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INTERNATIONAL TECHNOLOGY CORPORATION

REMEDIAL INVESTIGATION REPORT
SCRDI-BLUFF ROAD SITE
COLUMBIA, SOUTH CAROLINA

VOLUME 1

Prepared by:

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February 1990

IT Project No. 408619

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ACRONYMS

AIC	Acceptable intake for chronic exposure
AOC	Administrative Order by Consent
APRs	Air-purifying respirators
ARAR	Applicable or relevant and appropriate requirement
ASTM	American Society for Testing and Materials
BSHW	Bureau of Solid and Hazardous Waste
BRP	Bureau of Radiation Protection
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by Superfund
CLP	U.S. EPA Contract Laboratory Program
Continental	Continental Aerial Surveys
CFR	Code of Federal Regulations
DQO	Data quality objective
Ebasco	Ebasco Services, Inc.
EPA	U.S. Environmental Protection Agency
ESRI	Earth Sciences Resource Institute
ft^3	Cubic feet
FDA	Food and Drug Administration
FOP	Field Operations Plan
FSAP	Field Sampling and Analyses Plan
Golden	Golden Associates
gpm	Gallons per minute
HI	Hazard index
H&S	Health and Safety
HSP	Health and Safety Plan
IT	IT Corporation
ITAS	IT Analytical Services
LEL	Lower explosive limit
ug	Micrograms
m^3	Cubic meters
MCL	Maximum contaminant level
MCLG	Maximum contaminant level goal

ACRONYMS (Continued)

mg	Milligrams
mph	Miles per hour
MW	Monitoring well
NOAEL	No observed adverse effect level
NPL	National Priorities List
OSHA	Occupational Safety and Health Administration
OVA	Organic vapor analyzer
PCBs	Polychlorinated biphenyls
PEL	Permissible exposure limit
PID	Photoionization detector
ppb	Parts per billion
ppm	Parts per million
PRP	Potentially Responsible Parties
PVC	Polyvinyl chloride
QA/QC	Quality assurance/quality control
RCRA/HSWA	Solid Waste Disposal Act of 1965, as amended by the Resource Conservation and Recovery Act of 1976 and the Hazardous and Solid Waste Amendments of 1984
RHSS	Regional Health and Safety Supervisor
RI/FS	Remedial Investigation/Feasibility Study
SARA	Superfund Amendment and Reauthorization Act of 1986
SCDHEC	South Carolina Department of Health and Environmental Control
SCRDI	South Carolina Recycling and Disposal, Inc.
SDWA	Safe Drinking Water Act, as amended
SOP	Standard operating procedure
TAL	Target Analyte List
TCL	Target Compound List
TLV	Threshold limit value
USGS	United States Geological Survey
Versar	Versar, Inc.
VOC	Volatile organic compound
XRD	X-ray diffraction

EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency (EPA) has ranked the Bluff Road site in Columbia, South Carolina as number 83 on the National Priorities List. On April 21, 1988 some of the parties noticed by EPA as potentially responsible parties (the Bluff Road Group) entered into an Administrative Order by Consent with the EPA to conduct a Remedial Investigation/Feasibility Study (RI/FS). This report represents the findings of the remedial investigation conducted at the site.

The objectives of the RI were to determine the nature and extent of contamination on and adjacent to the South Carolina Recycling and Disposal, Inc. (SCRDI) site, determine and describe on-site and off-site features that could affect the cleanup methods and determine the extent to which, if any, the site poses an imminent hazard to public health or the environment.

The field investigation included the installation of 23 monitoring wells (19 shallow aquifer and 4 deep aquifer), drilling 29 soil borings from which samples were taken at 3 different depths, collection of 39 surface soil samples, collection of 2 surface water/sediment samples. Collection of 3 lagoon water and six lagoon sediment samples and chemical analysis for target compound list and target analyte list compounds of approximately 200 samples. Site geologic and hydrologic data were also collected from soil borings, soil testing, and aquifer slug tests.

A demographic survey along with a flora and fauna survey were researched and conducted on lands adjacent to or near the site between August and December 1988. In addition, a baseline risk assessment encompassing both current and hypothetical future risk scenarios was also completed.

Conclusions from the baseline risk assessment show that for the current use scenarios, the estimated levels of public health or environmental risk associated with the chemicals at the site are negligible. For the hypothetical future use scenarios, there appears to be concentrations of

site-related chemicals in the shallow aquifer that may result in unacceptable levels of exposure, but only if all the hypothetical health protective assumptions are realized.

Results of the field investigation show the on-site lagoon and soils on the SCRDI Site are source areas contributing volatile organics to the surficial aquifer. A volatile organic contaminant plume in the surficial aquifer approximately 1000 ft. wide has migrated from the SCRDI properties in a southeasterly direction and extends approximately 2200 ft. from the eastern edge of the lagoon. Soil contamination is prevalent to a depth of approximately 11 feet in the cleared portions of both the SCRDI and Roof properties. No site-related contamination was found in the surface water drainage system downgradient from the site and in the ambient air collected on the site. Results from the four monitoring wells installed into the deep aquifer under the site indicate no contamination is present. Neither the lower, confined aquifer nor Myers Creek are impacted by contamination associated with the site.

1.0 INTRODUCTION

The Bluff Road Site is ranked 83 on the National Priorities List (NPL) by the U.S. Environmental Protection Agency (EPA) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The site is also listed as the top priority site in the State of South Carolina [Title 40 Code of Federal Regulations Part 300 (40 CFR 300), Appendix B].

Some of the companies designated as Potentially Responsible Parties (PRPs), hereafter known as the "Group," entered into an Administrative Order by Consent (AOC) with EPA. The AOC became effective on or about April 21, 1988. The AOC required the Group to submit an implementation plan to EPA describing how the work outlined in the EPA-furnished Remedial Investigation/ Feasibility Study (RI/FS) Work Plan would be executed. This RI Report is submitted pursuant to Paragraph VI of the AOC and is subject to the terms, conditions, and reservations set forth in that order.

The EPA-furnished Work Plan was prepared by Ebasco Services, Inc. (Ebasco) for EPA Region IV under the REM III Program (Contract No. 68-01-7250, Work Assignment No. 189-4L15). With the accompanying Field Operations Plan (FOP), which consists of the Field Sampling and Analysis Plan (FSAP) and the Health and Safety Plan (HSP), the Ebasco Work Plan describes the EPA Region IV-approved approach to completing the RI/FS for the Bluff Road Site.

The Group for the Bluff Road Site RI/FS is conducting the work. The Work Plan and the FOP were revised at the direction of EPA so that the work may be conducted by the Group outside the REM III program requirements.

An RI of the Bluff Road Site was initiated in 1984 by Golder Associates (Golder) under the direction of the South Carolina Department of Health and Environmental Control (SCDHEC). Versar, Inc. (Versar) reviewed Golder's Draft RI Report for EPA under the TES III program (Work Assignment No. 353 of EPA Contract No. 68-01-731). As a result of this review, Versar identified data gaps in the Golder RI, developed recommendations to fill those gaps, and prepared written plans for completing the Bluff Road Site RI/FS. Versar's project plans, as reviewed and approved by EPA, consist of:

- Final RI/FS Completion Work Plan (submitted July 8, 1987)
- Final Sampling Plan (submitted August 18, 1987)
- Final Data Management Plan (submitted August 18, 1987)
- Final HSP (submitted September 8, 1987).

On September 25, 1987, following acceptance of the four Versar plans, EPA issued Work Assignment No. 189-4L15 to Ebasco to conduct the RI/FS under the REM III program. The first requirement of this assignment was the preparation of the detailed project Work Plan.

The Ebasco Work Plan supersedes the Versar documents and includes all the essential elements of the RI/FS program recommended in the Versar Work Plan, but was reorganized and expanded to conform to the latest requirements of EPA guidelines for preparing RI/FS Work Plans and conducting RI/FS projects. Specific elements added to this Work Plan that were not explicitly addressed in Versar's Work Plan include:

- A preliminary identification of applicable or relevant and appropriate requirements (ARARs)
- Development of preliminary remedial response objectives
- Preliminary identification of applicable remedial technologies
- Definition of Data Quality Objectives (DQOs)
- Consideration of a possible Expedited Response Action for an aboveground tank that remains on the site
- Community relations support.

IT Corporation (IT) of Knoxville, Tennessee entered into a contract with the Group to complete the RI/FS. IT provided technical services for preparing an Implementation Plan and for performing the RI, including procurement of goods and services for executing all tasks identified in the RI/FS Work Plans and supporting documents. The Implementation Plan was approved by EPA Region IV in August 1988.

The Group also entered into a contract with de maximis, inc. of Knoxville. The Group retained de maximis, inc. to provide project coordination for the

work performed by IT, to provide technical direction to IT on behalf of the Group, and to be the primary liaison between EPA and the Group and their contractors.

1.1 PURPOSE OF REPORT

An RI/FS is an established EPA procedure for Superfund sites and is used to determine the extent of site contamination[1] and the most effective remedial action alternative for site mitigation. The RI Report represents a compilation of all investigative activities included in the RI phase of the approved RI/FS Work Plans. This RI Report is a summary of site investigations conducted by IT as directed by the approved Work Plans, a report on collected data and interpretation of that data, and a statement addressing the extent of contamination and its impact on the public health and environment. In addition, the report provides the cornerstone for the subsequent FS for selection of a remedial action for the site, if remedial action is necessary.

The objectives of the RI portion of the RI/FS were to:

- Determine the nature and extent of ground water, surface water, air, soil, and sediment contamination on and adjacent to the site.
- Determine and describe on-site and off-site features that could affect the methods of containment or cleanup.
- Determine the extent, if any, to which the site poses an imminent hazard to public health or the environment.

These objectives are accomplished through an assessment of the existing conditions by using available data and the results of the RI activities as described in the RI/FS Work Plan. The RI includes:

- Mapping the site and surrounding area
- A hydrogeologic investigation

[1]Use of the words "contaminant, contaminate," and forms thereof throughout this document (unless expressly stated otherwise) means or refers to the occurrence of a substance or substances regulated under CERCLA, RCRA, and/or regulations thereunder.

- Geochemical and geotechnical testing of subsurface soils
- Environmental sampling and testing of ground water, surface water, sediments, and soils
- An evaluation of existing or potential exposure routes
- A risk assessment for public health and other environmental concerns.

The Superfund Amendments and Reauthorization Act of 1986 (SARA) also impacts the RI/FS for this site. First, SARA establishes a clear preference for treatment of hazardous substances and their residues that permanently and significantly reduce the volume, toxicity, and mobility of such material within the FS framework. Second, if hazardous substances remain on site, periodic review of the site must be made to ensure that the public health and environment continue to be protected. Third, the level of the cleanup for this site must ensure long-term protection of the public and environment by establishing cleanup levels that are compatible with all ARARs. These levels will be developed through the risk assessment included in the RI/FS. Last, if hazardous wastes are removed from this facility for off-site disposal, the wastes must go to a facility in general compliance with Resource Conservation and Recovery Act (RCRA) permitting requirements. Therefore, this RI/FS is being conducted in accordance with CERCLA and SARA.

1.2 SITE BACKGROUND

1.2.1 Site Description

The Bluff Road Site is located in Richland County, South Carolina (Figure 1-1) and is approximately 10 miles south of the City of Columbia on the northside of State Highway 48 (Figure 1-2). The site is a rectangular parcel of land measuring 133 feet of frontage on Bluff Road (Highway 48), with a depth of approximately 1,300 feet. The site is relatively level with ground elevations varying from approximately 139 feet [United States Geological Survey (USGS) datum] near the highway to 134 feet at the rear of the property. The front portion of the site, approximately 600 feet from the road, is cleared and has been used for various industrial and commercial purposes. The back portion of the site, encompassing one half of the area, and the adjacent properties are heavily wooded.

1.2.2 Site History

The first reported use of the site was as an acetylene gas manufacturing facility. Specific dates and other details regarding the facility operations are not available. However, two lagoons were constructed at the north end of the cleared area of the site to support the acetylene manufacture. The lagoon at the northeast corner of the cleared area was filled in with lime, a waste product generated in the manufacture of acetylene. This is known as the "dry" lagoon. The second lagoon contains several feet of lime sludge and approximately 6 inches of water. This is called the "wet" lagoon. See Figure 1-3 for locations of these features.

In 1975, the site became a marshalling center for Columbia Organic Chemicals. Columbia Organic Chemicals funded the operations of South Carolina Recycling and Disposal Inc. (SCRDI), which used the site from 1976 onward to store, recycle, and dispose of chemical wastes.

A site visit in March 1980 by representatives of EPA revealed a number of leaking drums containing volatile organics and other chemical compounds. EPA collected and analyzed samples of surface water and sediment that revealed the presence of organic compounds, halogenated hydrocarbons, pesticides, and metals contaminating site soils and waters.

A ground water investigation was performed by SCDHEC in the fall of 1980. The ground water samples had elevated levels of chlorinated organic solvents and lead. The site was shut down in 1982. Resampling of the SCDHEC wells in August 1982 indicated that concentrations of chemical compounds in the ground water were increasing.

A surficial cleanup of the site was performed in 1982 and 1983 in which over 7,500 drums containing chemicals that were stored on the site were removed for disposal. Visibly contaminated soil and all aboveground structures were also removed from the site. Clean fill and gravel were placed on the site to fill in excavations and provide clean roads. The two lagoons and an aboveground tank containing approximately 100 gallons of sludge remained on the site.

1.2.3 Previous Investigations

- Site Investigations Performed by EPA Region IV and SCDHEC
  The first investigation conducted on the site was performed by the Surveillance and Analysis Division of EPA. Results are described in EPA's report, "Ground Water and Surface Water Investigation, South Carolina Recycling and Disposal, Inc., Bluff Road Site, Columbia, South Carolina," July 1, 1980.

  Ground water conditions at the site were investigated by SCDHEC and described in its report, "Investigation of Ground Water at South Carolina Recycling and Disposal Company, Bluff Road Site, Richland County, South Carolina," January 1981. Ground water sampling was again performed by SCDHEC in August 1982 and the results published as an addendum to the 1981 report.

- Golder's RI
  Golder began an RI of the site and adjacent affected properties in 1985 and 1986. This RI was never completed. Results of the RI are described in Golder's second draft report entitled "Remedial Investigation, Bluff Road Site, Richland County, South Carolina," April 1986.

- Site Radiological Survey
  SCDHEC's Bureau of Solid and Hazardous Waste (BSHW) and the South Carolina Bureau of Radiation Protection (BRP) conducted a radiological survey of the site in February 1988. The survey revealed no gamma radiation readings above background levels.

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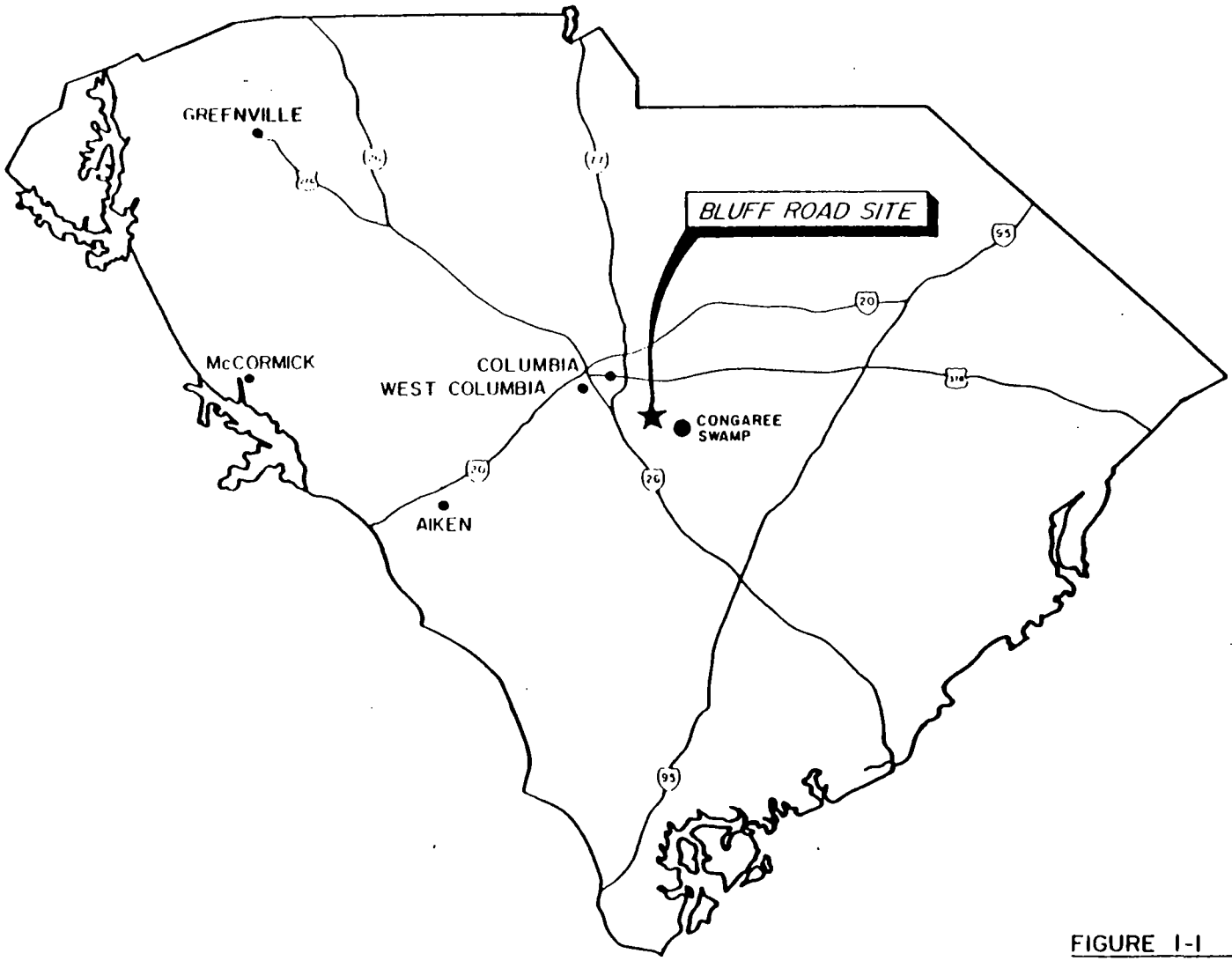

FIGURE 1-1
SITE LOCATION

BLUFF ROAD
COLUMBIA, SOUTH CAROLINA

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2.0 STUDY AREA INVESTIGATION

The study area was investigated by numerous methods, from aerial photography to a zoological survey. This section summarizes all the types of investigations and the products generated during the course of each investigation. Some of these products are presented in this report as figures, maps, tables, or appendices; others were used as basic sources of data, and only the interpretations are presented herein.

The results and interpretations generated from the site characterization activities are given in Sections 3.0 and 4.0. Section 3.0 discusses the physical characteristics of the study area. Section 4.0 discusses the nature and extent of contamination found as a result of sampling activities. To preserve continuity, data tables and maps specific to these discussions are presented in the appropriate sections.

2.1 FIELD ACTIVITIES FOR SITE CHARACTERIZATION

Each of the following subsections details the activities undertaken for data collection, including any special problems encountered. Standard Operating Procedures (SOPs) are given in Section 4.1. The data products generated by each activity are listed below.

2.1.1 Surface Feature Characterization

2.1.1.1 Aerial Photography Survey

In July 1988, Continental Aerial Surveys (Continental) was contracted to overfly the Bluff Road Site and photograph it in 9-inch by 9-inch format using black and white film. Photographs were generated at two scales: 1 inch equals 500 feet (1:6,000) and 1 inch equals 1,000 feet (1:12,000); stereo coverage was obtained for the entire study area.

From the photographic coverage, Continental produced two topographic maps, each of which also includes an interpretation of physical features visible on the aerial photographs. Because the photography was flown in the summer, dense vegetation obscures many features such as drainage ditches or otherwise

disturbed ground. These maps are at scales of 1:3,750 (Figure 2-1) and 1:930 (Figure 2-2).

2.1.1.2 Site Walks

Many site walks were conducted during the field work. These aided in documenting the direction and course of local drainage, the access roads created for well installation and sampling, specific site features, and the general condition of the site during each type of activity.

2.1.1.3 Ground Survey

Following installation of the monitoring wells, a ground survey was conducted by Whitworth and Associates. Data generated include:

- Locations of all IT and Golder monitoring wells and all IT sample sites
- Elevations of top of casing for all Golder monitoring wells designated "P-__" or "DW-__"
- Elevations of top of casing and nail in pad for all IT monitoring wells
- Ground surface elevations for soil boring sites
- Locations of miscellaneous site features such as the decontamination pad, fencelines, utility poles, and access roads
- Locations of legal property boundaries for the Seidenberg (SCRDI) and Roof (Campbell's Garage) properties.

The ground survey was tied into benchmarks generated for the aerial survey and plotted at the same scales as the aerial survey maps.

2.1.2 Contaminant Source Investigations

In 1982, the leaking drums that provided the source of contamination at the site were removed in two separate actions (SCDHEC, 1982; CDM,1985). Consequently, little activity was undertaken to further characterize primary sources of contamination beyond visual inspections of the SCRDI property and surrounding areas. The investigation of soils as a secondary or continuing source of contamination is described in Section 2.1.6. The SCRDI property and surrounding areas of concern were visually inspected and/or sampled as

necessary to confirm any further potential sources of and/or pathways for contamination. Concerns raised by SCDHEC, indications given by Golder data, and features noted during site walks were investigated as follows.

2.1.2.1 Underground Tank(s)

SCDHEC expressed the concern that one or more underground tanks may have been used for chemical storage on the SCRDI property. Visual inspection resulted in identification of a sump, which was apparently used to hold decontamination water during drum removal activities and is now capped with a heavy concrete lid. Verbal reports indicate that a 1,000-gallon septic tank (without drain field) also exists on the SCRDI property. Along the northwest fenceline are several concrete pads thought to be the foundations for site warehouses (see Figure 1-3). SCDHEC reported an underground tank in this area, but none were found by visual inspection.

2.1.2.2 Aboveground Tank

A 3,000-gallon capacity cylindrical steel tank was cleaned out and removed from the SCRDI property. Analytical results from a sample of the 6-inch-thick sludge remaining in the bottom of the tank gave a composition of approximately 40,000 parts per million (ppm) of phenols and chlorophenols. (Also see Certificates of Analysis for Sample No. T0825A82000, Appendix A.) The tank was flushed with approximately 300 gallons of diesel fuel using a vacuum tanker, and the resulting mixture was pumped into drums and sealed. The tank was then filled with nitrogen gas and was cut using reciprocating saws by workers from Bryson Industrial Services; Level B personnel protection was used. Remaining sludge was shoveled into drums and the tank pieces were placed in a covered roll-off box. The tank pieces were disposed of by burial in the ChemWaste Landfill at Emelle, Alabama, and the sludge was incinerated by ThermalKEM at its facility in Rock Hill, South Carolina.

2.1.2.3 SCDHEC Wells

Eleven 2-inch polyvinyl chloride (PVC) wells emplaced by SCDHEC (considered to be possible pathways for vertical contamination migration) were closed in accordance to the IT Implementation Plan (August 1988). The current status of these wells is as follows:

- W-1 - Abandoned by overdrilling and grouting to surface
- W-2 - Abandoned by overdrilling and grouting to surface
- W-3 - Well not located; two attempts made
- W-4 - Well not located; reported abandoned by filling with bentonite pellets (Golder Associates, 1986)
- W-5 - Well not located; reported destroyed (SCDHEC, 1981)
- W-6 - Abandoned by overdrilling and grouting to surface
- W-7 - Abandoned by overdrilling and grouting to surface
- W-8 - Abandoned by overdrilling and grouting to surface
- W-9 - Abandoned by tremie grouting casing in-place
- W-10 - Abandoned by tremie grouting casing in-place
- W-11 - Abandoned by overdrilling and grouting to surface.

Although the objective was to close all the remaining SCDHEC wells by overdrilling and grouting to the surface, in two instances this was not possible. W-9 and W-10 were abandoned by tremie grouting the casing in place due to site conditions.

- Other potential sources. Surface soil samples in addition to the ones required by the Ebasco Work Plan (1988) were taken at five different locations away from the SCRDI property where potential sources of contamination were noted (Figure 2-3):

  - At a trash pile, including a rusted drum near P-11 (Sample Site SS-35)
  - At the southeast corner of the SCRDI property near MW-6 (Sample Site SS-36)
  - Approximately 200 feet north of P-18 where a pesticide can was found (Sample Site SS-37)
  - Next to a water-filled pit east of MW-5 (Sample Site SS-38)
  - Along the northern jeep trail near several empty 1-gallon amber bottles (Sample Site SS-39).

2.1.3 Meteorological Investigations

Regional meteorological data were collected and summarized by Earth Sciences and Resources Institute (ESRI, 1989) from the office of the State Climatologist and other sources. This summary is presented in Section 3.2. No site-specific meteorological investigations were undertaken.

2.1.4 Surface Water and Sediment Investigations

The major surface drainage from the site was identified by Ebasco (1988) as a ditch trending southeast along Bluff Road and eventually joining a tributary to Myers Creek. In accordance with the IT Implementation Plan (1988), the surface water and sediments were sampled in two locations along this drainage (Figure 2-4).

2.1.5 Regional Geological Investigations

The geological features, stratigraphy, and hydrology of the region near the Bluff Road Site was researched by ESRI (1989). A summary of the geology from this work is given in Section 3.4. Site-specific geological investigations are explained in Subsection 2.1.6.

2.1.6 Soil and Vadose Zone Investigations

Physical properties of the soils were described and determined by logging soil borings and monitoring well borings, with Shelby tube samples of each major lithology analyzed for Atterberg limits, laboratory permeability, and particle size as follows:

- The analysis for Atterberg limits was performed according to the American Society for Testing and Materials (ASTM) D4318-84, "Standard Test Method for Liquid Limit, Plastic Limit, and Plastic Index of Soils," 1988 Annual Book of ASTM Standards, Vol. 04.08, Soil and Rock; Building Stones.

- The samples were analyzed for particle size according to ASTM D422-63 "Particle Size Analysis of Soils," 1988 Annual Book of ASTM Standards, Vol. 04.08, Soil and Rocks; Building Stones, using a stack of sieves down to size 200 mesh. The finer portion of the samples are determined by the hydrometer method based on Stokes equation for the velocity of free-falling sphere.

The logs for the soil borings and monitoring wells are given in Appendix B. Twenty-nine soil borings and 23 wells were installed (Figures 2-5 and 2-6). Of the wells, several were included in well pairs or clusters at a total of 13 different locations.

Surface soils and soil borings were sampled and analyzed to evaluate contamination at the surface and in the vadose zone. The native surface soils were sampled from 0 to 6 inches after fill or overburden was removed, as discussed in Subsection 4.1.1.1. The soil borings were typically sampled at the 3- to 7-foot and 7- to 11-foot intervals, as discussed in Subsection 4.1.1.2.

2.1.7 Ground Water Investigations

Twenty-three monitoring wells were installed to monitor the shallow and deep aquifers at the site. Wells were installed in the shallow aquifer by Boyles Brothers Drilling Company using the hollow stem auger drilling method. Wells

MW-1A, MW-1B, MW-2B, MW-4A, MW-4B, MW-7A, MW-7B, MW-11A, MW-11B, MW-12A, and MW-12B, were installed using a Simco hollow stem auger drill rig. Wells MW-2A, MW-3B, MW-5B, MW-6B, MW-8B, MW-9B, MW-10B, and MW-13B were installed using a Terramac 1000 HSA rig. Deep aquifer wells were installed by the mud rotary method. Wells MW-7C, MW-9C, and MW-12C were installed by Layne Central Company with a Mobile Drill B-80 rig. MW-3C was installed by S&ME using a Speedstar 30K rig. All wells are constructed of Schedule 316 stainless steel riser and screen with a nominal inside diameter (I.D.) of 2 inches. Screen lengths for all wells are 10 feet, with a slot size of 0.010 inch. Construction details of each well are given in Table 2-1 with generalized construction diagrams for each type of well shown as follows: "A" wells in Figure 2-7, "B" wells in Figure 2-8, and "C" wells in Figure 2-9. The zones monitored by the different wells are as follows:

- MW-1A - Shallow aquifer, shallow well (background)
- MW-1B - Shallow aquifer, deep well (background)
- MW-2A - Shallow aquifer, shallow well
- MW-2B - Shallow aquifer, deep well
- MW-3B - Shallow aquifer, deep well
- MW-3C - Deep aquifer
- MW-4A - Shallow aquifer, shallow well
- MW-4B - Shallow aquifer, deep well
- MW-5B - Shallow aquifer, deep well
- MW-6B - Shallow aquifer, deep well
- MW-7A - Shallow aquifer, shallow well
- MW-7B - Shallow aquifer, deep well
- MW-7C - Deep aquifer (background)
- MW-8B - Shallow aquifer, deep well
- MW-9B - Shallow aquifer, deep well
- MW-9C - Deep aquifer
- MW-10B - Shallow aquifer, deep well
- MW-11A - Shallow aquifer, shallow well
- MW-11B - Shallow aquifer, deep well
- MW-12A - Shallow aquifer, shallow well
- MW-12B - Shallow aquifer, deep well
- MW-12C - Deep aquifer
- MW-13B - Shallow aquifer, deep well.

Initially, four well pairs (MW-1A and MW-1B, MW-7A and MW-7B, MW-4A and MW-4B, and MW-12A and MW-12B) were installed in the shallow aquifer to determine if monitoring the shallow or deep zones was most effective. These four well pairs were sampled with fast turnaround on the volatile organic compounds (VOCs). The data from the deep zone typically gave higher contamination

values towards the edge of the plume than the data from the shallow zone. Consequently, the remaining single wells in the shallow aquifer were screened in the deep zone. Golder wells and IT wells were developed, purged, and sampled as described in Subsections 4.1.1.9 and 4.1.1.10.

2.1.8 Human Population Surveys

The demography of the SCRDI-Bluff Road Site was researched by Herrell (1989). This includes data and explanation of the demography of the region around the site. A summary of the work is presented in Section 3.7.

2.1.9 Ecological Investigations

Floral and faunal surveys were carried out on the properties surrounding the SCRDI tract (McCoy, 1989; Morris, 1989). The results are summarized in Section 3.8.

2.2 TECHNICAL MEMORANDA

2.2.1 Sample Location and Identification

All samples were collected from the locations that were (1) called for in the March 1988 Ebasco "Field Operation Plan," (2) described in the July 1988 IT "Implementation Plan," or (3) agreed to in meetings with EPA and SCDHEC (i.e., new well locations).

Each sample was assigned a unique alpha numeric identification number. These are related to sample location identification numbers in Appendix A. Some location identification numbers were assigned in the Ebasco plan and others were assigned during the Golder investigation or as needed in the field. These location identifications are referred to throughout the text and are listed as location codes on various computer printouts used in this report.

The sample location identifications are as follows:

SS-## - Surface soils for 0 to 6 inches of depth

B-##, A/B - Soil borings; A/B depth and interval the sample represents

DW-## - Golder-installed wells into the deep/confined aquifer

P-#	- Golder-installed wells into the upper/surficial aquifer
#-A	- IT-installed wells screened in the top 10 feet of the upper/surficial aquifer
#-B	- IT-installed wells screened in the bottom 10 feet of the upper/surficial aquifer
#-C	- IT-installed wells into the deep/confined aquifer
SR-#	- Surface run-off water
RS-#	- Surface run-off sediment
DLS-#	- Dry lagoon sediment
WLW-#	- Wet lagoon water
WLS-#	- Wet lagoon sediment
AR-#	- Ambient air.

2.2.2 Health and Safety

2.2.2.1 Personnel Monitoring

As specified in the FOP, a Foxboro organic vapor analyzer (OVA) was utilized continuously during the field activities, and an HNu supplied additional data for health and safety considerations. A daily scan of the working area was conducted, prior to work activities, and the Health and Safety Officer or the designated assistant monitored the boring, well and/or sample site, the sample, and the breathing zone during the entire duration of all field activities.

In addition, several health and safety samples were taken of unknown matrices to determine the appropriate protective levels and equipment requirements prior to access by the workers.

As required by the HSP, air-purifying respirators (APRs) were used when organic vapors exceed 1 ppm but less than 5 ppm. Please note: At no time during field activities did organic vapors exceed 4.5 ppm in the breathing zone.

2.2.2.2 Personnel Protection

At the onset of the field work, the Regional Health and Safety Supervisor (RHSS) designated the following protective clothing:

- Polycoated Tyvek with hoods
- Viton gloves
- PVC boots
- Full-face APR with organic vapor/acid gas and high-efficiency particulate cartridges; the above equipment constitutes Level C protection
- Supplied air equipment (i.e., Level B).

Per the FOP, APRs were to be used when the organic vapors exceeded 1 ppm in the breathing zone, and Level B would have been necessary at 5 ppm in the breathing zone.

Because the exposure potential was unknown on the SCRDI property, Level C protection was required initially. As analytical data became available, this level of protection was found to be justified. Throughout the duration of the field investigation, Level C protection was required for access to the SCRDI property.

On the Campbell's Garage property and surrounding study areas during the early phases of the project, modified Level D was used (i.e., polycoated Tyvek, Viton gloves, PVC boots). APRs were required to be readily available in the event elevated OVA or HNu readings occurred.

As analytical data from the Golder wells, surface soils, sediments, etc. became available, the RHSS downgraded the protective equipment to:

- Tyvek, safety glasses, nitrile gloves, and PVC boots in the plume area
- Nitrile gloves, safety glasses, and PVC boots outside the plume area, during nonsampling activities
- Level C protection remained a minimum requirement on the SCRDI property.

2.2.2.3 Personnel Decontamination

Upon return to the decontamination area, the following personnel decontamination procedure was used:

- Spray boots and gloves with water, removing all visible contamination
- Soap and water scrub of boots and gloves; rinse with fresh water
- Remove tape around wrists and ankles
- Remove Tyvek, rolling inside out during the process
- Remove outer gloves
- Remove respirator
- Remove and store boots as leaving decontamination pad
- Remove inner latex gloves
- Soap and water wash face and hands.

2.2.3 Equipment Decontamination Procedures

All sampling equipment was decontaminated according to EPA Region IV protocols and as specified in the Ebasco (1988) work plan.

Drill rigs, drums, heavy machinery, scrap metal, etc. (i.e., all materials that were used on the site) were decontaminated before leaving the site. A physical inspection was made, visually determining the lack of mud or other contaminants before these materials were released. Note that this process was for each exit from the decontamination pad. For example, the trailer truck for wastewater disposal was decontaminated before leaving with each load. All materials that were to be reused were washed with the high-pressure washer, using Alconox soap and approximately 180°F hot water generated by the washer.

Nonreusable Materials

These materials included discarded Tyvek, gloves, barrier tape, plastic, lumber, etc., which were sent to Ross Incineration Services, Inc.

TABLE 2-1
WELL CONSTRUCTION SUMMARY TABLE

(All measurements are in feet below ground surface)

Well ID	Bottom of Borehole	Backfill Type	Screened Interval	Filter Pack Interval	Top of Bent. Seal	Base of 8" Surface Casing	Number of Centralizers
MW-1A	20	None	10.0-20.0	8.0-20.0	6.0	NA[a]	NA
MW-2A	22.5	Filter pack	8.0-18.0	6.5-22.5	5.0	NA	NA
MW-4A	20	Borehole material	7.5-17.5	5.0-17.5	3.0	NA	NA
MW-7A	20.7	Filter Pack	9.7-19.7	6.0-20.7	3.5	NA	NA
MW-11A	19.5	Filter pack	8.0-18.0	6.5-19.5	5.0	NA	NA
MW-12A	20	Borehole material	9.5-19.5	7.0-19.5	5.0	NA	NA
MW-1B	45.1	Filter pack	35-45	32-45.1	25[b]	NA	NA
MW-2B	47.5	Filter pack	37-47	34.5-47.5	32	NA	NA
MW-3B	45.5	Filter pack	33.5-43.5	31.8-45.5	29.8	NA	NA
MW-4B	50	Filter pack	39-49	35-50	33	NA	NA
MW-5B	46.7	Filter pack	35.3-45.3	33.8-46.7	32.3	NA	NA
MW-6B	50	Bentonite pellets	37.5-47.5	35.0-47.5	32.7	NA	NA
MW-7B	50.3	Borehole material	37-47	34.8-48	24[b]	NA	NA
MW-8B	53.8	Filter pack	41.6-51.6	39.5-53.8	37.0	NA	NA
MW-9B	47.8	Filter pack	36-46	34.3-47.8	31	NA	NA
MW-10B	46.8	Filter pack	35.8-45.8	30.3-46.8	26.5	NA	NA
MW-11B	49.9	Filter pack	38.9-48.9	34.3-49.9	24[b]	NA	NA
MW-12B	50	Filter pack	38-48	35-50	25[b]	NA	NA
MW-13B	53.2	Filter pack	42.0-52.0	40.1-53.2	38.3	NA	NA
MW-3C	80.0	Filter pack	70.0-80.0	66.0-80.0	44.5	47.0	4
MW-7C	120	Bentonite hole plug to 69.8	58.0-68.0	51.0-69.8	46.2	50.8	4
MW-9C	120	Bentonite hole plug to 86.0	65.0-75.0	60.9-86.0	43.1	46.5	5
MW-12C	80.0	Filter pack	69.3-79.3	66.5-80.0	51.7	52.8	4

a - NA, Not Applicable
b - A bentonite/cement slurry was used in place of bentonite pellets.

