., December 10, 2008). All results are from the raw sample and are not filtered; therefore, the total mass or concentration of the constituent is reported.

### Passive Hyporheic Zone and Flood-Plain Survey

All 13 passive samplers deployed in the hyporheic zone and (or) flood plain of the stream detected TPH concentrations greater than the method detection level (MDL) of 0.81 microgram per liter ( $\mu\text{g/L}$ ; table 1; fig. 6). The TPH concentrations ranged from 58.17 to 144.09  $\mu\text{g/L}$  at all samplers. BTEX compounds were detected above the MDL at three locations (sampler numbers 622692, 622698, and 622704). Benzene was detected above the MDL at two locations (sampler numbers 622692 and 622704), and toluene was detected at the third location (sampler number 622698). Other compounds that were detected above the MDL at one location included octane (sampler number 622683) and TCE (sampler number 622704). The compound *cis*-1,2-dichloroethylene (DCE; sampler number 622698) was detected below the MDL but above the nondetection level. No other VOCs were detected in the hyporheic zone and flood plain. In one of the three field blanks, TPH was detected at a concentration below the MDL but above the nondetection level (table 1). The detection of TPH in the environmental sample was at a level many times greater than the concentration of TPH detected in the trip blanks; therefore, the results of TPH concentrations in the environmental samples are considered reliable.



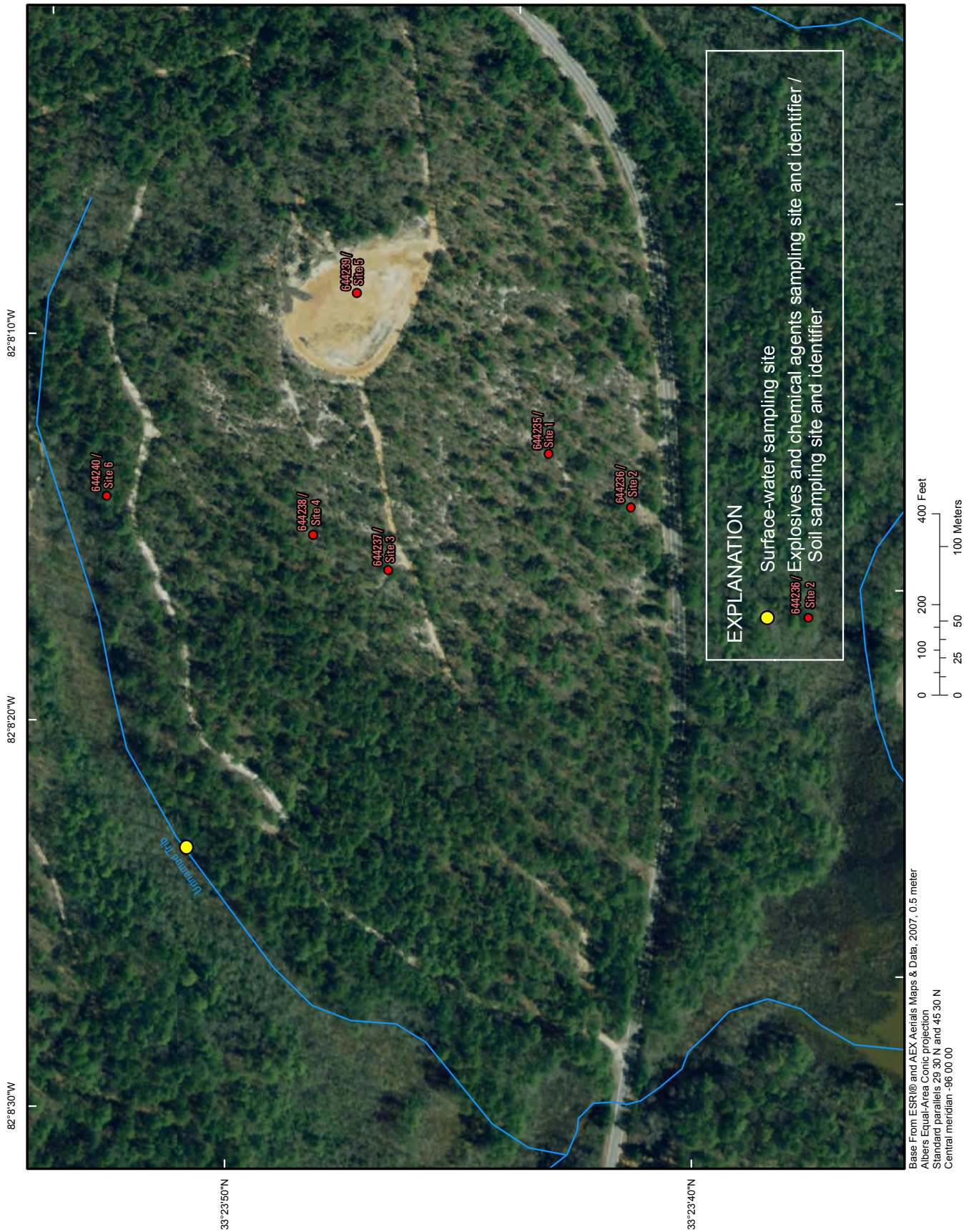
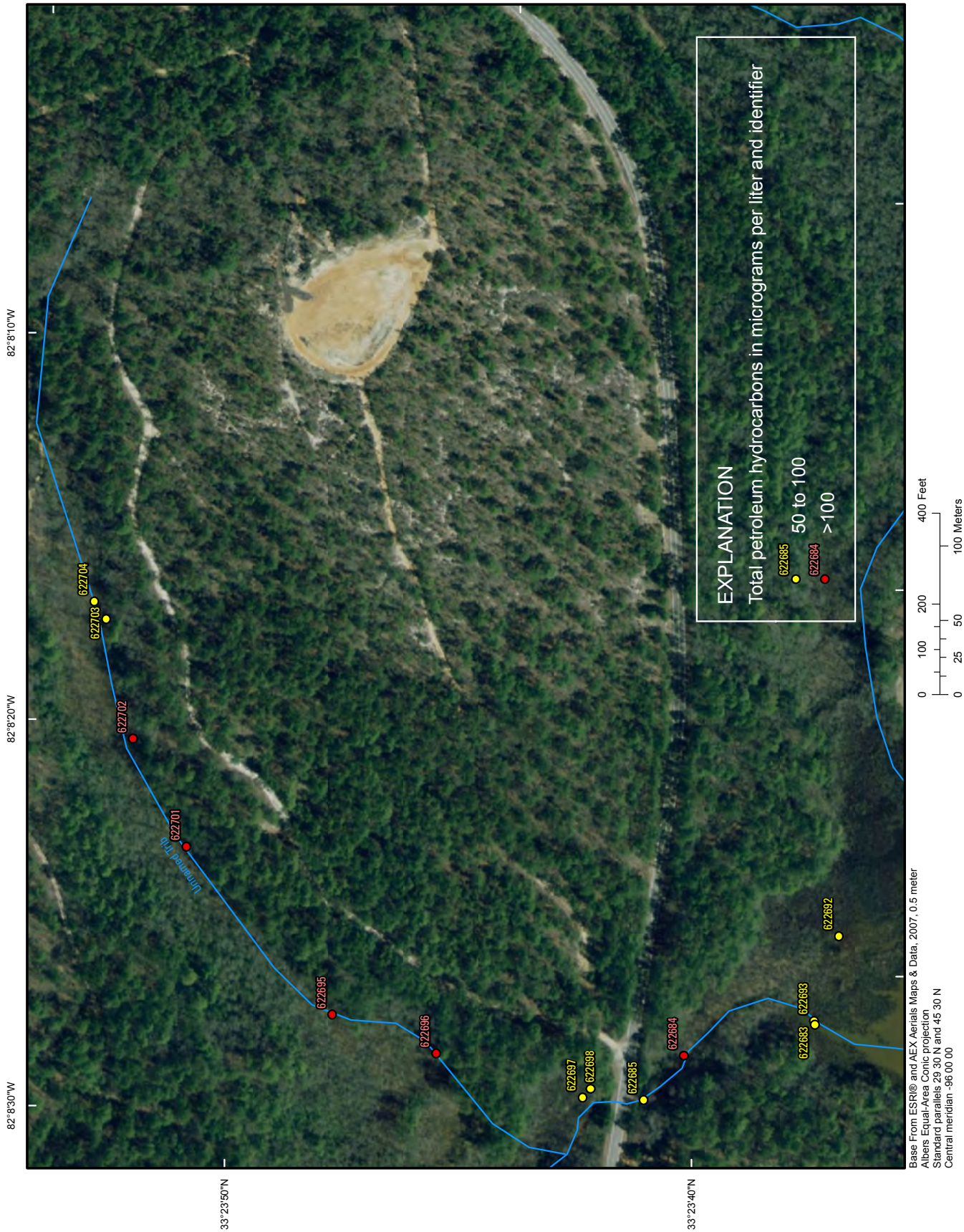


Figure 5. Locations of explosives and chemical agents, soil, and surface-water sampling sites, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.





**Figure 6.** Total petroleum hydrocarbons (TPH) concentrations in the hyporheic zone and flood-plain samplers, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010. Method detection level is 0.81 microgram per liter.



## Passive Soil-Gas Survey

All soil-gas samplers deployed at the OIA detected TPH mass greater than the MDL of 0.02 microgram ( $\mu\text{g}$ ) with a range of 0.11 to 104.6  $\mu\text{g}$  (fig. 7; table 2). Additionally, the three trip blanks and two of the three method blanks detected TPH mass greater than the MDL with a range of 0.02 to 0.04  $\mu\text{g}$ . The specific reason for the detection of TPH in the trip and method blanks could not be identified; therefore, except for TPH, all soil-gas results for the OIA investigation are accepted as valid environmental results. Results for TPH soil-gas mass were censored at 0.40  $\mu\text{g}$  and not included in figure 7, but the results are presented in table 2 as they were received from the laboratory. Values below 0.40  $\mu\text{g}$  were censored because, generally, if the mass in the blank(s) is less than 10 percent of the mass in the environmental sample(s), the effect of the contamination is likely to be within the precision of the method (U.S. Geological Survey, 1997). The censoring of the data shows that about one-half of the samplers (28 of 60 samplers) detected TPH mass above the value of 0.40  $\mu\text{g}$ . Eleven of the 60 soil-gas samplers had detections of BTEX mass above the MDL (fig. 8; table 2). Benzene was not detected in any of the samplers, but toluene was detected above the MDL as the main component of the BTEX mass in most of the samplers. In addition to toluene, meta- and para-xylene were detected below the MDL but above the nondetection level at sampler number 635142 and with a mass of 0.04  $\mu\text{g}$  at sampler number 634994 (table 2).

The combined soil-gas masses of the alkanes undecane, tridecane, and pentadecane ( $\text{C}_{11}$ ,  $\text{C}_{13}$ , and  $\text{C}_{15}$ ) were detected in 10 samplers from the OIA, but only three of those samplers were above the MDL (fig. 9; table 2). The other seven samplers were below MDL and above the nondetection level. Only undecane was detected above the MDL of 0.04  $\mu\text{g}$ . Tridecane and pentadecane were detected below the MDL, but above the nondetection level at all locations where they were detected (table 2). Octane (sampler number 635142), PCE (sampler number 635153), and 1,2,4-trimethylbenzene (sampler number 635142) were detected above the MDL at one location each. The only other VOC detected above the MDL was chloroform, which was detected at two locations (sampler numbers 6355157 and 635170).

## Explosives and Chemical Agents

Six soil-gas samplers were installed at selected locations at the OIA and analyzed for the presence of organic compounds classified as explosives and chemical agents (fig. 5). The samplers had no detections of explosives or chemical agents above their respective MDLs (table 3). Some explosive and chemical agents had masses below their MDLs but above the nondetection levels, including chloro acetophenones and para-chlorophenyl methyl sulfide. Para-chlorophenyl methyl sulfone was detected above the detection level in all six samples, but all six trip blanks also detected para-chlorophenyl methyl sulfone; therefore, the results are questionable and will not be considered. In addition, 2,4-dinitrotoluene was detected in one of the trip blanks, but was not detected in any of the samples (table 3).

## Soil Samples

Six composite soil samples were collected at select locations at the OIA (fig. 5). The soil samples detected no metal concentrations above the RSL at any of the six locations (tables 4–9). Some metal concentrations were, however, higher than background conditions reported for similar coastal plain sediments in South Carolina (South Carolina Department of Health and Environmental Control, 2002). Barium concentrations were higher than background concentrations reported for similar South Carolina coastal plain sediments and were detected at site 2 (table 5), site 3 (table 6), site 4 (table 7), site 5 (table 8), and site 6 (table 9).

## Surface-Water Sample

A water sample was collected (in duplicate) from the unnamed tributary to Spirit Creek west of the OIA (fig. 5) and analyzed for 85 VOCs, 56 SVOCs (including PAHs), and 22 inorganics (metals; tables 10–12). Of the 85 VOCs and 56 SVOCs that were analyzed, only toluene was detected above its LRL. The VOC 4-isopropyl-1-methylbenzene (table 10) and the SVOC isophorone (table 11) were detected below the LRL but above the nondetection level and were estimated. No VOCs or SVOCs were detected at levels above the NPDWS MCL (tables 10 and 11). Iron (concentration of 5,520  $\mu\text{g}/\text{L}$ ) was the only inorganic compound that exceeded the NSDWS MCL of 300  $\mu\text{g}/\text{L}$  (table 12). No other inorganic compounds were detected above the MCL for the USEPA NPDWS, NSDWS, or the Georgia ISWQS.

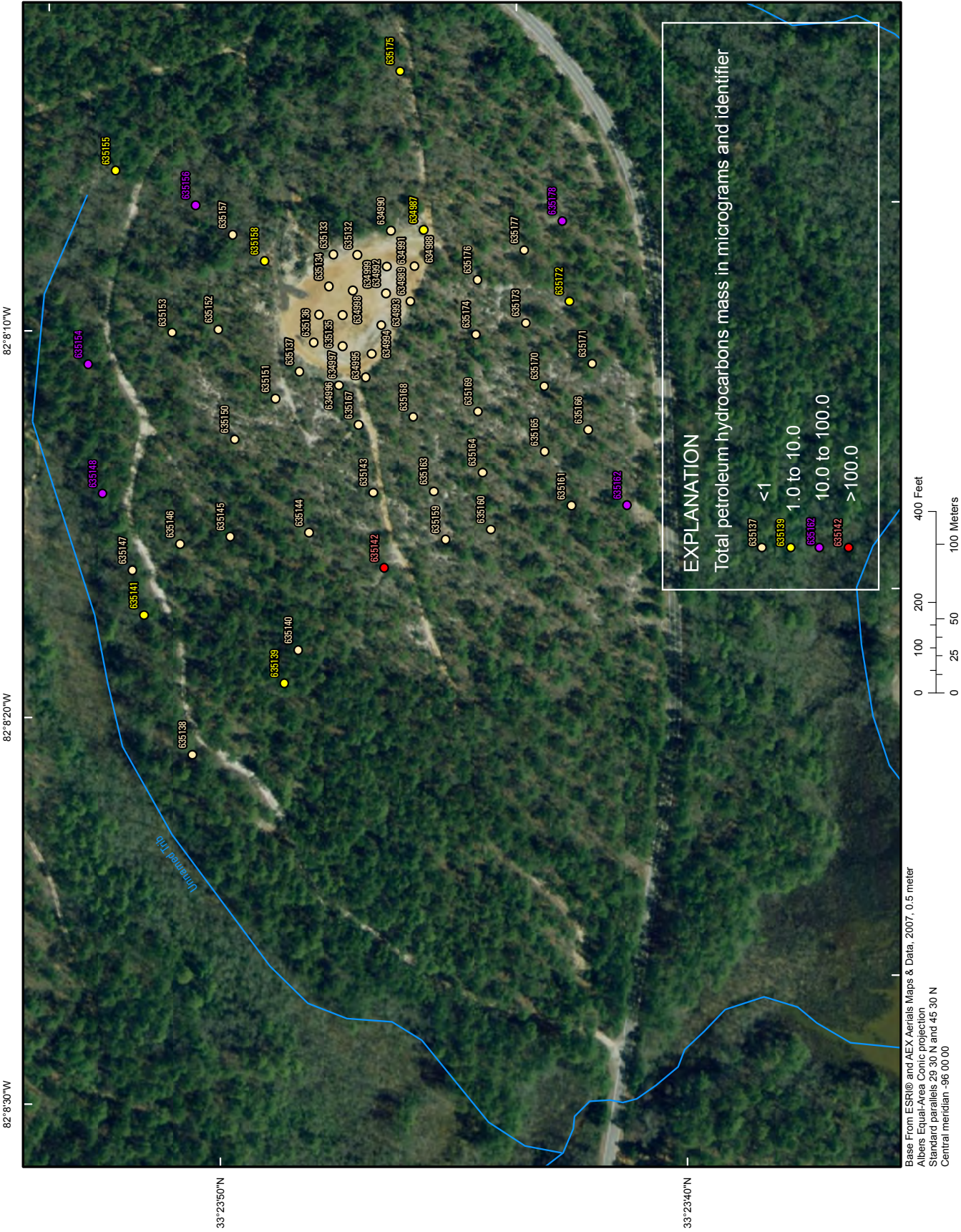
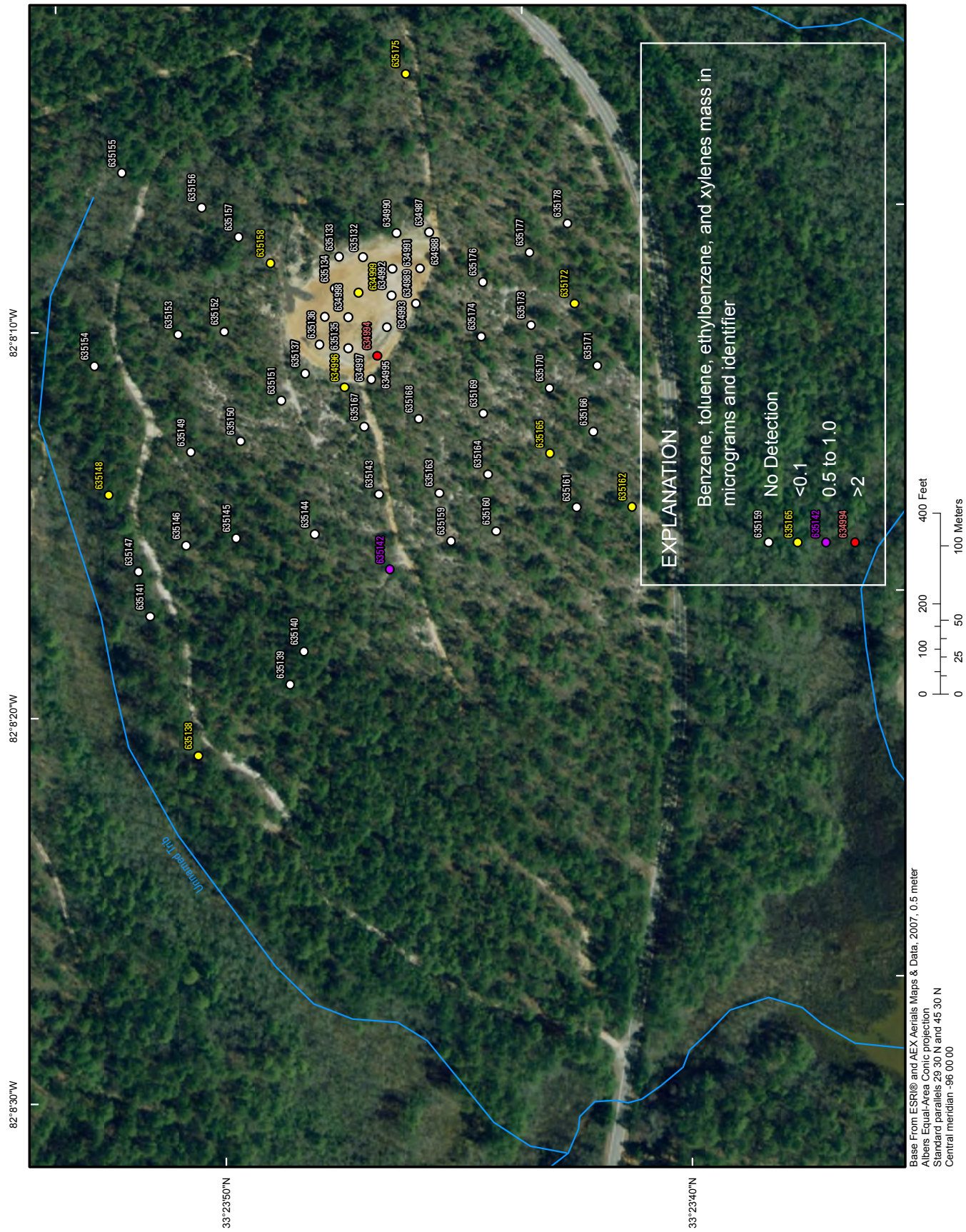


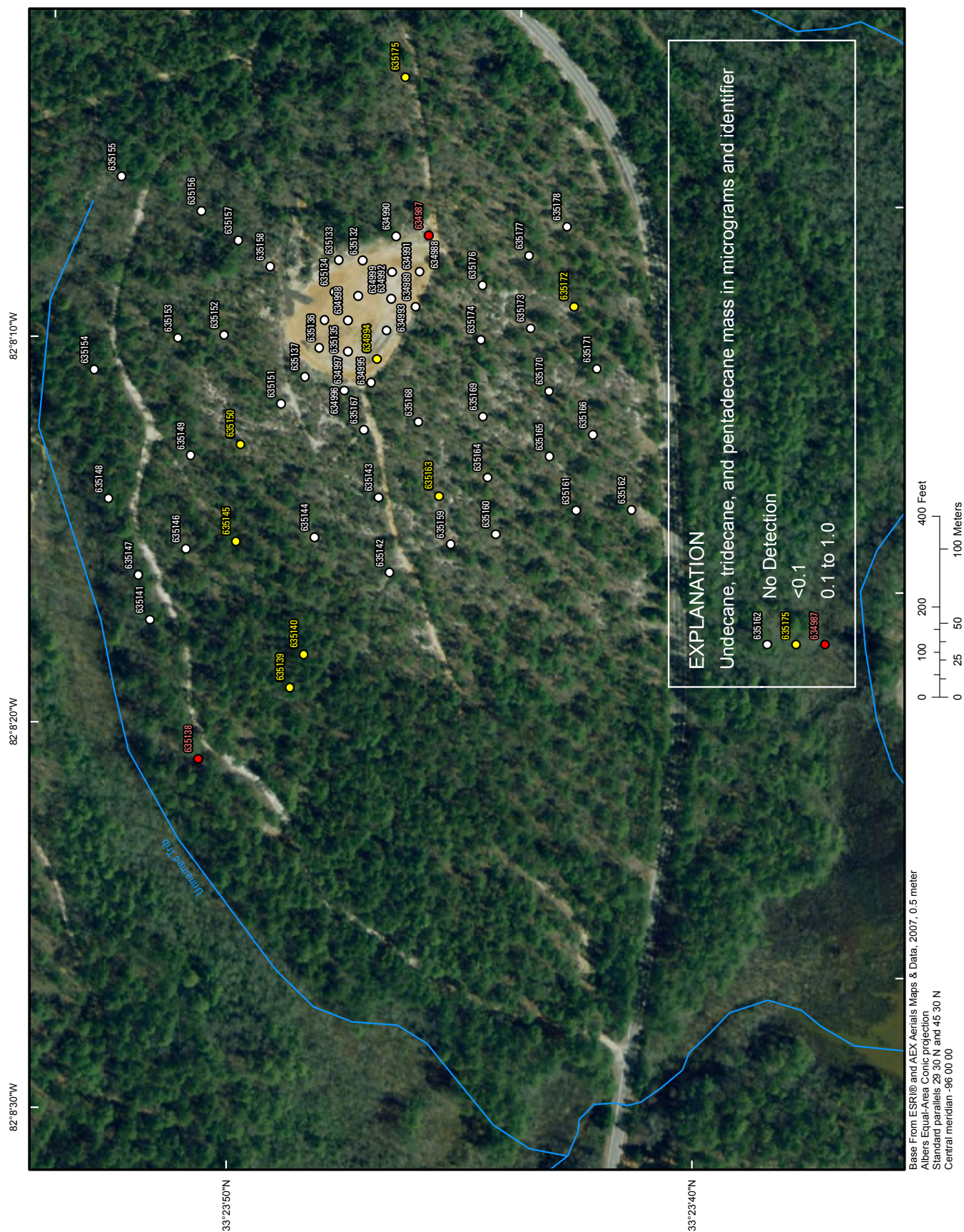
Figure 7. Total petroleum hydrocarbons (TPH) mass in soil-gas samplers, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010. Method detection level is 0.02 microgram.





**Figure 8.** Combined masses of benzene, toluene, ethylbenzene, and total xylenes (BTEX) in soil-gas samplers, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010. Method detection level is 0.02 microgram.





**Figure 9.** Combined masses of undecane, tridecane, and pentadecane ( $C_{11}$ ,  $C_{13}$ , and  $C_{15}$ ) in soil-gas samplers, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010. Method detection levels are 0.04, 0.02, and 0.02 microgram, respectively.

## Summary

The U.S. Geological Survey, in cooperation with the Environmental and Natural Resources Management Office of the U.S. Army Signal Center and Fort Gordon, assessed the hyporheic zone, flood plain, soil gas, soil, and surface water for contaminants at the Old Incinerator Area at Fort Gordon, Georgia, from October 2009 to September 2010. The assessment included the detection of organic compounds in the hyporheic zone, flood plain, soil, and surface water as well as the detection of organic compounds classified as explosives and chemical agents in selected areas. Surface-water and soil samples were analyzed for inorganic compounds. The assessment of the Old Incinerator Area was conducted to provide environmental contamination data to the U.S. Army at Fort Gordon pursuant to requirements of the Resource Conservation and Recovery Act Part B Hazardous Waste Permit process.

Total petroleum hydrocarbons (TPH) were detected in all 13 passive samplers installed in the hyporheic zone and flood plain. The combined concentrations of benzene, toluene, ethylbenzene, and total xylene were detected at 3 of the 13 samplers. Other organic compounds detected in one sampler included octane, and trichloroethylene.

In the soil-gas survey, TPH was detected in 28 of the 60 samplers that were deployed along the general extent of the Old Incinerator Area. Hyporheic zone samplers also included detections of octane, trichloroethene (TCE), and *cis*-,1,2-dichloroethylene (DCE). The compound, *cis*-,1,2-DCE was detected below the method detection level and above the nondetection level. Soil-gas samplers identified the occurrence of octane, 1,2,4-trimethylbenzene, perchloroethylene (PCE), and chloroform above the method detection level.

Soil-gas samplers were installed in areas that were determined to contain high contaminant mass by the soil-gas study to determine the presence of organic compounds classified as explosives and (or) chemical agents at the Old Incinerator Area. Analytical results indicated that no explosive or chemical agents were detected above the method detection level; however, some explosive and chemical agents were detected above a nondetection level.