3 10 00538

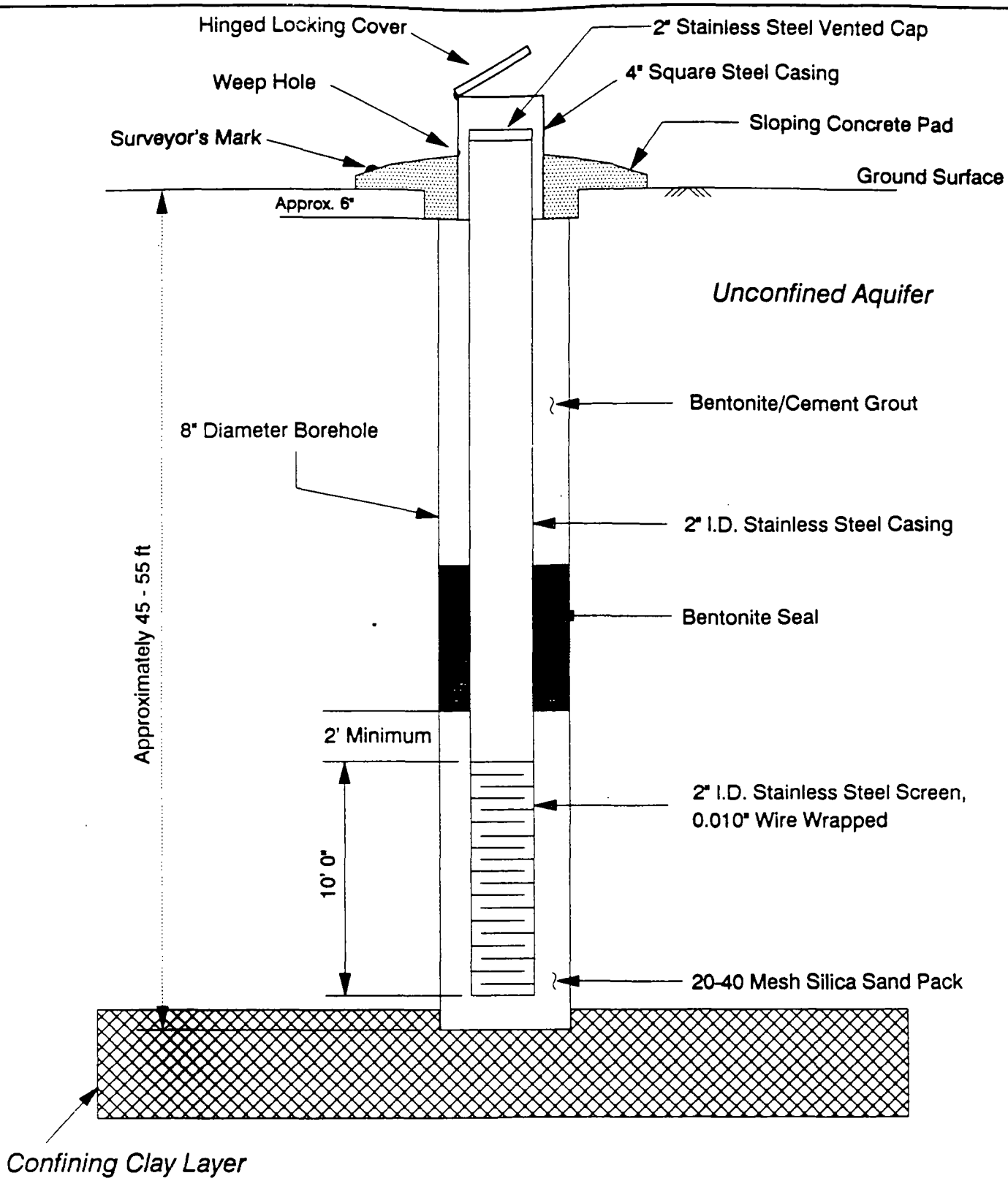


FIGURE 2-8

DEEP SURFICIAL MONITORING WELL CONSTRUCTION
BLUFF ROAD SITE
COLUMBIA, SOUTH CAROLINA

INTERNATIONAL TECHNOLOGY CORPORATION

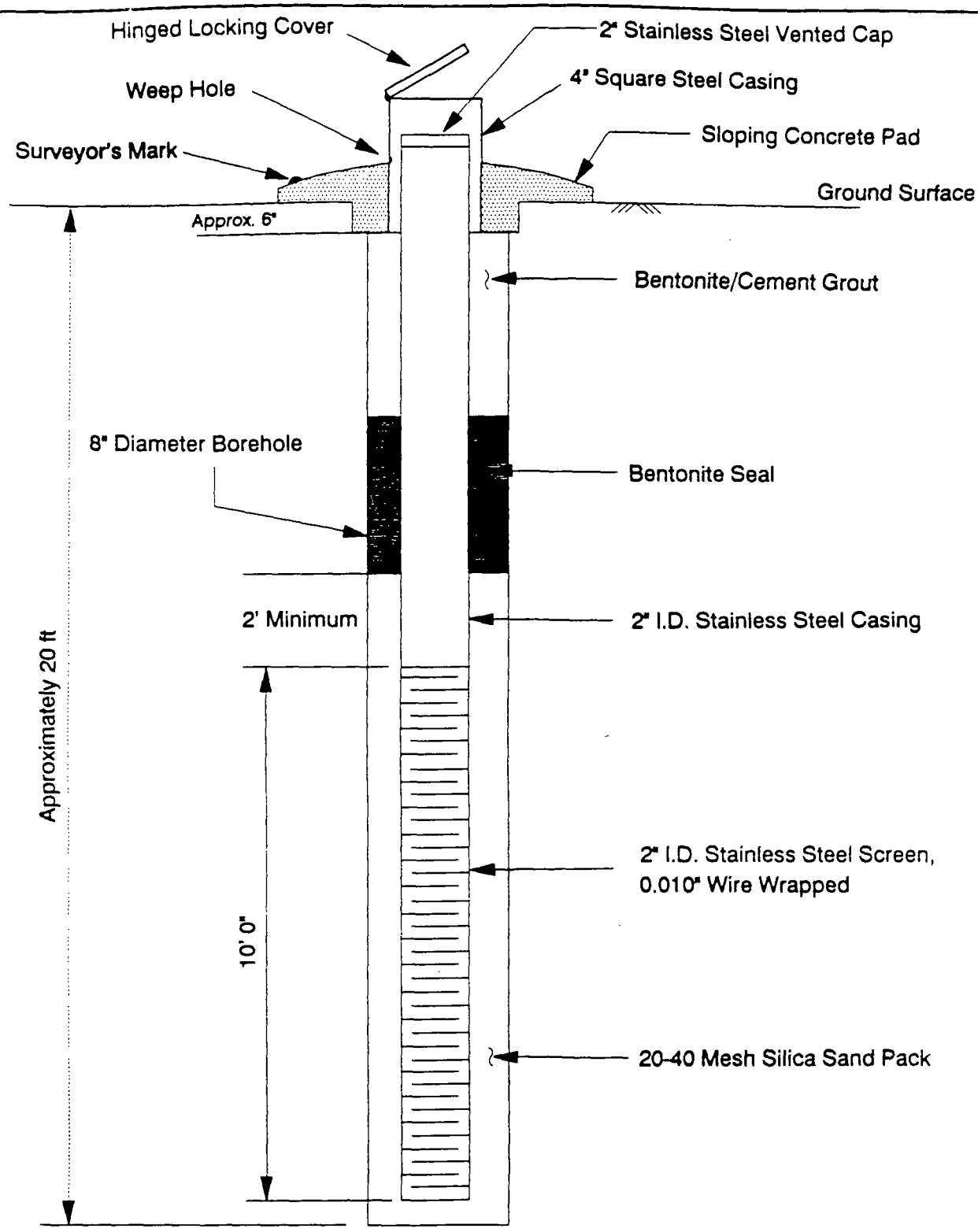


FIGURE 2-7

SHALLOW SURFICIAL MONITORING WELL CONSTRUCTION
BLUFF ROAD SITE
COLUMBIA, SOUTH CAROLINA

INTERNATIONAL TECHNOLOGY CORPORATION

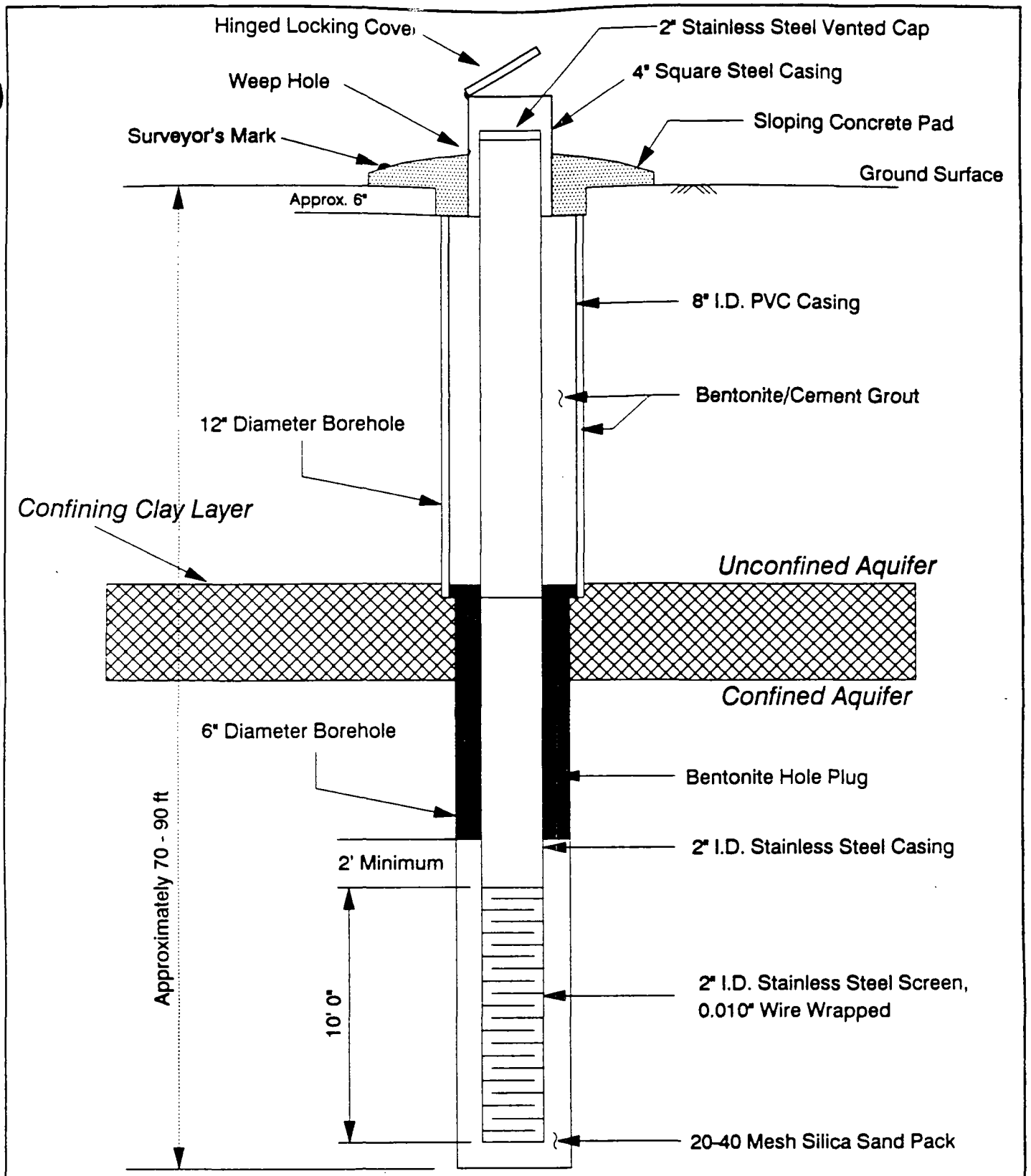


FIGURE 2-9

DEEP MONITORING WELL CONSTRUCTION
BLUFF ROAD SITE
COLUMBIA, SOUTH CAROLINA

INTERNATIONAL TECHNOLOGY CORPORATION

3.0 PHYSICAL CHARACTERISTICS OF STUDY AREA

3.1 RESIDENTIAL WELL SURVEY

A residential well survey was conducted in January 1989 by ESRI, University of South Carolina within a 1-mile radius of the site. The purpose of the survey was to identify the number and type of ground water well users.

The survey was conducted by reviewing available well records from the files of the South Carolina Water Resources Commission, the SCDHEC, the USGS, and by personal observations and interviews with residents of the community.

Information on wells in southern Richland County was very limited. Published hydrogeologic reports and well installation records, normally filed by the well drillers, were unavailable or difficult to locate. Wells were either very old or had been drilled by acquaintances of the owners and therefore had little recorded information.

Four domestic (Class 1) water wells and one agricultural (Class 3) well were identified within the area of interest 1 mile downgradient of the Bluff Road Site. No industrial (Class 2) wells were located. Well locations are presented in Figure 3-1.

A domestic well is located at the intersection of Bluff Road (Highway 48) and Richland Boulevard, which supplies water to a tavern. No records were obtained for this well, but the owner stated the well was drilled to a depth of 60 feet.

A small residential community is situated in the study area on Richland Boulevard and is divided into two sections by Myers Creek. Two domestic wells were located on properties on lower Richland Boulevard between Highway 48 and Myers Creek. There are no records on these wells.

One quarter mile east of Myers Creek on lower Richland Boulevard is another small neighborhood. One domestic well supplies water to three mobile homes. No records could be located on this well.

The Class 3 well used for both potable water and light agricultural use is located in a recreational area named Hopkins Park. The park is situated just east of the last domestic well on Richland Boulevard. The driller's log indicates that the well was installed in October 1983 to a depth of 187 feet using the mud rotary method. A 4-inch diameter PVC casing was installed with 20 feet of screen set at a depth of 152 to 172 feet.

3.2 METEOROLOGY

The climate of the region is classified as humid-subtropical, characterized by long hot summers, relatively short mild winters, and high humidity most of the year. The following data were gathered from a published summary of the climate of South Carolina and other documents from the office of the State Climatologist.

Table 3-1 shows the average temperature readings taken from three weather stations surrounding the site: the Columbia Metropolitan Airport (14 miles from the site), the City of Orangeburg (27 miles), and the Tilghman State Forest Nursery (21 miles). The means are from observations taken from 1951 to 1980. The coolest month of the year is January, and the warmest month is July. The 3-month period December through February is the coolest period of the year. Daily temperature minima are below 36°F. Warm weather extends from May to September (daily maxima above 80°F). The site is within a region that has a growing season of approximately 220 days.

Precipitation is shown in Table 3-2. Summer is the wettest portion of the year due to airmass thunderstorms. The winter and spring are also periods of frequent precipitations as a result of frontal activity. The autumn months are the driest. Annual rainfall is approximately 47 to 50 inches. The site can expect, on average, one snowfall of between 1.5 and 2 inches annually. There can be periods of drought during the summer, but severe drought is sporadic. Severe droughts occurred in 1925, 1933, 1954, 1983, and 1986.

In this area, the humidity exhibits a greater diurnal variability than it does from day-to-day or on a seasonal basis. Humidity is at its maximum in the

early morning hours (typically 80 to 90 percent) and at its minimum in the hours just after midday (typically 40 to 50 percent).

Sunshine varies from a low of 50 to 60 percent during the winter months to a maximum of 70 to 75 percent during dry periods in spring and autumn. During the summer it is sunny 60 to 70 percent of the time.

Because of the sheltering effects of the Appalachian Mountains, the prevailing surface wind directions are from the northeast or the southwest, although they are subject to seasonal variations. During the spring, the winds are predominantly out of the southwest; summer winds come from the southwest and south; autumn winds are from the northeast; and winter winds come out of the northeast and southwest with equal frequency. The average wind speed is between 6 and 10 miles per hour (mph). Wind speed and direction observations taken at the Columbia Metropolitan Airport are summarized as a wind rose in Figure 3-2.

Thunderstorms are frequent in both the spring and summer, but spring storms associated with frontal activity are the most likely to produce severe weather. Most tornadoes occur during the period March through June (60 percent). Tornadoes spawned by hurricanes also produce severe weather in Columbia, primarily during August and September (21 percent). Hurricanes bring heavy rains, but Columbia is far enough inland for their severity to be reduced.

3.3 SURFACE WATER HYDROLOGY

The soil in the region of the Bluff Road Site is characterized by a surface layer rich in silt and clay that causes water to pond instead of infiltrate. Drainage off the study area is away from the topographic high at Bluff Road (State Highway 48) and to the east. Bluff Road, however, runs along a drainage divide so that most of the drainage on the southwest side of the road is to the west. Drainage is mainly by sheet flow across the land surface since there are few ephemeral streams. In many areas, drainage ditches have been excavated to facilitate runoff.

In wet seasons, there is flooding in the floodplain to the east and south of the site. Drainage is into Myers Creek about 3,200 feet east of the site

(Figure 3-3), a tributary stream to Cedar Creek which passes through the Congaree Swamp National Monument. The waters of Cedar Creek meander southeasterly through several channels to the Congaree River over a distance of approximately 5 miles (Figure 3-4).

3.4 GEOLOGY

3.4.1 Regional Geology

The regional stratigraphy of the study area is divided into three major units. Pre-Mesozoic crystalline bedrock (Unit 1) is probably fractured and deeply weathered. The upper surface of this basement is irregular, with relief similar to the overlying sedimentary deposits. The basement surface dips toward the southeast with a gradient of about 20 to 40 feet per mile.

Coastal Plain sediments overlie the crystalline bedrock (Table 3-3). The Upper Cretaceous Middendorf/Black Creek Unit (Unit 2) is the oldest Coastal Plain sedimentary formation in the subsurface in southern Richland County. This unit extends southward beneath the entire South Carolina Coastal Plain, thickening and becoming more marine to the southeast. It is the principal aquifer in the South Carolina Coastal Plain (Colquhoun et al., 1969).

The Middendorf, also locally referred to as the Tuscaloosa Formation, is a complex assortment of lithologies. It contains variegated (generally light) fine- to coarse-grained quartzose, feldspathic sands, and light colored clays containing variable amounts of silt or sand. Fine- to medium-grained gravel, mica, and lignitic wood fragments are common constituents of this formation.

Above the Middendorf lies the Black Creek Formation. In the region of the Bluff Road Site, it is approximately 100 feet thick. It consists mostly of fine-grained sediments such as clays and silts; locally, lenses of coarser grained sand are present. The clays are typically dark brown, micaceous, highly plastic, and carbonaceous.

The Middendorf and Black Creek Formations are the most important hydrogeologic strata in the sedimentary prism of the Coastal Plain. Younger deposits rest uncomformably on these older units across much of the Coastal Plain. The

younger strata include Plio-Pleistocene terrace deposits of the middle Coastal Plain and the Holocene sediments on the floodplains.

The third major unit in the study area is the Plio-Pleistocene Okefenokee terrace deposits. These sediments are readily seen in the vicinity of the site wherever sand and clay beds are exposed in drainage ditches and road cuts. The sediments of the Okefenokee terrace are variable in thickness, but in this locality they are between 20 and 40 feet thick. The sediments are probably not marine in character but conform with the marine shoreline, as do the sediments of the other local terrace formations.

The Okefenokee terrace sediments contain various admixtures of silts, clays, and sands in beds that thicken or thin appreciably within short distances. The lithology of one bed commonly grades laterally or vertically into another lithology, for example, from sand to sandy clay. Thus, even within a site-specific area of only a few hundred square feet, it is not unusual to find that the subsurface geology of these sediments is difficult to correlate from one borehole to another. This is typical of terrace deposits.

West-southwest of the site, the top of the crystalline bedrock lies about 100 to 150 feet below mean sea level. Therefore, with topographic elevations of 110 to 140 feet above mean sea level, the sedimentary section at the site is estimated to be about 240 to 290 feet thick, depending on land surface elevation at any particular point.

3.4.2 Clay Layer Mineralogy

An X-ray diffraction (XRD) analysis of nine samples from the clay layer between the shallow and deep aquifer was performed by ESRI, University of South Carolina. In addition to the nine samples from the Bluff Road Site, a comparison sample of the Black Mingo Formation was also analyzed. The methods and result summary for each of the samples are given in Appendix C.

This study concludes that the nine samples from the Bluff Road Site (from MW-1B, MW-3B, MW-5B, MW-7B, MW-8B, MW-9B, MW-9C, MW-10B, and MW-11B) are characterized by concentrations of kaolinite ranging from 89 to 97 percent. Minor illite (2 to 10 percent) and traces of quartz and mixed layer

illite/smectite are also noted. In comparison, the sample of the Black Mingo Formation has 45 percent mixed layer illite/smectite, and smectite is present at 6 percent.

Previous studies up through Golder (1986) have claimed that the deep clay layer is the Black Mingo Formation, which is notable for the presence of expanding clays (smectite and smectite/illite). The mineralogical data generated by the ESRI study suggest that the two clay layers are not the same. This supports the contention by Colquhoun (1988, personal communication) that the Black Mingo Formation is not present in the region near the Bluff Road Site and that the clay layer is probably in the Black Creek Formation.

3.5 SOILS

Figure 3-5 shows the soils of the area taken from a current county soil survey. Loams, which are mixtures of sand, silt, and clay, are the dominant soil type in the region. The soils present in the vicinity of the site are Orangeburg loamy sand, Persanti very fine sandy loam, Smithboro loam, and Cantry loam.

3.6 HYDROGEOLOGY

3.6.1 Summary of Regional Hydrogeology

The following summary of the regional hydrogeology is excerpted from ESRI (1989).

The stratigraphy of the study may be divided into four hydrologically connected water-bearing units underlying the Bluff Road Site (Aucott and Speiran, 1985). Hydrogeologic units are as follows:

- A shallow, surficial aquifer in the Okefenokee terrace, underlain by a clay or sandy clay aquitard, part of the Black Creek Formation
- A deep aquifer consisting of sand and clay, also part of the Black Creek Formation, underlain by another aquitard of sandy clay
- The deepest aquifer, the Middendorf Formation, consisting of sand, silt, and clay (which many geologists call the Tuscaloosa Aquifer, Colquhoun et al., 1969)
- The crystalline pre-Mesozoic basement which has virtually no primary porosity but possibly has significant high secondary fracture porosity.

In southern Richland County, artesian conditions may occur within the Black Creek and Middendorf Formations (Aucott and Speiran, 1985), especially in topographically low areas such as the Congaree River floodplain.

Ground water in the near-surface terrace deposits generally occurs under water table conditions (Davis and Floyd, Inc., 1982). This shallow aquifer consists of the Pleistocene Okefenokee terrace at the Bluff Road Site. There is sand-to-sand contact between the Okefenokee deposits and the underlying Black Creek Formation in the many areas where the Black Creek Aquifer is not confined (ESRI, 1989). The depth and thickness of the shallow aquifer varies between 0 and 40 feet because of differences in the depth of the lower confining unit, and it also varies as a result of differences in aquifer thickness and permeability of the sediments, mostly coarse sand and clay at the Bluff Road Site (Davis and Floyd, Inc., 1982).

Recharge to the shallow aquifer occurs by local rainfall, primarily where surface sediments have a high permeability. Ground water flow tends to follow potentiometric surface gradients toward streams and toward the Congaree River floodplain (Aucott and Speiran, 1985).

The Okefenokee terrace deposits are unsuitable for large production wells. However, wells capable of producing small quantities of ground water [approximately 5 to 20 gallons per minute (gpm)], enough for household use, may be sited within this deposit. For the most part, this water is found to be of poor drinking-water quality due to high levels of naturally occurring iron (Soil and Materials Engineers, Inc., 1981).

The Black Creek Aquifer consists predominantly of sand, with thin clayey layers at a depth of 125 to 360 feet (Aucott and Speiran, 1985). Recharge of this aquifer is by rainfall in the aquifer outcrop areas in the interstream areas between the Congaree River, the Wateree River, and the Fall Line. There is also recharge by leakage from the shallow aquifer through less permeable confining beds in the upland areas north of the site in the Columbia-Fort Jackson area (Aucott and Speiran, 1985). Discharge from the Black Creek

Aquifer is primarily into major incised drainages of the region (i.e., the Wateree and Congaree Rivers), as shown in Figure 3-6.

Information on the hydrogeologic properties of the Black Creek Aquifer is not available for the immediate vicinity of the Bluff Road Site. However, the formation has been tapped for residential wells in the nearby community and provides sufficient water of drinking-water quality for residents of the two communities located within 1 mile of the Bluff Road Site. Three test wells at a nearby industrial property were drilled into this formation. Water level measurements made on November 19, 1981 showed that ground water in this unit has a potentiometric surface approximately 15 to 20 feet above the top of the formation (Soil and Material Engineers, Inc., 1981). Elsewhere in the Coastal Plain, this aquifer is used for industrial and agricultural wells.

The deep Middendorf Aquifer underlies all of southern Richland County. There are a number of beds within this aquifer that are composed of medium- to coarse-grained sand and fine- to medium-grained gravel (Aucott and Speiran, 1985). Near the Bluff Road Site, the Middendorf is known to have been penetrated at a depth of 200 feet (Davis and Floyd, Inc., 1982). It is interpreted to be between 100 and 140 feet thick near the Bluff Road Site (Davis and Floyd, Inc., 1982).

The baseflow of large streams in the Coastal Plain is maintained by ground water discharge into large regional streams. Estimates of baseflow at Myers Creek below the town of Hopkins were made by the USGS in 1986. From data presented by ESRI (1989), the baseflow at this point is approximately 25 cubic feet per second.

In the upland areas adjacent to the floodplain, ground water sustains the flow of tributaries during periods of low rainfall. Some small streams receive flow only from the shallow aquifer and have poorly sustained low flow. These streams are not incised into the deep aquifer or are located where the combined effects of ground water discharges to the Congaree and Wateree Rivers depress the potentiometric surface (Davis and Floyd, Inc., 1982). The more deeply incised streams that receive flow from the Black Creek Aquifer, as well

as from the shallow aquifer, have better sustained low flows and are important contributors to maintaining the Congaree Swamp (Patterson et al., 1985).

The potentiometric surface of the Black Creek Aquifer slopes from the upland recharge area toward the Congaree and Wateree Rivers. The potentiometric surface is more depressed near the confluence of the two rivers because of the effects of discharge of both rivers (Aucott and Speiran, 1985). The potentiometric surface of the Black Creek Aquifer at the Bluff Road Site is at an elevation of approximately 125 feet above sea level (Aucott and Speiran, 1985). This suggests that baseflow to Myers Creek in the vicinity of the site would consist of flow from the Okefenokee terrace hydrogeologic unit.

3.6.2 Local Hydrogeology of the Shallow Aquifer

The shallow aquifer typically extends to a depth of 45 to 50 feet and is composed primarily of sands which range from coarse and well sorted to silty and poorly sorted. It is semiconfined by a resistant layer composed of varying amounts of clay, silt, and sand which usually lies from the surface to depth ranging from 5 to 15 feet. These units are postulated to be Okefenokee terrace deposits and are laterally extensive across the site, as seen in Figure 3-7 and 3-8.

The ground water table in the shallow aquifer generally lies 10 to 15 feet below ground surface. Three rounds of ground water level measurements were taken, which are referenced by dates: May 23, 1989; May 24, 1989; and June 1, 1989. The ground water elevation data for all wells and all dates are given in Table 3-4, and the elevation data for June 1, 1989 is also presented on Figures 3-7 and 3-8.

Contour maps of the ground water surface of the shallow aquifer are presented for May 24, 1989 (Figure 3-9A) and for June 1, 1989 (Figure 3-9B). Both figures indicate that the overall ground water flow is approximately to the east. The gradient of the potentiometric surface is about 0.003 near Bluff Road and flattens dramatically to less than 0.001 in the vicinity of MW-4, M-6, M-8, and M-12. The surface in this area is very irregular and flow patterns are subject to local influences. Overall discharge is to Myers Creek.

3.6.3 Local Hydrogeology of the Deep Aquifer

The deep aquifer is separated from the shallow aquifer by a clay and silt unit which ranges in thickness from 1.5 to 25 feet. This partial confining layer is thinnest in the vicinity of MW-6 and MW-7 and thickens to the south and west, as shown in Figures 3-8 and 3-10. The lithology of the deep aquifer is similar to that of the shallow aquifer, though clay-rich layers are more common. Both the aquitard and the deep aquifer are thought to be units in the Black Creek Formation (Figures 3-7 and 3-8).

The ground water contour maps of the deep aquifer are presented for measurements taken on May 24, 1989 (Figure 3-11A) and June 1, 1989 (Figure 3-11B). Both maps were contoured only from the four IT wells water level data. Golder wells DW-1 , DW-2 and DW-3 were constructed differently and/or screened in different zones than the IT wells, thus the data from these wells were considered incompatible for purposes of comparison.

The ground water level at MW-7C is the highest in the deep wells indicating that it is appropriately designated as the upgradient well. At MW-7C, as at all the IT deep aquifer wells, the nearby shallow wells have a higher head than do the deep wells with differences of 3 to 6 feet (Table 3-4). The gradient of the potentiometric surface in the deep aquifer is 0.0003 ft/ft toward the south.

3.6.4 Geotechnical Test Results

Twelve samples representing various lithologies from selected soil and well borings were submitted for geotechnical testing. Table 3-5 presents the water content, plasticity index, liquid limit, USCS description, and permeability for each of the samples. All data are found in Appendix D.

3.6.5 Slug Tests

Slug tests were run on all IT wells (except MW-12B, due to bend in casing) to make evaluations of hydraulic conductivity. Results are presented in Table 3-6. Data and calculations are presented in Appendix E.

All of the IT monitoring wells have hydraulic conductivities in essentially the same range, from about 9×10^{-6} to 1×10^{-4} m/sec. This is the range expected for fine to medium sand and indicates that the formation is very permeable.

3.7 DEMOGRAPHY AND LAND USE

An area of mixed land use in a rural setting surrounds the Bluff Road Site. Most of the land near the site is wooded. Hay is the primary agricultural product in the area. The dominant natural feature on the south side of Bluff Road is Mill Creek with its associated wetlands. Other creeks near the site also are bordered by wetlands. Almost all of the land on the south side of Bluff Road and some on the north side is in the 100-year flood zone; the site itself, however, is outside the zone. A major industrial facility is directly across the road from the site but is set well back (approximately 2,000 feet). Scattered residential housing clusters (47 dwellings) and one commercial establishment occur within a 1-mile radius of the site.

Dwelling units were counted in the field. Only those units that exhibited evidence of daily occupation (car parked nearby, clothes hung out to dry, etc.) were counted. The following dwelling units were counted within a 1-mile radius of the site (Figure 3-12): 19 along Lower Richland Boulevard and at its intersection with Bluff Road; 17 along Bluff Road; 4 on Pincushion Road; and 7 on Coley Road.

Based on a sample of dwellings whose occupants were interviewed, the average number of occupants per household is 2.3 persons. Multiplying this by the number of dwelling units within the study area (47) yielded an estimate of 108 people residing within 1 mile of the site.

The census tract in which the site is located, Richland County No. 118, covers a large area from the Columbia city limit to Tom's Creek, with the Congaree River and the CSX railroad as the southern and northern boundaries, respectively. While only a small portion of the tract is within a 1-mile radius of the site, it is still useful to examine trends within this larger region. Table 3-7 gives the demographics of census tract 118.

Figure 3-12 shows land use in the study area. The largest single area shown on the map is scrub and brush surrounding an area of woodland that in turn surrounds the site. The majority of the residential sites are along Lower Richland Boulevard, Coley Road, and Bluff Road at Coley Road. North of Bluff Road, the agricultural, wood lot, and residential land uses are evenly distributed. Apart from the nearby industrial facility, land use south of Bluff Road is evenly split between agricultural uses and wood lots. Included in the wood lots are several large tracts of wetlands that surround Mill Creek. The source of these data was aerial photography flown during the summer of 1988.

3.8 ECOLOGY

A complete biological survey of the lands surrounding the Bluff Road Site was completed by ESRI, University of South Carolina in November and December 1988. Part I of the report addresses the fauna investigation (ESRI, 1989). Part II of the report describes the vegetation survey results (ESRI, 1989).

The report states that no endangered species or critical habitats were found in the study area based on the seven field investigations. These field investigations included the total number of individuals of a species found in each ecosystem for each visit ("species total"), as well as the number of times the species was encountered during the survey in that particular ecosystem ("species frequency").

Potential human food sources noted during the fauna investigation are: common snipe, american woodcock, wild turkey, mourning dove, eastern gray squirrel, whitetail deer, and wild hog.

ESRI (1989) intensively surveyed five sites representing four basic habitat types during November and December of 1988. Using aerial photographs and a ground survey of the area, sites were chosen to represent the habitat types in the vicinity of the Bluff Road Site. The sites were sampled by collecting all plant species within an area of approximately 100 square meters, and when that area was exhausted the search was expanded until no new species could be discovered with a reasonable effort. In addition, 6.4 km of territory was covered by walking around the site, and new species discovered were included

under the appropriate habitat type. The authority for scientific names and taxonomic classification is Radford et al., (1981); the authority for common names is Reed (1988); and the authority for edible plants is Peterson (1977).

At the time of the survey, most perennial plant species were well represented and identifiable. Plant species are identified largely on the basis of the morphology of their reproductive parts, their fruits and flowers, and most perennial plants possessed either flowers or fruits at the time of the survey. Annual plants are under-represented in the survey as many had senesced and were absent at this time of the year. Nevertheless, the habitats have been well characterized.

Apart from the perenially wet areas, the natural vegetation of the area can be categorized on the basis of its age since it was last logged. Most of the area is managed for pine production. In the absence of fire, these areas eventually mature into an oak-hickory climax community (Odum, 1971). There are small areas dominated by mixed hardwoods in the area, but the dominant community type is loblolly pine forest, and these pine forests are probably maintained by controlled burning.

The four habitat types in the vicinity of the Bluff Road Site are as follows. Type 1 is an early succession community that was recently clearcut, characterized by a community dominated by grasses and woody shrubs, and has pine seedlings and a sparse population of young and mature hardwood trees. Eighty-five plant species were counted, including 18 tree species. Of these, 25 are edible, including 3 blackberry species (Rubus spp.), 2 blueberry species (Vaccinium spp.), and black cherry (Prunus serotina).

The second habitat type is a wetland area represented by a combination of bottomland hardwood forest and open wetland. The open wetland occurs where Myers Creek crosses the power line right-of-way. Thirty-seven plant species including four edible species were counted in the aggregated wetland area.

The third and fourth habitat types are mature forests with no evidence of recent logging activity. Habitat 3 is a mature, mixed, hardwood community dominated by oaks (Quercus spp.) and sweetgum (Liquidambar styraciflua).

Twenty-one species were counted in this area, 10 of which are edible. Habitat 4 is a mature pine forest dominated by loblolly pine (Pinus taeda) with an understory of oaks (Quercus spp). Twenty-nine species were counted in this area, including 16 edible plants. No rare or endangered plant species were encountered in any area sampled.

Table 3-1. Temperature Means in °F

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Columbia Airport													
Maximum	56.2	59.5	67.1	77.0	83.8	89.2	91.9	91.0	85.5	76.5	67.1	58.8	75.3
Minimum	33.2	34.6	41.9	50.5	59.1	66.1	70.1	69.4	63.9	50.3	40.6	34.7	51.2
Mean	44.7	47.1	54.5	63.8	71.5	77.7	81.0	80.2	74.8	63.4	53.9	46.7	63.3
Tilghman													
Maximum	58.2	61.7	69.1	79.1	85.7	90.3	92.8	91.7	86.7	78.2	68.8	60.7	76.9
Minimum	33.7	35.4	42.3	50.6	59.3	66.0	69.4	68.6	63.1	50.8	41.4	35.1	51.3
Mean	46.0	48.6	55.7	64.9	72.5	78.1	81.1	80.2	74.9	64.5	55.1	48.0	64.1
Orangeburg													
Maximum	56.2	59.2	67.0	76.7	83.4	88.1	90.7	90.4	85.3	76.3	67.5	58.7	75.0
Minimum	33.3	35.1	42.5	51.0	59.1	66.2	69.8	69.3	64.0	51.1	41.6	34.8	51.5
Mean	44.8	47.2	54.8	63.9	71.3	77.2	80.3	79.8	74.7	63.7	54.6	46.8	63.3

Table 3-2. Average Precipitation in Inches

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
						Columbia Airport						
4.38	3.99	5.16	3.59	3.85	4.45	5.35	5.56	4.23	2.55	2.51	3.50	49.12
						Tilghman State Forest Nursery						
3.84	3.73	4.49	3.40	4.08	5.53	5.80	4.72	3.97	2.38	2.31	3.11	47.36
						Orangeburg						
4.00	3.99	4.58	3.32	4.22	4.56	5.46	5.32	4.16	2.42	2.28	3.28	47.59

3 10 00557

Table 3-3. Generalized Geohydrologic Units of the South Carolina Coastal Plain

Aquifer	System	Formation	Description
Surficial	Quaternary	Coastal terrace	Reddish brown, orange, gray, and white sand deposits and clay
Floridan aquifer system (down-dip)	Tertiary	Cooper group (lower part)	Green or brown, grayish sandy phosphatic, fossiliferous limestone, and marl
		Ocala limestone	White to cream colored, calcitized, fossiliferous limestone
		Santee limestone	White to creamy yellow, fossiliferous, glauconitic limestone with numerous bryozoans, interlayered in part with gray to yellow sandstone
Tertiary sand (up-dip)	Tertiary	Barnwell formation	Fine to coarse, red to brown massive sand
		McBean formation	Fine, green to yellow, glauconitic sand and gray-green glauconitic marl
		Congaree formation	Yellowish-brown to green, fine to coarse, glauconitic quartz sand or sandstone interbedded with dark green to gray clays
		Black Mingo formation (upper part)	Gray sand shale and black sand limestone; may be carbonaceous and fossiliferous in places
Black Creek	Cretaceous	Black Creek formation	Gray to white, glauconitic, phosphatic, micaceous calcareous quartz sand interbedded with dark gray to black, thinly laminated clay containing nodules of pyrite and marcasite and fragments of lignite
Middendorf	Cretaceous	Middendorf formation	Light gray, fine to coarse, micaceous, glauconitic and, in part, calcareous sand interbedded with green, purple, and maroon clay and greenish-gray micaceous silt, sandstone, and grit
Cape Fear	Cretaceous	Cape Fear formation	Reddish-brown, gray, and greenish clay interbedded with yellow to white, fine to coarse quartz and feldspar sand with some mica

3 10 00559

Table 3-4. Ground Water Elevations
Bluff Road Site, Columbia, South Carolina

Well ID	Top of Casing Elevation (ft)	Ground Water Elevation (Date)[a] 05/23/89	05/24/89	06/01/89
MW-1A	143.099	132.07	132.01	131.64
MW-2A	138.471	130.19	130.13	129.83
MW-4A	140.989	128.97	128.91	128.61
MW-7A	141.160	129.00	128.91	128.63
MW-11A	140.362	128.63	128.29	127.99
MW-12A	139.512	129.05	128.94	128.61
MW-1B	143.105	131.76	131.69	131.33
MW-2B	138.531	130.08	130.03	129.72
MW-3B	137.595	131.68	131.59	131.22
MW-4B	141.049	128.93	128.85	128.55
MW-5B	141.655	129.56	129.52	129.25
MW-6B	141.737	129.03	128.96	128.67
MW-7B	141.739	130.64	130.58	130.28
MW-8B	141.314	128.86	128.75	128.44
MW-9B	137.279	129.24	129.12	128.77
MW-10B	138.590	128.24	128.12	126.79
MW-11B	139.764	127.80	127.91	127.61
MW-12B	139.674	128.86	128.74	128.43
MW-13B	140.685	128.27	128.14	127.86
P-6	142.820	131.89	131.83	131.47
P-7	142.441	131.64	131.58	131.22
P-8	141.035	129.74	129.69	129.42
P-9	141.075	129.77	129.72	129.44
P-10	142.109	129.56	129.50	129.22
P-11	140.659	129.38	129.31	129.00
P-12	139.128	129.94	129.83	129.51
P-13	142.486	129.69	129.63	129.34
P-14	141.461	128.93	129.88	129.58
P-15	140.265	129.77	129.68	129.39
P-16	141.156	129.36	129.30	129.01
P-17	136.989	129.91	129.74	129.06
P-18	141.699	129.22	129.15	128.88
P-19	140.716	128.05	127.96	127.64
P-20	139.577	128.53	128.40	128.08
P-21	141.475	128.98	128.88	128.59
P-22	140.916	128.82	128.72	128.43
MW-3C	137.487	129.90	125.84	125.49
MW-7C	140.166	126.33	126.28	125.92
MW-9C	137.030	125.76	125.69	125.35
MW-12C	139.539	125.68	125.64	125.30
DW-1	139.144	124.88	124.82	124.44
DW-2	140.100	125.65	125.62	125.26
DW-3	139.446	124.81	124.76	124.39

[a]Water-level sampling rounds took 7.5 hours to complete, on the average. Readings were also collected for the wells installed by Golder and Associates.

RSK23583D
07/21/89 DRAFT #1

Table 3-5. Geotechnical Test Results

Sample ID	Location and Depth (ft)	Water Content (%)	Liquid Limit	Plasticity Index	USCS	Permeability (cm/sec)
-	B11A, 5-7	22.3		Non-plastic	SM	3.10×10^{-6}
-	B11A, 9-11	18.5		Non-plastic	SM	9.99×10^{-7}
-	B21, 2-3.25	23.3	49	34	CL	1.57×10^{-8}
-	B21, 4.5-6.5	13.8		Non-plastic	SP/ML	5.68×10^{-6}
-	B29A, 4.5-6.0	20.7	42	23	SC	5.37×10^{-7}
-	B29A, 9-11	22.3		Non-plastic	SW	2.61×10^{-5}
GT-1	MW-9C, 55-56.7	23.1	50	26	CH	2.04×10^{-8}
GT-2	MW-9C, 60-61	28.6	56	32	CH	3.55×10^{-8}
GT-3	MW-9C, 75-77	18.2	--	--	--	--
GT-4	MW-9C, 95-96.2	21.8	39	24	CL	1.62×10^{-8}
GT-5	MW-8B, 45-46.5	24.3	--	--	--	--
GT-6	MW-7C, 90-91.5	24.2	62	35	CH	--

Table 3-6. Slug Test Results

Well ID	Calculated K (cm/sec)
A-Wells	
MW-1A	8.26×10^{-3}
MW-2A	1.67×10^{-3}
MW-4A	1.46×10^{-3}
MW-7A	9.27×10^{-4}
MW-11A	1.03×10^{-2}
MW-12A	3.03×10^{-3}
B-Wells	
MW-1B	9.44×10^{-4}
MW-2B	3.92×10^{-3}
MW-3B	3.36×10^{-3}
MW-4B	7.82×10^{-3}
MW-5B	1.52×10^{-3}
MW-6B	4.75×10^{-3}
MW-7B	8.72×10^{-3}
MW-8B	7.47×10^{-3}
MW-9B	2.27×10^{-3}
MW-10B	1.83×10^{-3}
MW-11B	1.76×10^{-4}
MW-12B	- (no test done)
MW-13B	9.52×10^{-4}
C-Wells	
MW-3C	6.94×10^{-3}
MW-7C	1.03×10^{-2}
MW-9C	7.91×10^{-3}
MW-12C	4.62×10^{-3}

3 10 00562

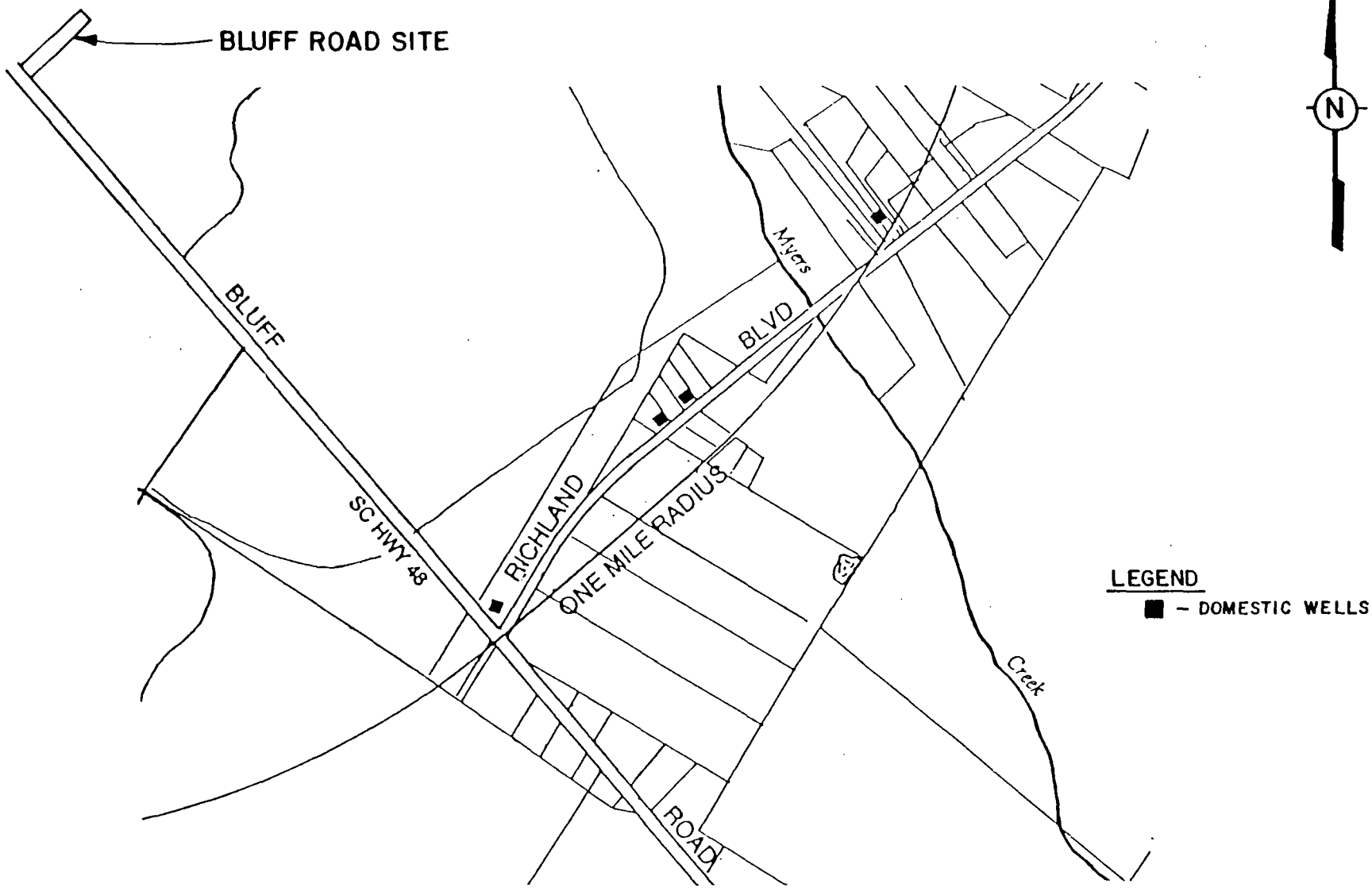
Table 3-7. Demographics of Census Tract 118
Richland County, South Carolina

Characteristic	1970	1980	%Change
Total population	5250	6035	+15.1
Number of persons under age 19	2506	1982	-20.9
Number of persons over age 64	252	357	+41.7
Black population	4525	5225	+15.4
Percent black	86.19	86.57	+0.38
Median household income	$6,066	$13,683	+125.6
(1970$)	$6,066	$6,443	+6.2
Number of housing units	1256	1750	+39.3
Percent vacant housing units	9.6	9.2	-4.2
Percent housing units w/o plumbing	47.7	14.6	-67.4
Percent owner-occupied housing	71.5	78.7	+10.5
Median housing value	$7,200	$23,600	+228.8
(1970$)	$7,200	$11,112	+64.8

BRUNING 72425

STARTING DATE: 7-19-89	DATE LAST REV.:	INITIATOR: D. ERIKSON	DRAWING NO.: 408619-A-C09
DRAWN BY: C. HINSHAW	DRAWN BY:	PROJ. MGR. D. ERIKSON	PROJECT NO.: 408619

3 10 00563



SCALE

0 1000 2000 feet

FIGURE 3-1

DOMESTIC WELL LOCATIONS

BLUFF ROAD
COLUMBIA, SOUTH CAROLINA

INTERNATIONAL TECHNOLOGY CORPORATION

BRUNING 72425

STARTING DATE: 7-7-89	DATE LAST REV.:	INITIATOR: D. ERIKSON	DRAWING NO.: 408619-A-C10
DRAWN BY: C. HINSHAW	DRAWN BY:	PROJ. MGR. D. ERIKSON	PROJECT NO.: 408619

3 10 00564

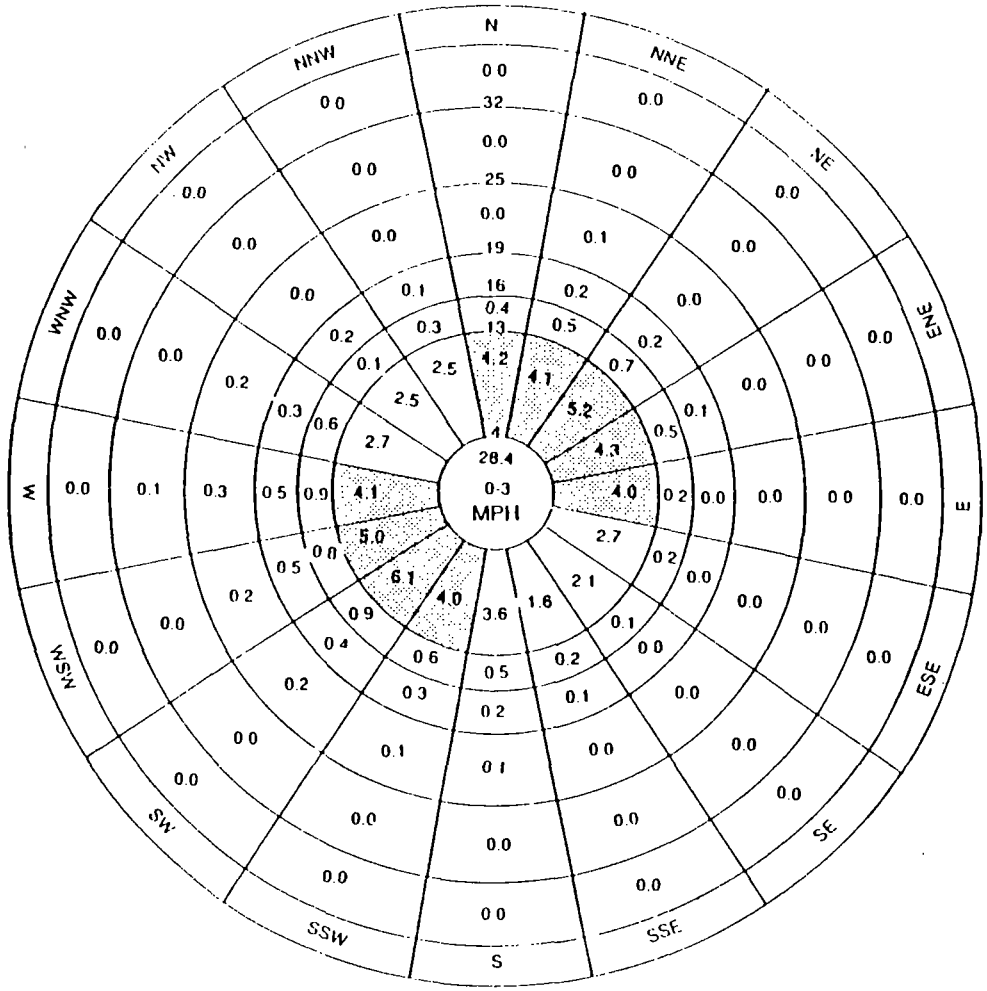


FIGURE 3-2

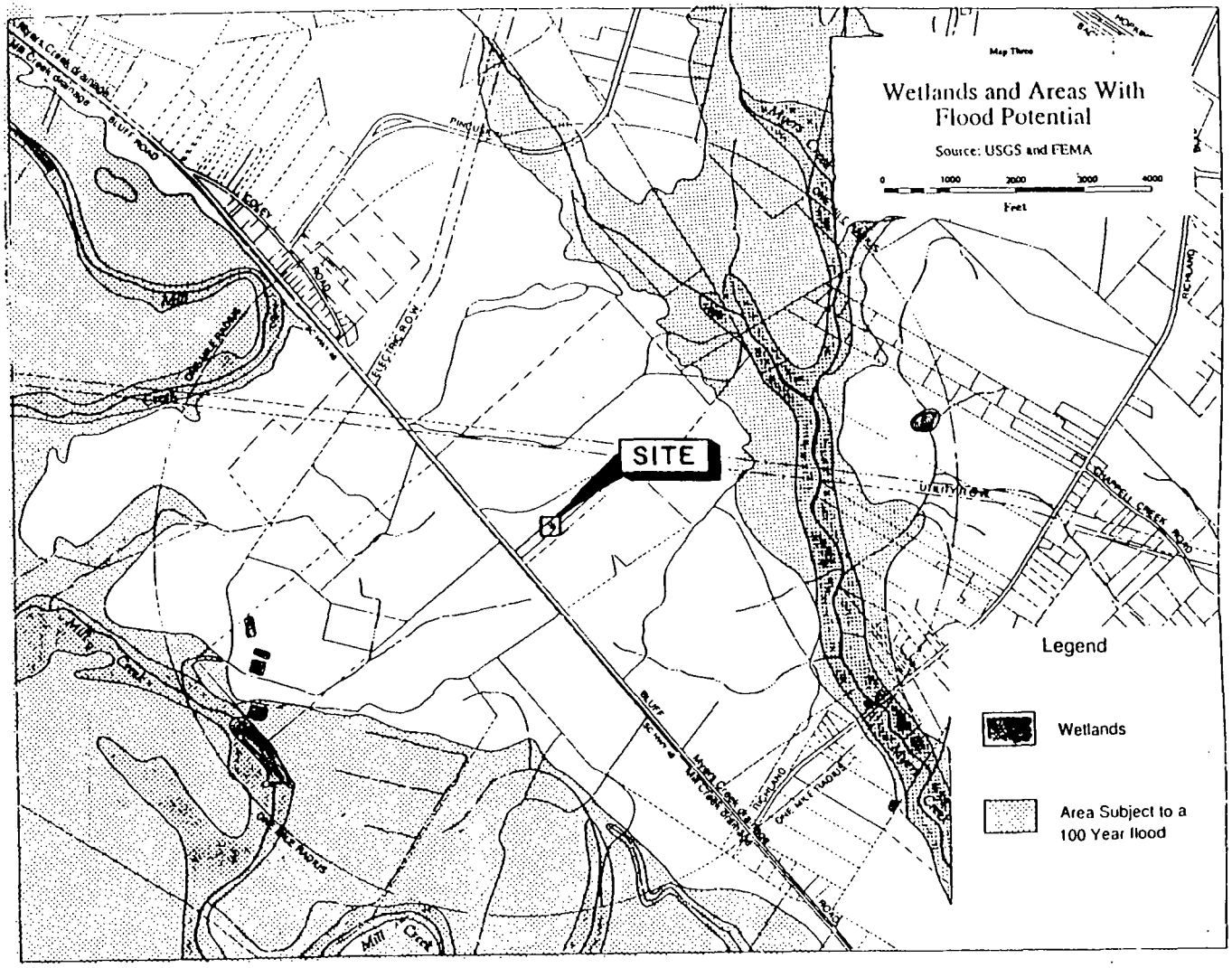
WIND ROSE

INTERNATIONAL TECHNOLOGY CORPORATION

BRUNING 72425

STARTING DATE: 7-7-89	DATE LAST REV.:	INITIATOR: D. ERIKSON	DRAWING NO.: 408619-A-C11
DRAWN BY: C. HINSHAW	DRAWN BY:	PROJ. MGR. D. ERIKSON	PROJECT NO.: 408619

3 10 00565



N

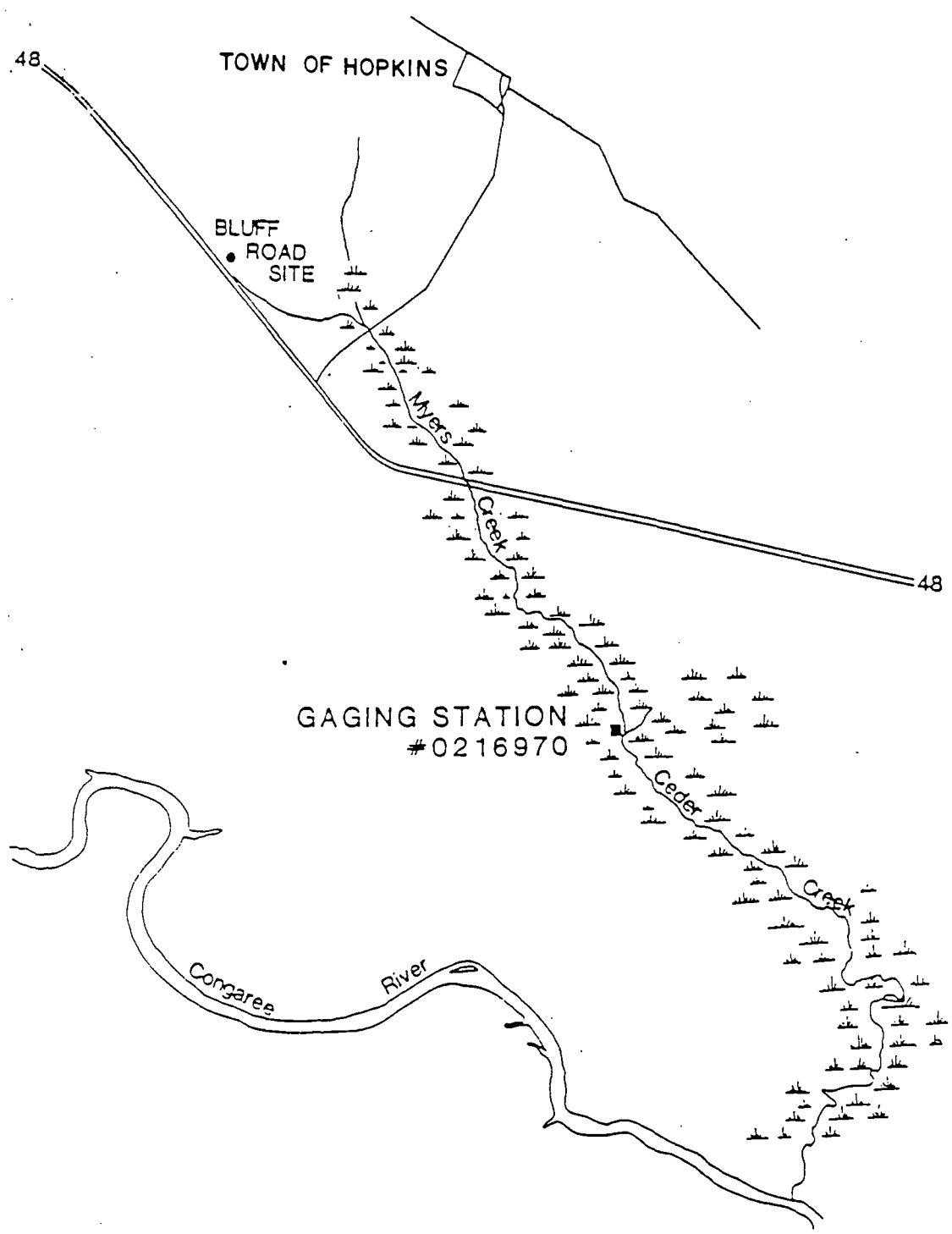
FIGURE 3-3

MEYERS CREEK AND WETLANDS WITH FLOOD POTENTIAL

BLUFF ROAD
COLUMBIA, SOUTH CAROLINA

INTERNATIONAL TECHNOLOGY CORPORATION

3 10 00566



SCALE

0 0.5 1 1.5 2.0 miles

FIGURE 3-4

MEYERS CREEK DRAINAGE

BLUFF ROAD
COLUMBIA, SOUTH CAROLINA

INTERNATIONAL TECHNOLOGY CORPORATION

STARTING DATE: 7-19-89	DATE LAST REV.:	INITIATOR: D.ERIKSON	DRAWING NO.: 408619-A-C12
DRAWN BY: C. HINSHAW	DRAWN BY:	PROJ. MGR. D.ERIKSON	PROJECT NO.: 408619

BRUNING 72425

BRUNING 72425

STARTING DATE: 7-7-89	DATE LAST REV.:	INITIATOR: D. ERIKSON	DRAWING NO.: 408619-A-C13
DRAWN BY: C. HINSHAW	DRAWN BY:	PROJ. MGR. D. ERIKSON	PROJECT NO.: 408619

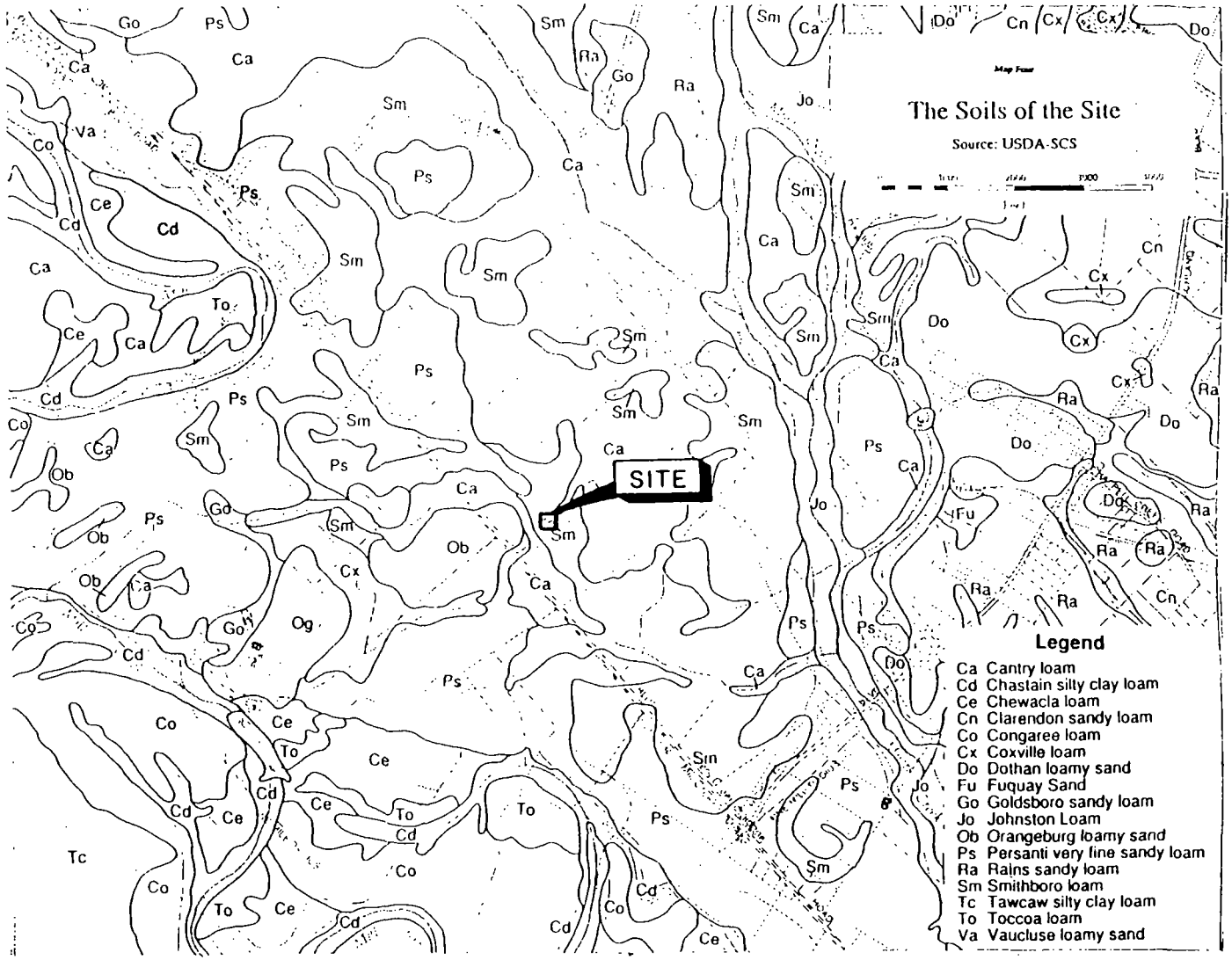


FIGURE 3-5

SOILS CLASSIFICATION NEAR THE BLUFF ROAD SITE

BLUFF ROAD
COLUMBIA, SOUTH CAROLINA

INTERNATIONAL TECHNOLOGY CORPORATION

3 10 00567

BRUNING 72425

STARTING DATE: 7-19-89	DATE LAST REV.:	INITIATOR: D. ERIKSON	DRAWING NO.: 408619-A-C16
DRAWN BY: C. HINSHAW	DRAWN BY:	PROJ. MGR. D. ERIKSON	PROJECT NO.: 408619

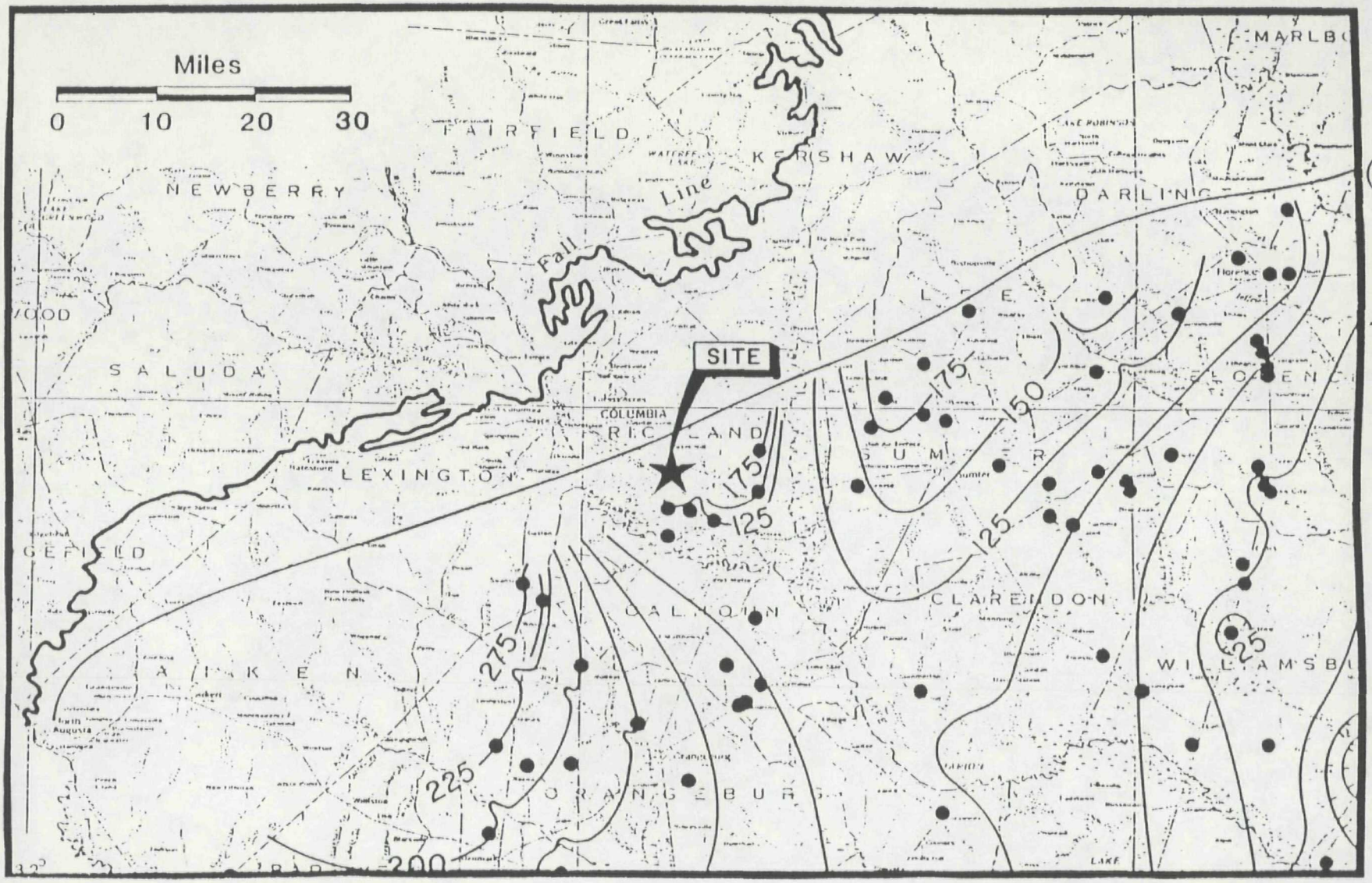


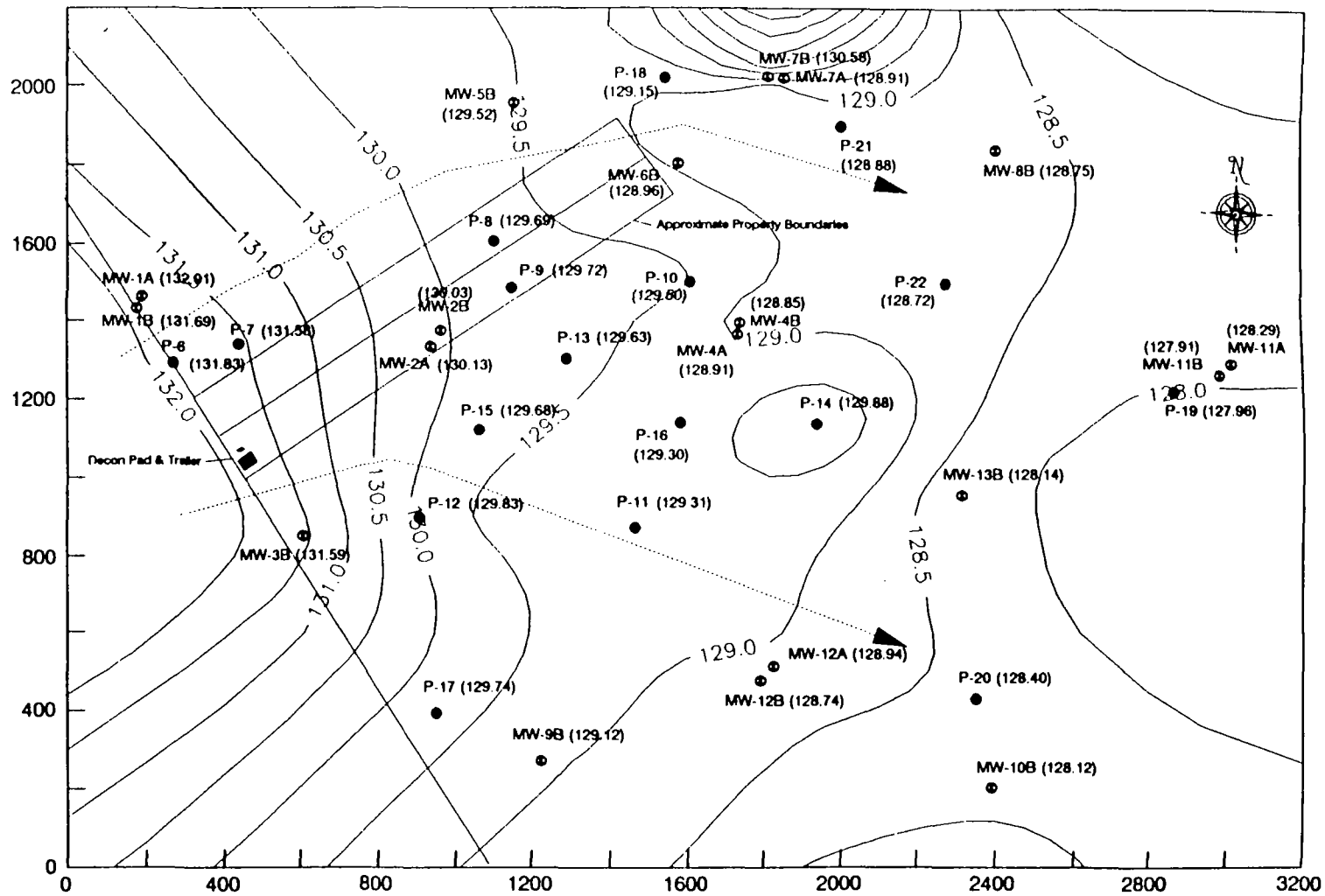
FIGURE 3-6

POTENTIOMETRIC SURFACE OF THE BLACK CREEK AQUIFER

BLUFF ROAD
COLUMBIA, SOUTH CAROLINA

INTERNATIONAL TECHNOLOGY CORPORATION

3 10 00568



LEGEND

GROUND WATER ELEVATION CONTOUR LINE (Elevation in feet Mean Sea Level)