The same six locations that were sampled for organic compounds classified as explosives and chemical agents were selected for the collection of soil samples. Composite samples were collected from land surface to a depth of 6 inches below land surface. Inorganic compound concentrations in the composite soil samples did not exceed the U.S. Environmental Protection Agency Regional Screening Levels for Industrial Soil; however, barium concentrations were higher than the South Carolina background concentrations at four of the six sampling locations.

A surface-water sample collected from an unnamed tributary to Spirit Creek was analyzed for volatile organic compounds, semivolatile organic compounds, and inorganic compounds. The only volatile organic compound and semivolatile organic compound detected in the sample above the

laboratory reporting levels was toluene. The volatile organic compounds 4-isopropyl-1-methylbenzene and isophorone were detected below the laboratory reporting level but above the nondetection level. No volatile organic compounds or semivolatile organic compounds were detected at levels above the National Primary Drinking Water Standard maximum contaminant level. For the inorganic compounds, iron was detected in the surface-water sample at 5,520 micrograms per liter, which exceeded the National Secondary Drinking Water Standard maximum contaminant level for iron. No other inorganic compounds were detected at levels greater than the maximum contaminant level for the U.S. Environmental Protection Agency National Primary Drinking Water Standard, National Secondary Drinking Water Standard, or the Georgia In-Stream Water-Quality Standard.

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**Table 1.** Concentrations of organic compounds detected in the hyporheic zone and flood-plain samplers from an unnamed tributary to Spirit Creek, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.

[TPH, total petroleum hydrocarbon; µg/L, microgram per liter; BTEX, combined mass of benzene, toluene, ethylbenzene, and total xylene; m, meta; p, para; o, ortho; MDL, method detection level; nd, not detected; bdl, below detection level; 622686, 622694, and 622699 are trip blanks; MTBE, methyl *tert*-butyl ether; C<sub>11</sub>, C<sub>13</sub>, C<sub>15</sub>, combined concentrations of undecane, tridecane, and pentadecane; DCA, dichloroethane; TCA, trichloroethane; c, cis; t, trans; TCE, trichloroethylene; PCE, perchloroethylene; DCE, dichloroethylene; CCl<sub>4</sub>, carbon tetrachloride; DCB, dichlorobenzene; TCA, trichloroethane; results are reported as unrounded values in the format reported by the commercial laboratory]

Sampler number	TPH (µg/L)	BTEX <sup>a</sup> (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	m-, p-Xylene (µg/L)	o-Xylene (µg/L)
<b>MDL</b>	<b>0.81</b>		<b>0.81</b>	<b>0.81</b>	<b>0.81</b>	<b>1.22</b>	<b>0.81</b>
622683	85.16	nd	nd	nd	nd	nd	nd
622684	103.01	nd	nd	nd	nd	nd	nd
622685	91.33	nd	nd	nd	nd	nd	nd
622692	58.17	1.24	1.24	nd	nd	nd	nd
622693	84.67	nd	nd	nd	nd	nd	nd
622695	126.88	nd	nd	nd	nd	nd	nd
622696	144.09	nd	nd	nd	nd	nd	nd
622697	75.26	nd	nd	nd	nd	nd	nd
622698	67.79	1.59	nd	1.59	nd	nd	nd
622701	118.84	nd	nd	nd	nd	nd	nd
622702	120.70	nd	nd	nd	nd	nd	nd
622703	97.07	nd	nd	nd	nd	nd	nd
622704	98.55	4.03	4.03	nd	nd	nd	nd
622686	nd	nd	nd	nd	nd	nd	nd
622694	bdl	nd	nd	nd	nd	nd	nd
622699	nd	nd	nd	nd	nd	nd	nd
Method blank	nd	nd	nd	nd	nd	nd	nd

**Table 1.** Concentrations of organic compounds detected in the hyporheic zone and flood-plain samplers from an unnamed tributary to Spirit Creek, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.—Continued

[TPH, total petroleum hydrocarbon; µg/L, microgram per liter; BTEX, combined mass of benzene, toluene, ethylbenzene, and total xylene; m, meta; p, para; o, ortho; MDL, method detection level; nd, not detected; bdl, below detection level; 622686, 622694, and 622699 are trip blanks; MTBE, methyl *tert*-butyl ether; C<sub>11</sub>, C<sub>13</sub>, C<sub>15</sub>, combined concentrations of undecane, tridecane, and pentadecane; DCA, dichloroethane; TCA, trichloroethane; c, cis; t, trans; TCE, trichloroethylene; PCE, perchloroethylene; DCE, dichloroethylene; CCl<sub>4</sub>, carbon tetrachloride; DCB, dichlorobenzene; TCA, trichloroethane; results are reported as unrounded values in the format reported by the commercial laboratory]

Sampler number	Naphthalene (µg/L)	2-Methyl-naphthalene (µg/L)	MTBE (µg/L)	Octane (µg/L)
<b>MDL</b>	<b>0.81</b>	<b>0.81</b>	<b>2.44</b>	<b>0.81</b>
622683	nd	nd	nd	2.17
622684	nd	nd	nd	nd
622685	nd	nd	nd	nd
622692	nd	nd	nd	nd
622693	nd	nd	nd	nd
622695	nd	nd	nd	nd
622696	nd	nd	nd	nd
622697	nd	nd	nd	nd
622698	nd	nd	nd	nd
622701	nd	nd	nd	nd
622702	nd	nd	nd	nd
622703	nd	nd	nd	nd
622704	nd	nd	nd	nd
622686	nd	nd	nd	nd
622694	nd	nd	nd	nd
622699	nd	nd	nd	nd
Method blank	nd	nd	nd	nd



**Table 1.** Concentrations of organic compounds detected in the hyporheic zone and flood-plain samplers from an unnamed tributary to Spirit Creek, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.—Continued

[TPH, total petroleum hydrocarbon; µg/L, microgram per liter; BTEX, combined mass of benzene, toluene, ethylbenzene, and total xylene; m, meta; p, para; o, ortho; MDL, method detection level; nd, not detected; bdl, below detection level; 622686, 622694, and 622699 are trip blanks; MTBE, methyl *tert*-butyl ether; C<sub>11</sub>, C<sub>13</sub>, C<sub>15</sub>, combined concentrations of undecane, tridecane, and pentadecane; DCA, dichloroethane; TCA, trichloroethane; c, cis; t, trans; TCE, trichloroethylene; PCE, perchloroethylene; DCE, dichloroethylene; CCl<sub>4</sub>, carbon tetrachloride; DCB, dichlorobenzene; TCA, trichloroethane; results are reported as unrounded values in the format reported by the commercial laboratory]

Sampler number	C <sub>11</sub> , C <sub>13</sub> , C <sub>15</sub> <sup>a</sup> (µg/L)	Undecane (µg/L)	Tridecane (µg/L)	Pentadecane (µg/L)
<b>MDL</b>		<b>1.62</b>	<b>0.81</b>	<b>0.81</b>
622683	nd	nd	nd	nd
622684	nd	nd	nd	nd
622685	nd	nd	nd	nd
622692	nd	nd	nd	nd
622693	nd	nd	nd	nd
622695	nd	nd	nd	nd
622696	nd	nd	nd	nd
622697	nd	nd	nd	nd
622698	nd	nd	nd	nd
622701	nd	nd	nd	nd
622702	nd	nd	nd	nd
622703	nd	nd	nd	nd
622704	nd	nd	nd	nd
622686	nd	nd	nd	nd
622694	nd	nd	nd	nd
622699	nd	nd	nd	nd
Method blank	nd	nd	nd	nd

**Table 1.** Concentrations of organic compounds detected in the hyporheic zone and flood-plain samplers from an unnamed tributary to Spirit Creek, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.—Continued

[TPH, total petroleum hydrocarbon; µg/L, microgram per liter; BTEX, combined mass of benzene, toluene, ethylbenzene, and total xylene; m, meta; p, para; o, ortho; MDL, method detection level; nd, not detected; bdl, below detection level; 622686, 622694, and 622699 are trip blanks; MTBE, methyl *tert*-butyl ether; C<sub>11</sub>, C<sub>13</sub>, C<sub>15</sub>, combined concentrations of undecane, tridecane, and pentadecane; DCA, dichloroethane; TCA, trichloroethane; c, cis; t, trans; TCE, trichloroethylene; PCE, perchloroethylene; DCE, dichloroethylene; CCl<sub>4</sub>, carbon tetrachloride; DCB, dichlorobenzene; TCA, trichloroethane; results are reported as unrounded values in the format reported by the commercial laboratory]

Sampler number	Trimethyl benzenes <sup>a</sup> (µg/L)	1,2,4-Trimethyl benzene (µg/L)	1,3,5-Trimethyl benzene (µg/L)	1,1-DCA (µg/L)	Chloroform (µg/L)	1,1,1-TCA (µg/L)	c -1,2-DCA (µg/L)
<b>MDL</b>		<b>0.81</b>	<b>1.22</b>	<b>0.81</b>	<b>0.81</b>	<b>1.22</b>	<b>0.81</b>
622683	nd	nd	nd	nd	nd	nd	nd
622684	nd	nd	nd	nd	nd	nd	nd
622685	nd	nd	nd	nd	nd	nd	nd
622692	nd	nd	nd	nd	nd	nd	nd
622693	nd	nd	nd	nd	nd	nd	nd
622695	nd	nd	nd	nd	nd	nd	nd
622696	nd	nd	nd	nd	nd	nd	nd
622697	nd	nd	nd	nd	nd	nd	nd
622698	nd	nd	nd	nd	nd	nd	nd
622701	nd	nd	nd	nd	nd	nd	nd
622702	nd	nd	nd	nd	nd	nd	nd
622703	nd	nd	nd	nd	nd	nd	nd
622704	nd	nd	nd	nd	nd	nd	nd
622686	nd	nd	nd	nd	nd	nd	nd
622694	nd	nd	nd	nd	nd	nd	nd
622699	nd	nd	nd	nd	nd	nd	nd
Method blank	nd	nd	nd	nd	nd	nd	nd

**Table 1.** Concentrations of organic compounds detected in the hyporheic zone and flood-plain samplers from an unnamed tributary to Spirit Creek, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.—Continued

[TPH, total petroleum hydrocarbon; µg/L, microgram per liter; BTEX, combined mass of benzene, toluene, ethylbenzene, and total xylene; m, meta; p, para; o, ortho; MDL, method detection level; nd, not detected; bdl, below detection level; 622686, 622694, and 622699 are trip blanks; MTBE, methyl *tert*-butyl ether; C<sub>11</sub>, C<sub>13</sub>, C<sub>15</sub>, combined concentrations of undecane, tridecane, and pentadecane; DCA, dichloroethane; TCA, trichloroethane; c, cis; t, trans; TCE, trichloroethylene; PCE, perchloroethylene; DCE, dichloroethylene; CCl<sub>4</sub>, carbon tetrachloride; DCB, dichlorobenzene; TCA, trichloroethane; results are reported as unrounded values in the format reported by the commercial laboratory]

Sampler number	TCE (µg/L)	PCE (µg/L)	c,t-1,2-DCE <sup>a</sup> (µg/L)	t-1,2-DCE (µg/L)	c-1,2-DCE (µg/L)
<b>MDL</b>	<b>0.81</b>	<b>0.81</b>		<b>1.87</b>	<b>1.26</b>
622683	nd	nd	nd	nd	nd
622684	nd	nd	nd	nd	nd
622685	nd	nd	nd	nd	nd
622692	nd	nd	nd	nd	nd
622693	nd	nd	nd	nd	nd
622695	nd	nd	nd	nd	nd
622696	nd	nd	nd	nd	nd
622697	nd	nd	nd	nd	nd
622698	nd	nd	0.00 <sup>b</sup>	nd	bdl
622701	nd	nd	nd	nd	nd
622702	nd	nd	nd	nd	nd
622703	nd	nd	nd	nd	nd
622704	1.66	nd	nd	nd	nd
622686	nd	nd	nd	nd	nd
622694	nd	nd	nd	nd	nd
622699	nd	nd	nd	nd	nd
Method blank	nd	nd	nd	nd	nd

**Table 1.** Concentrations of organic compounds detected in the hyporheic zone and flood-plain samplers from an unnamed tributary to Spirit Creek, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.—Continued

[TPH, total petroleum hydrocarbon; µg/L, microgram per liter; BTEX, combined mass of benzene, toluene, ethylbenzene, and total xylene; m, meta; p, para; o, ortho; MDL, method detection level; nd, not detected; bdl, below detection level; 622686, 622694, and 622699 are trip blanks; MTBE, methyl *tert*-butyl ether; C<sub>11</sub>, C<sub>13</sub>, C<sub>15</sub>, combined concentrations of undecane, tridecane, and pentadecane; DCA, dichloroethane; TCA, trichloroethane; c, cis; t, trans; TCE, trichloroethylene; PCE, perchloroethylene; DCE, dichloroethylene; CCl<sub>4</sub>, carbon tetrachloride; DCB, dichlorobenzene; TCA, trichloroethane; results are reported as unrounded values in the format reported by the commercial laboratory]

Sampler number	CCl <sub>4</sub> (µg/L)	1,4-DCB (µg/L)	1,1,2-TCA (µg/L)	Chlorobenzene (µg/L)	1,1,1,2-Tetrachloroethane (µg/L)	1,1,2,2-Tetrachloroethane (µg/L)
MDL	1.22	0.81	0.81	0.81	1.22	0.81
622683	nd	nd	nd	nd	nd	nd
622684	nd	nd	nd	nd	nd	nd
622685	nd	nd	nd	nd	nd	nd
622692	nd	nd	nd	nd	nd	nd
622693	nd	nd	nd	nd	nd	nd
622695	nd	nd	nd	nd	nd	nd
622696	nd	nd	nd	nd	nd	nd
622697	nd	nd	nd	nd	nd	nd
622698	nd	nd	nd	nd	nd	nd
622701	nd	nd	nd	nd	nd	nd
622702	nd	nd	nd	nd	nd	nd
622703	nd	nd	nd	nd	nd	nd
622704	nd	nd	nd	nd	nd	nd
622686	nd	nd	nd	nd	nd	nd
622694	nd	nd	nd	nd	nd	nd
622699	nd	nd	nd	nd	nd	nd
Method blank	nd	nd	nd	nd	nd	nd