GROUND WATER FLOW DIRECTION

IT WELL (Installed 1989)

GOLDER WELL (Installed 1985)

SCALE: 1" = 435 ft

NOTE: CONTOUR INTERVAL = 0.5 ft

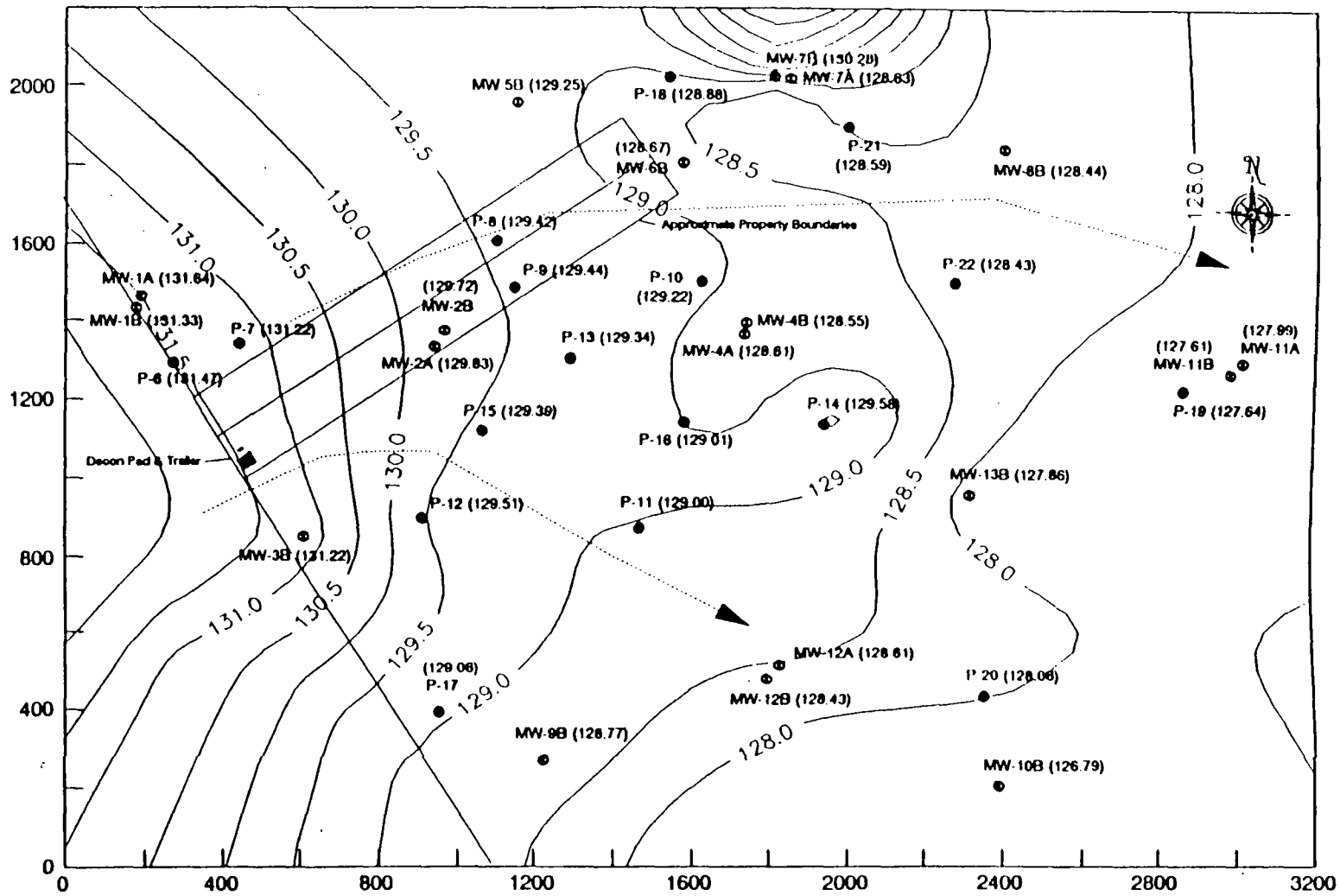
FIGURE 3-9A

GROUND WATER CONTOUR MAP

FOR SHALLOW AQUIFER SYSTEM ON 5-24-89

INTERNATIONAL TECHNOLOGY CORPORATION

3 10 00569



LEGEND

- GROUND WATER ELEVATION CONTOUR LINE (Elevation in feet Mean Sea Level)
- GROUND WATER FLOW DIRECTION
- IT WELL (Installed 1989)
- GOLDER WELL (Installed 1985)

SCALE: 1" = 435 ft

NOTE: CONTOUR INTERVAL = 0.2 ft

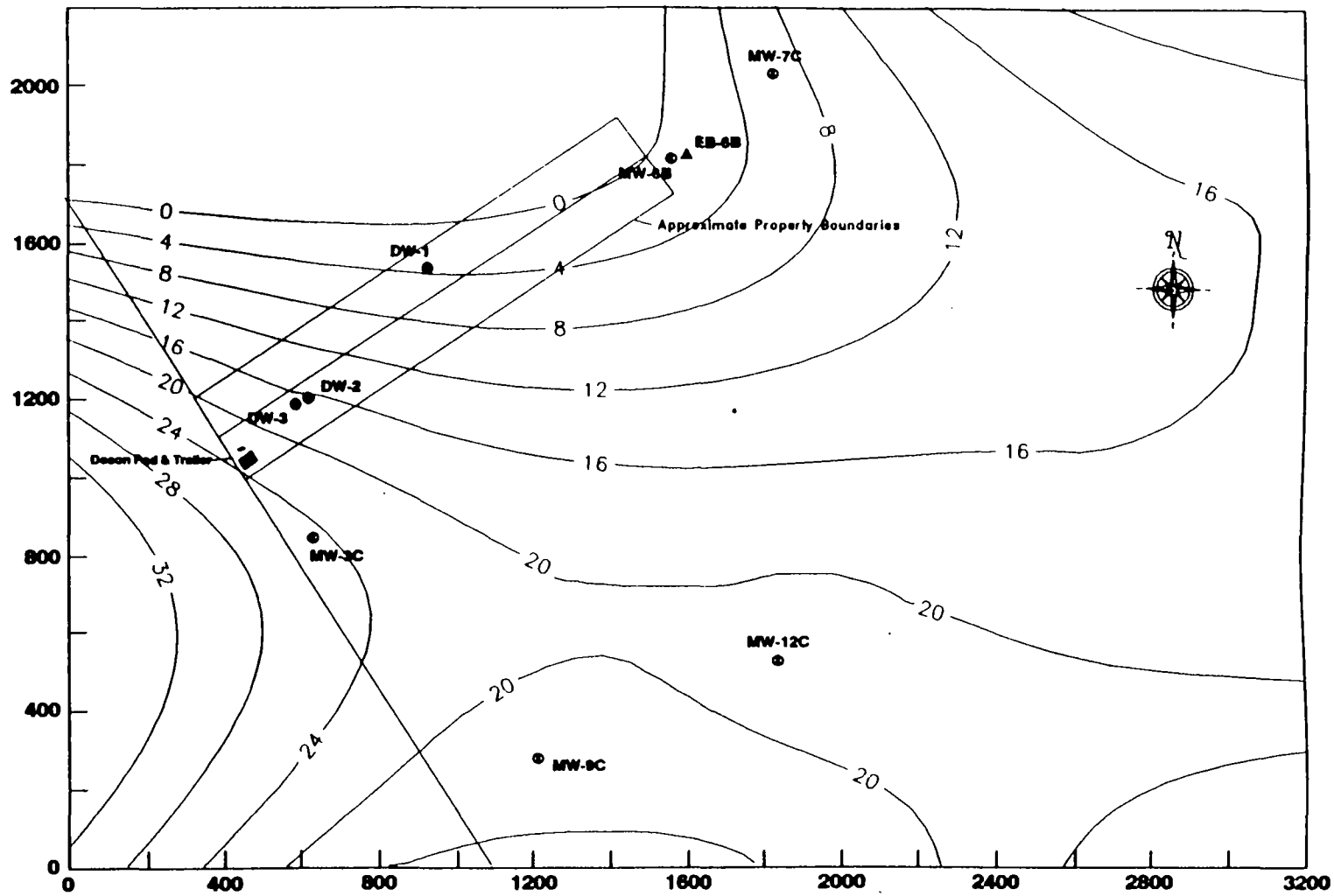
FIGURE 3-9B

GROUND WATER CONTOUR MAP

FOR SHALLOW AQUIFER SYSTEM ON 6-01-89

INTERNATIONAL TECHNOLOGY CORPORATION

3 10 00550



LEGEND

ISOPACH CONTOUR LINE (Thickness in feet)

IT WELL (Installed 1990)

GOLDER WELL (Installed 1995)

EXPLORATORY BORING

SCALE: 1" = 435 ft

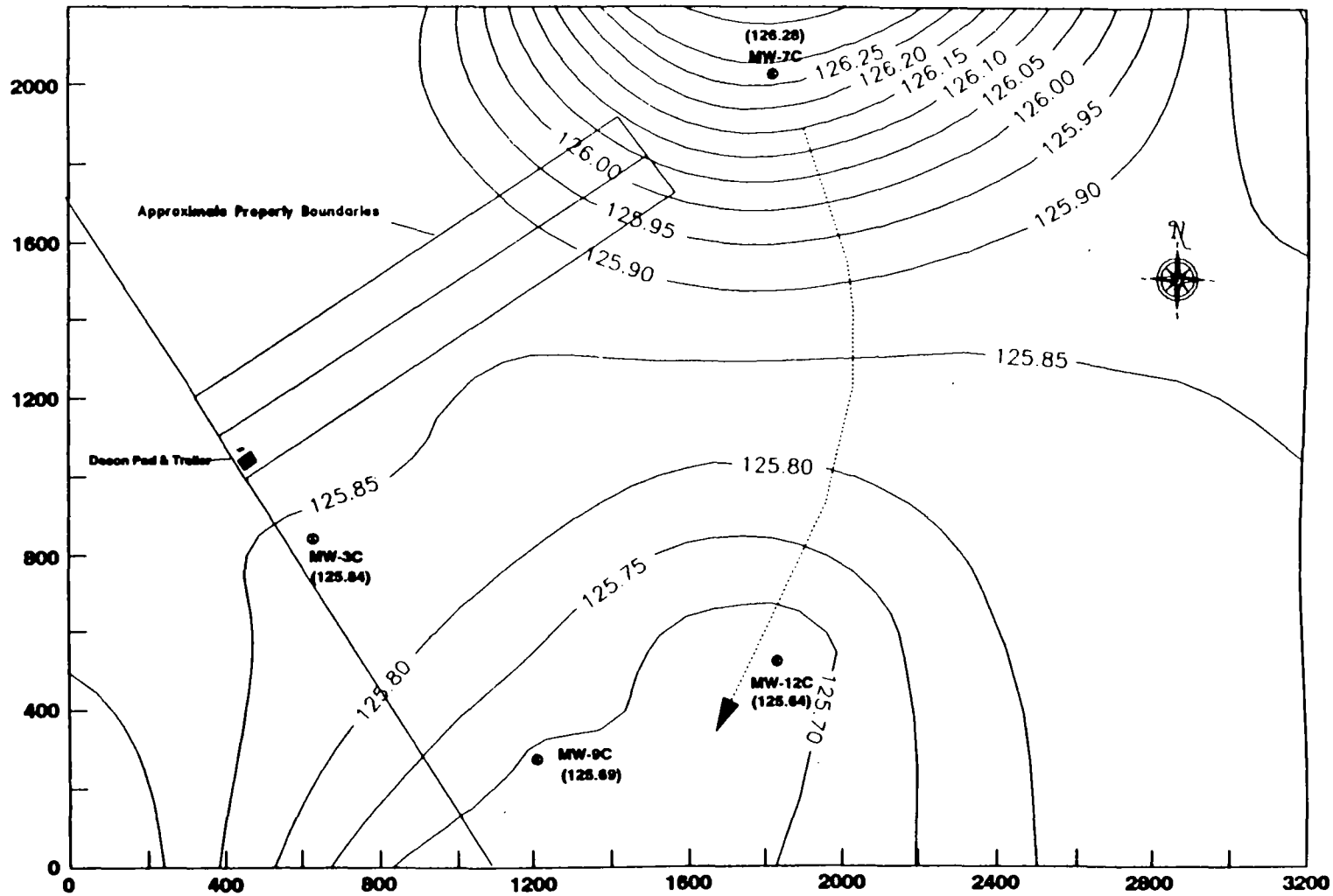
NOTE: CONTOUR INTERVAL = 4 ft

FIGURE 3-10

CONFINING CLAY ISOPACH MAP

INTERNATIONAL TECHNOLOGY CORPORATION

3 10 00571



LEGEND

GROUND WATER ELEVATION CONTOUR LINE (Elevation in feet Mean Sea Level)

GROUND WATER FLOW DIRECTION

IT WELL (Installed 1988)

GOLDER WELL (Installed 1985)

SCALE: 1" = 435 ft

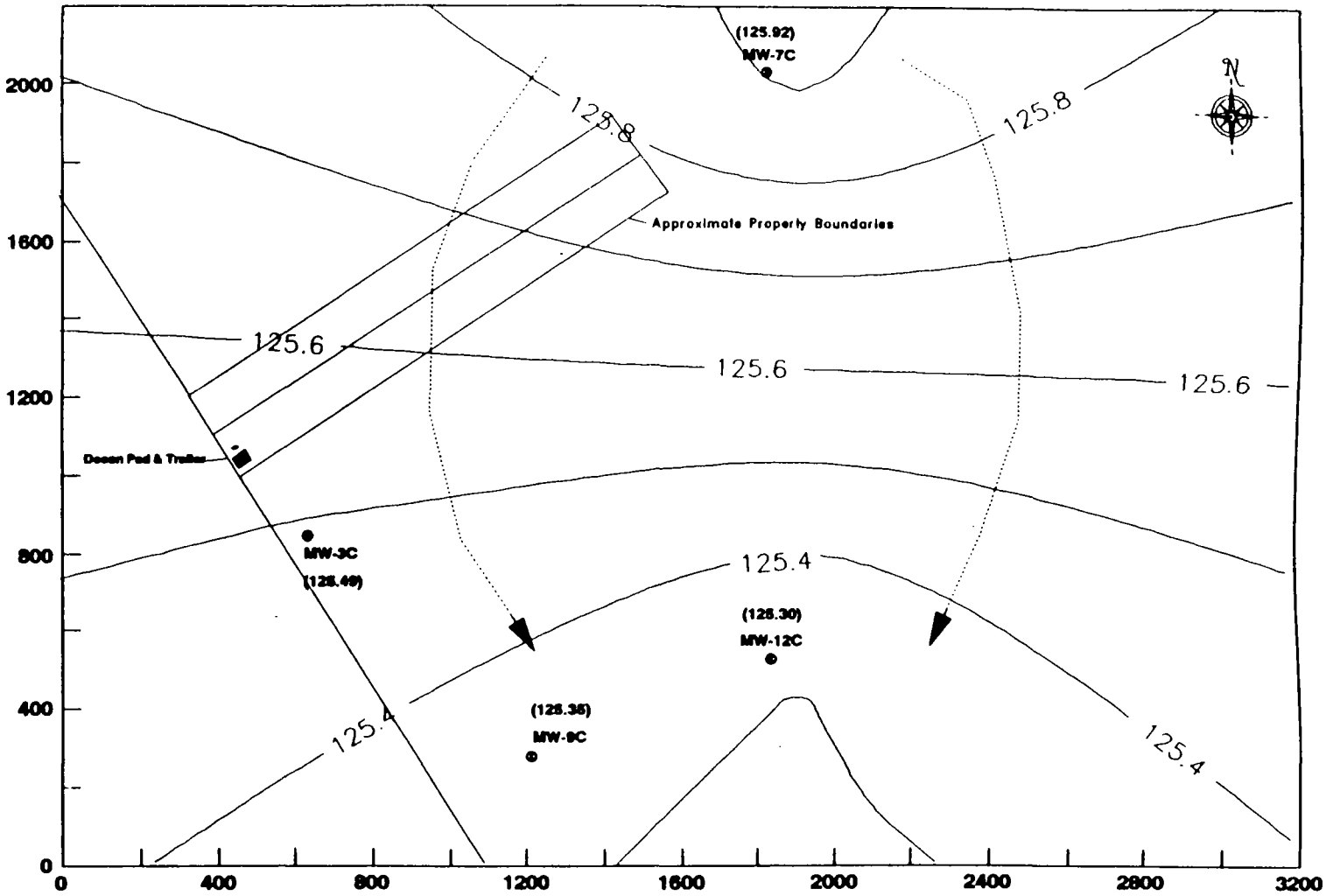
NOTE: CONTOUR INTERVAL = 0.05 ft

FIGURE 3-11A

GROUND WATER CONTOUR MAP FOR DEEP AQUIFER SYSTEM ON 5-24-89

INTERNATIONAL TECHNOLOGY CORPORATION

3 10 00572



LEGEND

GROUND WATER ELEVATION CONTOUR LINE (Elevation in feet Mean Sea Level)

IT WELL (Installed 1990)

GOLDER WELL (Installed 1995)

GROUND WATER FLOW DIRECTION

SCALE: 1" = 435 ft

NOTE: CONTOUR INTERVAL = 0.1 ft

FIGURE 3-11B

GROUND WATER CONTOUR MAP

FOR DEEP AQUIFER SYSTEM ON 6-01-99

INTERNATIONAL TECHNOLOGY CORPORATION

3 10 00573

BRUNING 72425

STARTING DATE: 7-7-89	DATE LAST REV.:	INITIATOR: D. ERIKSON	DRAWING NO.: 408619-A-C14
DRAWN BY: C. HINSHAW	DRAWN BY:	PROJ. MGR. D. ERIKSON	PROJECT NO.: 408619

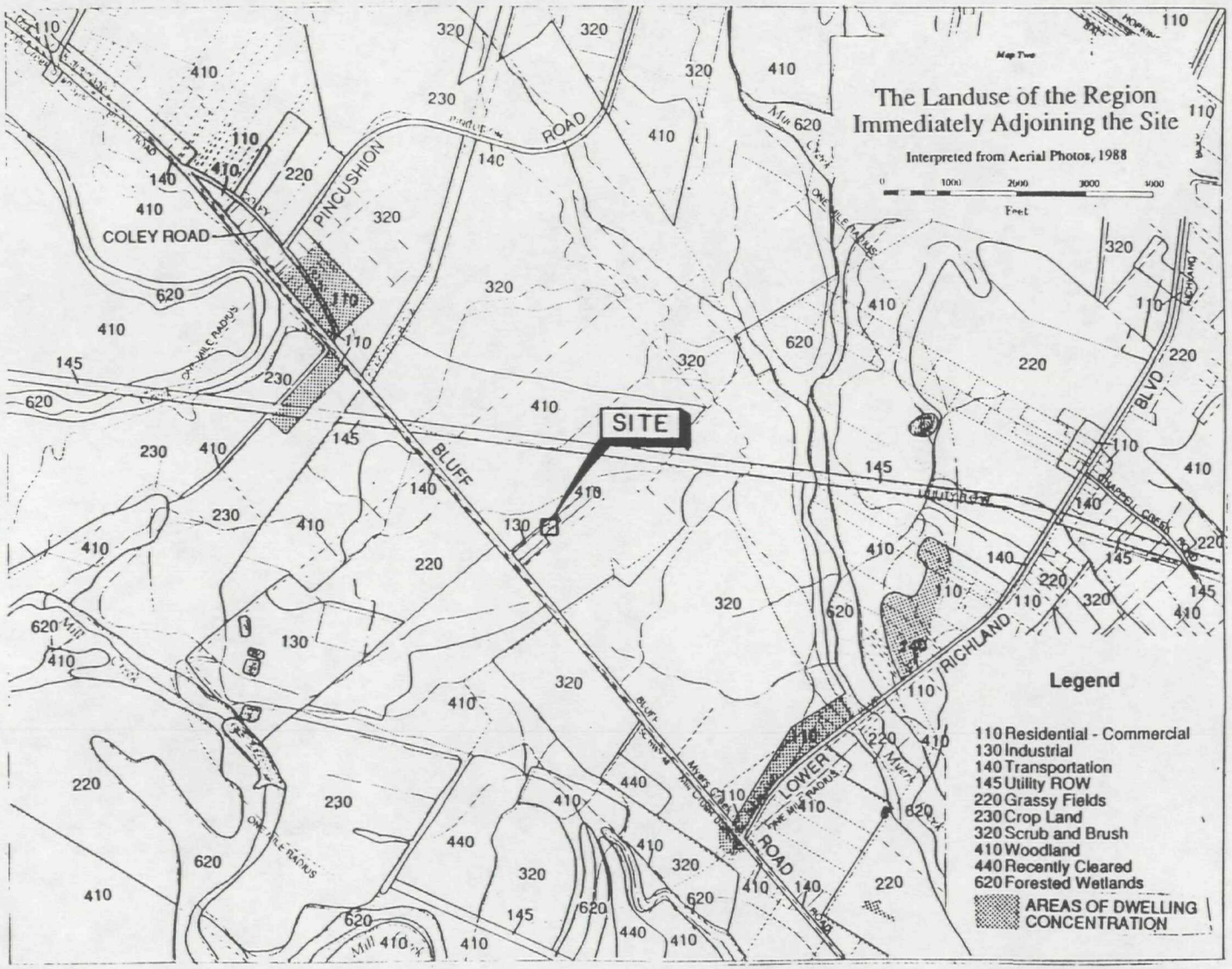


FIGURE 3-12

LAND USE AROUND THE BLUFF ROAD SITE

BLUFF ROAD
COLUMBIA, SOUTH CAROLINA

INTERNATIONAL TECHNOLOGY CORPORATION

3 10 00574

4.0 NATURE AND EXTENT OF CONTAMINATION

4.1 SAMPLING AND ANALYSIS

The sampling and analytical procedures for the Bluff Road investigation were in accordance with procedures and methods outlined in the March 1988 REM III "Field Operation Plan" written by Ebasco and the July 1988 "Implementation Plan" written by IT.

The investigation addressed the following field parameters:

- Surface soils
- Subsurface soils
- Wet and dry lagoon soils
- Surface runoff water
- Surface runoff sediment
- Wet lagoon water
- Wet lagoon sediment
- Dry lagoon sediment
- Upper aquifer water
- Lower aquifer water
- Ambient air.

All of the Work Plan samples collected for the soil, sediment, and water matrix were analyzed at the IT Middlebrook Pike Laboratory in Knoxville, Tennessee. The analytical parameters were those called for in the July 1988 IT Corporation "Implementation Plan." The analytical and quality assurance/ quality control (QA/QC) protocols followed were those outlined in the current EPA Contract Laboratory Program (CLP). The IT Analytical Services (ITAS) Middlebrook Laboratory is qualified by the EPA CLP program. The air samples were analyzed at the ITAS Cerritos laboratory, Cerritos, California.

4.1.1 Field Sampling Parameters

4.1.1.1 Surface Soils

A total of 34 surface soils, not including QA/QC samples, were collected both on and off the SCRDI property. The location of these sample points can be found in Figures 2-3 and 2-4.

Surface soil sample SS8 was not collected because, according to the Work Plan, its location is in the middle of a road bed. Any attempt to offset the sample point within a reasonable distance placed the location either in the dry lagoon, previously sampled, or on the adjacent Helms' property. Because there was no access to the property at the time these surface soils were collected, the sample was abandoned with concurrence from the EPA oversite contractor.

Surface soil sample consisted of native soil found from 0 to 6 inches deep after overfill or burden was removed. The collection method followed procedures outlined in Section 4.9 of the April 1, 1986 revision of EPA's Region IV SOPs. A clean, manually operated hand auger with a 4-inch bucket was used to obtain the soil samples.

The samples were analyzed for all parameters found on EPA's Target Compound List (TCL) and Target Analyte List (TAL).

Table 4-1 is a condensed tabulation of only the compounds and analytes found in the surface soil samples. Analytical results for all TCL and TAL parameters can be found in the individual sample's Certificate of Analysis in Appendix A. Figure 4-1 is a contour map displaying the lateral extent of total volatiles in the surface soils.

4.1.1.2 Subsurface Soils

A total of 29 subsurface soils, not including QA/QC samples, were collected both on and off the SCRDI site. The location of these points can be found in Figure 2-5.

The subsurface soil samples consisted of soils collected to represent the 3- to 7-foot and 7- to 11-foot intervals below the surface. The soil sampling used split spoon and hollow stemmed augers and followed procedures outlined in Section 4.9 of EPA's Region IV SOPs. The samples were analyzed for all parameters found on EPA's TCL and TAL list.

Table 4-2 is a condensed tabulation of only the compounds and analytes found in the subsurface soil samples. Analytical results for all TCL and TAL parameters can be found in the individual sample's Certificate of Analysis in

Appendix A. Figure 4-2 is a contour map displaying the lateral extent of average total volatiles in the subsurface soils.

4.1.1.3 Wet and Dry Lagoon Soils

Native soil samples from beneath the sediment in the wet and dry lagoon were required to be collected per the March 1988 Ebasco "Field Operation Plan."

After hand augering through the sediment in both lagoons, areas of refusal were encountered. Material from the refusal area appeared to be from an asphalt liner. Soil sampling from beneath the lagoons, therefore, was aborted.

4.1.1.4 Surface Runoff Water

Two surface runoff water samples (not including QA/QC sample) were collected from major drainage ditches downstream of SCRDI according to the scenario described in Section 2.9 of the July 1988, IT "Implementation Plan." The collection procedure followed the guidelines found in the April 1, 1986 revision of EPA's Region IV SOPs, Section 4.6. Locations can be found in Figure 2-4.

Table 4-3 is a condensed tabulation of compounds found as a result of full TCL and TAL analysis of the two water samples. Analytical results for all TCL and TAL analytical parameters can be found in the individual sample's Certificates of Analysis in Appendix A.

4.1.1.5 Surface Runoff Sediment

Two sediment samples were collected from the bottom of the two major drainage ditches downstream of SCRDI in conjunction with the surface runoff water sampling. The procedure described in Section 2.9 of the July 1988 IT "Implementation Plan" was used to locate the sampling points. The sample collection procedure followed the guidelines found in the April 1, 1986 revision of EPA Region IV SOPs, Section 4.6. Locations can be found in Figure 2-4.

Table 4-4 is a condensed tabulation of the compounds found as a result of full TCL and TAL analysis of the two sediment samples. Analytical results for all

TCL and TAL analytical parameters can be found in the individual sample's Certificates of Analysis in Appendix A.

4.1.1.6 Wet Lagoon Water

Three water samples (not including QA/QC samples) were collected from three separate areas of the wet lagoon. Sample point location and collection procedure followed guidelines found in the March 1988 Ebasco "Field Operation Plan" and the April 1, 1986 EPA Region IV SOPs, Section 4.6. Locations are shown in Figure 2-3.

Table 4-5 is a condensed tabulation of the compounds found as a result of full TCL and TAL analysis of the three water samples. Analytical results for all TCL and TAL analytical parameters can be found in the individual sample's Certificate of Analysis in Appendix A.

4.1.1.7 Wet Lagoon Sediment

Three sediment samples were collected from the wet lagoon in conjunction with the water samples. As with the water samples, collection locations and procedures followed guidelines found in the March 1988 Ebasco "Field Operation Plan" and the April 1, 1986 EPA Region IV SOPs, Section 4.6 (see Figure 2-3).

Table 4-6 is a condensed tabulation of the compounds found as a result of full TCL and TAL analysis of the three sediment samples. Analytical results for all TAL and TCL analytical parameters can be found in the individual sample's Certificate of Analysis in Appendix A.

4.1.1.8 Dry Lagoon Sediment

Three sediment samples (not including QA/QC samples) were collected using a manually operated hand auger with a 4-inch bucket. Sample point locations and procedures followed guidelines found in the March 1988 Ebasco "Field Operation Plan" and the April 1, 1968 revision of the EPA Region IV SOPs, Section 4.6 (see Figure 2-3).

Table 4-7 is a condensed tabulation of compounds found as a result of full TCL and TAL analysis of the three sediment samples. Analytical results for all

TCL and TAL analytical parameters can be found in the individual sample's Certificate of Analysis in Appendix A.

4.1.1.9 Shallow Aquifer

According to the March 1988 Ebasco "Field Operation Plan," the shallow aquifer water was to be sampled in three different phases. These three phases were:

- Phase I - one round of sampling Golder wells P6 through P22
- Phase II - installation and sampling of temporary wells
- Phase III - installation and sampling of 19 new wells.

All well locations can be found in Figure 2-6.

Phase I - Golder Wells

Wells P6 through P22 installed by Golder in 1985 were developed, purged, and sampled according to guidelines from the April 1, 1986 revision of the EPA Region IV SOPs.

Table 4-8 is a condensed tabulation of only the compounds and analytes found in the water samples. As stated in the July 1988 IT "Implementation Plan" all wells except P10, P14, and P16 were analyzed for full TAL and only TCL volatiles. Wells P10, P14, and P16 received full TCL and full TAL analysis. These were the 20-percent samples for which the full analysis was called. Analytical results for all required TCL and TAL parameters can be found in the individual sample's Certificate of Analysis in Appendix A.

Golder Wells are considered not suitable for future sampling because they do not meet current standards of construction.

Phase II - Temporary Wells

The July 1988 Implementation Plan called for the installation of 2-inch wells to serve as temporary wells. Due to the logistic problems encountered in trying to get the needed equipment required to the well site, this approach was abandoned in favor of temporary well points. The 1/2-inch diameter stainless steel well points could be driven by hand.

Because of the resistance characteristic of the surficial clay layer and other site conditions, it was concluded that this method would not provide representative water samples. Therefore, with the approval of EPA Region IV, the temporary well phase of the RI was abandoned.

Phase III - New Wells

A total of 19 new wells were installed on the property surrounding SCRDI. Six of the wells were installed with screened intervals in the upper 10 feet of the aquifer (Wells MW-1A, -2A, -4A, -7A, -11A, and -12A). Thirteen wells were installed with the screened interval in the lower 10 feet of the aquifer (Wells MW-1B, -2B, -3B, -4B, -5B, -6B, -7B, -8B, -9B, -10B, -11B, -12B, and -13B).

All wells were developed according to procedure guidelines from April 1, 1986 revision of EPA Region IV's SOP, Section 4.7. All samples were collected according to guidelines found in the April 1, 1986 revision of EPA Region IV's SOP, Section 4.7, except where verbal exceptions and instructions were given by representatives of EPA Region IV.

Table 4-9 is a condensed tabulation of only those compounds and analytes found in the water samples.

As stated in the July 1988 IT "Implementation Plan," all wells except 4A and 4B, one of 7B duplicate samples, and 12A and 12B were analyzed for full TAL and only TCL volatiles. Wells 4A, 4B, 7B, 12A, and 12B received full TCL and TAL analysis. These samples were the 20-percent samples required for full analysis.

4.1.1.10 Lower Aquifer

The March 1988 Ebasco "Field Operation Plan" called for the lower or deep aquifer to be sampled in two phases. Phase I was one round of sampling for Golder wells DW1, DW2, and DW3. Phase II was the installation and sampling of four new wells whose screened interval is in the deep aquifer.

Phase I - Golder Wells

Wells DW1, DW2, and DW3 installed by Golder in 1985 were developed, purged,

and sampled according to guidelines found in the April 1, 1986 revision of the EPA Region IV SOPs.

Table 4-9 is a condensed tabulation of only compounds and analytes found in the water samples. As stated in the July 1988, IT "Implementation Plan" wells DW2 and DW3 were analyzed for full TAL and TCL volatiles only. Well DW1 was analyzed for full TCL and TAL. Analytical results for all required TCL and TAL parameters can be found in the individual sample's Certificate of Analysis in Appendix A.

Phase II - New Wells

Four new wells were installed for the deep aquifer. All wells were developed, purged, and sampled according to guidelines found in the April 1, 1988 revision of EPA Region IV's SOP, Section 4.7, except where verbal exceptions and instructions were given by EPA Region IV.

Table 4-9 is a condensed tabulation of only compounds and analytes found in the water samples. Analytical results for all TCL and TAL parameters can be found in the individual sample's Certificate of Analysis in Appendix A.

4.1.1.11 Ambient Air Monitoring

Both the March 1988 Ebasco "Field Operation Plan" and IT's July 1988 "Implementation Plan" called for exposure monitoring of personnel for volatile organics in the ambient air. At the start of the investigation, the SCRDI property was screened for ambient volatile organics using an OVA. Based on the OVA screen and site conditions, a one-time analytical verification at specific site locations and constant monitoring of work areas with the OVA was performed. Three 10-liter Tedlar bags were set up to collect ambient air samples for laboratory analysis, based on the results of the OVA screen. The air content of each Tedlar bag was analyzed at IT Cerritos, California laboratory by GC/MS. The California Caladron analytical protocols were used. The results of the Caladron analysis can be found in Table 4-10.

Per the March 1988 Ebasco "Field Operation Plan" the breathing zones for all sampling activities and work areas were monitored with an OVA.

4.2 QUALITY ASSURANCE/QUALITY CONTROL

4.2.1 Field Quality Assurance/Quality Control

Table 4-11 in the July 1988 IT "Implementation Plan" is a summary of the required QA sampling. Table 4-11 compares the required QA to the performed QA sampling. The QA objective was either met or exceeded for all parameters except run-off sediment sampling where a split sample was inaccurately omitted.

Results of field duplicate samples can be found in Tables 4-1 through 4-9. In these tables, analytical results for both the original and duplicate samples are reported side by side for direct comparison.

The March 1988 Ebasco "Field Operation Plan" required a field water deionization plant. To ensure the quality of the final rinse water, a water sample from the plant was to have full TCL analysis weekly.

When the sampling program started, no field water deionization system was available. As a substitution, certified HPLC water was purchased and used for final equipment decontamination rinse and preparing equipment rinse and trip blank samples. Lot numbers were logged and results of trip blanks and equipment rinses monitored. When the deionization system was installed, an initial sample was sent for full TCL and TAL analysis. Thereafter, weekly water samples from the deionization system were analyzed for full TCL. The systems monitoring light was checked daily.

Per the March 1988 Ebasco "Field Operation Plan" and the April 1, 1986 EPA Region IV SOP, pesticide-grade isopropanol and ultra-spec acids and bases were used for equipment decontamination and sample preservation.

The sample containers used met the specifications for type and level of cleanliness found in the April 1, 1986 revision of EPA Region IV's SOP in Appendix A.

All samples were chemically preserved and/or cooled per specifications found in the April 1, 1986 revision of EPA Region IV's SOPs.

4.2.2 Analytical Quality Assurance/Quality Control

All analytical QA/QC protocols found in the CLP Statement of Work 788 for TAL and 787 for TCL were followed. Any variances are properly recorded and on file as part of the CLP data package. Table 4-12 is a summary of analytical results for all check samples submitted for analysis by the EPA.

4.3 SUPPLEMENTAL SAMPLING

4.3.1 Sampling the Aboveground Tank

The residual sludge in the aboveground tank was sampled for the proposed disposal characterization.

The sample procedure was to access the sludge through the 3-inch pipe fittings located approximately one-third of the tank length from each end of the tank. The sludge in the bottom of the tank was collected with a glass Coliwasa. Due to the low volume and consistency of the sludge, it was necessary to do multiple takes from each access point. Each take was split evenly between two glass mixing bowls. When enough sample was collected, the contents of each bowl was mixed. The content of one bowl was sent to Chem Waste Management for its required analysis for disposal at its Emelle, Alabama facility. The content of the second bowl was sent to IT's Middlebrook Pike Laboratory for disposal parameter analysis.

The analytical results of the Middlebrook Pike analysis can be found in Appendix A.

4.3.2 Additional Surface Soil Samples

In addition to the 3.4 surface soil samples called for in the March 1988 EBASCO "Field Operation Plan," five extra surface soil samples and one QA/QC sample were collected and analyzed for volatile organics, semivolatile organics and pesticide/PCBs. The location and reasoning for the extra samples are given in Section 2.1.2.3. Analytical results are presented in Table 4-13. Data did not confirm these locations as potential source areas.

The collection procedures followed the methods outlined in Section 4.9 of the April 1, 1986 revision of EPA Region IV's SOPs. A clean, manually operated stainless steel hand auger with a 4-inch bucket was used to obtain the soil samples.

The analytical program for the additional soil samples was as follows:

- No TAL analysis
- Full TCL volatiles on all samples
- Full TCL analysis for BNA, pesticides/PCBs on three samples
- Three samples were archived with the option of performing TCL analysis for BNA and pesticides/PCBs if the volatile analyses were high enough to warrant it.

4.4 SAMPLING RESULTS

4.4.1 Soils

A review of the analytical results for the soil sampling, which includes both surface soil and soil borings, indicates an area of contamination extending from the edge of Bluff Road in front of the SCRDI property, the SCDHEC drum staging area on the northwest corner of SCRDI property to just beyond the Campbell's Garage property line southeast of the east end of the wet lagoon. (Figures 4-1 and 4-2.) There are several organic and inorganic contaminants present. The most widespread compounds in elevated concentrations are:

- Acetone
- N-Nitrosodiphenzlamine
- Benzoic acid
- 2-Butanone
- Phenol
- Chloroform
- 1,1,2,2-Tetrachloroethane.

There are also areas of metal and pesticide and PCB contamination but they are localized, probably as a result of spills.

The organic contamination on the SCRDI property exists from the southern edge of the site (SS-1 and SS-2) at the Bluff Road end of the property eastward to the west end of the lagoons. Soils in this area are contaminated from the surface to the top of the water table. Soils along the edge of the lagoons

and across the east end of the lagoon on the SCRDI property show subsurface contamination at the top of the water table, approximately 11 feet below the ground surface.

The SCDHEC drum staging area on the northwest side of the SCRDI property is contaminated on the surface to a depth of less than 3 feet. Contamination in that area is reportedly due to spillage and leaks from drums resulting from the removal activities.

The SCDHEC drum staging area on the front side of the Campbell's Garage property is contaminated from the surface to the top of the water table. The Campbell's Garage property along the east end of the wet lagoon has subsurface contamination from 3 feet to the top of the water table. Contamination on the front of the property is also reported to be the result of spillage that occurred during the drum removal effort.

4.4.2 Lagoon

Both the dry and wet lagoons were sampled to confirm the nature and extent of contamination found in the Golder investigation. Three water samples and three corresponding sediment samples were collected from the wet lagoon. Three dry sediment samples were collected from the dry lagoon.

4.4.2.1 Lagoon Water

Results of the lagoon water analyses indicate that water in the lagoon is not contaminated with organic compounds. No pesticides/PCBs were detected, and bis (2-ethylhexyl) phthalate (14 ppb) was the only semivolatile detected. Concentrations of volatile compounds including acetone, methylene chloride, 1,1-dichloroethane, 1,1,1-trichloroethane, and tetrachloroethene are not significant (1 to 7 ppb).

Inorganics are present in the water at elevated levels. Results indicate that calcium at 72.5 ppm, sodium at 13.9 ppm, and potassium at 8.0 ppm are present in the water. They are present because lime was deposited in the lagoons during acetylene manufacture. Priority pollutant metals were also present, but at very low concentrations (<12 ppb).

4.4.2.2 Lagoon Sediment

- Wet Lagoon Sediment - Organic contamination in the wet lagoon sediment is limited primarily to phenol at 800 ppb and acetone at 340 ppb. Other compounds detected were in very low concentrations or appeared in the associated blanks. No pesticides/PCBs were found in the wet lagoon sediment samples.

  Metals analyses confirmed that the sediment is essentially lime. Metals present in the largest concentrations were calcium (443,000 ppm), aluminum (14,500 ppm), iron (7,710 ppm), magnesium (494 ppm), and sodium (428 ppm). Some priority pollutant metals were also found with chromium - the highest at 42 ppm. Cyanide was detected at 13.2 ppm.

- Dry Lagoon Sediment - The sediment of the dry lagoon is contaminated with VOCs, phenol, and some pesticides.

  Volatile chemicals present in the highest concentrations include trichloroethylene (23,000 ppb), tetrachloroethene (17,000 ppb), methylene chloride (4,700 ppb), and acetone (4500 ppb). Benzene compounds and chlorinated ethenes were also detected. Phenol was detected at 15,000 ppb at sample location DLS3.

  Pesticides detected include 4,4'-DDE at 30 ppb and endosulfan sulfate at 600 ppb.

  The metals analyses for the dry lagoon sediment were virtually identical to the wet lagoon sediment samples. Similar compounds at the same range of concentrations were found in both sets of samples.

4.4.3 Surface Water and Sediment

4.4.3.1 Surface Water

The major source of surface drainage from the site is a ditch that runs in a southeasterly direction along Bluff Road and eventually joins a tributary of Myers Creek (see Figure 2-4). Surface water and sediment samples were collected at two locations along this drainage system prior to its confluence with Myers Creek.

The surface water in the drainage ditch is uncontaminated. Although acetone was present at 6 to 7 ppb and bis (2-ehtylhexyl) phthalate was present at 7 to 13 ppb, both acetone and bis (2-ethylhexyl) phthalate are considered to be laboratory contaminants since they were also detected in the associated blanks at comparable levels. Metal concentrations do not change appreciably along the drainage system and do not differ from expected background conditions.

4.4.3.2 Sediments

Acetone, methylene chloride, and toluene were found in both sediment samples. The results are not considered to be significant due to low concentrations (6 to 100 ppb) and because acetone and methylene chloride were detected in the associated blanks. No pesticides or PCBs were detected in either of the sediment samples.

The presence of bis (2-ethylhexyl) phthalate at both sample locations is probably a result of laboratory contamination. Similar contamination was also confirmed in the travel blank. Because benzoic acid at 1,100 ppb was the only other organic compound (semivolatile) detected in the sediment sample and benzoic acid is a naturally occurring chemical found in nuts, tree bark, and leaves of plants in the area, its presence in the sediment sample is not considered site related.

Metals analyses, although somewhat elevated, show a reduction of approximately 50 percent from the upstream to the downstream sediment sample locations. Based on field observations made during sampling, a reduction in metals and an increase in organics would be expected due to location and matrix consistency of the two samples. The sample collected closest to the site clearly contains more soil content as opposed to the down gradient sample which contains more natural organic matter. This would be expected due to the increased surface runoff accumulation as it proceeds down the drainage ditchline.

The analytical results confirm this since the upgradient sample demonstrates higher inorganic content and the down gradient sample shows increased natural organic material such as benzoic acid.

Surface water quality is not affected.

4.4.4 Ground Water Contamination

4.4.4.1 Shallow Aquifer Contamination

Contamination of the shallow ground water by the SCRDI site has been reported by SCDHEC (1981) and Golder Associates (1986). The data generated by the IT

RI reconfirm the earlier results and better define the extent and composition of the contaminant plume.

The Golder wells were resampled by IT in December 1988, prior to installation of monitoring wells by IT. The data indicated that the contaminant plume had not migrated significantly since the wells were last sampled by Golder Associates in 1985. Based on these results, IT planned the installation of new monitoring wells to better define the extent of contamination, to ascertain continuity of the plume toward the north, and to confirm the actual contaminants present in various portions of the plume. Installation and sampling of the wells ran from February to May 1989, and well log data are presented in Appendix B and Certificates of Analysis are found in Appendix A.

Total volatile organic analytical results are contoured in Figure 4-3. Overall, the highest total concentrations are found in the vicinity of P-14, MW-2, P-10, P-16, and MW-4. Total volatiles at MW-2A are high due to an large concentration of acetone (18,000 ppb). Acetone was seen at less than one-half this concentration in the other contaminated wells. MW-4A and -4B have total volatile concentrations significantly lower than the surrounding Golder wells (P-14, P-10, and P-16) and additionally do not have the significant concentrations of semivolatiles seen in those wells. The reason for this is unknown; however, it may be related to well construction differences. If dense compounds are sinking through the water column or if the ground water flow has a downward component of movement, then the highest contaminant concentrations at this distance from the site may be found in the central plume, approximately 20 feet of the shallow aquifer, which is monitored by the Golder wells but not the IT wells. This theory is supported by IT well data which show higher contaminant concentrations in shallow well MW-2A than deep well MW-2B (well pair close to the site), approximately equal concentrations in MW-4A and MW-4B (well pair in the central plume area), and higher concentrations in deep well MW-12B as compared to shallow well MW-12A at the periphery of the plume. Total volatile organic analytical results contoured for the "A" wells are shown in Figure 4-4 and for the "B" wells in Figure 4-5.

The IT analytical data support the following:

- P-18 is contaminated due to lateral northward migration of the plume, not due to a discrete source area.

- The composition of the highly contaminated zone at MW-2A varies significantly from the other contaminated zone (near P-14, P-10, P-16 and MW-4), indicating a possible second release of material during removal actions, performed by SCDHEC, as postulated by Golder (1986). The types and levels of VOC at MW-2A differs from those in the other highly contaminated zone (P-10, P-14, P-16, MW-4) in the following aspects: Acetone, 2-butanone, and 1,2-dichloroethylene concentrations are much higher in MW-2A, 1,1,2-trichloroethane was detected in MW-2A and not in the other wells; the level of trichlorothene and 1,1,2,2-tetrachloroethane are much lower in MW-2A; and neither chloroform nor 1,1,1-trichloroethane both common compounds found in other wells were detected in MW-2A.

- Uncontaminated wells at locations MW-5, MW-8, MW-11, MW-9, and MW-3 lie beyond the boundaries of the plume on the northwest, northeast, east, south, and southwest.

- MW-1A, MW-7A, MW-7B, and MW-10B and MW-13B all show extremely low levels of site-related contaminants and probably have intercepted the leading edges of the plume on the west, north-northeast, and southeast.

4.4.4.2. Deep Aquifer Contamination

Monitoring wells MW-3C, MW-7C, MW-9C, and MW-12C were installed to monitor the upper portion of the deep aquifer, directly beneath the confining clay layer. None of the samples from these wells showed any contamination. The resampling of Golder wells DW-1, DW-2, and DW-3 also showed them to be clean. Based on the above results, the deep aquifer is uncontaminated.

4.4.5 Ambient Air

Initial air screening of the SCRDI site was conducted using an organic vapor analyzer. During the initial site walks, some elevated readings (between 1 and 4.5 ppm) were detected on the instrument. As a result of these findings, as well as the noted on-site conditions, a one-time analytical verification of potential airborne contaminants was instigated. Three Tedlar gas bag samples of ambient air were collected from the SCRDI property and analyzed by GC/MS for volatile organics. The results indicated only toluene present in ambient air at 22 to 27 ppb. All other volatile constituents were not detected.

4.4.6 Aboveground Tank

The 3,000-gallon cylindrical aboveground tank located on the front portion of the SCRDI property near Bluff Road was sampled in August 1988. The tank contained approximately 100 gallons of residual sludge that had previously been sampled by Golder and Associates in 1985. The initial sampling results showed that the sludge contained 33,000 ppm of 2-chlorophenol and 14,000 ppm of phenol along with other VOCs compounds. The resampling of the residual tank sludge in August 1988 was required to enable complete characterization of the material for disposal. The residual sludge was analyzed for full TCL and TAL compounds. Results of the analysis revealed that the sludge was made up of the following compounds:

- Iron - 109,000 ppm
- 2-chlorophenol - 28,000 ppm
- Phenol - 11,000 ppm
- Cyclohexene - 9,200 ppm
- Total volatiles - 1,900 ppm
- Other semivolatiles - 64,800 ppm.

A sample of the sludge and the analytical results were sent to Chemical Waste Management in Emelle, Alabama and to ThermalKEM in Rockhill, South Carolina. ThermalKEM agreed to accept the sludge for incineration. The sludge was removed from the tank by flushing with approximately 300 gallons of diesel fuel using a vacuum tanker to surge the sludge/fuel mixture back and forth between the tank and the truck to maximize the amount of dissolved material. The resulting mixture was pumped into seven openhead drums and sealed. After the tank had been cut up into manageable pieces, the remaining sludge was shoveled into two drums and sealed. The tanker was flushed with water to clean the vehicle and the hoses, and the resulting water rinse was pumped into three drums and sealed. All 12 drums of material generated from the tank cleanout were sent to ThermalKEM on June 7, 1989 and incinerated. The tank pieces were placed in a roll-off bin and sent to the Chemical Waste landfill in Emelle, Alabama for disposal by burial.

4.5 BACKGROUND CONTAMINATION

Throughout the analytical program, residual background contamination for acetone, methylene chloride and bis (2-ethylhexyl)-phthalate was found in a number of the associated analytical blanks along with an occasional positive

value for toluene. Table 4-14 shows the breakdown of the samples by analytical lots with the four chemicals detected along with the associated analytical blank analysis.

- Those samples identified with a qualifer "B" are suspect as a result of laboratory artifact in the associated blank (methylene chloride, acetone, bis(2-ethylhexyl)phthalate or toluene). Samples with qualifiers "D" in addition to "B" are especially suspect due to secondary dilution effects which will magnify the impact of the laboratory artifact.

- The primary information shown by this table is the impact of blank contamination/laboratory artifacts on the majority of analytical results for the four compounds identified.

- This does not mean that these compounds are not site contaminants. It does, however, make suspect those results where only one or more of these specific compounds and no other known site contaminants are present.

4.5.1 Laboratory Contamination

Acetone, methylene chloride, toluene, and bis(2-ethylhexyl) phthalate are recognized by the EPA as inherent laboratory introduced contamination (artifacts). As stated in the applicable CLP protocol, no corrective action by the laboratory is required if a concentration of less than 5x the contract required detection limit (CRDL) is found in method blanks for these four artifact compounds. The presumption is, that from the EPA's point of view, any concentration less than 5x CRDL for these four compounds is a possible laboratory artifact.

The summary shown in Table 4-15 gives the range of detection for the four artifacts in the analytical blanks and the applicable concentrations at 5x CRDL.

CLP protocols allow the analyst, based upon his assessment of the sample, to use two different weights/volumes for analysis. CLP refers to these as low and medium levels and the 5x CRDL's are adjusted appropriately. Therefore, artifact compounds with a concentration higher than a majority of the analytical blanks but with a "BJ" qualifier should be checked to see if they were analyzed as medium level samples.

For this investigation the analytical blanks show that:

- For methylene chloride:

  Low level solids less than 7 ppb are an artifact and less than 25 ppb are a possible artifact.

  Medium level solids less than 300 ppb are an artifact and less than 3,125 ppb are a possible artifact.

  Low level water less than 15 ppb is a laboratory artifact and less than 25 ppb is a possible artifact.

- For acetone:

  Low level soils less than 10 ppb are an artifact and less than 50 ppb are a possible artifact.

  Medium level soils less than 290 ppb are an artifact and less than 6,250 ppb are a possible artifact.

  Low level water less than 8 ppb is a artifact and less than 50 ppb is a possible artifact.

- For toluene:

  Low level soils less than 3 ppb are an artifact and less than 25 ppb are a possible artifact.

  Low level water less than 1 ppb is an artifact and less than 25 ppb is a possible artifact.

- For bis(2-ethylhexyl) phthalate:

  Low level soils less than 680 ppb are an artifact and less than 1,650 ppb are a possible artifact.

  Medium level soils less than 860 ppb are an artifact and less than 206,250 ppb are a possible artifact.

  Low level water less than 4 ppb is an artifact and less than 50 is a possible artifact.

3 10 00593

CONDENSED VOLATILE RESULTS FOR SURFACE SOILS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J0357 SS1	J0348 SS2	J0338 SS3	J0337 SS4	J0345 SS5	J0346 SS6	J0353 SS6	J0347 SS7	J0349 SS9	J0350 SS10	J0351 SS11	J0352 SS12	J0354 SS12	J0342 SS13	J034 SS14
Acetone {1}	4,900	120	700	45,000	290	16	28	6	6	18	14	11	14	1,200	54
Chloroform			3	2,000	10,000							1			
1,1,1-Trichloroethane			3		14,000										
Methylene chloride {1}	9	9	8		250	32	18	7	7	5	10	21	20	7	
Carbon disulfide															
1,1-Dichloroethane					390										
2-Butanone			55												
Trichloroethene		160	5	23,000	44,000										
1,1,2,2-Tetrachloroethane				100,000											
Ethylbenzene					710										
4-Methyl-2-pentanone			3												
Toluene			4	29,000	1,400					1		1			
Chlorobenzene				16,000											
Tetrachlorethene			140	56,000	1,700	1									
1,2-Dichloroethylene			45												
Total xylenes			10	5,200											

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar concentrations.

TABLE 4-1

3 10 00594

CONDENSED VOLATILE RESULTS FOR SURFACE SOILS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J0341 SS15	J0340 SS16	J0339 SS17	J0368 SS18	J0369 SS19	J0371 SS19	J0370 SS20	J0372 SS20	J0373 SS21	J0374 SS22	J0375 SS23	J0376 SS24	J0378 SS25	J0379 SS26	J0380 SS27
Acetone {1}	280	17	29,000	47	2600	6500	59	66	100	33	1100	580	18000	18	4800
Chloroform															
1,1,1-Trichloroethane															
Methylene chloride {1}	12	23	1,800	25	20	26	18	16	13	11	8	5	5	5	8
Carbon disulfide	2														
1,1-Dichloroethane															
2-Butanone								6							
Trichloroethene										2					
1,1,2,2-Tetrachloroethane															
Ethylbenzene															
4-Methyl-2-pentanone															
Toluene	2				2	3	1	2	24	2				2	
Chlorobenzene															
Tetrachlorethene															
1,2-Dichloroethylene															
Total xylenes															

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar concentrations.

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619

TABLE 4-1

3 10 00595

CONDENSED VOLATILE RESULTS FOR SURFACE SOILS

ANALYTE (PPB)	SAMPLE NUMBER / LOCATION IDENTIFICATION						
	J0381 SS28	J0382 SS29	J0383 SS30	J0384 SS31	J0385 SS32	J0386 SS33	J0387 SS34
Acetone {1}	18	9400	17000	6100	15000	16	17000
Chloroform							
1,1,1-Trichloroethane							
Methylene chloride {1}	7	7	410	6	9	12	8
Carbon disulfide							
1,1-Dichloroethane							
2-Butanone							
Trichloroethene							
1,1,2,2-Tetrachloroethane							
Ethylbenzene							
4-Methyl-2-pentanone							
Toluene						1	
Chlorobenzene							
Tetrachlorethene		1					
1,2-Dichloroethylene							
Total xylenes							

NOTE: Only the compounds which were detected are listed on this table. For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar concentrations.

TABLE 4-1

CONDENSED SEMI-VOLATILE RESULTS FOR SURFACE SOILS

3 10 00596

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J0357 SS1	J0348 SS2	J0338 SS3	J0337 SS4	J0345 SS5	J0346 SS6	J0353 SS6	J0347 SS7	J0349 SS9	J0350 SS10	J0351 SS11	J0352 SS12	J0354 SS12	J0342 SS13	J0343 SS14
Benzoic acid															
Di-n-butyl phthalate				2,200	1,100				42		45				
Naphthalene				1200											
2-Methylphenol				58000											
2-Chlorophenol				200,000											
2,4,5-Trichlorophenol				810											
Benzyl alcohol				110000											
4-Methylphenol				14000											
Phenol				210,000											
Bis(2-Ethylhexyl)phthalate {1}	390	450	830		7,600	480	360	560	1,100	550	1,800	550	790	540	97(
Di-n-octyl phthalate			160	44,000	9,300										
Hexachlorobenzene					7,200							290	270		
Isophorone				450											
2,4-dichlorophenol				29000											
Diethylphthalate				1500											
N-Nitrosodiphenylamine															

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar concentrations.

TABLE 4-1

3 10 00597

CONDENSED SEMI-VOLATILE RESULTS FOR SURFACE SOILS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J0341 SS15	J0340 SS16	J0339 SS17	J0368 SS18	J0369 SS19	J0371 SS19	J0370 SS20	J0372 SS20	J0373 SS21	J0374 SS22	J0375 SS23	J0376 SS24	J0378 SS25	J0379 SS26	J038[illegible] SS27
Benzoic acid			390		620		730			590	100	260	1200	220	330
Di-n-butyl phthalate								180							
Naphthalene															
2-Methylphenol															
2-Chlorophenol	1,300														
2,4,5-Trichlorophenol															
Benzyl alcohol															
4-Methylphenol															
Phenol															
Bis(2-Ethylhexyl)phthalate (1)	*2,000*	*560*	*610*	*470*	*880*	*960*	*1100*	*1500*	*260*	*430*	*680*	*730*	*390*	*660*	*390*
Di-n-octyl phthalate					240	340									
Hexachlorobenzene											53				
Isophorone															
2,4-dichlorophenol															
Diethylphthalate															
N-Nitrosodiphenylamine									50						

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations.

TABLE 4-1

CONDENSED SEMI-VOLATILE RESULTS FOR SURFACE SOILS

3 10 00598

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J0381 SS28	J0382 SS29	J0383 SS30	J0384 SS31	J0385 SS32	J0386 SS33	J0387 SS34
Benzoic acid				580			690
Di-n-butyl phthalate							
Naphthalene							
2-Methylphenol							
2-Chlorophenol							
2,4,5-Trichlorophenol							
Benzyl alcohol							
4-Methylphenol							
Phenol							
Bis(2-Ethylhexyl)phthalate {1}	410	530	720	180	520	220	220
Di-n-octyl phthalate							
Hexachlorobenzene							
Isophorone							
2,4-dichlorophenol							
Diethylphthalate							
N-Nitrosodiphenylamine							

NOTE: Only the compounds which were detected are listed on this table. For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar concentrations.

FILE:SSPPM

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619

TABLE 4-1

3 10 00599

CONDENSED PESTICIDE AND PCB RESULTS FOR SURFACE SOILS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J0357 SS1	J0348 SS2	J0338 SS3	J0337 SS4	J0345 SS5	J0346 SS6	J0353 SS6	J0347 SS7	J0349 SS9	J0350 SS10	J0351 SS11	J0352 SS12	J0354 SS12	J0342 SS13	J0343 SS14
4,4'-DDE					85										
4,4'-DDD															
Endosulfan Sulfate															
4,4'-DDT			38	220											34
Methoxychlor				2,700											
Dieldrin															
Endosulfan II															
PCB Aroclor 1242					1,900										

ANALYTE (PPB)	J0341 SS15	J0340 SS16	J0339 SS17	J0368 SS18	J0369 SS19	J0371 SS19	J0370 SS20	J0372 SS20	J0373 SS21	J0374 SS22	J0375 SS23	J0376 SS24	J0378 SS25	J0379 SS26	J0380 SS27
4,4'-DDE							42								
4,4'-DDD					37	46									
Endosulfan Sulfate															
4,4'-DDT	100						180	150							
Methoxychlor	140														
Dieldrin							52								
Endosulfan II								26							
PCB Aroclor 1242	240														

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations.

3 10 00600

FILE:SSPPM

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619

TABLE 4-1

CONDENSED PESTICIDE AND PCB RESULTS FOR SURFACE SOILS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J0381 SS28	J0382 SS29	J0383 SS30	J0384 SS31	J0385 SS32	J0386 SS33	J0387 SS34
4,4'-DDE							
4,4'-DDD							
Endosulfan Sulfate							
4,4'-DDT							
Methoxychlor							
Dieldrin							
Endosulfan II							
PCB Aroclor 1242							

NOTE: Only the compounds which were detected are listed on this table. For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar concentrations.

TABLE 4-1

3 10 00601

CONDENSED METAL AND CYANIDE RESULTS FOR SURFACE SOILS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPM)	J0357 SS1	J0348 SS2	J0338 SS3	J0337 SS4	J0345 SS5	J0346 SS6	J0353 SS6	J0347 SS7	J0349 SS9	J0350 SS10	J0351 SS11	J0352 SS12	J0354 SS12	J0342 SS13	J0343 SS14	J0341 SS15
Aluminum	11,900	8,700	6,310	5,880	3,950	11,600	7,800	2,890	2,070	3,560	8,720	5,080	4,360	1,570	3,150	1,970
Iron	8,130	4,950	3,700	13,900	8,410	7,240	5,650	3,280	5,930	4,460	39,000	16,800	9,400	1,310	5,320	2,790
Magnesium	338	230	163	813	625	323	205	106	59	101	371	185	144	54	144	469
Manganese	298	499	421	214	253	236	259	288	14.7	77.9	66.1	53.9	16.5	187	178	122
Nickel				30	34											4
Potassium	362	407	290	2690							516					
Silver																
Sodium	201	236	215	328	346	262	173	201	116	186	281	307	237	125	252	170
Antimony																
Barium	113	109	91.1	54.2	66.8	141	103	66.7	20	42.2	74.5	41.2	30.4	19 8	55.9	46.5
Beryllium	0.8	1	0.7	0.7	0.4	1.1	0.8	0.6	0.3	0.5	0.9	0.6	0.4	0.3	0.5	0.5
Cadmium		1			4										1	
Chromium	9	8	6	64	34	16	6	6	5	5	17	9	7	5	16	23
Cobalt	4	4		5	9	6	5				8					4
Copper	6	7	3	68	205	6	4	18		5	9	10	3	7	26	46
Vanadium	20	12	9	11	10	19	15	7	19	13	64	34	26	4	8	5
Zinc	14	24	11	67	738	10	6	378	3	4	9	18	4	24	99	259
Calcium	600	328	577	1,770	1,720	596	333	530	92	139	493	281	190	152	361	763
Lead	13.9	26.1	7.0	18.1	158	18.3	10.9	14	10.7	11.7	13.3	11	10.8	16.2	104	66
Arsenic			0.9	1.5	8.2		1.3							1	2.1	1.1
Selenium			0.5													
Mercury	0.06	0.09	0.07	5.3	6.56	0.27	0.03	1.19	0.07	0.04	0.08	0.06	0.2	0.03	0.99	0.7
Thallium			0.7		0.7									0.8	0.8	0.9
Cyanide				0.61												

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar concentrations.

PROJECT: BLUFF ROAD, S.C. NUMBER: 40861?

TABLE 4-1

3 10 00602

CONDENSED METAL AND CYANIDE RESULTS FOR SURFACE SOILS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPM)	J0340 SS16	J0339 SS17	J0368 SS18	J0369 SS19	J0371 SS19	J0370 SS20	J0372 SS20	J0373 SS21	J0374 SS22	J0375 SS23	J0376 SS24	J0378 SS25	J0379 SS26	J0380 SS27	J0381 SS28	J0382 SS29
Aluminum	2,970	1,170	13500	4560	4970	5670	7940	7860	6120	3910	3090	9060	4020	4660	6780	1570
Iron	4,760	4,830	7370	4310	4450	9810	12400	5630	3640	3290	4190	8080	10500	5720	11000	2370
Magnesium	90	88	365	170	166	203	330	230	179	136	298	287	130	162	388	16
Manganese	7.8	10.7	1190	229	249	807	800	1240	420	411	445	295	38.6	26.7	22.9	2.5
Nickel			5	3	3	4	6	3	2		3	5			3	
Potassium								252				249				
Silver			5				0.9				3	4				
Sodium	127	186	39										51	57		
Antimony								4			6					
Barium	30.3	20.9	190	69.3	71.9	108	123	189	107	74.1	81.2	214	57.8	34.7	54.6	18
Beryllium	0.5	0.3	1.3	0.8	0.5	0.7	0.7	1.1	0.5	0.4	0.4	0.9	0.4		0.3	0.1
Cadmium				0.7		0.7	0.8									
Chromium	4	5	7	19	19	23	22	5	6	5	13	11	8	7	11	2
Cobalt			5		2	3	4	3			8	8			2	
Copper	2		9	20	19	30	26	7	4	9	6	10	3	3	6	4
Vanadium	13	15	16	7	7	9	11	13	9	7	17	34	28	28	32	7
Zinc	3	3	14	19	20	35	38	8.4	8	14.8	6.4	20.9	5.2	3.9	7	1.9
Calcium	86	119	671	93	100	107	155	587	345	405	94800	4040	658	142		
Lead	10.1	13.8	10.5	16.8	8	36	22	7.9	9.6	8.1	8.8	22	8.7	15.2	12.4	5.9
Arsenic	1.7				0.9	2.3	3.2		0.4	0.7	1.3					1.2
Selenium						3	3.6									
Mercury		0.03	0.03	3.6	3.4	0.43	0.61	0.03	0.09	0.66		0.1		0.04	0.12	
Thallium	0.6	0.9														
Cyanide						0.85		0.57								

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations.

TABLE 4-1

3 10 00603

CONDENSED METAL AND CYANIDE RESULTS FOR SURFACE SOILS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPM)	J0383 SS30	J0384 SS31	J0385 SS32	J0386 SS33	J0387 SS34
Aluminum	7070	4290	4270	4640	6770
Iron	19600	3480	1820	3250	4440
Magnesium	130	112	92	103	217
Manganese	23.8	123	24.1	59.8	1100
Nickel					
Potassium					255
Silver		1.3			
Sodium		47	44	46	48
Antimony					
Barium	30.2	66.8	29	58.5	131
Beryllium	0.4	0.4		0.3	0.8
Cadmium					
Chromium	13	6	3	4	6
Cobalt		3			4
Copper	6	11	2	2	3
Vanadium	43	15	10	15	10
Zinc	6.3	17.8	3.9	3.8	8.7
Calcium		330	97	96	560
Lead	19.8	30.2	10.9	10.5	9.5
Arsenic	0.5	0.6	0.9		0.6
Selenium					
Mercury		0.15	0.04	0.04	0.02
Thallium					
Cyanide					

NOTE: Only the compounds which were detected are listed on this table. For complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations.

FILE:D:SBUM

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619

TABLE 4-2

3 10 00604

CONDENSED VOLATILE RESULTS FOR SOIL BORINGS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J0493 B1,3/7	J0495 B1,3/7	J0494 B1,7/11	J0496 B2,3/7	J0498 B2,3/7	J0497 B2,7/11	J0445 B3,3/7	J0446 B3,7/11	J1508 B4,3/7	J1509 B4,3/7	J1510 B4,7/11	J1512 B5,3/7	J1513 B5,3/7
Carbon tetrachloride												4100	
Acetone {1}	32	42	39	15	24	30	35	38	210	740	700	160000	
Chloroform													
Benzene													
1,1,1-Trichloroethane												6800	
Methylene chloride {1}	6	12	14	11	14	14	11	11	15	18	22	5100	39000
Carbon disulfide													
1,1-Dichloroethane													
1,1-Dichloroethene													
2-Butanone									890	1400	100	89000	38000
1,1,2-Trichloroethane													
Trichloroethene												25000	18000
1,1,2,2-Tetrachloroethane									65	75	7	2000000	2500000
Ethylbenzene												18000	14000
4-Methyl-2-pentanone									15	32	340		
Toluene	1	2	2	2	3	3	2	2	2	2		340000	340000
Chlorobenzene												23000	
Tetrachlorethene										7		95000	86000
1,2-Dichloroethylene													
Total xylenes												62000	46000

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar concentrations.

PROJECT: BLUFF ROAD, S.C. NUMBER: 408519

TABLE 4-2

3 10 00605

CONDENSED VOLATILE RESULTS FOR SOIL BORINGS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J1514 B5,7/11	J0475 B6,3/7	J0476 B6,7/11	J1505 B7,3/7	J1506 B7,3/7	J1507 B7,7/11	J0499 B8,3/7	J1501 B8,3/7	J1500 B8,7/11	J0492 B9,11/15	J0491 B9,3/7	J0490 B9,7/11	J0489 B10,3/7
Carbon tetrachloride													
Acetone {1}	24000	38	62	5400	2000	390	300	110	220	360	250	170	73
Chloroform				2			67	160	3	28	11	51	
Benzene								3				7	
1,1,1-Trichloroethane								1		110	58	220	
Methylene chloride {1}	6500	11	9	8	36	22	64	20	9	100	64	140	10
Carbon disulfide													
1,1-Dichloroethane								2				69	
1,1-Dichloroethene										44		39	
2-Butanone	14000		1	140	120	75		25	12	230	30	72	
1,1,2-Trichloroethane												7	
Trichloroethene								8		61	94	220	5
1,1,2,2-Tetrachloroethane	220000	1						22		370	1100	1100	
Ethylbenzene				2			14	20		6	630	400	
4-Methyl-2-pentanone				2				2	3	18		18	
Toluene	9600	2		2			90	140	2	110	520	1000	5
Chlorobenzene								3					
Tetrachlorethene				2			820	940	5		450	460	
1,2-Dichloroethylene										12		40	
Total xylenes				13		4	63	79		52	3600	2700	

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar concentrations.

FILE:D:SBVM

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619

TABLE 4-2

3 10 00000

CONDENSED VOLATILE RESULTS FOR SOIL BORINGS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J0455 B11,3/7	J0456 B11,7/11	J0450 B12,3/7	J0454 B12,7/11	J0457 B13,3/7	J0458 B13,7/11	J0488 B14,3/7	J0482 B14,7/11	J0473 B15,3/7	J0474 B15,7/11	J0462 B16,3/7	J0461 B16,7/11	J0448 B17,3/7
Carbon tetrachloride													
Acetone {1}	95	52	120	82		52	43	44	90		47		39
Chloroform			29	3									
Benzene													
1,1,1-Trichloroethane					2	1							
Methylene chloride {1}	6	6	12	11	8	10	11	16	12	8	12	4	10
Carbon disulfide						2			2				
1,1-Dichloroethane						3							
1,1-Dichloroethene						4							
2-Butanone								12					
1,1,2-Trichloroethane													
Trichloroethene													
1,1,2,2-Tetrachloroethane	3	3	4										
Ethylbenzene					1								
4-Methyl-2-pentanone													
Toluene	2	2	3	3	3	7	6	5	2	2	5	4	2
Chlorobenzene													
Tetrachlorethene													
1,2-Dichloroethylene													
Total xylenes							3				1		

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar analytical results will be reported at a later date.

FILE:D:SBVM

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619

TABLE 4-2

3 10 00607

CONDENSED VOLATILE RESULTS FOR SOIL BORINGS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J0449 B17,7/11	J0451 B18,3/7	J0452 B18,7/11	J0485 B19,11/15	J0483 B19,3/7	J0484 B19,7/11	J0481 B20,3/7	J0487 B21,3/7	J0486 B21,7/11	J0479 B22,3/7	J0480 B22,7/11	J0477 B23,3/7
Carbon tetrachloride												
Acetone (1)	67	57	100	23	18	24	48		160		380	
Chloroform												
Benzene												
1,1,1-Trichloroethane												
Methylene chloride (1)	12	9	11	16	16	13	12	13	10	7	5	5
Carbon disulfide	1											
1,1-Dichloroethane												
1,1-Dichloroethene												
2-Butanone										6	31	
1,1,2-Trichloroethane												
Trichloroethene												
1,1,2,2-Tetrachloroethane												
Ethylbenzene												
4-Methyl-2-pentanone												
Toluene	2	6	6	1	2	4	2	2	2	2	6	2
Chlorobenzene												
Tetrachlorethene												
1,2-Dichloroethylene												
Total xylenes											3	

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations.

FILE:D:SBVM

PROJECT: BLUFF ROAD, S.C. NUMBER: 40863.9

TABLE 4-2

3 10 00668

CONDENSED VOLATILE RESULTS FOR SOIL BORINGS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J0478 B23,7/11	J0471 B24,3/7	J0469 B25,3/7	J0470 B25,7/11	J0467 B26,3/7	J0468 B26,7/11	J0465 B27,3/7	J0466 B27,7/11	J0463 B28,3/7	J0464 B28,7/11	J0459 B29,3/7	J0460 B29,7/11
Carbon tetrachloride												
Acetone {1}	32	67	120	200	150	74	94		38		110	600
Chloroform									4	1	15	8
Benzene												
1,1,1-Trichloroethane												
Methylene chloride {1}	8	8	5	3	4	4	10		11	5	10	17
Carbon disulfide												
1,1-Dichloroethane									2			[illegible]
1,1-Dichloroethene												
2-Butanone	4	3	3	31		4						14
1,1,2-Trichloroethane												
Trichloroethene												
1,1,2,2-Tetrachloroethane									8	4	5	[illegible]
Ethylbenzene												
4-Methyl-2-pentanone												
Toluene	2	5	7	6	4	5	7		7	4	5	
Chlorobenzene												
Tetrachlorethene												
1,2-Dichloroethylene												
Total xylenes		4	4	8		2	1		1			

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar concentrations.