**Table 1.** Concentrations of organic compounds detected in the hyporheic zone and flood-plain samplers from an unnamed tributary to Spirit Creek, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.—Continued

[TPH, total petroleum hydrocarbon; µg/L, microgram per liter; BTEX, combined mass of benzene, toluene, ethylbenzene, and total xylene; m, meta; p, para; o, ortho; MDL, method detection level; nd, not detected; bdl, below detection level; 622686, 622694, and 622699 are trip blanks; MTBE, methyl *tert*-butyl ether; C<sub>11</sub>, C<sub>13</sub>, C<sub>15</sub>, combined concentrations of undecane, tridecane, and pentadecane; DCA, dichloroethane; TCA, trichloroethane; c, cis; t, trans; TCE, trichloroethylene; PCE, perchloroethylene; DCE, dichloroethylene; CCl<sub>4</sub>, carbon tetrachloride; DCB, dichlorobenzene; TCA, trichloroethane; results are reported as unrounded values in the format reported by the commercial laboratory]

Sampler number	1,3-Dichlorobenzene (µg/L)	1,2-Dichlorobenzene (µg/L)
<b>MDL</b>	<b>0.81</b>	<b>0.81</b>
622683	nd	nd
622684	nd	nd
622685	nd	nd
622692	nd	nd
622693	nd	nd
622695	nd	nd
622696	nd	nd
622697	nd	nd
622698	nd	nd
622701	nd	nd
622702	nd	nd
622703	nd	nd
622704	nd	nd
622686	nd	nd
622694	nd	nd
622699	nd	nd
Method blank	nd	nd

<sup>a</sup>Combined concentration for two or more compounds with no method detection level provided by laboratory.

<sup>b</sup>A value of 0.00 is reported for combined concentrations if none of the compounds are detected above the method detection level, but at least one of the compounds is detected above the nondetection level.

**Table 2.** Mass of organic compounds detected in the soil-gas samplers, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.

[TPH, total petroleum hydrocarbon; µg, microgram; BTEX, combined masses of benzene, toluene, ethylbenzene and total xylenes; m-, meta; p-, para; o-, ortho; MDL, method detection level; nd, not detected; bdl, below detection level; 635179, 635180, 635181 are trip blanks; MTBE, methyl *tert*-butyl ether; C<sub>11</sub>, C<sub>13</sub>, C<sub>15</sub>, combined masses of undecane, tridecane, and pentadecane; TCA, trichloroethane; DCA, dichloroethane; TCE, trichloroethylene, DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; CCl<sub>4</sub>, carbon tetrachloride. Although all results of TPH are reported in the tables, values below 0.40 microgram are censored. Values are reported as received from the laboratory and do not reflect significant figures]

Sampler number	TPH (µg)	BTEX <sup>a</sup> (µg)	Benzene (µg)	Toluene (µg)	Ethylbenzene (µg)	m-, p-Xylene, (µg)	o-Xylene (µg)
MDL	0.02		0.02	0.02	0.02	0.03	0.02
634987	1.32	nd	nd	nd	nd	nd	nd
634988	0.67	nd	nd	nd	nd	nd	nd
634989	0.12	nd	nd	nd	nd	nd	nd
634990	0.19	nd	nd	nd	nd	nd	nd
634991	0.24	nd	nd	nd	nd	nd	nd
634992	0.24	nd	nd	nd	nd	nd	nd
634993	0.13	nd	nd	nd	nd	nd	nd
634994	0.42	2.56	nd	2.45	nd	0.04	0.07
634995	0.57	nd	nd	nd	nd	nd	nd
634996	0.36	0.07	nd	0.07	nd	nd	nd
634997	0.38	nd	nd	nd	nd	nd	nd
634998	0.66	nd	nd	nd	nd	nd	nd
634999	0.27	0.02	nd	0.02	nd	nd	nd
635132	0.33	nd	nd	nd	nd	nd	nd
635133	0.79	nd	nd	nd	nd	nd	nd
635134	0.25	nd	nd	nd	nd	nd	nd
635135	0.29	nd	nd	nd	nd	nd	nd
635136	0.17	nd	nd	nd	nd	nd	nd
635137	0.17	nd	nd	nd	nd	nd	nd
635138	2.14	0.03	nd	0.03	nd	nd	nd
635139	12.21	nd	nd	nd	nd	nd	nd
635140	0.88	nd	nd	nd	nd	nd	nd
635141	7.12	nd	nd	nd	nd	nd	nd
635142	104.60	0.81	nd	0.81	nd	bdl	nd
635143	0.13	nd	nd	nd	nd	nd	nd
635144	0.19	nd	nd	nd	nd	nd	nd
635145	0.32	nd	nd	nd	nd	nd	nd
635146	0.76	nd	nd	nd	nd	nd	nd
635147	0.76	nd	nd	nd	nd	nd	nd
635148	27.59	0.05	nd	0.05	nd	nd	nd
635149	7.05	nd	nd	nd	nd	nd	nd
635150	0.63	nd	nd	nd	nd	nd	nd
635151	0.36	nd	nd	nd	nd	nd	nd
635152	0.28	nd	nd	nd	nd	nd	nd
635153	0.48	nd	nd	nd	nd	nd	nd

**Table 2.** Mass of organic compounds detected in the soil-gas samplers, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.—Continued

[TPH, total petroleum hydrocarbon; µg, microgram; BTEX, combined masses of benzene, toluene, ethylbenzene and total xylenes; m-, meta; p-, para; o-, ortho; MDL, method detection level; nd, not detected; bdl, below detection level; 635179, 635180, 635181 are trip blanks; MTBE, methyl *tert*-butyl ether; C<sub>11</sub>, C<sub>13</sub>, C<sub>15</sub>, combined masses of undecane, tridecane, and pentadecane; TCA, trichloroethane; DCA, dichloroethane; TCE, trichloroethylene, DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; CCl<sub>4</sub>, carbon tetrachloride. Although all results of TPH are reported in the tables, values below 0.40 microgram are censored. Values are reported as received from the laboratory and do not reflect significant figures]

Sampler number	TPH (µg)	BTEX <sup>a</sup> (µg)	Benzene (µg)	Toluene (µg)	Ethylbenzene (µg)	m-, p-Xylene, (µg)	o-Xylene (µg)
635154	14.12	nd	nd	nd	nd	nd	nd
635155	2.31	nd	nd	nd	nd	nd	nd
635156	11.54	nd	nd	nd	nd	nd	nd
635157	0.31	nd	nd	nd	nd	nd	nd
635158	2.60	0.04	nd	0.04	nd	nd	nd
635159	0.18	nd	nd	nd	nd	nd	nd
635160	0.31	nd	nd	nd	nd	nd	nd
635161	0.43	nd	nd	nd	nd	nd	nd
635162	25.09	0.03	nd	0.03	nd	nd	nd
635163	0.26	nd	nd	nd	nd	nd	nd
635164	0.17	nd	nd	nd	nd	nd	nd
635165	0.23	0.02	nd	0.02	nd	nd	nd
635166	0.30	nd	nd	nd	nd	nd	nd
635167	0.31	nd	nd	nd	nd	nd	nd
635168	0.13	nd	nd	nd	nd	nd	nd
635169	0.15	nd	nd	nd	nd	nd	nd
635170	0.77	nd	nd	nd	nd	nd	nd
635171	0.27	nd	nd	nd	nd	nd	nd
635172	7.53	0.00 <sup>b</sup>	nd	bdl	nd	nd	nd
635173	0.95	nd	nd	nd	nd	nd	nd
635174	0.16	nd	nd	nd	nd	nd	nd
635175	4.16	0.05	nd	0.05	nd	nd	nd
635176	0.14	nd	nd	nd	nd	nd	nd
635177	0.11	nd	nd	nd	nd	nd	nd
635178	18.49 <sup>c</sup>	nd	nd	nd	nd	nd	nd
635179	0.04	nd	nd	nd	nd	nd	nd
635180	0.04	nd	nd	nd	nd	nd	nd
635181	0.03	nd	nd	nd	nd	nd	nd
method blank	0.03	nd	nd	nd	nd	nd	nd
method blank	bdl	nd	nd	nd	nd	nd	nd
method blank	0.02	nd	nd	nd	nd	nd	nd

**Table 2.** Mass of organic compounds detected in the soil-gas samplers, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.—Continued

[TPH, total petroleum hydrocarbon; µg, microgram; BTEX, combined masses of benzene, toluene, ethylbenzene and total xylenes; m-, meta; p-, para; o-, ortho; MDL, method detection level; nd, not detected; bdl, below detection level; 635179, 635180, 635181 are trip blanks; MTBE, methyl *tert*-butyl ether; C<sub>11</sub>, C<sub>13</sub>, C<sub>15</sub>, combined masses of undecane, tridecane, and pentadecane; TCA, trichloroethane; DCA, dichloroethane; TCE, trichloroethylene, DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; CCl<sub>4</sub>, carbon tetrachloride. Although all results of TPH are reported in the tables, values below 0.40 microgram are censored. Values are reported as received from the laboratory and do not reflect significant figures]

Sampler number	Naphthalene (µg)	2-Methyl-naphthalene (µg)	MTBE (µg)	Octane (µg)
<b>MDL</b>	<b>0.02</b>	<b>0.02</b>	<b>0.03</b>	<b>0.02</b>
634987	nd	nd	nd	nd
634988	nd	nd	nd	nd
634989	nd	nd	nd	nd
634990	nd	nd	nd	nd
634991	nd	nd	nd	nd
634992	nd	nd	nd	nd
634993	nd	nd	nd	nd
634994	nd	nd	nd	nd
634995	nd	nd	nd	nd
634996	nd	nd	nd	nd
634997	nd	nd	nd	nd
634998	nd	nd	nd	nd
634999	nd	nd	nd	nd
635132	nd	nd	nd	nd
635133	nd	nd	nd	nd
635134	nd	nd	nd	nd
635135	nd	nd	nd	nd
635136	nd	nd	nd	nd
635137	nd	nd	nd	nd
635138	nd	nd	nd	nd
635139	nd	nd	nd	nd
635140	nd	nd	nd	nd
635141	nd	nd	nd	nd
635142	nd	nd	nd	0.17
635143	nd	nd	nd	nd
635144	nd	nd	nd	nd
635145	nd	bdl	nd	nd
635146	nd	nd	nd	nd
635147	nd	nd	nd	nd
635148	nd	nd	nd	nd
635149	nd	nd	nd	nd
635150	nd	nd	nd	nd
635151	nd	nd	nd	nd
635152	nd	nd	nd	nd
635153	nd	nd	nd	nd



**Table 2.** Mass of organic compounds detected in the soil-gas samplers, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.—Continued

[TPH, total petroleum hydrocarbon; µg, microgram; BTEX, combined masses of benzene, toluene, ethylbenzene and total xylenes; m-, meta; p-, para; o-, ortho; MDL, method detection level; nd, not detected; bdl, below detection level; 635179, 635180, 635181 are trip blanks; MTBE, methyl *tert*-butyl ether; C<sub>11</sub>, C<sub>13</sub>, C<sub>15</sub>, combined masses of undecane, tridecane, and pentadecane; TCA, trichloroethane; DCA, dichloroethane; TCE, trichloroethylene, DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; CCl<sub>4</sub>, carbon tetrachloride. Although all results of TPH are reported in the tables, values below 0.40 microgram are censored. Values are reported as received from the laboratory and do not reflect significant figures]

Sampler number	Naphthalene (µg)	2-Methyl-naphthalene (µg)	MTBE (µg)	Octane (µg)
635154	nd	nd	nd	nd
635155	nd	nd	nd	nd
635156	nd	nd	nd	nd
635157	nd	nd	nd	nd
635158	nd	nd	nd	nd
635159	nd	nd	nd	nd
635160	nd	nd	nd	nd
635161	nd	nd	nd	nd
635162	nd	nd	nd	nd
635163	nd	nd	nd	nd
635164	nd	nd	nd	nd
635165	nd	nd	nd	nd
635166	nd	nd	nd	nd
635167	nd	nd	nd	nd
635168	nd	nd	nd	nd
635169	nd	nd	nd	nd
635170	nd	nd	nd	nd
635171	nd	nd	nd	nd
635172	nd	nd	nd	nd
635173	nd	nd	nd	nd
635174	nd	nd	nd	nd
635175	nd	nd	nd	nd
635176	nd	nd	nd	nd
635177	nd	nd	nd	nd
635178	nd	nd	nd	nd
635179	nd	nd	nd	nd
635180	nd	nd	nd	nd
635181	nd	nd	nd	nd
method blank	nd	nd	nd	nd
method blank	nd	nd	nd	nd
method blank	nd	nd	nd	nd

**Table 2.** Mass of organic compounds detected in the soil-gas samplers, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.—Continued