FILE:SBSVM

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619

TABLE 4-2

3 10 00609

CONDENSED SEMI-VOLATILE RESULTS FOR SOIL BORINGS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J0493 B1,3/7	J0495 B1,3/7	J0494 B1,7/11	J0496 B2,3/7	J0498 B2,3/7	J0497 B2,7/11	J0445 B3,3/7	J0446 B3,7/11	J1508 B4,3/7	J1509 B4,3/7	J1510 B4,7/11	J1512 B5,3/7	J1513 B5,3/7	J1514 B5,7/
Benzoic acid										76	310			
Hexachloroethane												1200		
Di-n-butyl phthalate		98			82									
N-Nitrosodiphenylamine											55	740	820	
2,4,6-Trichlorophenol													280	
Naphthalene												3900		
2-Methylphenol											63	74000	120000	11(
2-Chlorophenol											62	1600000	2000000	67(
2,4,5-Trichlorophenol													200	
Nitrobenzene												370	320	1(
Benzyl alcohol												200000	330000	34
4-Methylphenol											260	3000	3600	
Phenol											910	4900000	6300000	450
Bis(2-Ethylhexyl)phthalate (1)	1000	1000	1200	820	880	1700	1100	1200	970	740	560	1800	1900	
Di-n-octyl phthalate												650	620	
Hexachlorobenzene														
2,4-Dichlorophenol													130000	

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations.

FILE:SBSVM

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619

TABLE 4-2

3 10 00610

CONDENSED SEMI-VOLATILE RESULTS FOR SOIL BORINGS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J0475 B6,3/7	J0476 B6,7/11	J1505 B7,3/7	J1506 B7,3/7	J1507 B7,7/11	J0499 B8,3/7	J1501 B8,3/7	J1500 B8,7/11	J0492 B9,11/15	J0491 B9,3/7	J0490 B9,7/11	J0489 B10,3/7	J0455 B11,3/7	J045 B11,7
Benzoic acid			320	290	5400		1300	700	23000	110000	30000			
Hexachloroethane														
Di-n-butyl phthalate							250							
N-Nitrosodiphenylamine	160	130												
2,4,6-Trichlorophenol														
Naphthalene														
2-Methylphenol														
2-Chlorophenol							190	150			110			
2,4,5-Trichlorophenol														
Nitrobenzene														
Benzyl alcohol									15000	230000	40000			
4-Methylphenol							250							
Phenol				99	63	610	900				1800			
Bis(2-Ethylhexyl)phthalate {1}	630	370	790	740	910	1400	2400	1200	1400	1100	710	350	770	4
Di-n-octyl phthalate	79					580	1700							
Hexachlorobenzene											190			
2,4-Dichlorophenol														

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar concentrations.

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619

TABLE 4-2

3 10 00611

CONDENSED SEMI-VOLATILE RESULTS FOR SOIL BORINGS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J0450 B12,3/7	J0454 B12,7/11	J0457 B13,3/7	J0458 B13,7/11	J0488 B14,3/7	J0482 B14,7/11	J0473 B15,3/7	J0474 B15,7/11	J0462 B16,3/7	J0461 B16,7/11	J0448 B17,3/7	J0449 B17,7/11	J0451 B18,3/7
Benzoic acid													
Hexachloroethane													
Di-n-butyl phthalate													
N-Nitrosodiphenylamine									83	63			
2,4,6-Trichlorophenol													
Naphthalene													
2-Methylphenol													
2-Chlorophenol	290												
2,4,5-Trichlorophenol													
Nitrobenzene													
Benzyl alcohol													
4-Methylphenol													
Phenol	140												
Bis(2-Ethylhexyl)phthalate (1)	670	1100	1100	1400	1000	910	840	770	800	690	1300	1300	
Di-n-octyl phthalate													
Hexachlorobenzene													
2,4-Dichlorophenol													

NOTE: Only the compounds which were detected are listed on this table. For complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations.

FILE:SBSVM

PROJECT: BLUFF ROAD, S.C. NUMBER: 4086[illegible]

TABLE 4-2

3 10 00612

CONDENSED SEMI-VOLATILE RESULTS FOR SOIL BORINGS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J0452 B18,7/11	J0485 B19,11/15	J0483 B19,3/7	J0484 B19,7/11	J0481 B20,3/7	J0487 B21,3/7	J0486 B21,7/11	J0479 B22,3/7	J0480 B22,7/11	J0477 B23,3/7	J0478 B23,7/11	J0471 B24,3/7
Benzoic acid		50	200		79			61	77			
Hexachloroethane												
Di-n-butyl phthalate												
N-Nitrosodiphenylamine	130	200	180	68	290			120	70			
2,4,6-Trichlorophenol												
Naphthalene												
2-Methylphenol												
2-Chlorophenol												
2,4,5-Trichlorophenol												
Nitrobenzene												
Benzyl alcohol												
4-Methylphenol												
Phenol												
Bis(2-Ethylhexyl)phthalate (1)	730	490	790	620	610	770	970	680	900	500	910	490
Di-n-octyl phthalate												
Hexachlorobenzene												
2,4-Dichlorophenol												

NOTE: Only the compounds which were detected are listed on this table. For complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations.

PROJECT: BLUFF ROAD, S.C. NUMBER: 40861?

TABLE 4-2

3 10 00613

CONDENSED SEMI-VOLATILE RESULTS FOR SOIL BORINGS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J0469 B25,3/7	J0470 B25,7/11	J0467 B26,3/7	J0468 B26,7/11	J0465 B27,3/7	J0466 B27,7/11	J0463 B28,3/7	J0464 B28,7/11	J0459 B29,3/7	J0460 B29,7/11
Benzoic acid										
Hexachloroethane										
Di-n-butyl phthalate										
N-Nitrosodiphenylamine					260	68	50		140	50
2,4,6-Trichlorophenol										
Naphthalene										
2-Methylphenol										
2-Chlorophenol										
2,4,5-Trichlorophenol										
Nitrobenzene										
Benzyl alcohol										
4-Methylphenol										
Phenol										100
Bis(2-Ethylhexyl)phthalate {1}	710	520	940	630	290	550	620	940	500	1500
Di-n-octyl phthalate										
Hexachlorobenzene										
2,4-Dichlorophenol										

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar concentrations.

PROJECT: BLUFF ROAD, S.C. NUMBER: 408017

TABLE 4-2

3 10 00614

COMDENSED PESTICIDE AND PCB RESULTS FOR SOIL BORINGS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J0493 B1,3/7	J0495 B1,3/7	J0494 B1,7/11	J0496 B2,3/7	J0498 B2,3/7	J0497 B2,7/11	J0445 B3,3/7	J0446 B3,7/11	J1508 B4,3/7	J1509 B4,3/7	J1510 B4,7/11	J1512 B5,3/7	J1513 B5,3/7	J1514 B5,7/
gamma-BHC (Lindane)														
Aroclor-1242														
Methoxychlor												160	130	
Toxaphene												470	470	
Heptachlor													86	
Eldrin ketone													47	

ANALYTE (PPB)	J0475 B6,3/7	J0476 B6,7/11	J1505 B7,3/7	J1506 B7,3/7	J1507 B7,7/11	J0499 B8,3/7	J1501 B8,3/7	J1500 B8,7/11	J0492 B9,11/15	J0491 B9,3/7	J0490 B9,7/11	J0489 B10,3/7	J0455 B11, 3/7	J045 B11,
gamma-BHC (Lindane)							12							
Aroclor-1242							260			510				
Methoxychlor														
Toxaphene														
Heptachlor														
Eldrin ketone														

ANALYTE (PPB)	J0450 B12,3/7	J0454 B12,7/11	J0457 B13,3/7	J0458 B13,7/11	J0488 B14,3/7	J0482 B14,7/11	J0473 B15,3/7	J0474 B15,7/11	J0462 B16,3/7	J0461 B16,7/11	J0448 B17,3/7	J0449 B17,7/11	J0451 B18,3/7	J045 B18.
gamma-BHC (Lindane)														
Aroclor-1242														
Methoxychlor														
Toxaphene														
Heptachlor														
Eldrin ketone														

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations.

FILE:SBPPM

PROJECT: BLUFF ROAD, S.C. NUMBER: 406c.[illegible]

TABLE 4-2

3 10 00615

CONDENSED PESTICIDE AND PCB RESULTS FOR SOIL BORINGS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J0485 B19,11/1	J0483 B19,3/7	J0484 B19,7/11	J0481 B20,3/7	J0487 B21,3/7	J0486 B21,7/11	J0479 B22,3/7	J0480 B22,7/11	J0477 B23,3/7	J0478 B23,7/11	J0471 B24,3/7	J0469 B25,3/7	J0470 B25,7/11	J0467 B26,[illegible]
gamma-BHC (Lindane)														
Aroclor-1242														
Methoxychlor														
Toxaphene														
Heptachlor														
Eldrin ketone														

ANALYTE (PPB)	J0468 B26,7/11	J0465 B27,3/7	J0466 B27,7/11	J0463 B28,3/7	J0464 B28,7/11	J0459 B29,3/7	J0460 B29,7/11
gamma-BHC (Lindane)							
Aroclor-1242							
Methoxychlor							
Toxaphene							
Heptachlor							
Eldrin ketone							

NOTE: Only the compounds which were detected are listed on this table. For complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations.

TABLE 4-2

3 10 00616

CONDENSED METALS AND CYANIDE RESULTS FOR SOIL BORINGS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPM)	J0493 B1,3/7	J0495 B1,3/7	J0494 B1,7/11	J0496 B2,3/7	J0498 B2,3/7	J0497 B2,7/11	J0445 B3,3/7	J0446 B3,7/11	J1508 B4,3/7	J1509 B4,3/7	J1510 B4,7/11	J1512 B5,3/7
Aluminum	3310	6530	4160	3890	3770	5460	8210	12700	13200	10800	11400	11300
Iron	2730	7130	2780	4000	3130	4460	11200	8530	10400	10500	7700	9670
Magnesium	115	155	151	170	168	153	259	281	258	203	200	282
Manganese	11.1	26.4	5.3	54.9	69.8	211	14.7	8	148	148	7.9	35.8
Nickel								3	4	3	2	3
Potassium									450	375	277	324
Silver												
Sodium	41	27	44	25	37	34			48	48	79	50
Barium	19.9	22.7	17.9	37.4	41.3	58	28.5	59.8	50.4	46.1	17.3	42.9
Beryllium	0.1	0.2	0.1	0.2	0.2	0.3			0.3	0.2	0.1	0.2
Cadmium												
Chromium	4	8	3	6	6	6	9	7	15	13	6	18
Cobalt	3											2
Copper	2	3	2	4	2	3	3	4	20	16	20	22
Vanadium	10	18	7	14	13	10	25	25	26	26	18	24
Zinc	4.3	12.4	4.1	4.6	5.3	6.8	6.9	8.6	9	6.6	3.8	8.6
Calcium	158	159	101	373	388	236	316	231	167	160	242	475
Lead	6	4.7	3.7	4.7	7.2	6.4	2.6	3	6.4	4.9	4.3	3.8
Arsenic										0.4		
Thallium												
Selenium												
Mercury	0.03			0.04	0.05				0.03	0.04		0.37

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations.

TABLE 4-2

CONDENSED METALS AND CYANIDE RESULTS FOR SOIL BORINGS

3 10 00617

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPM)	J1513 B5,3/7	J1514 B5,7/11	J0475 B6,3/7	J0476 B6,7/11	J1505 B7,3/7	J1506 B7,3/7	J1507 B7,7/11	J0499 B8,3/7	J1501 B8,3/7	J1500 B8,7/11	J0492 B9,11/15	J0491 B9,3/7
Aluminum	7320	13400	2750	5110	16800	11000	15100	9120	2580	8540	2990	6080
Iron	8850	9540	4190	3140	22700	22700	7460	11400	3300	4480	1170	7920
Magnesium	197	236	117	185	228	166	177	586	304	128	95	227
Manganese	29.6	11.1	69.6	4.1	24.9	48.8	7.2	93.9	74.7	4.6	6.4	58.3
Nickel		3					3					
Potassium	199	167	134	331	239	266	172	663	342	591		118
Silver												
Sodium	45	38	56	30	57	42	34	263	266	160	174	162
Barium	35.9	22.7	23.1	34.6	30.5	62.9	29.7	53.9	53	22.2	19.5	45.1
Beryllium	0.2	0.2			0.2	0.3	0.2	0.2	0.2	0.1	0.2	0.3
Cadmium												
Chromium	15	8	5	3	14	15	8	14	8	7		6
Cobalt			3	2								
Copper	22	16	1	2	30	29	26	16	15	3	3	23
Vanadium	22	24	12	14	37	42	16	24	11	17	10	16
Zinc	5.5	7.8	3.2	4.3	6.9	5	4.6	34	30.3	5.5	13.2	42.7
Calcium	447	239	233	329	566	582	172	1900	1610	405	255	736
Lead	3.5	2.9	3.9	9.1	4.9	6.1	5.3	15	13.9	5.5	2.9	7.7
Arsenic												
Thallium												
Selenium				1.4								
Mercury	0.37	0.05	0.03	0.04	0.04	0.04	0.06	0.11	0.17			0.16

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations.

PROJECT: BLUFF ROAD, S.C. NUMBER 4085.

TABLE 4-2

CONDENSED METALS AND CYANIDE RESULTS FOR SOIL BORINGS

3 10 00618

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPM)	J0490 B9,7/11	J0489 B10,3/7	J0455 B10,7/11	J0456 B11,7/11	J0450 B12,3/7	J0454 B12,7/11	J0457 B13,3/7	J0458 B13,7/11	J0488 B14,3/7	J0482 B14,7/11	J0473 B15,3/7	J0474 B15,7/11
Aluminum	13600	3500	6640	8860	5820	9110	3940	5570	4340	5540	2950	2910
Iron	11200	2300	14000	5940	5660	3440	9310	2340	4990	4300	3540	1980
Magnesium	232	277	198	168	173	143	372	214	142	127	43	82
Manganese	11.7	9.4	19.4	3.6	26.4	8.6	13.9	9.8	3.4	2.1	19.4	16.2
Nickel	3					2	4					
Potassium	118										149	180
Silver									0.8	2.1		
Sodium	212	92	43				35	33	29		83	82
Barium	25.5	33.3	42.3	25.7	36.8	27.7	29.2	41	22.5	15.8	52.3	37.5
Beryllium	0.2	0.2								0.1	0.3	
Cadmium												
Chromium	9	3	8	5	6	7	5	4	4	4		3
Cobalt												
Copper	8	6	4	3	3	3	5	2	3	4	3	1
Vanadium	25	7	37	27	22	14	32	10	12	8	14	9
Zinc	23.7	7.4	3.9	2.7	19.5	4.4	14.1	3.9	2.6	3.3	5.5	2.4
Calcium	421	316	323	282	263	211	486	245	379	235	3630	567
Lead	11.4	7.8	5.1	3.3	8.2	4.7	28	5.1	5.2	4.3	9.9	8.4
Arsenic												
Thallium												
Selenium							9.7					
Mercury		0.03	0.04		0.03		0.1	0.04	0.04			

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar concentrations.

FILE:SBMM

PROJECT: BLUFF ROAD, S.C. NUMBER 408619

TABLE 4-2

CONDENSED METALS AND CYANIDE RESULTS FOR SOIL BORINGS

3 10 00619

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPM)	J0462 B16,3/7	J0461 B16,7/11	J0448 B17,3/7	J0449 B17,7/11	J0451 B18,3/7	J0452 B18,7/11	J0485 B19,11/15	J0483 B19,3/7	J0484 B19,7/11	J0481 B20,3/7	J0487 B21,3/7
Aluminum	4430	4800	4400	7470	2440	6650	6970	4780	9600	7880	6450
Iron	3830	1760	2360	2500	1960	5520	2480	5030	3470	3830	3540
Magnesium	85	103	89	178	75	143	211	107	194	178	128
Manganese	1.4	2.5	6.1	12.4	0.7	2.9	8.5	9.2	4.7	6.4	3.6
Nickel									2		
Potassium											
Silver								0.6			
Sodium	207	60	26		65	56	120	88	161	74	104
Barium	29.2	34.1	36.1	45.3	30.7	34.4	54.1	50.2	55.7	35.4	31.3
Beryllium	0.2	0.2			0.1	0.2	0.3	0.3	0.3	0.3	0.3
Cadmium								0.6			
Chromium	5	5	3	8	2	6	8	5	8	7	7
Cobalt											
Copper	8	4		2	7	6	4	4	5	2	3
Vanadium	12	8	8	10	14	16	12	17	13	11	11
Zinc	1.8	3.1	3.7	5.9	1.6	4.8	10.4	4.6	10	5.5	6.4
Calcium	25	88	144	194	30	66	746	834	204	335	34
Lead	2.4	2.9	5.6	6.1	5	5.7	4.7	7.4	5.2	3.9	6.8
Arsenic											
Thallium											
Selenium							2	0.7		0.4	
Mercury								0.03			

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations

PROJECT: BLUFF ROAD, S.C. NUMBER 406619
TABLE 4-2

3 10 00620

CONDENSED METALS AND CYANIDE RESULTS FOR SOIL BORINGS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPM)	J0486 B21,7/11	J0479 B22,3/7	J0480 B22,7/11	J0477 B23,3/7	J0478 B23,7/11	J0471 B24,3/7	J0469 B25,3/7	J0470 B25,7/11	J0467 B26,3/7	J0468 B26,7/11
Aluminum	2550	5880	4950	13600	6370	9270	14800	22100	4390	5650
Iron	2290	8650	3470	14800	2620	12900	31100	6320	10300	2240
Magnesium	99	225	141	342	168	309	816	488	169	196
Manganese	8.2	5.5	5.6	12	7.4	7.5	11	18	1.4	2
Nickel						4	8	8		
Potassium							103	209		
Silver		0.9								
Sodium	80	107	61	183	91	260	327	156	180	66
Barium	39.1	56.4	26.3	70.1	27.9	60.4	156	103	59.8	54.8
Beryllium	0.3	0.3	0.2	0.5	0.2	0.5	1	0.9	0.3	0.2
Cadmium									0.7	0.7
Chromium	2	7	6	12	4	10	16	24	4	4
Cobalt				3		4	13	5		
Copper	1	4	3	6	3	3	8	6	4	3
Vanadium	8	24	11	35	11	25	32	35	17	10
Zinc	2.5	7	7.1	16	7.2	21	18	25	2	3
Calcium	137	28	140	55	137	67	192	217	42	175
Lead	5.6	5.2	3.9	6.7	2.3	5.8	8.8	5.5	10	4
Arsenic										
Thallium					0.4					
Selenium			0.3							
Mercury										

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations.

FILE:SBMM

PROJECT: BLUFF ROAD, S.C. NUMBER 408619
TABLE 4-2

3 10 00621

CONDENSED METALS AND CYANIDE RESULTS FOR SOIL BORINGS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPM)	J0465 B27,3/7	J0466 B27,7/11	J0463 B28,3/7	J0464 B28,7/11	J0459 B29,3/7	J0460 B29,7/11
Aluminum	2710	2890	2000	3970	9040	454
Iron	1440	1390	2300	1450	25400	337
Magnesium	132	87	261	155	515	93
Manganese	0.5	1.5	3.1	3.3	12	6.5
Nickel						
Potassium				234	167	
Silver						
Sodium	307	64	800	160	733	43
Barium	61.7	34.8	148	32.9	85.3	20.5
Beryllium	0.3	0.2	0.6	0.2	0.7	0.2
Cadmium						
Chromium	2	3	2	6	12	
Cobalt			4		5	
Copper	9		2	10	14	3
Vanadium	5	10	7	12	38	6
Zinc	2.2	1.7	2.2	3.1	7.8	2.5
Calcium	40	86	76	111	39	254
Lead	3.9	3.8	3.9	2.3	5.8	2.3
Arsenic						
Thallium						
Selenium						
Mercury						

NOTE: Only the compounds which were detected are listed on this table. For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar concentrations.

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619
TABLE 4-3

CONDENSED VOLATILE RESULTS FOR SURFACE RUN-OFF WATER

3 10 00622

ANALYTE (PPB)	SAMPLE NUMBER / LOCATION IDENTIFICATION J0390 SR1	J0392 SR1	J0394 SR2
Acetone {1}	6	7	7

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619
TABLE 4-3

CONDENSED SEMI-VOLATILE RESULTS FOR SURFACE RUN-OFF WATER

ANALYTE (PPB)	SAMPLE NUMBER / LOCATION IDENTIFICATION J0390 SR1	J0392 SR1	J0394 SR2
bis(2-Ethylhexyl) phthalate {1}		13	7

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619
TABLE 4-3

CONDENSED PESTICIDE AND PCB RESULTS FOR SURFACE RUN-OFF WATER

ANALYTE (PPB)	SAMPLE NUMBER / LOCATION IDENTIFICATION J0390 SR1	J0392 SR1	J0394 SR2

NOTE: Only the compounds which were detected are listed on this table. For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar concentrations.

TABLE 4-3

CONDENSED METAL RESULTS FOR SURFACE RUNOFF WATER

3 10 00623

ANALYTE (PPM)	SAMPLE NUMBER/LOCATION IDENTIFICATION		
	J0390 SR1	J0392 SR1	J0394 SR2
Aluminum	2.94	10	5.13
Barium	0.134	0.127	0.201
Calcium	2.08	2.09	2.01
Cobalt			0.024
Copper	0.012	0.011	0.012
Iron	7.09	10.8	8.34
Lead	0.005	0.004	0.014
Magnesium	0.758	0.943	0.739
Manganese	0.925	0.892	1.63
Sodium	2.58	2.92	2.06
Vanadium		0.016	0.012
Zinc	0.025	0.041	0.06

NOTE: Only the compounds which were detected are listed on this table. For complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations.

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619
TABLE 4-4

CONDENSED VOLATILE RESULTS FOR SURFACE RUNOFF SEDIMENT

3 10 00624

ANALYTE (PPB)	SAMPLE NUMBER / LOCATION IDENTIFICATION J0391 RS1	J0393 RS2
Acetone {1}	100	82
Methylene chloride {1}	15	27
Toluene	6	17

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619
TABLE 4-4

CONDENSED SEMI-VOLATILE RESULTS FOR SURFACE RUNOFF SEDIMENT

ANALYTE (PPB)	SAMPLE NUMBER / LOCATION IDENTIFICATION J0391 RS1	J0393 RS2
Benzoic acid *		1100
Bis(2-ethylhexyl)phthalate {1}	740	670

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619
TABLE 4-4

CONDENSED PESTICIDE AND PCB RESULTS FOR SURFACE RUNOFF SEDIMENT

ANALYTE (PPB)	SAMPLE NUMBER / LOCATION IDENTIFICATION J0391 RS1	J0393 RS2

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar concentrations.

TABLE 4-4

CONDENSED METAL AND CYANIDE RESULTS FOR SURFACE RUNOFF SEDIMENT

3 10 00625

ANALYTE (PPM)	SAMPLE NUMBER / LOCATION IDENTIFICATION J0391 RS1	J0393 RS2
Aluminum	10600	4400
Iron	7990	4350
Magnesium	265	103
Manganese	308	163
Nickel	6	
Barium	125	67.9
Beryllium	0.6	0.2
Chromium	13	6
Cobalt	8	4
Copper	11	6
Vanadium	24	14
Zinc	20	13
Calcium	485	226
Lead	35.1	16.9
Mercury	0.09	0.06

NOTE: Only the compounds which were detected are listed on this table. For complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations.

FILE:WLWM PROJECT: BLUFF ROAD, S.C. NUMBER: 408619

TABLE 4-5

3 10 00626 CONDENSED VOLATILE RESULTS FOR WET LAGOON WATER SAMPLE

ANALYTE (PPB)	SAMPLE NUMBER/LOCATION IDENTIFICATION J0363 WLW1	J0364 WLW2	J0365 WLW3
Methylene chloride {1}	2	2	1
Acetone	7		
1,1-dichloroethane	1		
1,1,1-trichloroethane	1		
Tetrachloroethene	1		

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619

TABLE 4-5

CONDENSED SEMI-VOLATILE RESULTS FOR WET LAGOON WATER SAMPLE

ANALYTE (PPB)	SAMPLE NUMBER/LOCATION IDENTIFICATION J0363 WLW1	J0364 WLW2	J0365 WLW3
Bis(2-ethylhexyl)phthalate {1}			14

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619

TABLE 4-5

CONDENSED PESTICIDE AND PCB RESULTS FOR WET LAGOON WATER SAMPLE

ANALYTE (PPB)	SAMPLE NUMBER/LOCATION IDENTIFICATION J0363 WLW1	J0364 WLW2	J0365 WLW3

NOTE: Only the compounds which were detected are listed on this table. For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar concentrations.

FILE:WLWM PROJECT: BLUFF ROAD, S.C. NUMBER: 408619

TABLE 4-5

3 10 00627 CONDENSED METAL RESULTS FOR WET LAGOON WATER SAMPLE

ANALYTE (PPM)	SAMPLE NUMBER/LOCATION IDENTIFICATION J0363 WLW1	J0364 WLW2	J0365 WLW3
Aluminum	0.16	0.071	
Arsenic	0.004		
Barium	0.03	0.037	0.038
Calcium	72.5	67.7	68.3
Iron	0.212	0.17	0.158
Magnesium	1.34	0.842	0.859
Manganese	0.013	0.026	0.027
Mercury	0.0006		
Potassium	7.98	5.09	5
Sodium	13.9	11.6	11.6
Selenium		0.003	
Vanadium		0.011	0.011
Zn	0.011	0.012	0.012

NOTE: Only the compounds which were detected are listed on this table. For complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations.

3 10 00628

FILE:WLSM

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619
TABLE 4-6

CONDENSED VOLATILE RESULTS FOR WET LAGOON SEDIMENTS

ANALYTE (PPB)	SAMPLE NUMBER/LOCATION IDENTIFICATION J0358 WLS3	J0359 WLS1	J0362 WLS2
Methylene chloride {1}	9	35	28
Acetone {1}	24	340	92
Carbon disulfide	10		3
Toluene		5	2

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619
TABLE 4-6

CONDENSED SEMI-VOLATILE RESULTS FOR WET LAGOON SEDIMENTS

ANALYTE (PPB)	SAMPLE NUMBER/LOCATION IDENTIFICATION J0358 WLS3	J0359 WLS1	J0362 WLS2
Bis(2-ethylhexyl)phthalate {1}	900	1,700	1,200
Phenol			800
Di-n-butylphthalate		180	130

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619
TABLE 4-6

CONDENSED PESTICIDE AND PCB RESULTS FOR WET LAGOON SEDIMENTS

ANALYTE (PPB)	SAMPLE NUMBER/LOCATION IDENTIFICATION J0358 WLS3	J0359 WLS1	J0362 WLS2

NOTE: Only the compounds which were detected are listed on this table. For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar concentrations.

3 10 00629

FILE:WLSM

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619

TABLE 4-6

CONDENSED METAL RESULTS FOR WET LAGOON SEDIMENTS

SAMPLE NUMBER/LOCATION IDENTIFICATION

ANALYTE (PPM)	J0358 WLS3	J0359 WLS1	J0362 WLS2
Aluminum	9,700	3,390	14,500
Antimony		6	
Arsenic		1.6	
Barium	75.4	22.9	164
Beryllium	0.6	0.3	0.8
Calcium	5,820	443,000	66,000
Chromium	9	42	11
Copper	4	13	5
Iron	6,640	1,620	7,710
Lead	19	12.8	9.6
Magnesium	151	494	312
Manganese	21.7	108	27
Mercury		0.62	0.05
Nickel		13	
Sodium	247	350	428
Vanadium	23	29	24
Zinc	20	32	7
Cyanide		13.2	

NOTE: Only the compounds which were detected are listed on this table. For complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations.

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619

TABLE 4-7

CONDENSED VOLATILE RESULTS FOR DRY LAGOON SEDIMENTS

ANALYTE (PPB)	SAMPLE NUMBER/LOCATION IDENTIFICATION J0356 DLS1	J0360 DLS2	J0361 DLS3
Vinyl chloride	24		
Methylene chloride	79	4,700	120
Acetone	430	4,500	960
1,1-dichloroethene	13		240
1,1-dichloroethane			360
1,2-dichloroethene	48		
1,2-dichloroethane	120		
2-butanone			27
Trichloroethene	180	23,000	220
1,1,1-trichloro-ethane	48		820
Benzene		590	6
Tetrachloroethene	17,000	14,000	100
Toluene	350	1,000	200
Ethylbenzene	22		93
Total xylenes	150		590

NOTE: Only the compounds which were detected are listed on this table for complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations.

3 10 00631

FILE:DLSM

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619
TABLE 4-7

CONDENSED SEMI-VOLATILE RESULTS FOR DRY LAGOON SEDIMENTS

ANALYTE (PPB)	SAMPLE NUMBER/LOCATION IDENTIFICATION J0356 DLS1	J0360 DLS2	J0361 DLS3
Bis(2-ethylhexyl)phthalate {1}	1,300	1,500	4,100
Phenol		9,400	15,000
Benzoic acid			140
Di-n-butylphthalate	110	82	210

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619
TABLE 4-7

CONDENSED PESTICDE AND PCB RESULTS FOR DRY LAGOON SEDIMENTS

ANALYTE (PPB)	SAMPLE NUMBER/LOCATION IDENTIFICATION J0356 DLS1	J0360 DLS2	J0361 DLS3
4,4'-DDE	30		
Endosulfan sulfate			600

NOTE: Only the compounds which were detected are listed on this table. For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar concentrations.

3 10 00632

FILE:DLSM

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619

TABLE 4-7

CONDENSED METAL RESULTS FOR DRY LAGOON SEDIMENTS

SAMPLE NUMBER/LOCATION IDENTIFICATION

ANALYTE (PPM)	J0356 DLS1	J0360 DLS2	J0361 DLS3
Aluminum	3,820	8,070	4,060
Arsenic		1.8	
Barium	33.9	24.2	5
Beryllium	0.6		
Cadmium	2		
Calcium	29,500	230,000	454,000
Chromium	1,610	2	17
Cobalt	7	34	
Copper	9	18	8
Iron	5,980	19,200	2,260
Lead	11.1	23.4	2.7
Magnesium	184		281
Manganese	145	110	13.8
Mercury	1.1	3.74	0.16
Nickel	9	229	8
Potassium	475		
Silver		164	22
Sodium	396	455	1,020
Selenium			1.7
Vanadium	17	56	35
Zinc	44	24	16
Cyanide	0.84	2.9	9.1

NOTE: Only the compounds which were detected are listed on this table. For complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations.

FILE:GWVM

PROJECT: BLUFF ROAD, S.C. NUMBER 408619
TABLE 4-8

3 10 00633

CONDENSED VOLATILE RESULTS FOR ALL GOLDER WELLS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J0408 DW1	J0416 DW1	J0411 DW2	J0415 DW3	J0389 P6	J0397 P7	J0423 P8	J0424 P9	J0422 P10	J0409 P11	J0413 P12	J0414 P13	J0410 P14	J0419 P15
Carbon tetrachloride							4	72	100	5	3	5	11	
Acetone {1}	19	5	9	20	7		150	36	5600	29	12	11	7800	50
Chloroform						110	5	280	380	9		140	2800	4
Benzene									28				110	
1,1,1-Trichloroethane						18	2	74	190	130		31	1900	37
Vinyl chloride														
Methylene chloride {1}			1	2		1			44				1600	
1,1-Dichloroethane								2	1600	7		75	2000	20
1,1-Dichloroethene						7		31	320	40		36	1300	12
1,2-Dichloropropane													31	
2-Butanone													720	
1,1,2-Trichloroethane						6								
Trichloroethene						100	2	8	120	2		16	330	2
1,1,2,2-Tetrachloroethane							2		120				180	6
Ethylbenzene									160				76	
1,2-Dichloroethane									160				100	
4-Methyl-2-pentanone													270	
Toluene									410				860	4
Chlorobenzene													23	
Tetrachlorethene						8	7	31	73	9	20	18	290	
1,2-Dichloroethylene								4	1700	13		39	1900	42
Total xylenes									45				140	

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar concentrations.

PROJECT: BLUFF ROAD, S.C. NUMBER 408619

TABLE 4-8

CONDENSED VOLATILE RESULTS FOR ALL GOLDER WELLS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J0417 P16	J0418 P16	J0399 P17	J0400 P18	J0401 P19	J0388 P20	J0402 P21	J0398 P22
Carbon tetrachloride				120		5	9	59
Acetone {1}	2200	2200	6	20	9	16	15	7
Chloroform	670	710		170			4	49
Benzene	64	70		9				
1,1,1-Trichloroethane	560	640		240				14
Vinyl chloride				13				
Methylene chloride {1}	180	170		5				1
1,1-Dichloroethane	1800	1900		160				
1,1-Dichloroethene	590	640		260				11
1,2-Dichloropropane		17		3				
2-Butanone	230	260						
1,1,2-Trichloroethane				89				2
Trichloroethene	190	210		77				8
1,1,2,2-Tetrachloroethane	120	140		140				24
Ethylbenzene	67	77						
1,2-Dichloroethane		120		37				
4-Methyl-2-pentanone	67	77						
Toluene	580	620						
Chlorobenzene								
Tetrachlorethene	110	120		180		2		33
1,2-Dichloroethylene	1200	1300		250				
Total xylenes	150	170		3				

NOTE: Only the compounds which were detected are listed on this table. For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar concentrations.

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619

TABLE 4-8

3 10 00635

CONDENSED SEMI-VOLATILE RESULTS FOR ALL GOLDER WELLS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J0408 DW1	J0416 DW1	J0411 DW2(*)	J0415 DW3(*)	J0389 P6(*)	J0397 P7(*)	J0423 P8(*)	J0424 P9(*)	J0422 P10	J0409 P11	J0413 P12(*)	J0414 P13(*)	J0410 P14	J0419 P15(*)
Benzoic acid													19	
Isophorone													6	
N-Nitrosodiphenylamine													2	
Naphthalene													4	
2-Methylphenol									3				2	
1,2-Dichlorobenzene									150				250	
2-Chlorophenol									400				800	
1,4-Dichlorobenzene									13				10	
Phenol									89				260	
bis(2-Chloroethyl)ether									6				7	
bis(2-Ethylhexyl) phthalate (1)													2	
1,2,4-Trichlorobenzene													8	

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations.
(*) Analysis not requested.

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619

TABLE 4-8

3 10 00636

CONDENSED SEMI-VOLATILE RESULTS FOR ALL GOLDER WELLS

ANALYTE (PPB)	SAMPLE NUMBER / LOCATION IDENTIFICATION							
	J0417 P16	J0418 P16	J0399 P17(*)	J0400 P18(*)	J0401 P19	J0388 P20(*)	J0402 P21(*)	J0398 P22(*)
Benzoic acid								
Isophorone								
N-Nitrosodiphenylamine								
Naphthalene	3	3						
2-Methylphenol								
1,2-Dichlorobenzene	190	180						
2-Chlorophenol	340	290						
1,4-Dichlorobenzene	6	6						
Phenol	130	43						
bis(2-Chloroethyl)ether	5	5						
bis(2-Ethylhexyl) phthalate {1}								
1,2,4-Trichlorobenzene								

NOTE: Only the compounds which were detected are listed on this
For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar concentrations.
(*) Analysis not requested.

TABLE 4-8

3 10 00637

CONDENSED PESTICIDE AND PCB RESULTS FOR ALL GOLDER WELLS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J0408 DW1	J0416 DW1	J0411 DW2(*)	J0415 DW3(*)	J0389 P6(*)	J0397 P7(*)	J0423 P8(*)	J0424 P9(*)	J0422 P10	J0409 P11	J0413 P12(*)	J0414 P13(*)
Heptachlor									0.12			

ANALYTE (PPB)	J0410 P14	J0419 P15(*)	J0417 P16	J0418 P16	J0399 P17(*)	J0400 P18(*)	J0401 P19	J0388 P20(*)	J0402 P21(*)	J0398 P22(*)
Heptachlor										

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations.
(*) Analysis not requested.

PROJECT: BLUFF ROAD, S.C. NUMBER: 406619

TABLE 4-8

3 10 00638

CONDENSED METALS AND CYANIDE RESULTS FROM ALL GOLDER WELLS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPM)	J0408 DW1	J0416 DW1	J0411 DW2	J0415 DW3	J0389 P6	J0397 P7	J0423 P8	J0424 P9	J0422 P10	J0409 P11	J0413 P12	J0414 P13	J0410 P14	J0419 P15
Aluminum		0.083	1.66	1.98	21	4.86	0.135	0.139	0.158	3.46	2.96	0.621	0.158	0.585
Iron	0.174	0.166	0.386	0.521	3.04	1.68	0.023	0.014	0.227	1.61	1.62	0.232	3.26	0.183
Magnesium	0.072	0.036	0.568	0.696	3.97	9.22	1.82	2.15	9.44	1.22	1.14	2.38	14.8	1.05
Manganese	0.028	0.025	0.023	0.01	0.101	0.508	0.004	0.014	0.772	0.008	0.012	0.406	4.7	0.009
Nickel						0.031							0.022	
Potassium	1.31		2.13	1.34	3.96	4	1.92	1.72	2.13		2	2.5	2.43	
Silver					0.009	0.012							0.005	
Sodium	6.57	5.39	2.13	1.6	2.1	7.99	3.32	5.71	12.1	11.8	5.82	3.13	15.3	2.23
Antimony													0.039	
Barium	0.005	0.004	0.034	0.025	0.933	3.04	0.066	0.103	0.148	0.113	0.112	0.096	0.251	0.071
Beryllium					0.001	0.019								
Cadmium								0.006	0.006				0.006	
Chromium				0.015	0.013								0.013	
Cobalt						0.06							0.028	
Copper				0.017	0.033	0.062								
Vanadium				0.026	0.027	0.069								
Zinc	0.032	0.029	0.013	0.03	0.023	0.152		0.018	0.008	0.014	0.013	0.01	0.015	0.013
Calcium	0.541	0.433	1.55	23.6	8.26	18.8	4.43	6.02	16.7	2.57	2.22	5.54	29	2.04
Lead			0.003	0.018	0.061	0.029				0.002		0.057		
Mercury		0.0003								0.0004		0.0003		0.0003
Cyanide											0.011			

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations.

TABLE 4-8

CONDENSED METALS AND CYANIDE RESULTS FROM ALL GOLDER WELLS

3 10 00639

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPM)	J0417 P16	J0418 P16	J0399 P17	J0400 P18	J0401 P19	J0388 P20	J0402 P21	J0398 P22
Aluminum	0.285	0.237	152	2.59	14.6	5.1	0.752	1.31
Iron	6.09	5.85	23.4	0.86	7.1	2.46	0.332	0.269
Magnesium	8.91	8.39	2.94	3.35	1.73	8.72	1.54	3.51
Manganese	6.44	6.06	0.102	0.052	0.212	2.47	0.011	0.063
Nickel			0.05			0.028		
Potassium	1.63	1.84	1.44	2.06	1.39	4.2	1.97	3.14
Silver			0.005			0.02		0.016
Sodium	10.2	9.59	6.76	9.34	16.5	9.09	4.71	2.6
Antimony								
Barium	0.206	0.187	1	0.148	0.145	2.48	0.08	0.822
Beryllium			0.01		0.001	0.017		0.001
Cadmium	0.005	0.005						
Chromium			0.115		0.018	0.011		
Cobalt	0.063	0.049	0.022		0.048	0.09		
Copper			0.07	0.02	0.034	0.049	0.015	0.031
Vanadium			0.166		0.027	0.044		0.022
Zinc	0.008	0.006	0.084	0.017	0.063	0.119	0.01	0.019
Calcium	19.3	18.2	8.23	3.94	1.94	24.5	3.91	7.96
Lead			0.036		0.01	0.174		0.051
Mercury		0.0004		0.0128		0.0005		
Cyanide								

NOTE: Only the compounds which were detected are listed on this table. For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar concentrations.

TABLE 4-9

CONDENSED VOLATILE RESULTS FOR THE IT WELLS

3 10 00640

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J1533 1A	J1532 1B	J1554 2A	J1553 2B	J1557 3B	J1578 3C	J1522 4A	J1523 4B	J1537 5B	J1559 6B	J0430 7A	J1530 7B	J1531 7B	J1566 7C	J1567 7C
Carbon tetrachloride				13			190	130		10					
Acetone {1}	80	10	18000	640	20	3	53	65	36	170	2	12	12	8	7
Chloroform	2			540			1700	2000		84	3	1	2		
Benzene			110							6					
1,1,1-Trichloroethane				21			130	110		38					
Methylene chloride {1}		2	2	4			35	22							
Carbon disulfide	4														
1,1-Dichloroethane			2000	2			75	74		260					
1,1-Dichloroethene			1200	16			64	65		120					
1,2-Dichloropropane			21							2					
2-Butanone			2100												
1,1,2-Trichloroethane			9							4					
Trichloroethene			2	16			220	100		69					
1,1,2,2-Tetrachloroethane			7	5			440	78		14					
Ethylbenzene			220							1					
1,2-Dichloroethane			280							36					
4-Methyl-2-pentanone			98												
Toluene			980							6					
Chlorobenzene			16												
Tetrachlorethene			2	25				36		11					
1,2-Dichloroethylene			6800				130	57		530					
Total xylenes			360							4					

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar concentrations.

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619

TABLE 4-9

3 10 00641

CONDENSED VOLATILE RESULTS FOR THE IT WELLS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J1538 8B	J1560 9B	J1577 9C	J1558 10B	J0426 11A	J0429 11B	J1524 12A	J1525 12B	J1582 12C	J1563 13B
Carbon tetrachloride				2				25		200
Acetone {1}	36	90	19	18	5	25	54	17	4	47
Chloroform							3	2		530
Benzene										
1,1,1-Trichloroethane								5		260
Methylene chloride {1}			1							2
Carbon disulfide										
1,1-Dichloroethane										10
1,1-Dichloroethene								1		190
1,2-Dichloropropane										2
2-Butanone										
1,1,2-Trichloroethane										2
Trichloroethene										45
1,1,2,2-Tetrachloroethane										71
Ethylbenzene										
1,2-Dichloroethane										12
4-Methyl-2-pentanone										
Toluene										
Chlorobenzene										
Tetrachlorethene				2				27		68
1,2-Dichloroethylene										9
Total xylenes										

NOTE: Only the compounds which were detected are listed on this table. For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar concentrations.

TABLE 4-9

3 10 00642

CONDENSED SEMI-VOLATILE RESULTS FOR IT WELLS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J1533 1A(*)	J1532 1B(*)	J1554 2A(*)	J1553 2B(*)	J1557 3B(*)	J1578 3C(*)	J1522 4A	J1523 4B	J1537 5B(*)	J1559 6B(*)	J0430 7A(*)	J1530 7B
Diethyl phthalate												
N-Nitrosodiphenylamine												4
1,2-Dichlorobenzene							4					

ANALYTE (PPB)	J1531 7B(*)	J1566 7C	J1567 7C	J1538 8B(*)	J1560 9B(*)	J1577 9C(*)	J1558 10B(*)	J0426 11A(*)	J0429 11B(*)	J1524 12A	J1525 12B	J1582 12C(*)	J1563 13B(*)
Diethyl phthalate		2											
N-Nitrosodiphenylamine													
1,2-Dichlorobenzene													

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations.
(*) Analysis not requested.

TABLE 4-9

CONDENSED PESTICIDE AND PCB RESULTS FOR IT WELLS

3 10 00643

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J1533 1A(*)	J1532 1B(*)	J1554 2A(*)	J1553 2B(*)	J1557 3B(*)	J1578 3C(*)	J1522 4A	J1523 4B	J1537 5B(*)	J1559 6B(*)	J0430 7A(*)	J1530 7B

ANALYTE (PPB)	J1531 7B(*)	J1566 7C	J1567 7C	J1538 8B(*)	J1560 9B(*)	J1577 9C(*)	J1558 10B(*)	J0426 11A(*)	J0429 11B(*)	J1524 12A	J1525 12B	J1582 12C(*)	J1563 13B(*)

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations.
(*) Analysis not requested.

PROJECT: BLUFF ROAD, S.C. NUMBER: 406619

TABLE 4-9

3 10 00644

CONDENSED METAL AND CYANIDE RESULTS FOR IT WELLS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPM)	J1533 1A	J1532 1B	J1554 2A	J1553 2B	J1557 3B	J1578 3C	J1522 4A	J1523 4B	J1537 5B	J1559 6B	J0430 7A	J1530 7B	J1531 7B
Aluminum	9.67		217	310	0.424	0.654	2.15	0.051	3.53	52.7	3.7	0.33	0.824
Iron	1.52	0.088	156	58.1	0.079	0.966	3.4	0.017	0.883	47.1	1.38	0.043	0.139
Magnesium	1.52	1.8	15.6	6.9	1.33	0.758	1.4	1.76	0.45	5 29	2.36	1.66	1.72
Manganese	0.171	0.06	3.04	0.552	0.178	0.051	0.04	0.08	0.043	0.701	0.094	0.126	0.131
Nickel	0.021		0.079	0.185						0.061	0.025		
Potassium	2.59	1.04	7.41	6.97	1.85			2.33		5.27	1.37	2.17	2.11
Sodium	13.3	1.46	37.5	6		3.03	16.8	6	4.77	25	14.5	7.21	7.53
Barium	0.104	0.01	1.77	3.27	0.061	0.041	0.115	0.062	0.031	0.394	0.111	0.077	0.083
Beryllium	0.001		0.01	0.066						0.009			
Cadmium									0.006	0.007	0.006	0.006	
Chromium			0.161	0.315					0.015	0.046			
Cobalt	0.023	0.021	0.069	0.058						0.028		0.049	0.034
Copper	0.025	0.01	0.102	0.411	0.014	0.012			0.027	0.058			
Vanadium	0.016		0.293	0.833						0.17			
Zinc	0.071	0.043	0.258	0.551	0.004	0.022	0.023	0.009	0.075	0.147	0.057	0.025	0.044
Calcium	7.94	4.21	51.9	23.3	5.73	3.01	1.81	4.99	2.05	20	3.78	5.61	5.78
Lead	0.016		0.132	0.257		0.005				0.026			
Arsenic													
Selenium													0.003
Mercury			0.0006	0.0009			0.0003	0.0003					

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations.

FILE:ITMM

3 10 00645

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619

TABLE 4-9

CONDENSED METAL AND CYANIDE RESULTS FOR IT WELLS

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPM)	J1566 7C	J1567 7C	J1538 8B	J1560 9B	J1577 9C	J1558 10B	J0426 11A	J0429 11B	J1524 12A	J1525 12B	J1582 12C	J1563 13B
Aluminum	8.26	7.27	0.347	43.5	1.05	59	1.16	3.42	11.9	0.396	1.02	8.4
Iron	3.55	5.29	0.06	10.2	0.45	90	1.7	0.705	13	0.103	0.264	1.5
Magnesium	0.822	0.705	0.56	2.19	5.29	3.23	15.3	0.718	1.6	1.99	0.336	1.61
Manganese	0.03	0.045	0.09	0.137	0.184	0.665	0.222	0.076	0.097	0.101	0.043	0.011
Nickel				0.029	0.02	0.086						
Potassium	6.29	4.25	1.18	1.9	1	2.38			2.04	2.37		2.73
Sodium	22.3	215	5.05	7.02	14.1	6.02	1.37	5.9	9.35	5.64	6.87	5.6
Barium	0.077	0.072	0.023	0.227	0.105	0.394	0.067	0.05	0.266	0.114	0.025	0.08
Beryllium		0.0001	0.001	0.003		0.013			0.003			
Cadmium	0.037	0.035				0.01						
Chromium	0.01	0.013		0.04		0.139	0.01		0.013			0.011
Cobalt						0.154		0.021				0.02
Copper		0.112	0.017	0.04	0.012	0.114	0.017		0.018		0.012	0.012
Vanadium	0.015	0.022		0.053		0.534			0.043			0.019
Zinc	0.441	0.429	0.037	0.098	0.019	0.362	0.021	0.028	0.04	0.02	0.017	0.073
Calcium	6.77	6.26	2.84	11.8	19.2	13.6	84.5	6.05	2.06	5.2	2.43	12.8
Lead	0.042	0.03		0.03	0.007	0.084		0.005	0.012		0.005	0.024
Arsenic	0.004											
Selenium	0.003											
Mercury						0.0003			0.0002			

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: (1) The compound was found in the associated blanks, possibly at similar concentrations.

Table 4-10. Air Monitoring Samples

Compound	Detection Limit	J0334	J0335	J0336	Method Blank
Chloromethane	40	ND	ND	ND	ND
Bromomethane	40	ND	ND	ND	ND
Vinyl chloride	40	ND	ND	ND	ND
Chloroethane	40	ND	ND	ND	ND
Dichloromethane (methylene chloride)	20	ND	ND	ND	ND
Acetone	40	ND	ND	ND	ND
Carbon disulfide	20	ND	ND	ND	ND
1,1-Dichloroethylene	20	ND	ND	ND	ND
1,1-Dichloroethane	20	ND	ND	ND	ND
1,2-Dichloroethenes (Total)	20	ND	ND	ND	ND
Chloroform	20	ND	ND	ND	ND
1,2-Dichloroethane	20	ND	ND	ND	ND
Methyl ethyl ketone (2-Butanone)	40	ND	ND	ND	ND
1,1,1-Trichloroethane	20	ND	ND	ND	ND
Carbon tetrachloride	20	ND	ND	ND	ND
Vinyl acetate	40	ND	ND	ND	ND
Bromodichloromethane	20	ND	ND	ND	ND
1,2-Dichloropropane	20	ND	ND	ND	ND
trans-1,3-Dichloropropene	20	ND	ND	ND	ND
Trichloroethene	20	ND	ND	ND	ND
Chlorodibromomethane	20	ND	ND	ND	ND
1,1,2-Trichloroethane	20	ND	ND	ND	ND
Benzene	20	ND	ND	ND	ND
cis-1,3-Dichloropropene	20	ND	ND	ND	ND
2-Chloroethyl vinyl ether	40	ND	ND	ND	ND
Tribromomethane, (Bromoform)	20	ND	ND	ND	ND
2-Hexanone	40	ND	ND	ND	ND
4-Methyl-2-pentanone	40	ND	ND	ND	ND
Tetrachloroethene	20	ND	ND	ND	ND
1,2,2,2-Tetrachloroethane	20	ND	ND	ND	ND
Toluene	20	27	22	ND	ND
Chlorobenzene	20	ND	ND	ND	ND
Ethyl benzene	20	ND	ND	ND	ND
Styrene	20	ND	ND	ND	ND
Xylenes (Total)	20	ND	ND	ND	ND
Acrolein	80	ND	ND	ND	ND
Acrylonitrile	20	ND	ND	ND	ND
Dichlorobenzenes	20	ND	ND	ND	ND

ND - The analyte was not detected at or above the stated detection limit.

Table 4-11. Field Quality Assurance/Quality Control Summary

Sampling Task	Duplicate Samples		Field Blanks		Trip Blanks		Percent Completeness
	Required	Performed	Required	Performed	Required	Performed	
Surface soils	3	4	1	1	1	1	120
Golder wells	2	2	1	1	1	1	100
Surface runoff water	1	1	1	1	1	1	100
Surface runoff sediment	1	0	1	1	-	-	50
Wet lagoon water	-	-	1	1	-	-	100
Wet lagoon sediment	-	-	1	1	-	-	100
Dry lagoon sediment	-	-	1	1	-	-	100
Lagoon soils	1	N/A	1	N/A	1	N/A	N/A
Temporary wells	1	N/A	1	N/A	1	N/A	N/A
Soil borings	3	6	1	2	1	1	180
New wells	2	3	1	2	1	2	175

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TABLE 4-12
EPA CHECK SAMPLES

SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULTS	QUALIFIER	UNITS	PRODUCT CODE	SAMPLE LOCATION	FLAG
L0826880915-1	50-29-3	4,4'-DDT	17	U	UG/KG	GC 723	EPC	TRG
	60-57-1	Dieldrin	17	U	UG/KG		EPC	
	72-43-5	Methoxychlor	170		UG/KG		EPC	
	72-55-9	4,4'-DDE	17	U	UG/KG		EPC	
	IT0-001	% Moisture	6		% MOISTURE		EPC	
	319-84-6	alpha-BHC	8.5	U	UG/KG		EPC	
	319-86-8	delta-BHC	8.5	U	UG/KG		EPC	
	1024-57-3	Heptachlor epoxide	8.5	U	UG/KG		EPC	
	5103-71-9	alpha-Chlordane	85	U	UG/KG		EPC	
	8001-35-2	Toxaphene	170	U	UG/KG		EPC	
	11097-69-1	Aroclor-1254	170	U	UG/KG		EPC	
	11141-16-5	Aroclor-1232	85	U	UG/KG		EPC	
	12674-11-2	Aroclor-1016	85	U	UG/KG		EPC	
	53469-21-9	Aroclor-1242	85	U	UG/KG		EPC	
	53494-70-5	Endrin ketone	17	U	UG/KG		EPC	
	33213-65-9	Endosulfan II	17	U	UG/KG		EPC	
	12672-29-6	Aroclor-1248	85	U	UG/KG		EPC	
	11104-28-2	Aroclor-1221	440	U	UG/KG		EPC	
	11096-82-5	Aroclor-1260	170	U	UG/KG		EPC	
	5103-74-2	gamma-Chlordane	85	U	UG/KG		EPC	
	1031-07-8	Endosulfan sulfate	17	U	UG/KG		EPC	
	959-98-8	Endosulfan-I	25		UG/KG		EPC	
	319-85-7	beta-BHC	8.5	U	UG/KG		EPC	
	309-00-2	Aldrin	8.5	U	UG/KG		EPC	
	76-44-8	Heptachlor	22		UG/KG		EPC	
	72-54-8	4,4'-DDD	17	U	UG/KG		EPC	
	72-20-8	Endrin	40		UG/KG		EPC	
	58-89-9	gamma-BHC (Lindane)	24		UG/KG		EPC	

TABLE 4-12
EPA CHECK SAMPLES

SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULTS	QUALIFIER	UNITS	PRODUCT CODE	SAMPLE LOCATION	FLAG
L0826880915-2	50-29-3	4,4'-DDT	17	U	UG/KG	GC 723	EPC	TRG
	319-84-6	alpha-BHC	8.7	U	UG/KG		EPC	
	319-86-8	delta-BHC	8.7	U	UG/KG		EPC	
	959-98-8	Endosulfan-I	8.7	U	UG/KG		EPC	
	1024-57-3	Heptachlor epoxide	8.7	U	UG/KG		EPC	
	5103-71-9	alpha-Chlordane	87	U	UG/KG		EPC	
	5103-74-2	gamma-Chlordane	87	U	UG/KG		EPC	
	8001-35-2	Toxaphene	170	U	UG/KG		EPC	
	11097-69-1	Aroclor-1254	170	U	UG/KG		EPC	
	11104-28-2	Aroclor-1221	100	U	UG/KG		EPC	
	11141-16-5	Aroclor-1232	87	U	UG/KG		EPC	
	12674-11-2	Aroclor-1016	87	U	UG/KG		EPC	
	33213-65-9	Endosulfan II	17	U	UG/KG		EPC	
	53469-21-9	Aroclor-1242	87	U	UG/KG		EPC	
	53494-70-5	Endrin ketone	17	U	UG/KG		EPC	
	12672-29-6	Aroclor-1248	87	U	UG/KG		EPC	
	11096-82-5	Aroclor-1260	170	U	UG/KG		EPC	
	1031-07-8	Endosulfan sulfate	17	U	UG/KG		EPC	
	319-85-7	beta-BHC	8.7	U	UG/KG		EPC	
	72-54-8	4,4'-DDD	17	U	UG/KG		EPC	
	72-55-9	4,4'-DDE	17	U	UG/KG		EPC	
	76-44-8	Heptachlor	8.7	U	UG/KG		EPC	
	IT0-001	% Moisture	8		% MOISTURE		EPC	
	309-00-2	Aldrin	8.7	U	UG/KG		EPC	
	60-57-1	Dieldrin	17	U	UG/KG		EPC	
	72-43-5	Methoxychlor	87	U	UG/KG		EPC	
	72-20-8	Endrin	17	U	UG/KG		EPC	
	58-89-9	gamma-BHC (Lindane)	8.7	U	UG/KG		EPC	
	50-32-8	Benzo(a)pyrene	360	U	UG/KG	ME 705	EPC	
	205-99-2	Benzo(b)fluoranthene	360	U	UG/KG		EPC	
	207-08-9	Benzo(k)fluoranthene	360	U	UG/KG		EPC	
	218-01-9	Chrysene	360	U	UG/KG		EPC	
	541-73-1	1,3-Dichlorobenzene	360	U	UG/KG		EPC	
	621-64-7	N-Nitroso-di-n-propylamine	360	U	UG/KG		EPC	
	7005-72-3	4-Chlorophenylphenyl ether	360	U	UG/KG		EPC	
	606-20-2	2,6-Dinitrotoluene	360	U	UG/KG		EPC	
	534-52-1	4,6-Dinitro-2-methylphenol	1700	U	UG/KG		EPC	
	208-96-8	Acenaphthylene	360	U	UG/KG		EPC	
	206-44-0	Fluoranthene	360	U	UG/KG		EPC	
	88-74-4	2-Nitroaniline	1700	U	UG/KG		EPC	
	88-75-5	2-Nitrophenol	360	U	UG/KG		EPC	
	91-20-3	Naphthalene	360	U	UG/KG		EPC	
	91-58-7	2-Chloronaphthalene	360	U	UG/KG		EPC	
	91-94-1	3,3'-Dichlorobenzidine	710	U	UG/KG		EPC	
	95-48-7	2-Methylphenol	360	U	UG/KG		EPC	
	95-57-8	2-Chlorophenol	360	U	UG/KG		EPC	
	95-95-4	2,4,5-Trichlorophenol	1700	U	UG/KG		EPC	
	98-95-3	Nitrobenzene	360	U	UG/KG		EPC	
	IT0-001	% Moisture	8		% MOISTURE		EPC	
	100-01-6	4-Nitroaniline	1700	U	UG/KG		EPC-	
	100-02-7	4-Nitrophenol	1700	U	UG/KG		EPC	
	101-55-3	4-Bromophenyl phenyl ether	360	U	UG/KG		EPC	
	105-67-9	2,4-Dimethylphenol	360	U	UG/KG		EPC	
	106-44-5	4-Methylphenol	360	U	UG/KG		EPC	
	106-47-8	4-Chloroaniline	360	U	UG/KG		EPC	

3 10 00650

TABLE 4-12
EPA CHECK SAMPLES

SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULTS	QUALIFIER	UNITS	PRODUCT CODE	SAMPLE LOCATION	FLAG
L0826880915-2	108-60-1	bis(2-Chloroisopropyl)ether	360	U	UG/KG	ME 705	EPC	TRG
	108-95-2	Phenol	360	U	UG/KG		EPC	
	111-91-1	bis(2-Chloroethoxy)methane	360	U	UG/KG		EPC	
	117-81-7	bis(2-Ethylhexyl) phthalate	1400	B	UG/KG		EPC	
	117-84-0	Di-n-octyl phthalate	360	U	UG/KG		EPC	
	120-12-7	Anthracene	360	U	UG/KG		EPC	
	120-82-1	1,2,4-Trichlorobenzene	360	U	UG/KG		EPC	
	120-83-2	2,4-Dichlorophenol	360	U	UG/KG		EPC	
	129-00-0	Pyrene	360	U	UG/KG		EPC	
	131-11-3	Dimethyl phthalate	360	U	UG/KG		EPC	
	132-64-9	Dibenzofuran	360	U	UG/KG		EPC	
	193-39-5	Indeno(1,2,3-cd)pyrene	360	U	UG/KG		EPC	
	191-24-2	Benzo(g,h,i)perylene	360	U	UG/KG		EPC	
	121-14-2	2,4-Dinitrotoluene	360	U	UG/KG		EPC	
	118-74-1	Hexachlorobenzene	360	U	UG/KG		EPC	
	111-44-4	bis(2-Chloroethyl)ether	360	U	UG/KG		EPC	
	106-46-7	1,4-Dichlorobenzene	360	U	UG/KG		EPC	
	100-51-6	Benzyl alcohol	360	U	UG/KG		EPC	
	99-09-2	3-Nitroaniline	1700	U	UG/KG		EPC	
	95-50-1	1,2-Dichlorobenzene	360	U	UG/KG		EPC	
	91-57-6	2-Methylnaphthalene	360	U	UG/KG		EPC	
	83-32-9	Acenaphthene	360	U	UG/KG		EPC	
	84-66-2	Diethyl phthalate	360	U	UG/KG		EPC	
	84-74-2	Di-n-butyl phthalate	360	U	UG/KG		EPC	
	85-01-8	Phenanthrene	360	U	UG/KG		EPC	
	85-68-7	Butyl benzyl phthalate	360	U	UG/KG		EPC	
	86-30-6	N-Nitrosodiphenylamine	360	U	UG/KG		EPC	
	87-68-3	Hexachlorobutadiene	360	U	UG/KG		EPC	
	87-86-5	Pentachlorophenol	1700	U	UG/KG		EPC	
	88-06-2	2,4,6-Trichlorophenol	360	U	UG/KG		EPC	
	86-73-7	Fluorene	360	U	UG/KG		EPC	
	59-50-7	4-Chloro-3-methylphenol	360	U	UG/KG		EPC	
	65-85-0	Benzoic acid	1700	U	UG/KG		EPC	
	67-72-1	Hexachloroethane	360	U	UG/KG		EPC	
	78-59-1	Isophorone	360	U	UG/KG		EPC	
	77-47-4	Hexachlorocyclopentadiene	360	U	UG/KG		EPC	
	53-70-3	Dibenzo(a,h)anthracene	360	U	UG/KG		EPC	
	56-55-3	Benzo(a)anthracene	360	U	UG/KG		EPC	
	51-28-5	2,4-Dinitrophenol	1700	U	UG/KG		EPC	

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3 10 00651

TABLE 4-12
EPA CHECK SAMPLES

SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULTS	QUALIFIER	UNITS	PRODUCT CODE	SAMPLE LOCATION	FLAG
L0826880915-3	7439-92-1	Lead	.9	B	MG/KG	AG 704	EPC	TRG
	7440-38-2	Arsenic	.4	U	MG/KG		EPC	
	7782-49-2	Selenium	.4	U	MG/KG		EPC	
	7440-28-0	Thallium	.7	B	MG/KG		EPC	
	ITO-003	% Solids	90		% SOLIDS	AP 706	EPC	
	7439-89-6	Iron	142		MG/KG		EPC	
	7440-36-0	Antimony	7	U	MG/KG		EPC	
	7440-39-3	Barium	1.3	B	MG/KG		EPC	
	7440-70-2	Calcium	86	B	MG/KG		EPC	
	7440-41-7	Beryllium	.2	U	MG/KG		EPC	
	7440-43-9	Cadmium	1	U	MG/KG		EPC	
	7440-47-3	Chromium	2	U	MG/KG		EPC	
	7440-48-4	Cobalt	4	U	MG/KG		EPC	
	7440-50-8	Copper	3	B	MG/KG		EPC	
	7440-66-6	Zinc	2	B	MG/KG		EPC	
	7440-62-2	Vanadium	2	U	MG/KG		EPC	
	7440-23-5	Sodium	280	B	MG/KG		EPC	
	7440-22-4	Silver	1	U	MG/KG		EPC	
	7440-09-7	Potassium	222	U	MG/KG		EPC	
	7440-02-0	Nickel	4	U	MG/KG		EPC	
	7439-96-5	Manganese	1.6	B	MG/KG		EPC	
	7439-95-4	Magnesium	7	U	MG/KG		EPC	
	7429-90-5	Aluminum	112		MG/KG		EPC	
	7439-97-6	Mercury	.02	U	MG/KG	AV 004	EPC	
	57-12-5	Cyanide	.5	U	MG/KG	WW 037	EPC	

3 10 00652

TABLE 4-12
EPA CHECK SAMPLES

SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULTS	QUALIFIER	UNITS	PRODUCT CODE	SAMPLE LOCATION	FLAG
J0404	59-50-7	4-Chloro-3-methylphenol	10	U	UG/LITER	ME 702	BP100	TRG
	65-85-0	Benzoic acid	50	U	UG/LITER		BP100	
	67-72-1	Hexachloroethane	10	U	UG/LITER		BP100	
	77-47-4	Hexachlorocyclopentadiene	10	U	UG/LITER		BP100	
	53-70-3	Dibenzo(a,h)anthracene	10	U	UG/LITER		BP100	
	56-55-3	Benzo(a)anthracene	10	U	UG/LITER		BP100	
	51-28-5	2,4-Dinitrophenol	50	U	UG/LITER		BP100	
	56-23-5	Carbon Tetrachloride	5	U	UG/LITER	MV 702	BP100	
	67-66-3	Chloroform	5	U	UG/LITER		BP100	
	75-35-4	1,1-Dichloroethene	5	U	UG/LITER		BP100	
	78-87-5	1,2-Dichloropropane	5	U	UG/LITER		BP100	
	79-00-5	1,1,2-Trichloroethane	5	U	UG/LITER		BP100	
	79-01-6	Trichloroethene	5	U	UG/LITER		BP100	
	79-34-5	1,1,2,2-Tetrachloroethane	5	U	UG/LITER		BP100	
	100-41-4	Ethylbenzene	5	U	UG/LITER		BP100	
	100-42-5	Styrene	5	U	UG/LITER		BP100	
	107-06-2	1,2-Dichloroethane	5	U	UG/LITER		BP100	
	108-05-4	Vinyl Acetate	10	U	UG/LITER		BP100	
	108-10-1	4-Methyl-2-pentanone	10	U	UG/LITER		BP100	
	108-90-7	Chlorobenzene	5	U	UG/LITER		BP100	
	124-48-1	Dibromochloromethane	5	U	UG/LITER		BP100	
	127-18-4	Tetrachloroethene	5	U	UG/LITER		BP100	
	540-59-0	1,2-Dichloroethylene	5	U	UG/LITER		BP100	
	591-78-6	2-Hexanone	10	U	UG/LITER		BP100	
	1330-20-7	Total xylenes	5	U	UG/LITER		BP100	
	10061-02-6	trans-1,3-Dichloropropene	5	U	UG/LITER		BP100	
	10061-01-5	cis-1,3-Dichloropropene	5	U	UG/LITER		BP100	
	108-88-3	Toluene	5	U	UG/LITER		BP100	
	78-93-3	2-Butanone	10	U	UG/LITER		BP100	
	75-00-3	Chloroethane	10	U	UG/LITER		BP100	
	75-01-4	Vinyl chloride	10	U	UG/LITER		BP100	
	75-15-0	Carbon disulfide	5	U	UG/LITER		BP100	
	75-25-2	Bromoform	5	U	UG/LITER		BP100	
	75-27-4	Bromodichloromethane	5	U	UG/LITER		BP100	
	75-34-3	1,1-Dichloroethane	5	U	UG/LITER		BP100	
	75-09-2	Methylene chloride	4	JB	UG/LITER		BP100	
	71-43-2	Benzene	5	U	UG/LITER		BP100	
	74-87-3	Chloromethane	10	U	UG/LITER		BP100	
	74-83-9	Bromomethane	10	U	UG/LITER		BP100	
	71-55-6	1,1,1-Trichloroethane	5	U	UG/LITER		BP100	
	67-64-1	Acetone	7	J	UG/LITER		BP100	
	57-12-5	Cyanide	10	U	UG/LITER	WW 034	BP100	

3 10 00653

TABLE 4-12
EPA CHECK SAMPLES

SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULTS	QUALIFIER	UNITS	PRODUCT CODE	SAMPLE LOCATION	FLAG
J0404	191-24-2	Benzo(g,h,i)perylene	10	U	UG/LITER	ME 702	BP100	TRG
	205-99-2	Benzo(b)fluoranthene	10	U	UG/LITER		BP100	
	207-08-9	Benzo(k)fluoranthene	10	U	UG/LITER		BP100	
	218-01-9	Chrysene	10	U	UG/LITER		BP100	
	541-73-1	1,3-Dichlorobenzene	10	U	UG/LITER		BP100	
	621-64-7	N-Nitroso-di-n-propylamine	10	U	UG/LITER		BP100	
	7005-72-3	4-Chlorophenylphenyl ether	10	U	UG/LITER		BP100	
	606-20-2	2,6-Dinitrotoluene	10	U	UG/LITER		BP100	
	534-52-1	4,6-Dinitro-2-methylphenol	50	U	UG/LITER		BP100	
	208-96-8	Acenaphthylene	10	U	UG/LITER		BP100	
	206-44-0	Fluoranthene	10	U	UG/LITER		BP100	
	193-39-5	Indeno(1,2,3-cd)pyrene	10	U	UG/LITER		BP100	
	132-64-9	Dibenzofuran	10	U	UG/LITER		BP100	
	88-06-2	2,4,6-Trichlorophenol	10	U	UG/LITER		BP100	
	88-74-4	2-Nitroaniline	50	U	UG/LITER		BP100	
	88-75-5	2-Nitrophenol	10	U	UG/LITER		BP100	
	91-57-6	2-Methylnaphthalene	10	U	UG/LITER		BP100	
	91-58-7	2-Chloronaphthalene	10	U	UG/LITER		BP100	
	91-94-1	3,3'-Dichlorobenzidine	20	U	UG/LITER		BP100	
	95-50-1	1,2-Dichlorobenzene	10	U	UG/LITER		BP100	
	95-57-8	2-Chlorophenol	10	U	UG/LITER		BP100	
	95-95-4	2,4,5-Trichlorophenol	50	U	UG/LITER		BP100	
	99-09-2	3-Nitroaniline	50	U	UG/LITER		BP100	
	100-01-6	4-Nitroaniline	50	U	UG/LITER		BP100	
	100-02-7	4-Nitrophenol	50	U	UG/LITER		BP100	
	101-55-3	4-Bromophenyl phenyl ether	10	U	UG/LITER		BP100	
	105-67-9	2,4-Dimethylphenol	10	U	UG/LITER		BP100	
	106-44-5	4-Methylphenol	10	U	UG/LITER		BP100	
	106-47-8	4-Chloroaniline	10	U	UG/LITER		BP100	
	108-60-1	bis(2-Chloroisopropyl)ether	10	U	UG/LITER		BP100	
	108-95-2	Phenol	10	U	UG/LITER		BP100	
	111-91-1	bis(2-Chloroethoxy)methane	10	U	UG/LITER		BP100	
	117-81-7	bis(2-Ethylhexyl) phthalate	2	J	UG/LITER		BP100	
	117-84-0	Di-n-octyl phthalate	10	U	UG/LITER		BP100	
	120-12-7	Anthracene	10	U	UG/LITER		BP100	
	120-82-1	1,2,4-Trichlorobenzene	10	U	UG/LITER		BP100	
	120-83-2	2,4-Dichlorophenol	10	U	UG/LITER		BP100	
	129-00-0	Pyrene	10	U	UG/LITER		BP100	
	121-14-2	2,4-Dinitrotoluene	10	U	UG/LITER		BP100	
	118-74-1	Hexachlorobenzene	10	U	UG/LITER		BP100	
	111-44-4	bis(2-Chloroethyl)ether	10	U	UG/LITER		BP100	
	106-46-7	1,4-Dichlorobenzene	10	U	UG/LITER		BP100	
	100-51-6	Benzyl alcohol	10	U	UG/LITER		BP100	
	98-95-3	Nitrobenzene	10	U	UG/LITER		BP100	
	95-48-7	2-Methylphenol	10	U	UG/LITER		BP100	
	91-20-3	Naphthalene	10	U	UG/LITER		BP100	
	87-86-5	Pentachlorophenol	50	U	UG/LITER		BP100	
	78-59-1	Isophorone	10	U	UG/LITER		BP100	
	83-32-9	Acenaphthene	10	U	UG/LITER		BP100	
	84-66-2	Diethyl phthalate	10	U	UG/LITER		BP100	
	84-74-2	Di-n-butyl phthalate	10	U	UG/LITER		BP100	
	85-01-8	Phenanthrene	10	U	UG/LITER		BP100	
	86-30-6	N-Nitrosodiphenylamine	10	U	UG/LITER		BP100	
	86-73-7	Fluorene	10	U	UG/LITER		BP100	
	87-68-3	Hexachlorobutadiene	10	U	UG/LITER		BP100	
	85-68-7	Butyl benzyl phthalate	10	U	UG/LITER		BP100	