[TPH, total petroleum hydrocarbon; µg, microgram; BTEX, combined masses of benzene, toluene, ethylbenzene and total xylenes; m-, meta; p-, para; o-, ortho; MDL, method detection level; nd, not detected; bdl, below detection level; 635179, 635180, 635181 are trip blanks; MTBE, methyl *tert*-butyl ether; C<sub>11</sub>, C<sub>13</sub>, C<sub>15</sub>, combined masses of undecane, tridecane, and pentadecane; TCA, trichloroethane; DCA, dichloroethane; TCE, trichloroethylene; DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; CCl<sub>4</sub>, carbon tetrachloride. Although all results of TPH are reported in the tables, values below 0.40 microgram are censored. Values are reported as received from the laboratory and do not reflect significant figures]

Sampler number	C <sub>11</sub> , C <sub>13</sub> , C <sub>15</sub> <sup>a</sup> (µg)	Undecane (µg)	Tridecane (µg)	Pentadecane (µg)
<b>MDL</b>		<b>0.04</b>	<b>0.02</b>	<b>0.02</b>
634987	0.82	0.82	nd	nd
634988	nd	nd	nd	nd
634989	nd	nd	nd	nd
634990	nd	nd	nd	nd
634991	nd	nd	nd	nd
634992	nd	nd	nd	nd
634993	nd	nd	nd	nd
634994	0.00 <sup>d</sup>	bdl	nd	nd
634995	nd	nd	nd	nd
634996	nd	nd	nd	nd
634997	nd	nd	nd	nd
634998	nd	nd	nd	nd
634999	nd	nd	nd	nd
635132	nd	nd	nd	nd
635133	nd	nd	nd	nd
635134	nd	nd	nd	nd
635135	nd	nd	nd	nd
635136	nd	nd	nd	nd
635137	nd	nd	nd	nd
635138	0.32	0.32	bdl	nd
635139	0.05	0.05	nd	nd
635140	0.00 <sup>d</sup>	bdl	nd	nd
635141	nd	nd	nd	nd
635142	nd	nd	nd	nd
635143	nd	nd	nd	nd
635144	nd	nd	nd	nd
635145	0.00 <sup>d</sup>	nd	bdl	bdl
635146	nd	nd	nd	nd
635147	nd	nd	nd	nd
635148	nd	nd	nd	nd
635149	nd	nd	nd	nd
635150	0.00 <sup>d</sup>	nd	nd	bdl
635151	nd	nd	nd	nd
635152	nd	nd	nd	nd
635153	nd	nd	nd	nd

**Table 2.** Mass of organic compounds detected in the soil-gas samplers, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.—Continued

[TPH, total petroleum hydrocarbon;  $\mu\text{g}$ , microgram; BTEX, combined masses of benzene, toluene, ethylbenzene and total xylenes; m-, meta; p-, para; o-, ortho; MDL, method detection level; nd, not detected; bdl, below detection level; 635179, 635180, 635181 are trip blanks; MTBE, methyl *tert*-butyl ether;  $\text{C}_{11}$ ,  $\text{C}_{13}$ ,  $\text{C}_{15}$ , combined masses of undecane, tridecane, and pentadecane; TCA, trichloroethane; DCA, dichloroethane; TCE, trichloroethylene; DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene;  $\text{CCl}_4$ , carbon tetrachloride. Although all results of TPH are reported in the tables, values below 0.40 microgram are censored. Values are reported as received from the laboratory and do not reflect significant figures]

Sampler number	$\text{C}_{11}$ , $\text{C}_{13}$ , $\text{C}_{15}$ <sup>a</sup> ( $\mu\text{g}$ )	Undecane ( $\mu\text{g}$ )	Tridecane ( $\mu\text{g}$ )	Pentadecane ( $\mu\text{g}$ )
635154	nd	nd	nd	nd
635155	nd	nd	nd	nd
635156	nd	nd	nd	nd
635157	nd	nd	nd	nd
635158	nd	nd	nd	nd
635159	nd	nd	nd	nd
635160	nd	nd	nd	nd
635161	nd	nd	nd	nd
635162	nd	nd	nd	nd
635163	0.00 <sup>d</sup>	bdl	nd	nd
635164	nd	nd	nd	nd
635165	nd	nd	nd	nd
635166	nd	nd	nd	nd
635167	nd	nd	nd	nd
635168	nd	nd	nd	nd
635169	nd	nd	nd	nd
635170	nd	nd	nd	nd
635171	nd	nd	nd	nd
635172	0.00 <sup>b</sup>	nd	nd	bdl
635173	nd	nd	nd	nd
635174	nd	nd	nd	nd
635175	0.00 <sup>d</sup>	nd	bdl	nd
635176	nd	nd	nd	nd
635177	nd	nd	nd	nd
635178	nd	nd	nd	nd
635179	nd	nd	nd	nd
635180	nd	nd	nd	nd
635181	nd	nd	nd	nd
method blank	nd	nd	nd	nd
method blank	nd	nd	nd	nd
method blank	nd	nd	nd	nd

**Table 2.** Mass of organic compounds detected in the soil-gas samplers, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.—Continued

[TPH, total petroleum hydrocarbon; µg, microgram; BTEX, combined masses of benzene, toluene, ethylbenzene and total xylenes; m-, meta; p-, para; o-, ortho; MDL, method detection level; nd, not detected; bdl, below detection level; 635179, 635180, 635181 are trip blanks; MTBE, methyl *tert*-butyl ether; C<sub>11</sub>, C<sub>13</sub>, C<sub>15</sub>, combined masses of undecane, tridecane, and pentadecane; TCA, trichloroethane; DCA, dichloroethane; TCE, trichloroethylene, DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; CCl<sub>4</sub>, carbon tetrachloride. Although all results of TPH are reported in the tables, values below 0.40 microgram are censored. Values are reported as received from the laboratory and do not reflect significant figures]

Sampler number	Trimethyl benzenes <sup>a</sup> (µg)	1,2,4-Trimethyl benzene (µg)	1,3,5-Trimethyl benzene (µg)	1,1-DCA (µg)	Chloroform (µg)	1,1,1-TCA (µg)	c-1,2-DCA (µg)
<b>MDL</b>		<b>0.02</b>	<b>0.03</b>	<b>0.02</b>	<b>0.03</b>	<b>0.03</b>	<b>0.02</b>
634987	nd	nd	nd	nd	nd	nd	nd
634988	nd	nd	nd	nd	nd	nd	nd
634989	nd	nd	nd	nd	nd	nd	nd
634990	nd	nd	nd	nd	nd	nd	nd
634991	nd	nd	nd	nd	nd	nd	nd
634992	nd	nd	nd	nd	nd	nd	nd
634993	nd	nd	nd	nd	nd	nd	nd
634994	nd	nd	nd	nd	nd	nd	nd
634995	nd	nd	nd	nd	nd	nd	nd
634996	nd	nd	nd	nd	nd	nd	nd
634997	nd	nd	nd	nd	nd	nd	nd
634998	nd	nd	nd	nd	nd	nd	nd
634999	nd	nd	nd	nd	nd	nd	nd
635132	nd	nd	nd	nd	nd	nd	nd
635133	nd	nd	nd	nd	nd	nd	nd
635134	nd	nd	nd	nd	nd	nd	nd
635135	nd	nd	nd	nd	nd	nd	nd
635136	nd	nd	nd	nd	nd	nd	nd
635137	nd	nd	nd	nd	nd	nd	nd
635138	nd	nd	nd	nd	nd	nd	nd
635139	nd	nd	nd	nd	nd	nd	nd
635140	nd	nd	nd	nd	nd	nd	nd
635141	nd	nd	nd	nd	nd	nd	nd
635142	0.07	0.07	nd	nd	nd	nd	nd
635143	nd	nd	nd	nd	nd	nd	nd
635144	nd	nd	nd	nd	nd	nd	nd
635145	nd	nd	nd	nd	nd	nd	nd
635146	nd	nd	nd	nd	nd	nd	nd
635147	nd	nd	nd	nd	nd	nd	nd
635148	nd	nd	nd	nd	nd	nd	nd
635149	nd	nd	nd	nd	nd	nd	nd
635150	nd	nd	nd	nd	nd	nd	nd
635151	nd	nd	nd	nd	nd	nd	nd
635152	nd	nd	nd	nd	nd	nd	nd
635153	nd	nd	nd	nd	nd	nd	nd

**Table 2.** Mass of organic compounds detected in the soil-gas samplers, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.—Continued

[TPH, total petroleum hydrocarbon; µg, microgram; BTEX, combined masses of benzene, toluene, ethylbenzene and total xylenes; m-, meta; p-, para; o-, ortho; MDL, method detection level; nd, not detected; bdl, below detection level; 635179, 635180, 635181 are trip blanks; MTBE, methyl *tert*-butyl ether; C<sub>11</sub>, C<sub>13</sub>, C<sub>15</sub>, combined masses of undecane, tridecane, and pentadecane; TCA, trichloroethane; DCA, dichloroethane; TCE, trichloroethylene; DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; CCl<sub>4</sub>, carbon tetrachloride. Although all results of TPH are reported in the tables, values below 0.40 microgram are censored. Values are reported as received from the laboratory and do not reflect significant figures]

Sampler number	Trimethyl benzenes <sup>a</sup> (µg)	1,2,4-Trimethyl benzene (µg)	1,3,5-Trimethyl benzene (µg)	1,1-DCA (µg)	Chloroform (µg)	1,1,1-TCA (µg)	c-1,2-DCA (µg)
635154	nd	nd	nd	nd	nd	nd	nd
635155	nd	nd	nd	nd	nd	nd	nd
635156	nd	nd	nd	nd	nd	nd	nd
635157	nd	nd	nd	nd	0.03	nd	nd
635158	nd	nd	nd	nd	nd	nd	nd
635159	nd	nd	nd	nd	nd	nd	nd
635160	nd	nd	nd	nd	nd	nd	nd
635161	nd	nd	nd	nd	nd	nd	nd
635162	nd	nd	nd	nd	nd	nd	nd
635163	nd	nd	nd	nd	nd	nd	nd
635164	nd	nd	nd	nd	nd	nd	nd
635165	nd	nd	nd	nd	nd	nd	nd
635166	nd	nd	nd	nd	nd	nd	nd
635167	nd	nd	nd	nd	nd	nd	nd
635168	nd	nd	nd	nd	nd	nd	nd
635169	nd	nd	nd	nd	nd	nd	nd
635170	nd	nd	nd	nd	0.05	nd	nd
635171	nd	nd	nd	nd	nd	nd	nd
635172	nd	nd	nd	nd	nd	nd	nd
635173	nd	nd	nd	nd	nd	nd	nd
635174	nd	nd	nd	nd	nd	nd	nd
635175	nd	nd	nd	nd	nd	nd	nd
635176	nd	nd	nd	nd	nd	nd	nd
635177	nd	nd	nd	nd	nd	nd	nd
635178	nd	nd	nd	nd	nd	nd	nd
							nd
635179	nd	nd	nd	nd	nd	nd	nd
635180	nd	nd	nd	nd	nd	nd	nd
635181	nd	nd	nd	nd	nd	nd	nd
							nd
method blank	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd

**Table 2.** Mass of organic compounds detected in the soil-gas samplers, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.—Continued

[TPH, total petroleum hydrocarbon; µg, microgram; BTEX, combined masses of benzene, toluene, ethylbenzene and total xylenes; m-, meta; p-, para; o-, ortho; MDL, method detection level; nd, not detected; bdl, below detection level; 635179, 635180, 635181 are trip blanks; MTBE, methyl *tert*-butyl ether; C<sub>11</sub>, C<sub>13</sub>, C<sub>15</sub>, combined masses of undecane, tridecane, and pentadecane; TCA, trichloroethane; DCA, dichloroethane; TCE, trichloroethylene, DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; CCl<sub>4</sub>, carbon tetrachloride. Although all results of TPH are reported in the tables, values below 0.40 microgram are censored. Values are reported as received from the laboratory and do not reflect significant figures]

Sampler number	TCE (µg)	PCE (µg)	c-t-1,2-DCE (µg) <sup>a</sup>	t-1,2-DCE (µg)	c-1,2-DCE (µg)
<b>MDL</b>	<b>0.02</b>			<b>0.03</b>	<b>0.03</b>
634987	nd	nd	nd	nd	nd
634988	nd	nd	nd	nd	nd
634989	nd	nd	nd	nd	nd
634990	nd	nd	nd	nd	nd
634991	nd	nd	nd	nd	nd
634992	nd	nd	nd	nd	nd
634993	nd	nd	nd	nd	nd
634994	nd	nd	nd	nd	nd
634995	nd	nd	nd	nd	nd
634996	nd	nd	nd	nd	nd
634997	nd	nd	nd	nd	nd
634998	nd	nd	nd	nd	nd
634999	nd	nd	nd	nd	nd
635132	nd	nd	nd	nd	nd
635133	nd	nd	nd	nd	nd
635134	nd	nd	nd	nd	nd
635135	nd	nd	nd	nd	nd
635136	nd	nd	nd	nd	nd
635137	nd	nd	nd	nd	nd
635138	nd	nd	nd	nd	nd
635139	nd	nd	nd	nd	nd
635140	nd	nd	nd	nd	nd
635141	nd	nd	nd	nd	nd
635142	nd	nd	nd	nd	nd
635143	nd	nd	nd	nd	nd
635144	nd	nd	nd	nd	nd
635145	nd	nd	nd	nd	nd
635146	nd	nd	nd	nd	nd
635147	nd	nd	nd	nd	nd
635148	nd	nd	nd	nd	nd
635149	nd	nd	nd	nd	nd
635150	nd	nd	nd	nd	nd
635151	nd	nd	nd	nd	nd
635152	nd	nd	nd	nd	nd
635153	nd	0.02	nd	nd	nd

**Table 2.** Mass of organic compounds detected in the soil-gas samplers, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.—Continued

[TPH, total petroleum hydrocarbon; µg, microgram; BTEX, combined masses of benzene, toluene, ethylbenzene and total xylenes; m-, meta; p-, para; o-, ortho; MDL, method detection level; nd, not detected; bdl, below detection level; 635179, 635180, 635181 are trip blanks; MTBE, methyl *tert*-butyl ether; C<sub>11</sub>, C<sub>13</sub>, C<sub>15</sub>, combined masses of undecane, tridecane, and pentadecane; TCA, trichloroethane; DCA, dichloroethane; TCE, trichloroethylene, DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; CCl<sub>4</sub>, carbon tetrachloride. Although all results of TPH are reported in the tables, values below 0.40 microgram are censored. Values are reported as received from the laboratory and do not reflect significant figures]

Sampler number	TCE (µg)	PCE (µg)	c-t-1,2-DCE (µg) <sup>a</sup>	t-1,2-DCE (µg)	c-1,2-DCE (µg)
635154	nd	nd	nd	nd	nd
635155	nd	nd	nd	nd	nd
635156	nd	nd	nd	nd	nd
635157	nd	nd	nd	nd	nd
635158	nd	nd	nd	nd	nd
635159	nd	nd	nd	nd	nd
635160	nd	nd	nd	nd	nd
635161	nd	nd	nd	nd	nd
635162	nd	nd	nd	nd	nd
635163	nd	nd	nd	nd	nd
635164	nd	nd	nd	nd	nd
635165	nd	nd	nd	nd	nd
635166	nd	nd	nd	nd	nd
635167	nd	nd	nd	nd	nd
635168	nd	nd	nd	nd	nd
635169	nd	nd	nd	nd	nd
635170	nd	nd	nd	nd	nd
635171	nd	nd	nd	nd	nd
635172	nd	nd	nd	nd	nd
635173	nd	nd	nd	nd	nd
635174	nd	nd	nd	nd	nd
635175	nd	nd	nd	nd	nd
635176	nd	nd	nd	nd	nd
635177	nd	nd	nd	nd	nd
635178	nd	nd	nd	nd	nd
635179	nd	nd	nd	nd	nd
635180	nd	nd	nd	nd	nd
635181	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd

**Table 2.** Mass of organic compounds detected in the soil-gas samplers, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.—Continued

[TPH, total petroleum hydrocarbon; µg, microgram; BTEX, combined masses of benzene, toluene, ethylbenzene and total xylenes; m-, meta; p-, para; o-, ortho; MDL, method detection level; nd, not detected; bdl, below detection level; 635179, 635180, 635181 are trip blanks; MTBE, methyl *tert*-butyl ether; C<sub>11</sub>, C<sub>13</sub>, C<sub>15</sub>, combined masses of undecane, tridecane, and pentadecane; TCA, trichloroethane; DCA, dichloroethane; TCE, trichloroethylene, DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; CCl<sub>4</sub>, carbon tetrachloride. Although all results of TPH are reported in the tables, values below 0.40 microgram are censored. Values are reported as received from the laboratory and do not reflect significant figures]

Sampler number	1,4-DCB (µg)	CCl <sub>4</sub> (µg)	1,1,2-TCA (µg)	Chlorobenzene (µg)	1,1,1,2-Tetrachloroethane (µg)	1,1,2,2-Tetrachloroethane (µg)
MDL	0.02	0.03	0.02	0.02	0.03	0.02
634987	nd	nd	nd	nd	nd	nd
634988	nd	nd	nd	nd	nd	nd
634989	nd	nd	nd	nd	nd	nd
634990	nd	nd	nd	nd	nd	nd
634991	nd	nd	nd	nd	nd	nd
634992	nd	nd	nd	nd	nd	nd
634993	nd	nd	nd	nd	nd	nd
634994	nd	nd	nd	nd	nd	nd
634995	nd	nd	nd	nd	nd	nd
634996	nd	nd	nd	nd	nd	nd
634997	nd	nd	nd	nd	nd	nd
634998	nd	nd	nd	nd	nd	nd
634999	nd	nd	nd	nd	nd	nd
635132	nd	nd	nd	nd	nd	nd
635133	nd	nd	nd	nd	nd	nd
635134	nd	nd	nd	nd	nd	nd
635135	nd	nd	nd	nd	nd	nd
635136	nd	nd	nd	nd	nd	nd
635137	nd	nd	nd	nd	nd	nd
635138	nd	nd	nd	nd	nd	nd
635139	nd	nd	nd	nd	nd	nd
635140	nd	nd	nd	nd	nd	nd
635141	nd	nd	nd	nd	nd	nd
635142	nd	nd	nd	nd	nd	nd
635143	nd	nd	nd	nd	nd	nd
635144	nd	nd	nd	nd	nd	nd
635145	nd	nd	nd	nd	nd	nd
635146	nd	nd	nd	nd	nd	nd
635147	nd	nd	nd	nd	nd	nd
635148	nd	nd	nd	nd	nd	nd
635149	nd	nd	nd	nd	nd	nd
635150	nd	nd	nd	nd	nd	nd
635151	nd	nd	nd	nd	nd	nd
635152	nd	nd	nd	nd	nd	nd
635153	nd	nd	nd	nd	nd	nd



**Table 2.** Mass of organic compounds detected in the soil-gas samplers, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.—Continued

[TPH, total petroleum hydrocarbon; µg, microgram; BTEX, combined masses of benzene, toluene, ethylbenzene and total xylenes; m-, meta; p-, para; o-, ortho; MDL, method detection level; nd, not detected; bdl, below detection level; 635179, 635180, 635181 are trip blanks; MTBE, methyl *tert*-butyl ether; C<sub>11</sub>, C<sub>13</sub>, C<sub>15</sub>, combined masses of undecane, tridecane, and pentadecane; TCA, trichloroethane; DCA, dichloroethane; TCE, trichloroethylene, DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; CCl<sub>4</sub>, carbon tetrachloride. Although all results of TPH are reported in the tables, values below 0.40 microgram are censored. Values are reported as received from the laboratory and do not reflect significant figures]

Sampler number	1,4-DCB (µg)	CCl <sub>4</sub> (µg)	1,1,2-TCA (µg)	Chlorobenzene (µg)	1,1,1,2-Tetrachloroethane (µg)	1,1,2,2-Tetrachloroethane (µg)
635154	nd	nd	nd	nd	nd	nd
635155	nd	nd	nd	nd	nd	nd
635156	nd	nd	nd	nd	nd	nd
635157	nd	nd	nd	nd	nd	nd
635158	nd	nd	nd	nd	nd	nd
635159	nd	nd	nd	nd	nd	nd
635160	nd	nd	nd	nd	nd	nd
635161	nd	nd	nd	nd	nd	nd
635162	nd	nd	nd	nd	nd	nd
635163	nd	nd	nd	nd	nd	nd
635164	nd	nd	nd	nd	nd	nd
635165	nd	nd	nd	nd	nd	nd
635166	nd	nd	nd	nd	nd	nd
635167	nd	nd	nd	nd	nd	nd
635168	nd	nd	nd	nd	nd	nd
635169	nd	nd	nd	nd	nd	nd
635170	nd	nd	nd	nd	nd	nd
635171	nd	nd	nd	nd	nd	nd
635172	nd	nd	nd	nd	nd	nd
635173	nd	nd	nd	nd	nd	nd
635174	nd	nd	nd	nd	nd	nd
635175	nd	nd	nd	nd	nd	nd
635176	nd	nd	nd	nd	nd	nd
635177	nd	nd	nd	nd	nd	nd
635178	nd	nd	nd	nd	nd	nd
635179	nd	nd	nd	nd	nd	nd
635180	nd	nd	nd	nd	nd	nd
635181	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd

**Table 2.** Mass of organic compounds detected in the soil-gas samplers, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.—Continued

[TPH, total petroleum hydrocarbon;  $\mu\text{g}$ , microgram; BTEX, combined masses of benzene, toluene, ethylbenzene and total xylenes; m-, meta; p-, para; o-, ortho; MDL, method detection level; nd, not detected; bdl, below detection level; 635179, 635180, 635181 are trip blanks; MTBE, methyl *tert*-butyl ether;  $\text{C}_{11}$ ,  $\text{C}_{13}$ ,  $\text{C}_{15}$ , combined masses of undecane, tridecane, and pentadecane; TCA, trichloroethane; DCA, dichloroethane; TCE, trichloroethylene; DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene;  $\text{CCl}_4$ , carbon tetrachloride. Although all results of TPH are reported in the tables, values below 0.40 microgram are censored. Values are reported as received from the laboratory and do not reflect significant figures]

Sampler number	13DCB ( $\mu\text{g}$ )	12DCB ( $\mu\text{g}$ )
<b>MDL</b>	<b>0.02</b>	<b>0.02</b>
634987	nd	nd
634988	nd	nd
634989	nd	nd
634990	nd	nd
634991	nd	nd
634992	nd	nd
634993	nd	nd
634994	nd	nd
634995	nd	nd
634996	nd	nd
634997	nd	nd
634998	nd	nd
634999	nd	nd
635132	nd	nd
635133	nd	nd
635134	nd	nd
635135	nd	nd
635136	nd	nd
635137	nd	nd
635138	nd	nd
635139	nd	nd
635140	nd	nd
635141	nd	nd
635142	nd	nd
635143	nd	nd
635144	nd	nd
635145	nd	nd
635146	nd	nd
635147	nd	nd
635148	nd	nd
635149	nd	nd
635150	nd	nd
635151	nd	nd
635152	nd	nd
635153	nd	nd

**Table 2.** Mass of organic compounds detected in the soil-gas samplers, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.—Continued

[TPH, total petroleum hydrocarbon; µg, microgram; BTEX, combined masses of benzene, toluene, ethylbenzene and total xylenes; m-, meta; p-, para; o-, ortho; MDL, method detection level; nd, not detected; bdl, below detection level; 635179, 635180, 635181 are trip blanks; MTBE, methyl *tert*-butyl ether; C<sub>11</sub>, C<sub>13</sub>, C<sub>15</sub>, combined masses of undecane, tridecane, and pentadecane; TCA, trichloroethane; DCA, dichloroethane; TCE, trichloroethylene; DCE, dichloroethylene; PCE, perchloroethylene; DCB, dichlorobenzene; CCl<sub>4</sub>, carbon tetrachloride. Although all results of TPH are reported in the tables, values below 0.40 microgram are censored. Values are reported as received from the laboratory and do not reflect significant figures]

Sampler number	13DCB (µg)	12DCB (µg)
635154	nd	nd
635155	nd	nd
635156	nd	nd
635157	nd	nd
635158	nd	nd
635159	nd	nd
635160	nd	nd
635161	nd	nd
635162	nd	nd
635163	nd	nd
635164	nd	nd
635165	nd	nd
635166	nd	nd
635167	nd	nd
635168	nd	nd
635169	nd	nd
635170	nd	nd
635171	nd	nd
635172	nd	nd
635173	nd	nd
635174	nd	nd
635175	nd	nd
635176	nd	nd
635177	nd	nd
635178	nd	nd
635179	nd	nd
635180	nd	nd
635181	nd	nd
method blank	nd	nd
method blank	nd	nd
method blank	nd	nd

<sup>a</sup>Combined concentration for two or more compounds with no method detection level provided by laboratory.

<sup>b</sup>A value of 0.00 is reported for combined concentrations if none of the compounds are detected above the method detection level, but at least one of the compounds is detected above the nondetection level.

**Table 3.** Mass of explosives and chemical agents detected in soil-gas samplers, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.

[µg, microgram; MDL, minimum detection level; nd, not detected; 644252, 644253, 644254, 644255, and 644256 are trip blanks; bdl, below detection level]

Sampler number	Dimethyl disulfide (µg)	Dimethyl methylphosphonate (µg)	1,4-Thioxane (µg)	Nitrobenzene (µg)
MDL	0.10	0.10	0.10	0.10
644235	nd	nd	nd	nd
644236	nd	nd	nd	nd
644237	nd	nd	nd	nd
644238	nd	nd	nd	nd
644239	nd	nd	nd	nd
644240	nd	nd	nd	nd
644252	nd	nd	nd	nd
644253	nd	nd	nd	nd
644254	nd	nd	nd	nd
644255	nd	nd	nd	nd
644256	nd	nd	nd	nd

**Table 3.** Mass of explosives and chemical agents detected in soil-gas samplers, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.—Continued

[µg, microgram; MDL, minimum detection level nd, not detected; 644252, 644253, 644254, 644255, and 644256 are trip blanks; bdl, below detection level]

Sampler number	Diisopropyl methylphosphonate (µg)	1,4-Dithiane (µg)	2-Nitrotoluene (µg)	3-Nitrotoluene (µg)	4-Nitrotoluene (µg)
MDL	0.10	0.10	0.10	0.10	0.10
644235	nd	nd	nd	nd	nd
644236	nd	nd	nd	nd	nd
644237	nd	nd	nd	nd	nd
644238	nd	nd	nd	nd	nd
644239	nd	nd	nd	nd	nd
644240	nd	nd	nd	nd	nd
644252	nd	nd	nd	nd	nd
644253	nd	nd	nd	nd	nd
644254	nd	nd	nd	nd	nd
644255	nd	nd	nd	nd	nd
644256	nd	nd	nd	nd	nd

**Table 3.** Mass of explosives and chemical agents detected in soil-gas samplers, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.—Continued

[µg, microgram; MDL, minimum detection level nd, not detected; 644252, 644253, 644254, 644255, and 644256 are trip blanks; bdl, below detection level]

Sampler number	Thiodiglycol (µg)	Benzothiazole (µg)	Chloroacetophenones (µg)	p-Chlorophenyl methyl sulfide (µg)
<b>MDL</b>	<b>0.20</b>	<b>0.10</b>	<b>0.10</b>	<b>0.10</b>
644235	nd	bdl	nd	bdl
644236	nd	nd	nd	nd
644237	nd	bdl	bdl	nd
644238	nd	nd	nd	nd
644239	nd	bdl	bdl	ndl
644240	nd	nd	nd	bdl
644252	nd	nd	nd	nd
644253	nd	nd	nd	nd
644254	nd	nd	nd	nd
644255	nd	nd	nd	nd
644256	nd	nd	nd	nd

**Table 3.** Mass of explosives and chemical agents detected in soil-gas samplers, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.—Continued

[µg, microgram; MDL, minimum detection level nd, not detected; 644252, 644253, 644254, 644255, and 644256 are trip blanks; bdl, below detection level]

Sampler number	1,3-Dinitrobenzene (µg)	2,6-Dinitrotoluene (µg)	2,4-Dinitrotoluene (µg)	1,3,5-Trinitrobenzene (µg)
<b>MDL</b>	<b>0.10</b>	<b>0.10</b>	<b>0.10</b>	<b>0.10</b>
644235	nd	nd	nd	nd
644236	nd	nd	nd	nd
644237	nd	nd	nd	nd
644238	nd	nd	nd	nd
644239	nd	nd	nd	nd
644240	nd	nd	nd	nd
644252	nd	nd	nd	nd
644253	nd	nd	nd	nd
644254	nd	nd	nd	nd
644255	nd	nd	nd	nd
644256	nd	nd	bdl	nd

**Table 3.** Mass of explosives and chemical agents detected in soil-gas samplers, Old Incinerator Area, Fort Gordon, Georgia, 2009–2010.—Continued

[µg, microgram; MDL, minimum detection level nd, not detected; 644252, 644253, 644254, 644255, and 644256 are trip blanks; bdl, below detection level]

<b>Sampler number</b>	<b>p-Chlorophenyl methyl sulfoxide (µg)</b>	<b>p-Chlorophenyl methyl sulfone (µg)</b>	<b>2,4,6-Trinitro toluene (µg)</b>
<b>MDL</b>	<b>0.10</b>	<b>0.10</b>	<b>0.10</b>
644235	nd	bdl	nd
644236	nd	bdl	nd
644237	nd	bdl	nd
644238	nd	bdl	nd
644239	nd	bdl	nd
644240	nd	bdl	nd
644252	nd	bdl	nd
644253	nd	bdl	nd
644254	nd	bdl	nd
644255	nd	bdl	nd
644256	nd	bdl	nd

**Table 4.** Inorganic compounds detected in the soil from land surface to 6 inches below land surface, site 1, Old Incinerator Area, Fort Gordon, Georgia, August 30, 2010.

[µg/g, microgram per gram; USEPA RSL, U.S. Environmental Protection Agency Regional Screening Level, Industrial Soil; mg/kg, milligram per kilogram; SCDHEC, South Carolina Department of Health and Environmental Control; --, not applicable; \*, Resource Conservation and Recovery Act (RCRA) metal; <, less than; nr, not reported. Note: 1 µg/g is equivalent to 1 mg/kg, and 1 mg/kg is equivalent to 1 part per million (ppm); selenium and mercury were not analyzed]

Compound	Result (µg/g)	USEPA <sup>a</sup> RSL (mg/kg)	SCDHEC <sup>b</sup> background (mg/kg)
Aluminum	3,540	990,000	13,528
Antimony	0.1	410	--
Arsenic*	<1	260	6.1
Barium*	19.9	190,000	38
Beryllium	0.08	2,000	0.6
Bismuth	nr	--	--
Cadmium*	<0.007	800	1
Calcium	<100	--	699
Cerium	12.1	--	--
Cesium	0.26	--	--
Chromium*	4.6	1,500,000	16
Cobalt	0.26	300	4
Copper	<2	41,000	9
Gallium	1.1	--	--
Iron	1,780	720,000	15,608
Lanthanum	5.9	--	--
Lead*	2.4	800	16
Lithium	2.8	2,000	--
Magnesium	115	--	988
Manganese	26.1	23,000	120
Molybdenum	0.1	5,100	--
Nickel	1.1	47,000	6
Niobium	2.2	--	--
Phosphorus	42.8	--	--
Potassium	161	--	856
Rubidium	1.8	--	--
Scandium	0.6	--	--
Silver*	0.01	5,100	4
Sodium	<25	--	194
Strontium	4.1	610,000	--
Thallium	<0.08	--	4.5
Thorium	2.19	--	--
Titanium	nr	--	--
Uranium	0.62	--	--
Vanadium	5.7	5,200	--
Yttrium	1.1	--	--
Zinc	6.0	310,000	23

<sup>a</sup>U.S. Environmental Protection Agency (2009a).

<sup>b</sup>South Carolina Department of Health and Environmental Control (2002).

**Table 5.** Inorganic compounds detected in the soil from land surface to 6 inches below land surface, site 2, Old Incinerator Area, Fort Gordon, Georgia, August 30, 2010.

[µg/g, microgram per gram; USEPA RSL, U.S. Environmental Protection Agency Regional Screening Level, Industrial Soil; mg/kg, milligram per kilogram; SCDHEC, South Carolina Department of Health and Environmental Control; --, not applicable; \*, Resource Conservation and Recovery Act (RCRA) metal; 51.8, higher than South Carolina background; nr, not reported; <, less than. Note: 1 µg/g is equivalent to 1 mg/kg, and 1 mg/kg is equivalent to 1 part per million (ppm); selenium and mercury were not analyzed]

Compound	Result (µg/g)	USEPA <sup>a</sup> RSL (mg/kg)	SCDHEC <sup>b</sup> background (mg/kg)
Aluminum	8,630	990,000	13,528
Antimony	0.2	410	--
Arsenic*	1	260	6.1
Barium*	51.8	190,000	38
Beryllium	0.18	2,000	0.6
Bismuth	nr	--	--
Cadmium*	0.02	800	1
Calcium	<100	--	699
Cerium	18.1	--	--
Cesium	0.65	--	--
Chromium*	9.0	1,500,000	16
Cobalt	0.45	300	4
Copper	2.5	41,000	9
Gallium	2.4	--	--
Iron	3,470	720,000	15,608
Lanthanum	8.7	--	--
Lead*	4.62	800	16
Lithium	6.2	2,000	--
Magnesium	240	--	988
Manganese	27.5	23,000	120
Molybdenum	0.22	5,100	--
Nickel	2.3	47,000	6
Niobium	3	--	--
Phosphorus	90.7	--	--
Potassium	468	--	856
Rubidium	4.2	--	--
Scandium	1.1	--	--
Silver*	0.015	5,100	4
Sodium	79.2	--	194
Strontium	12.2	610,000	--
Thallium	<0.08	--	4.5
Thorium	2.74	--	--
Titanium	nr	--	--
Uranium	0.77	--	--
Vanadium	11.8	5,200	--
Yttrium	1.9	--	--
Zinc	9.4	310,000	23

<sup>a</sup>U.S. Environmental Protection Agency (2009a).

<sup>b</sup>South Carolina Department of Health and Environmental Control (2002).



**Table 6.** Inorganic compounds detected in the soil from land surface to 6 inches below land surface, site 3, Old Incinerator Area, Fort Gordon, Georgia, August 30, 2010.

[µg/g, microgram per gram; USEPA RSL, U.S. Environmental Protection Agency Regional Screening Level, Industrial Soil; mg/kg, milligram per kilogram; SCDHEC, South Carolina Department of Health and Environmental Control; --, not applicable; \*, Resource Conservation and Recovery Act (RCRA) metal; 50, higher than South Carolina background; nr, not reported; <, less than. Note: 1 µg/g is equivalent to 1 mg/kg, and 1 mg/kg is equivalent to 1 part per million (ppm); selenium and mercury were not analyzed]

Compound	Result (µg/g)	USEPA <sup>a</sup> RSL (mg/kg)	SCDHEC <sup>b</sup> background (mg/kg)
Aluminum	9,220	990,000	13,528
Antimony	0.1	410	--
Arsenic*	1.4	260	6.1
Barium*	50	190,000	38
Beryllium	0.15	2,000	0.6
Bismuth	nr	--	--
Cadmium*	0.02	800	1
Calcium	<100	--	699
Cerium	14.4	--	--
Cesium	0.7	--	--
Chromium*	7.9	1,500,000	16
Cobalt	0.53	300	4
Copper	4.9	41,000	9
Gallium	2.2	--	--
Iron	3,140	720,000	15,608
Lanthanum	6.3	--	--
Lead*	7.79	800	16
Lithium	4.5	2,000	--
Magnesium	306	--	988
Manganese	36.2	23,000	120
Molybdenum	0.2	5,100	--
Nickel	2.5	47,000	6
Niobium	2.3	--	--
Phosphorus	87.7	--	--
Potassium	562	--	856
Rubidium	5.6	--	--
Scandium	1.2	--	--
Silver*	0.024	5,100	4
Sodium	54.3	--	194
Strontium	8.5	610,000	--
Thallium	<0.08	--	4.5
Thorium	1.84	--	--
Titanium	nr	--	--
Uranium	0.63	--	--
Vanadium	10.7	5,200	--
Yttrium	1.7	--	--
Zinc	13.9	310,000	23

<sup>a</sup>U.S. Environmental Protection Agency (2009a).

<sup>b</sup>South Carolina Department of Health and Environmental Control (2002).

**Table 7.** Inorganic compounds detected in the soil from land surface to 6 inches below land surface, site 4, Old Incinerator Area, Fort Gordon, August 30, 2010.

[µg/g, microgram per gram; USEPA RSL, U.S. Environmental Protection Agency Regional Screening Level, Industrial Soil; mg/kg, milligram per kilogram; SCDHEC, South Carolina Department of Health and Environmental Control; --, not applicable; \*, Resource Conservation and Recovery Act (RCRA) metal; <, less than; 44.9, higher than South Carolina background; nr, not reported. Note: 1 µg/g is equivalent to 1 mg/kg, and 1 mg/kg is equivalent to 1 part per million (ppm); selenium and mercury were not analyzed]

Compound	Result (µg/g)	USEPA <sup>a</sup> RSL (mg/kg)	SCDHEC <sup>b</sup> background (mg/kg)
Aluminum	6,540	990,000	13,528
Antimony	0.07	410	--
Arsenic*	<1	260	6.1
Barium*	44.9	190,000	38
Beryllium	0.12	2,000	0.6
Bismuth	nr	--	--
Cadmium*	<0.007	800	1
Calcium	<100	--	699
Cerium	13.1	--	--
Cesium	0.55	--	--
Chromium*	5.5	1,500,000	16
Cobalt	0.34	300	4
Copper	2.1	41,000	9
Gallium	1.6	--	--
Iron	2,310	720,000	15,608
Lanthanum	6	--	--
Lead*	2.97	800	16
Lithium	4.8	2,000	--
Magnesium	224	--	988
Manganese	16.7	23,000	120
Molybdenum	0.1	5,100	--
Nickel	2	47,000	6
Niobium	1.8	--	--
Phosphorus	70.3	--	--
Potassium	386	--	856
Rubidium	4.2	--	--
Scandium	0.8	--	--
Silver*	0.013	5,100	4
Sodium	41.2	--	194
Strontium	7.6	610,000	--
Thallium	<0.08	--	4.5
Thorium	2.11	--	--
Titanium	nr	--	--
Uranium	0.53	--	--
Vanadium	7.9	5,200	--
Yttrium	1.3	--	--
Zinc	7.6	310,000	23

<sup>a</sup>U.S. Environmental Protection Agency (2009a).

<sup>b</sup>South Carolina Department of Health and Environmental Control (2002).

**Table 8.** Inorganic compounds detected in the soil from land surface to 6 inches below land surface, site 5, Old Incinerator Area, Fort Gordon, Georgia, August 30, 2010.

[µg/g, microgram per gram; USEPA RSL, U.S. Environmental Protection Agency Regional Screening Level, Industrial Soil; mg/kg, milligrams per kilogram; SCDHEC, South Carolina Department of Health and Environmental Control; --, not applicable; \*, Resource Conservation and Recovery Act (RCRA) metal; <, less than; 106, higher than South Carolina background; nr, not reported. Note: 1 µg/g is equivalent to 1 mg/kg, and 1 mg/kg is equivalent to 1 part per million (ppm); selenium and mercury were not analyzed]

Compound	Result (µg/g)	USEPA <sup>a</sup> RSL (mg/kg)	SCDHEC <sup>b</sup> background (mg/kg)
Aluminum	10,500	990,000	13,528
Antimony	0.08	410	--
Arsenic*	<1	260	6.1
Barium*	106	190,000	38
Beryllium	0.3	2,000	0.6
Bismuth	nr	--	--
Cadmium*	<0.007	800	1
Calcium	<100	--	699
Cerium	25	--	--
Cesium	0.18	--	--
Chromium*	11	1,500,000	16
Cobalt	0.28	300	4
Copper	2.3	41,000	9
Gallium	2.5	--	--
Iron	2,610	720,000	15,608
Lanthanum	10.8	--	--
Lead*	4.5	800	16
Lithium	3.8	2,000	--
Magnesium	84.7	--	988
Manganese	7.6	23,000	120
Molybdenum	0.2	5,100	--
Nickel	1.8	47,000	6
Niobium	1.2	--	--
Phosphorus	169	--	--
Potassium	150	--	856
Rubidium	1.3	--	--
Scandium	1.2	--	--
Silver*	<0.01	5,100	4
Sodium	<25	--	194
Strontium	27	610,000	--
Thallium	<0.08	--	4.5
Thorium	2.21	--	--
Titanium	nr	--	--
Uranium	0.93	--	--
Vanadium	9.2	5,200	--
Yttrium	1.8	--	--
Zinc	4.7	310,000	23

<sup>a</sup>U.S. Environmental Protection Agency (2009a).

<sup>b</sup>South Carolina Department of Health and Environmental Control (2002).

**Table 9.** Inorganic compounds detected in the soil from land surface to 6 inches below land surface, site 6, Old Incinerator Area, Fort Gordon, Georgia, August 30, 2010.

[ $\mu\text{g/g}$ , microgram per gram; USEPA RSL, U.S. Environmental Protection Agency Regional Screening Level, Industrial Soil;  $\text{mg/kg}$ , milligram per kilogram; SCDHEC, South Carolina Department of Health and Environmental Control; --, not applicable; \*, Resource Conservation and Recovery Act (RCRA) metal; <, less than; nr, not reported. Note:  $1 \mu\text{g/g}$  is equivalent to  $1 \text{ mg/kg}$ , and  $1 \text{ mg/kg}$  is equivalent to 1 part per million (ppm); selenium and mercury were not analyzed]

Compound	Result ( $\mu\text{g/g}$ )	USEPA <sup>a</sup> RSL ( $\text{mg/kg}$ )	SCDHEC <sup>b</sup> background ( $\text{mg/kg}$ )
Aluminum	6,220	990,000	13,528
Antimony	0.1	410	--
Arsenic*	<1	260	6.1
Barium*	32.4	190,000	38
Beryllium	0.1	2,000	0.6
Bismuth	nr	--	--
Cadmium*	<0.007	800	1
Calcium	<100	--	699
Cerium	28.6	--	--
Cesium	0.33	--	--
Chromium*	5	1,500,000	16
Cobalt	0.35	300	4
Copper	2.7	41,000	9
Gallium	2	--	--
Iron	1,860	720,000	15,608
Lanthanum	13.7	--	--
Lead*	3.26	800	16
Lithium	4	2,000	--
Magnesium	150	--	988
Manganese	27.5	23,000	120
Molybdenum	0.1	5,100	--
Nickel	1.4	47,000	6
Niobium	2.8	--	--
Phosphorus	65.7	--	--
Potassium	629	--	856
Rubidium	4.6	--	--
Scandium	1	--	--
Silver*	<0.01	5,100	4
Sodium	72.6	--	194
Strontium	4.4	610,000	--
Thallium	<0.08	--	4.5
Thorium	5.22	--	--
Titanium	nr	--	--
Uranium	0.77	--	--
Vanadium	7.3	5,200	--
Yttrium	2.4	--	--
Zinc	7.9	310,000	23

<sup>a</sup>U.S. Environmental Protection Agency (2009a).

<sup>b</sup>South Carolina Department of Health and Environmental Control (2002).

**Table 10.** Organic compounds detected in an unnamed tributary to Spirit Creek to the west and north of the Old Incinerator Area, Fort Gordon, Georgia, September 8, 2010.

[µg/L, microgram per liter; MCL, maximum contaminant level; <, less than the indicated laboratory reporting level; --, not applicable; E, estimated; m, meta; p, para; n, normal; o, ortho]

Compound	Result (µg/L)	MCL <sup>a</sup> (µg/L)
1,1,1,2-Tetrachloroethane	<0.04	--
1,1,1-Trichloroethane	<0.03	200
1,1,2,2-Tetrachloroethane	<0.14	--
1,1,2-Trichloroethane	<0.046	5
1,1,2-Trichlorotrifluoroethane	<0.034	--
1,1-Dichloroethane	<0.044	--
1,1-Dichloroethylene	<0.022	7
1,1-Dichloropropene	<0.03	--
1,2,3,4-Tetramethylbenzene	<0.08	--
1,2,3,5-Tetramethylbenzene	<0.08	--
1,2,3-Trichlorobenzene	<0.06	--
1,2,3-Trichloropropane	<0.12	--
1,2,3-Trimethylbenzene	<0.06	--
1,2,4-Trichlorobenzene	<0.08	70
1,2,4-Trimethylbenzene	<0.032	--
1,2-Dibromo-3-chloropropane	<0.34	0.2
1,2-Dibromoethane	<0.05	--
1,2-Dichlorobenzene	<0.028	600
1,2-Dichloroethane	<0.08	5
1,2-Dichloropropane	<0.026	5
1,3,5-Trimethylbenzene	<0.032	--
1,3-Dichlorobenzene	<0.024	--
1,3-Dichloropropane	<0.06	--
1,4-Dichlorobenzene	<0.026	75
2,2-Dichloropropane	<0.06	--
2-Butanone	<1.6	--
2-Chlorotoluene	<0.028	--
2-Hexanone	<0.46	--
3-Chloropropene	<0.08	--
4-Chlorotoluene	<0.042	--
4-Isopropyl-1-methylbenzene	0.039 (E)	--
4-Methyl-2-pentanone	<0.32	--
Acetone	<3.4	--
Acrylonitrile	<0.8	--
Benzene	<0.026	5
Bromobenzene	<0.022	--
Bromochloromethane	<0.06	--
Bromodichloromethane	<0.034	--
Bromoethene	<0.12	--
Bromoform	<0.1	--
Bromomethane	<0.2	--
Butylbenzene	<0.08	--
Carbon disulfide	<0.04	--
Chlorobenzene	<0.016	100
Chloroethane	<0.06	--

**Table 10.** Organic compounds detected in an unnamed tributary to Spirit Creek to the west and north of the Old Incinerator Area, Fort Gordon, Georgia, September 8, 2010.—Continued

[µg/L, microgram per liter; MCL, maximum contaminant level; <, less than the indicated laboratory reporting level; --, not applicable; E, estimated; m, meta; p, para; n, normal; o, ortho]

Compound	Result (µg/L)	MCL <sup>a</sup> (µg/L)
Chloroform	<0.03	--
Chloromethane	<0.14	--
cis-1,2-Dichloroethylene	<0.022	70
cis-1,3-Dichloropropene	<0.1	--
Dibromochloromethane	<0.12	--
Dibromomethane	<0.05	--
Dichlorodifluoromethane	<0.1	--
Dichloromethane	<0.038	--
Diethyl ether	<0.08	--
Diisopropyl ether	<0.06	--
Ethyl methacrylate	<0.14	--
Ethyl <i>tert</i> -butyl ether	<0.032	--
Ethylbenzene	<0.036	700
Hexachlorobutadiene	<0.06	--
Hexachloroethane	<0.14	--
Isopropylbenzene	<0.042	--
m- and p-Xylene	<0.08	10,000 <sup>b</sup>
Methyl acrylate	<0.56	--
Methyl acrylonitrile	<0.26	--
Methyl iodide	<0.26	--
Methyl methacrylate	<0.22	--
n-Propylbenzene	<0.036	--
Naphelene	<0.18	--
o-Ethyl toluene	<0.032	--
o-Xylene	<0.032	10,000 <sup>b</sup>
sec-Butylbenzene	<0.034	--
Styrene	<0.03	100
<i>tert</i> -Butyl methyl ether	<0.1	--
<i>tert</i> -Butylbenzene	<0.06	--
<i>tert</i> -Pentyl methyl ether	<0.06	--
Tetrachloroethylene	<0.026	5
Tetrachloromethane	<0.052	--
Tetrahydrofuran	<1.4	--
Toluene	0.038	1,000
trans-1,2-Dichloroethylene	<0.018	100
trans-1,3-Dichloropropene	<0.14	--
trans-1,4-Dichloro-2-butene	<0.36	--
Trichloroethylene	<0.022	5
Trichlorofluoromethane	<0.08	--
Vinyl chloride	<0.06	2

<sup>a</sup>U.S. Environmental Protection Agency (2009b).

<sup>b</sup>The maximum contaminant level for the National Primary Drinking Water Regulations for total xylene (the summation of para-, meta-, and ortho-xylene).

**Table 11.** Semivolatile organic compounds detected in an unnamed tributary to Spirit Creek to the west and north of the Old Incinerator Area, Fort Gordon, Georgia, September 8, 2010.

[µg/L, microgram per liter; MCL, maximum contaminant level; <, less than the indicated laboratory reporting level; E, estimated]

Compound	Result (µg/L)	MCL <sup>a</sup> (µg/L)
1, 2 –Dichlorobenzene	<0.26	600
1, 3-Dichlorobenzene	<0.22	
1, 4 Dichlorobenzene	<0.22	75
1,2-Diphenylhydrazine	<0.3	
1, 2 4-Trichlorobenzene	<0.26	70
2,4,6-Trichlorophenol	<0.34	
2,4-Dichlorophenol	<0.36	
2,4-Dimethylphenol	<0.8	
2,4-Dinitrophenol	<1.4	
2,4-Dinitrotoluene	<0.56	
2,6-Dinitrotoluene	<0.4	
2-Chloronaphthalene	<0.16	
2-Chlorophenol	<0.26	
2-Nitrophenol	<0.4	
3,3-Dichlorobenzidine	<0.42	
4,6-Dinitro-2-methylphenol	<0.76	
4-Bromophenylphenylether	<0.24	
4-Chloro-3-methylphenol	<0.55	
4-Chlorophenyl phenyl ether	<0.34	
4-Nitrophenol	<0.51	
Acenaphthene	<0.28	
Acenaphthylene	<0.3	
Anthracene	<0.39	
Benz[a]anthracene	<0.26	
Benzo[a]pyrene	<0.33	0.2
Benzo[b]fluoranthene,	<0.3	
Benzo[ghi]perylene	<0.38	
Benzo[k]fluoranthene	<0.3	
bis(2-Chloroethoxy)methane	<0.24	
bis(2-Chloroethyl)ether	<0.3	
bis(2-Chloroisopropyl) ether	<0.14	
bis(2-Ethylhexyl) phthalate	<2	
Butylbenzyl phthalate	<1.8	
Chrysene	<0.33	
dibenz[a,h]Anthracene	<0.42	
diethyl Phthalate	<0.61	
dimethyl Phthalate	<0.36	
di-n-Butyl phthalate	<2	
di-n-Octyl phthalate	<0.6	

**Table 11.** Semivolatile organic compounds detected in an unnamed tributary to Spirit Creek to the west and north of the Old Incinerator Area, Fort Gordon, Georgia, September 8, 2010.—Continued

[µg/L, microgram per liter; MCL, maximum contaminant level; &lt;, less than the indicated laboratory reporting level; E, estimated]

Compound	Result (µg/L)	MCL <sup>a</sup> (µg/L)
Fluoranthene	<0.3	
Fluorine	<0.33	
Hexachlorobutadiene	<0.24	
Hexachlorobenzene	<0.3	1
Hexachloroethane	<0.24	
Hexachlorocyclopentadiene	<0.5	50
Isophorone	0.021 (E)	
Indeno[1,2,3-cd]pyrene	<0.38	
Naphthalene	<0.22	
Nitrobenzene	<0.26	
n-Nitrosodimethylamine	<0.24	
n-Nitrosodi-n-propylamine	<0.4	
n-Nitrosodiphenylamine	<0.28	
Pentachlorophenol	<0.6	1
Phenanthrene	<0.32	
Phenol	<0.28	
Pyrene	<0.35	

<sup>a</sup>U.S. Environmental Protection Agency (2009b).



**Table 12.** Inorganic compounds detected in an unnamed tributary to Spirit Creek to the west and north of the Old Incinerator Area, Fort Gordon, Georgia, September 8, 2010.

[µg/L, microgram per liter; ISWQS, Georgia In-Stream Water-Quality Standard, acute freshwater; MCL, maximum contaminant level for National Primary Drinking Water Standard (NPDWS); SMCL, maximum contaminant level for National Secondary Drinking Water Standard (NSDWS); --, not applicable; \*, Resource Conservation and Recovery Act (RCRA) metal; <, less than the indicated laboratory reporting level; E, estimated ; yellow highlight indicates exceedance]

Compound	Result (µg/L)	ISWQS <sup>a</sup> (µg/L)	MCL <sup>b</sup> (µg/L)	SMCL <sup>b</sup> (µg/L)
Aluminum	27.4	--	--	50 to 200
Arsenic *	0.893	50	10	--
Barium *	19.1	--	2,000	--
Beryllium	<0.38	--	4	--
Cadmium *	<0.04	0.7 <sup>c</sup>	5	--
Calcium	656	--	--	--
Chromium *	0.213 (E)	120 <sup>c</sup>	100	--
Cobalt	0.236	--	--	--
Copper	<3.8	6.5 <sup>c</sup>	1,300 <sup>d</sup>	1,000
Iron	5,520	--	--	300
Lead *	0.036 (E)	1.3 <sup>c</sup>	15 <sup>d</sup>	--
Lithium	0.098	--	--	--
Magnesium	307	--	--	--
Manganese	34.1	--	--	50
Molybdenum	<0.1	--	--	--
Nickel	<0.36	88 <sup>c</sup>	--	--
Potassium	133	--	--	--
Selenium *	<0.1	5.0	50	--
Silver *	<0.016	--	--	100
Sodium	1,050	--	--	--
Strontium	5.84	--	--	--
Zinc	3.9 (E)	60 <sup>c</sup>	--	5,000

<sup>a</sup>Georgia Environmental Protection Division (2005).

<sup>b</sup>U.S. Environmental Protection Agency (2009a and 2009b).

<sup>c</sup>The standard listed is for water with a hardness of less than 100 milligrams per liter.

<sup>d</sup>The value is listed in the standard as an action level value.



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**For additional information regarding this publication, contact:**

Director  
USGS South Carolina Water Science Center  
720 Gracern Road, Suite 129  
Columbia, SC 29210  
phone: 803-750-6100  
e-mail: [dc\\_sc@usgs.gov](mailto:dc_sc@usgs.gov)

**Or visit the South Carolina Water Science Center Web site at:**

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