3 10 00654

TABLE 4-12
EPA CHECK SAMPLES

SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULTS	QUALIFIER	UNITS	PRODUCT CODE	SAMPLE LOCATION	FLAG
J0404	7439-92-1	Lead	2	U	UG/LITER	AG 702	BP100	TRG
	7440-38-2	Arsenic	3	UW	UG/LITER		BP100	
	7782-49-2	Selenium	2	U	UG/LITER		BP100	
	7440-28-0	Thallium	2	UW	UG/LITER		BP100	
	7429-90-5	Aluminum	40	U	UG/LITER	AP 703	BP100	
	7440-22-4	Silver	5	U	UG/LITER		BP100	
	7440-36-0	Antimony	30	U	UG/LITER		BP100	
	7440-41-7	Beryllium	1	U	UG/LITER		BP100	
	7440-47-3	Chromium	10	U	UG/LITER		BP100	
	7440-50-8	Copper	17	B	UG/LITER		BP100	
	7440-66-6	Zinc	5	U	UG/LITER		BP100	
	7440-70-2	Calcium	30	U	UG/LITER		BP100	
	7440-62-2	Vanadium	10	U	UG/LITER		BP100	
	7440-48-4	Cobalt	20	U	UG/LITER		BP100	
	7440-43-9	Cadmium	5	U	UG/LITER		BP100	
	7440-39-3	Barium	.2	U	UG/LITER		BP100	
	7440-23-5	Sodium	200	U	UG/LITER		BP100	
	7440-09-7	Potassium	1000	U	UG/LITER		BP100	
	7439-95-4	Magnesium	30	U	UG/LITER		BP100	
	7440-02-0	Nickel	20	U	UG/LITER		BP100	
	7439-96-5	Manganese	2	U	UG/LITER		BP100	
	7439-89-6	Iron	10	U	UG/LITER		BP100	
	7439-97-6	Mercury	.2	U	UG/LITER	AV 002	BP100	
	50-29-3	4,4'-DDT	.1	U	UG/LITER	GC 720	BP100	
	53469-21-9	Aroclor-1242	.5	U	UG/LITER		BP100	
	53494-70-5	Endrin ketone	.1	U	UG/LITER		BP100	
	33213-65-9	Endosulfan II	.1	U	UG/LITER		BP100	
	319-84-6	alpha-BHC	.05	U	UG/LITER		BP100	
	319-85-7	beta-BHC	.05	U	UG/LITER		BP100	
	319-86-8	delta-BHC	.05	U	UG/LITER		BP100	
	1024-57-3	Heptachlor epoxide	.05	U	UG/LITER		BP100	
	1031-07-8	Endosulfan sulfate	1	U	UG/LITER		BP100	
	5103-71-9	alpha-Chlordane	.5	U	UG/LITER		BP100	
	8001-35-2	Toxaphene	1	U	UG/LITER		BP100	
	11096-82-5	Aroclor-1260	1	U	UG/LITER		BP100	
	11097-69-1	Aroclor-1254	1	U	UG/LITER		BP100	
	11141-16-5	Aroclor-1232	.5	U	UG/LITER		BP100	
	12672-29-6	Aroclor-1248	.5	U	UG/LITER		BP100	
	12674-11-2	Aroclor-1016	.5	U	UG/LITER		BP100	
	11104-28-2	Aroclor-1221	.5	U	UG/LITER		BP100	
	5103-74-2	gamma-Chlordane	.5	U	UG/LITER		BP100	
	959-98-8	Endosulfan-I	.05	U	UG/LITER		BP100	
	309-00-2	Aldrin	.05	U	UG/LITER		BP100	
	72-43-5	Methoxychlor	.5	U	UG/LITER		BP100	
	72-54-8	4,4'-DDD	.1	U	UG/LITER		BP100	
	72-55-9	4,4'-DDE	.1	U	UG/LITER		BP100	
	76-44-8	Heptachlor	.05	U	UG/LITER		BP100	
	60-57-1	Dieldrin	1	U	UG/LITER		BP100	
	72-20-8	Endrin	.1	U	UG/LITER		BP100	
	58-89-9	gamma-BHC (Lindane)	.05	U	UG/LITER		BP100	
	50-32-8	Benzo(a)pyrene	10	U	UG/LITER	ME 702	BP100	
	131-11-3	Dimethyl phthalate	10	U	UG/LITER		BP100	

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TABLE 4-12
EPA CHECK SAMPLES

SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULTS	QUALIFIER	UNITS	PRODUCT CODE	SAMPLE LOCATION	FLAG
J0405	78-59-1	Isophorone	10	U	UG/LITER	ME 702	BP200	TRG
	84-66-2	Diethyl phthalate	10	U	UG/LITER		BP200	
	83-32-9	Acenaphthene	10	U	UG/LITER		BP200	
	65-85-0	Benzoic acid	50	U	UG/LITER		BP200	
	59-50-7	4-Chloro-3-methylphenol	10	U	UG/LITER		BP200	
	56-55-3	Benzo(a)anthracene	10	U	UG/LITER		BP200	
	51-23-5	2,4-Dinitrophenol	50	U	UG/LITER		BP200	
	57-12-5	Cyanide	59		UG/LITER	WW 034	BP200	

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TABLE 4-12
EPA CHECK SAMPLES

SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULTS	QUALIFIER	UNITS	PRODUCT CODE	SAMPLE LOCATION	FLAG
J0405	87-86-5	Pentachlorophenol	47	J	UG/LITER	ME 702	BP200	TRG
	111-91-1	bis(2-Chloroethoxy)methane	28		UG/LITER		BP200	
	88-06-2	2,4,6-Trichlorophenol	10	U	UG/LITER		BP200	
	91-20-3	Naphthalene	10	U	UG/LITER		BP200	
	91-57-6	2-Methylnaphthalene	26		UG/LITER		BP200	
	91-58-7	2-Chloronaphthalene	10	U	UG/LITER		BP200	
	91-94-1	3,3'-Dichlorobenzidine	20	U	UG/LITER		BP200	
	95-48-7	2-Methylphenol	10	U	UG/LITER		BP200	
	95-50-1	1,2-Dichlorobenzene	10	U	UG/LITER		BP200	
	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER		BP200	
	117-84-0	Di-n-octyl phthalate	10	U	UG/LITER		BP200	
	120-12-7	Anthracene	10	U	UG/LITER		BP200	
	120-82-1	1,2,4-Trichlorobenzene	10	U	UG/LITER		BP200	
	121-14-2	2,4-Dinitrotoluene	10	U	UG/LITER		BP200	
	129-00-0	Pyrene	10	U	UG/LITER		BP200	
	132-64-9	Dibenzofuran	10	U	UG/LITER		BP200	
	131-11-3	Dimethyl phthalate	10	U	UG/LITER		BP200	
	191-24-2	Benzo(g,h,i)perylene	10	U	UG/LITER		BP200	
	193-39-5	Indeno(1,2,3-cd)pyrene	10	U	UG/LITER		BP200	
	205-99-2	Benzo(b)fluoranthene	10	U	UG/LITER		BP200	
	206-44-0	Fluoranthene	32		UG/LITER		BP200	
	218-01-9	Chrysene	10	U	UG/LITER		BP200	
	534-52-1	4,6-Dinitro-2-methylphenol	50	U	UG/LITER		BP200	
	541-73-1	1,3-Dichlorobenzene	10	U	UG/LITER		BP200	
	621-64-7	N-Nitroso-di-n-propylamine	10	U	UG/LITER		BP200	
	7005-72-3	4-Chlorophenylphenyl ether	10	U	UG/LITER		BP200	
	606-20-2	2,6-Dinitrotoluene	31		UG/LITER		BP200	
	208-96-8	Acenaphthylene	10	U	UG/LITER		BP200	
	207-08-9	Benzo(k)fluoranthene	10	U	UG/LITER		BP200	
	120-83-2	2,4-Dichlorophenol	10	U	UG/LITER		BP200	
	118-74-1	Hexachlorobenzene	10	U	UG/LITER		BP200	
	95-57-8	2-Chlorophenol	10	U	UG/LITER		BP200	
	95-95-4	2,4,5-Trichlorophenol	50	U	UG/LITER		BP200	
	98-95-3	Nitrobenzene	10	U	UG/LITER		BP200	
	99-09-2	3-Nitroaniline	50	U	UG/LITER		BP200	
	100-01-6	4-Nitroaniline	50	U	UG/LITER		BP200	
	100-02-7	4-Nitrophenol	50	U	UG/LITER		BP200	
	101-55-3	4-Bromophenyl phenyl ether	10	U	UG/LITER		BP200	
	105-67-9	2,4-Dimethylphenol	74		UG/LITER		BP200	
	106-44-5	4-Methylphenol	10	U	UG/LITER		BP200	
	106-46-7	1,4-Dichlorobenzene	10	U	UG/LITER		BP200	
	108-60-1	bis(2-Chloroisopropyl)ether	10	U	UG/LITER		BP200	
	108-95-2	Phenol	30		UG/LITER		BP200	
	111-44-4	bis(2-Chloroethyl)ether	10	U	UG/LITER		BP200	
	106-47-8	4-Chloroaniline	10	U	UG/LITER		BP200	
	100-51-6	Benzyl alcohol	10	U	UG/LITER		BP200	
	88-75-5	2-Nitrophenol	10	U	UG/LITER		BP200	
	88-74-4	2-Nitroaniline	50	U	UG/LITER		BP200	
	67-72-1	Hexachloroethane	10	U	UG/LITER		BP200	
	77-47-4	Hexachlorocyclopentadiene	10	U	UG/LITER		BP200	
	85-01-8	Phenanthrene	33		UG/LITER		BP200	
	85-68-7	Butyl benzyl phthalate	10	U	UG/LITER		BP200	
	86-30-6	N-Nitrosodiphenylamine	10	U	UG/LITER		BP200	
	86-73-7	Fluorene	10	U	UG/LITER		BP200	
	87-68-3	Hexachlorobutadiene	10	U	UG/LITER		BP200	
	84-74-2	Di-n-butyl phthalate	10	U	UG/LITER		BP200	

TABLE 4-12
EPA CHECK SAMPLES

SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULTS	QUALIFIER	UNITS	PRODUCT CODE	SAMPLE LOCATION	FLAG
30405	7439-92-1	Lead	14		UG/LITER	AG 702	BP200	TRG
	7782-49-2	Selenium	18		UG/LITER		BP200	
	7440-38-2	Arsenic	14		UG/LITER		BP200	
	7440-28-0	Thallium	8	BS	UG/LITER		BP200	
	7429-90-5	Aluminum	948		UG/LITER	AP 703	BP200	
	7440-41-7	Beryllium	10		UG/LITER		BP200	
	7440-43-9	Cadmium	14		UG/LITER		BP200	
	7440-47-3	Chromium	12		UG/LITER		BP200	
	7440-48-4	Cobalt	60		UG/LITER		BP200	
	7440-62-2	Vanadium	132		UG/LITER		BP200	
	7440-50-8	Copper	54		UG/LITER		BP200	
	7440-66-6	Zinc	39		UG/LITER		BP200	
	7440-70-2	Calcium	30	U	UG/LITER		BP200	
	7440-39-3	Barium	93	B	UG/LITER		BP200	
	7440-36-0	Antimony	101		UG/LITER		BP200	
	7440-23-5	Sodium	200	U	UG/LITER		BP200	
	7440-22-4	Silver	5	U	UG/LITER		BP200	
	7439-96-5	Manganese	28		UG/LITER		BP200	
	7440-02-0	Nickel	119		UG/LITER		BP200	
	7440-09-7	Potassium	1000	U	UG/LITER		BP200	
	7439-95-4	Magnesium	553	B	UG/LITER		BP200	
	7439-89-6	Iron	779		UG/LITER		BP200	
	7439-97-6	Mercury	8.8		UG/LITER	AV 002	BP200	
	50-29-3	4,4'-DDT	.1	U	UG/LITER	GC 720	BP200	
	8001-35-2	Toxaphene	1	U	UG/LITER		BP200	
	72-20-8	Endrin	1.3	D	UG/LITER		BP200	
	11096-82-5	Aroclor-1260	1	U	UG/LITER		BP200	
	11097-69-1	Aroclor-1254	1	U	UG/LITER		BP200	
	11104-28-2	Aroclor-1221	.5	U	UG/LITER		BP200	
	11141-16-5	Aroclor-1232	.5	U	UG/LITER		BP200	
	12672-29-6	Aroclor-1248	.5	U	UG/LITER		BP200	
	53469-21-9	Aroclor-1242	.5	U	UG/LITER		BP200	
	53494-70-5	Endrin ketone	.5	U	UG/LITER		BP200	
	33213-65-9	Endosulfan II	.1	U	UG/LITER		BP200	
	12674-11-2	Aroclor-1016	.5	U	UG/LITER		BP200	
	72-43-5	Methoxychlor	4.6	D	UG/LITER		BP200	
	72-54-8	4,4'-DDD	.1	U	UG/LITER		BP200	
	1024-57-3	Heptachlor epoxide	.05	U	UG/LITER		BP200	
	1031-07-8	Endosulfan sulfate	.1	U	UG/LITER		BP200	
	959-98-8	Endosulfan-I	.9	D	UG/LITER		BP200	
	5103-71-9	alpha-Chlordane	.5	U	UG/LITER		BP200	
	5103-74-2	gamma-Chlordane	.5	U	UG/LITER		BP200	
	319-86-8	delta-BHC	.05	U	UG/LITER		BP200	
	72-55-9	4,4'-DDE	.1	U	UG/LITER		BP200	
	319-85-7	beta-BHC	.05	U	UG/LITER		BP200	
	319-84-6	alpha-BHC	.05	U	UG/LITER		BP200	
	309-00-2	Aldrin	.05	U	UG/LITER		BP200	
	76-44-8	Heptachlor	.64	D	UG/LITER		BP200	
	60-57-1	Dieldrin	.1	U	UG/LITER		BP200	
	58-89-9	gamma-BHC (Lindane)	1	D	UG/LITER		BP200	
	50-32-8	Benzo(a)pyrene	10	U	UG/LITER	ME 702	BP200	
	53-70-3	Dibenzo(a,h)anthracene	10	U	UG/LITER		BP200	

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TABLE 4-12
EPA CHECK SAMPLES

SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULTS	QUALIFIER	UNITS	PRODUCT CODE	SAMPLE LOCATION	FLAG
J0406	7439-92-1	Lead	2	U	UG/LITER	AG 702	BP300	TRG
	7782-49-2	Selenium	5	UW	UG/LITER		BP300	
	7440-38-2	Arsenic	16	UW	UG/LITER		BP300	
	7440-28-0	Thallium	18	UE	UG/LITER		BP300	
	7429-90-5	Aluminum	109000		UG/LITER	AP 703	BP300	
	7440-22-4	Silver	5	U	UG/LITER		BP300	
	7440-23-5	Sodium	200	U	UG/LITER		BP300	
	7440-36-0	Antimony	30	U	UG/LITER		BP300	
	7440-39-3	Barium	2	U	UG/LITER		BP300	
	7440-41-7	Beryllium	1	U	UG/LITER		BP300	
	7440-70-2	Calcium	204	B	UG/LITER		BP300	
	7440-66-6	Zinc	20		UG/LITER		BP300	
	7440-62-2	Vanadium	10	U	UG/LITER		BP300	
	7440-50-8	Copper	50		UG/LITER		BP300	
	7440-48-4	Cobalt	22	B	UG/LITER		BP300	
	7440-47-3	Chromium	10	U	UG/LITER		BP300	
	7440-43-9	Cadmium	5	U	UG/LITER		BP300	
	7440-09-7	Potassium	1000	U	UG/LITER		BP300	
	7440-02-0	Nickel	20	U	UG/LITER		BP300	
	7439-96-5	Manganese	14	B	UG/LITER		BP300	
	7439-95-4	Magnesium	30	U	UG/LITER		BP300	
	7439-89-6	Iron	119000		UG/LITER		BP300	
	7439-97-6	Mercury	.3		UG/LITER	AV 002	BP300	

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TABLE 4-12
EPA CHECK SAMPLES

SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULTS	QUALIFIER	UNITS	PRODUCT CODE	SAMPLE LOCATION	FLAG
J0437	7439-92-1	Lead	10		UG/LITER	AG 702	BQ100	TRG
	7440-38-2	Arsenic	2	BN	UG/LITER		BQ100	
	7782-49-2	Selenium	3	UW	UG/LITER		BQ100	
	7440-28-0	Thallium	2	U	UG/LITER		BQ100	
	7429-90-5	Aluminum	40	U	UG/LITER	AP 703	BQ100	
	7440-22-4	Silver	5	U	UG/LITER		BQ100	
	7440-36-0	Antimony	30	U	UG/LITER		BQ100	
	7440-41-7	Beryllium	1	U	UG/LITER		BQ100	
	7440-47-3	Chromium	10	U	UG/LITER		BQ100	
	7440-50-8	Copper	10	U	UG/LITER		BQ100	
	7440-66-6	Zinc	10	B	UG/LITER		BQ100	
	7440-70-2	Calcium	30	U	UG/LITER		BQ100	
	7440-62-2	Vanadium	10	U	UG/LITER		BQ100	
	7440-48-4	Cobalt	20	U	UG/LITER		BQ100	
	7440-43-9	Cadmium	5	U	UG/LITER		BQ100	
	7440-39-3	Barium	2	U	UG/LITER		BQ100	
	7440-23-5	Sodium	200	U	UG/LITER		BQ100	
	7440-09-7	Potassium	1000	U	UG/LITER		BQ100	
	7439-95-4	Magnesium	30	U	UG/LITER		BQ100	
	7440-02-0	Nickel	20	U	UG/LITER		BQ100	
	7439-96-5	Manganese	2	U	UG/LITER		BQ100	
	7439-89-6	Iron	22	B	UG/LITER		BQ100	
	7439-97-6	Mercury	.2	U	UG/LITER	AV 002	BQ100	
	50-29-3	4,4'-DDT	.2	U	UG/LITER	GC 720	BQ100	
	53469-21-9	Aroclor-1242	1	U	UG/LITER		BQ100	
	53494-70-5	Endrin ketone	.2	U	UG/LITER		BQ100	
	33213-65-9	Endosulfan II	.2	U	UG/LITER		BQ100	
	319-84-6	alpha-BHC	.1	U	UG/LITER		BQ100	
	319-85-7	beta-BHC	.1	U	UG/LITER		BQ100	
	319-86-8	delta-BHC	.95	UZ	UG/LITER		BQ100	
	1024-57-3	Heptachlor epoxide	.1	U	UG/LITER		BQ100	
	1031-07-8	Endosulfan sulfate	.2	U	UG/LITER		BQ100	
	5103-71-9	alpha-Chlordane	1	U	UG/LITER		BQ100	
	8001-35-2	Toxaphene	2	U	UG/LITER		BQ100	
	11096-82-5	Aroclor-1260	2	U	UG/LITER		BQ100	
	11097-69-1	Aroclor-1254	2	U	UG/LITER		BQ100	
	11141-16-5	Aroclor-1232	1	U	UG/LITER		BQ100	
	12672-29-6	Aroclor-1248	1	U	UG/LITER		BQ100	
	12674-11-2	Aroclor-1016	1	U	UG/LITER		BQ100	
	11104-28-2	Aroclor-1221	1	U	UG/LITER		BQ100	
	5103-74-2	gamma-Chlordane	1	U	UG/LITER		BQ100	
	959-98-8	Endosulfan-I	1	D	UG/LITER		BQ100	
	309-00-2	Aldrin	.1	U	UG/LITER		BQ100	
	72-43-5	Methoxychlor	5.9	D	UG/LITER		BQ100	
	72-54-8	4,4'-DDD	.2	U	UG/LITER		BQ100	
	72-55-9	4,4'-DDE	.2	U	UG/LITER		BQ100	
	76-44-8	Heptachlor	1.2	D	UG/LITER		BQ100	
	60-57-1	Dieldrin	.2	U	UG/LITER		BQ100	
	72-20-8	Endrin	1.4	D	UG/LITER		BQ100	
	58-89-9	gamma-BHC (Lindane)	1.2	D	UG/LITER		BQ100	
	50-32-8	Benzo(a)pyrene	10	U	UG/LITER	ME 702	BQ100	
	131-11-3	Dimethyl phthalate	10	U	UG/LITER		BQ100	

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TABLE 4-12
EPA CHECK SAMPLES

SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULTS	QUALIFIER	UNITS	PRODUCT CODE	SAMPLE LOCATION	FLAG
J0437	191-24-2	Benzo(g,h,i)perylene	10	U	UG/LITER	ME 702	BQ100	TRG
	205-99-2	Benzo(b)fluoranthene	10	U	UG/LITER		BQ100	
	207-08-9	Benzo(k)fluoranthene	10	U	UG/LITER		BQ100	
	218-01-9	Chrysene	10	U	UG/LITER		BQ100	
	541-73-1	1,3-Dichlorobenzene	10	U	UG/LITER		BQ100	
	621-64-7	N-Nitroso-di-n-propylamine	10	U	UG/LITER		BQ100	
	7005-72-3	4-Chlorophenylphenyl ether	10	U	UG/LITER		BQ100	
	606-20-2	2,6-Dinitrotoluene	43		UG/LITER		BQ100	
	534-52-1	4,6-Dinitro-2-methylphenol	50	U	UG/LITER		BQ100	
	208-96-8	Acenaphthylene	10	U	UG/LITER		BQ100	
	206-44-0	Fluoranthene	49		UG/LITER		BQ100	
	193-39-5	Indeno(1,2,3-cd)pyrene	10	U	UG/LITER		BQ100	
	132-64-9	Dibenzofuran	10	U	UG/LITER		BQ100	
	88-06-2	2,4,6-Trichlorophenol	10	U	UG/LITER		BQ100	
	88-74-4	2-Nitroaniline	50	U	UG/LITER		BQ100	
	88-75-5	2-Nitrophenol	10	U	UG/LITER		BQ100	
	91-57-6	2-Methylnaphthalene	35		UG/LITER		BQ100	
	91-58-7	2-Chloronaphthalene	10	U	UG/LITER		BQ100	
	91-94-1	3,3'-Dichlorobenzidine	20	U	UG/LITER		BQ100	
	95-50-1	1,2-Dichlorobenzene	10	U	UG/LITER		BQ100	
	95-57-8	2-Chlorophenol	10	U	UG/LITER		BQ100	
	95-95-4	2,4,5-Trichlorophenol	50	U	UG/LITER		BQ100	
	99-09-2	3-Nitroaniline	50	U	UG/LITER		BQ100	
	100-01-6	4-Nitroaniline	50	U	UG/LITER		BQ100	
	100-02-7	4-Nitrophenol	50	U	UG/LITER		BQ100	
	101-55-3	4-Bromophenyl phenyl ether	10	U	UG/LITER		BQ100	
	105-67-9	2,4-Dimethylphenol	85		UG/LITER		BQ100	
	106-44-5	4-Methylphenol	10	U	UG/LITER		BQ100	
	106-47-8	4-Chloroaniline	10	U	UG/LITER		BQ100	
	108-60-1	bis(2-Chloroisopropyl)ether	10	U	UG/LITER		BQ100	
	108-95-2	Phenol	29		UG/LITER		BQ100	
	111-91-1	bis(2-Chloroethoxy)methane	36		UG/LITER		BQ100	
	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER		BQ100	
	117-84-0	Di-n-octyl phthalate	10	U	UG/LITER		BQ100	
	120-12-7	Anthracene	10	U	UG/LITER		BQ100	
	120-82-1	1,2,4-Trichlorobenzene	10	U	UG/LITER		BQ100	
	120-83-2	2,4-Dichlorophenol	10	U	UG/LITER		BQ100	
	129-00-0	Pyrene	10	U	UG/LITER		BQ100	
	121-14-2	2,4-Dinitrotoluene	10	U	UG/LITER		BQ100	
	118-74-1	Hexachlorobenzene	10	U	UG/LITER		BQ100	
	111-44-4	bis(2-Chloroethyl)ether	10	U	UG/LITER		BQ100	
	106-46-7	1,4-Dichlorobenzene	10	U	UG/LITER		BQ100	
	100-51-6	Benzyl alcohol	10	U	UG/LITER		BQ100	
	98-95-3	Nitrobenzene	10	U	UG/LITER		BQ100	
	95-48-7	2-Methylphenol	10	U	UG/LITER		BQ100	
	91-20-3	Naphthalene	10	U	UG/LITER		BQ100	
	87-86-5	Pentachlorophenol	51		UG/LITER		BQ100	
	78-59-1	Isophorone	10	U	UG/LITER		BQ100	
	83-32-9	Acenaphthene	10	U	UG/LITER		BQ100	
	84-66-2	Diethyl phthalate	10	U	UG/LITER		BQ100	
	84-74-2	Di-n-butyl phthalate	10	U	UG/LITER		BQ100	
	85-01-8	Phenanthrene	45		UG/LITER		BQ100	
	86-30-6	N-Nitrosodiphenylamine	10	U	UG/LITER		BQ100	
	86-73-7	Fluorene	10	U	UG/LITER		BQ100	
	87-68-3	Hexachlorobutadiene	10	U	UG/LITER		BQ100	
	85-68-7	Butyl benzyl phthalate	10	U	UG/LITER		BQ100	

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TABLE 4-12
EPA CHECK SAMPLES

SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULTS	QUALIFIER	UNITS	PRODUCT CODE	SAMPLE LOCATION	FLAG
J0437	59-50-7	4-Chloro-3-methylphenol	10	U	UG/LITER	ME 702	BQ100	TRG
	65-85-0	Benzoic acid	50	U	UG/LITER		BQ100	
	67-72-1	Hexachloroethane	10	U	UG/LITER		BQ100	
	77-47-4	Hexachlorocyclopentadiene	10	U	UG/LITER		BQ100	
	53-70-3	Dibenzo(a,h)anthracene	10	U	UG/LITER		BQ100	
	56-55-3	Benzo(a)anthracene	10	U	UG/LITER		BQ100	
	51-28-5	2,4-Dinitrophenol	50	U	UG/LITER		BQ100	
	56-23-5	Carbon Tetrachloride	5	U	UG/LITER	MV 702	BQ100	
	67-66-3	Chloroform	5	U	UG/LITER		BQ100	
	75-35-4	1,1-Dichloroethene	5	U	UG/LITER		BQ100	
	78-87-5	1,2-Dichloropropane	5	U	UG/LITER		BQ100	
	79-00-5	1,1,2-Trichloroethane	5	U	UG/LITER		BQ100	
	79-01-6	Trichloroethene	5	U	UG/LITER		BQ100	
	79-34-5	1,1,2,2-Tetrachloroethane	5	U	UG/LITER		BQ100	
	100-41-4	Ethylbenzene	5	U	UG/LITER		BQ100	
	100-42-5	Styrene	5	U	UG/LITER		BQ100	
	107-06-2	1,2-Dichloroethane	5	U	UG/LITER		BQ100	
	108-05-4	Vinyl Acetate	10	U	UG/LITER		BQ100	
	108-10-1	4-Methyl-2-pentanone	10	U	UG/LITER		BQ100	
	108-90-7	Chlorobenzene	5	U	UG/LITER		BQ100	
	124-48-1	Dibromochloromethane	5	U	UG/LITER		BQ100	
	127-18-4	Tetrachlorethene	5	U	UG/LITER		BQ100	
	540-59-0	1,2-Dichloroethylene	5	U	UG/LITER		BQ100	
	591-78-6	2-Hexanone	10	U	UG/LITER		BQ100	
	1330-20-7	Total xylenes	5	U	UG/LITER		BQ100	
	10061-02-6	trans-1,3-Dichloropropene	5	U	UG/LITER		BQ100	
	10061-01-5	cis-1,3-Dichloropropene	5	U	UG/LITER		BQ100	
	108-88-3	Toluene	5	U	UG/LITER		BQ100	
	78-93-3	2-Butanone	10	U	UG/LITER		BQ100	
	75-00-3	Chloroethane	10	U	UG/LITER		BQ100	
	75-01-4	Vinyl chloride	10	U	UG/LITER		BQ100	
	75-15-0	Carbon disulfide	5	U	UG/LITER		BQ100	
	75-25-2	Bromoform	5	U	UG/LITER		BQ100	
	75-27-4	Bromodichloromethane	5	U	UG/LITER		BQ100	
	75-34-3	1,1-Dichloroethane	5	U	UG/LITER		BQ100	
	75-09-2	Methylene chloride	6	B	UG/LITER		BQ100	
	71-43-2	Benzene	5	U	UG/LITER		BQ100	
	74-87-3	Chloromethane	10	U	UG/LITER		BQ100	
	74-83-9	Bromomethane	10	U	UG/LITER		BQ100	
	71-55-6	1,1,1-Trichloroethane	5	U	UG/LITER		BQ100	
	67-64-1	Acetone	8	BJ	UG/LITER		BQ100	
	57-12-5	Cyanide	10	U	UG/LITER	WW 034	BQ100	

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TABLE 4-12
EPA CHECK SAMPLES

SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULTS	QUALIFIER	UNITS	PRODUCT CODE	SAMPLE LOCATION	FLAG
J0438	7439-92-1	Lead	18		UG/LITER	AG 702	BQ200	TRG
	7782-49-2	Selenium	11		UG/LITER		BQ200	
	7440-38-2	Arsenic	15	SN	UG/LITER		BQ200	
	7440-28-0	Thallium	17	W	UG/LITER		BQ200	
	7429-90-5	Aluminum	1040		UG/LITER	AP 703	BQ200	
	7440-41-7	Beryllium	15		UG/LITER		BQ200	
	7440-43-9	Cadmium	21		UG/LITER		BQ200	
	7440-47-3	Chromium	25		UG/LITER		BQ200	
	7440-48-4	Cobalt	48	B	UG/LITER		BQ200	
	7440-62-2	Vanadium	93		UG/LITER		BQ200	
	7440-50-8	Copper	52		UG/LITER		BQ200	
	7440-66-6	Zinc	69		UG/LITER		BQ200	
	7440-70-2	Calcium	30	U	UG/LITER		BQ200	
	7440-39-3	Barium	197	B	UG/LITER		BQ200	
	7440-36-0	Antimony	202		UG/LITER		BQ200	
	7440-23-5	Sodium	200	U	UG/LITER		BQ200	
	7440-22-4	Silver	5	U	UG/LITER		BQ200	
	7439-96-5	Manganese	41		UG/LITER		BQ200	
	7440-02-0	Nickel	81		UG/LITER		BQ200	
	7440-09-7	Potassium	1000	U	UG/LITER		BQ200	
	7439-95-4	Magnesium	569		UG/LITER		BQ200	
	7439-89-6	Iron	1070		UG/LITER		BQ200	
	7439-97-6	Mercury	4.8		UG/LITER	AV 002	BQ200	
	50-29-3	4,4'-DDT	.1	U	UG/LITER	GC 720	BQ200	
	8001-35-2	Toxaphene	1	U	UG/LITER		BQ200	
	72-20-8	Endrin	.1	U	UG/LITER		BQ200	
	11096-82-5	Aroclor-1260	1	U	UG/LITER		BQ200	
	11097-69-1	Aroclor-1254	1	U	UG/LITER		BQ200	
	11104-28-2	Aroclor-1221	.5	U	UG/LITER		BQ200	
	11141-16-5	Aroclor-1232	.5	U	UG/LITER		BQ200	
	12672-29-6	Aroclor-1248	.5	U	UG/LITER		BQ200	
	53469-21-9	Aroclor-1242	.5	U	UG/LITER		BQ200	
	53494-70-5	Endrin ketone	.1	U	UG/LITER		BQ200	
	33213-65-9	Endosulfan II	.1	U	UG/LITER		BQ200	
	12674-11-2	Aroclor-1016	.5	U	UG/LITER		BQ200	
	72-43-5	Methoxychlor	.5	U	UG/LITER		BQ200	
	72-54-8	4,4'-DDD	.1	U	UG/LITER		BQ200	
	1024-57-3	Heptachlor epoxide	.05	U	UG/LITER		BQ200	
	1031-07-8	Endosulfan sulfate	.1	U	UG/LITER		BQ200	
	959-98-8	Endosulfan-I	.05	U	UG/LITER		BQ200	
	5103-71-9	alpha-Chlordane	.5	U	UG/LITER		BQ200	
	5103-74-2	gamma-Chlordane	.5	U	UG/LITER		BQ200	
	319-86-8	delta-BHC	.05	U	UG/LITER		BQ200	
	72-55-9	4,4'-DDE	.1	U	UG/LITER		BQ200	
	319-85-7	beta-BHC	.05	U	UG/LITER		BQ200	
	319-84-6	alpha-BHC	.05	U	UG/LITER		BQ200	
	309-00-2	Aldrin	.05	U	UG/LITER		BQ200	
	76-44-8	Heptachlor	.05	U	UG/LITER		BQ200	
	60-57-1	Dieldrin	.1	U	UG/LITER		BQ200	
	58-89-9	gamma-BHC (Lindane)	.05	U	UG/LITER		BQ200	
	50-32-8	Benzo(a)pyrene	10	U	UG/LITER	ME 702	BQ200	
	53-70-3	Dibenzo(a,h)anthracene	10	U	UG/LITER		BQ200	

TABLE 4-12
EPA CHECK SAMPLES

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SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULTS	QUALIFIER	UNITS	PRODUCT CODE	SAMPLE LOCATION	FLAG
J0438	87-86-5	Pentachlorophenol	50	U	UG/LITER	ME 702	BQ200	TRG
	111-91-1	bis(2-Chloroethoxy)methane	10	U	UG/LITER		BQ200	
	88-06-2	2,4,6-Trichlorophenol	10	U	UG/LITER		BQ200	
	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER		BQ200	
	91-20-3	Naphthalene	10	U	UG/LITER		BQ200	
	91-57-6	2-Methylnaphthalene	10	U	UG/LITER		BQ200	
	91-58-7	2-Chloronaphthalene	10	U	UG/LITER		BQ200	
	117-84-0	Di-n-octyl phthalate	10	U	UG/LITER		BQ200	
	118-74-1	Hexachlorobenzene	10	U	UG/LITER		BQ200	
	120-12-7	Anthracene	10	U	UG/LITER		BQ200	
	120-82-1	1,2,4-Trichlorobenzene	10	U	UG/LITER		BQ200	
	120-83-2	2,4-Dichlorophenol	10	U	UG/LITER		BQ200	
	129-00-0	Pyrene	10	U	UG/LITER		BQ200	
	131-11-3	Dimethyl phthalate	10	U	UG/LITER		BQ200	
	132-64-9	Dibenzofuran	10	U	UG/LITER		BQ200	
	191-24-2	Benzo(g,h,i)perylene	10	U	UG/LITER		BQ200	
	121-14-2	2,4-Dinitrotoluene	10	U	UG/LITER		BQ200	
	91-94-1	3,3'-Dichlorobenzidine	20	U	UG/LITER		BQ200	
	193-39-5	Indeno(1,2,3-cd)pyrene	10	U	UG/LITER		BQ200	
	205-99-2	Benzo(b)fluoranthene	10	U	UG/LITER		BQ200	
	207-08-9	Benzo(k)fluoranthene	10	U	UG/LITER		BQ200	
	206-44-0	Fluoranthene	10	U	UG/LITER		BQ200	
	95-48-7	2-Methylphenol	10	U	UG/LITER		BQ200	
	208-96-8	Acenaphthylene	10	U	UG/LITER		BQ200	
	218-01-9	Chrysene	10	U	UG/LITER		BQ200	
	534-52-1	4,6-Dinitro-2-methylphenol	50	U	UG/LITER		BQ200	
	541-73-1	1,3-Dichlorobenzene	10	U	UG/LITER		BQ200	
	606-20-2	2,6-Dinitrotoluene	10	U	UG/LITER		BQ200	
	7005-72-3	4-Chlorophenylphenyl ether	10	U	UG/LITER		BQ200	
	621-64-7	N-Nitroso-di-n-propylamine	10	U	UG/LITER		BQ200	
	95-50-1	1,2-Dichlorobenzene	10	U	UG/LITER		BQ200	
	95-57-9	2-Chlorophenol	10	U	UG/LITER		BQ200	
	95-95-4	2,4,5-Trichlorophenol	50	U	UG/LITER		BQ200	
	98-95-3	Nitrobenzene	10	U	UG/LITER		BQ200	
	99-09-2	3-Nitroaniline	50	U	UG/LITER		BQ200	
	100-01-6	4-Nitroaniline	50	U	UG/LITER		BQ200	
	100-02-7	4-Nitrophenol	50	U	UG/LITER		BQ200	
	101-55-3	4-Bromophenyl phenyl ether	10	U	UG/LITER		BQ200	
	105-67-9	2,4-Dimethylphenol	10	U	UG/LITER		BQ200	
	106-44-5	4-Methylphenol	10	U	UG/LITER		BQ200	
	106-46-7	1,4-Dichlorobenzene	10	U	UG/LITER		BQ200	
	108-60-1	bis(2-Chloroisopropyl)ether	10	U	UG/LITER		BQ200	
	108-95-2	Phenol	10	U	UG/LITER		BQ200	
	111-44-4	bis(2-Chloroethyl)ether	10	U	UG/LITER		BQ200	
	106-47-8	4-Chloroaniline	10	U	UG/LITER		BQ200	
	100-51-6	Benzyl alcohol	10	U	UG/LITER		BQ200	
	88-75-5	2-Nitrophenol	10	U	UG/LITER		BQ200	
	88-74-4	2-Nitroaniline	50	U	UG/LITER		BQ200	
	67-72-1	Hexachloroethane	10	U	UG/LITER		BQ200	
	77-47-4	Hexachlorocyclopentadiene	10	U	UG/LITER		BQ200	
	85-01-8	Phenanthrene	10	U	UG/LITER		BQ200	
	85-68-7	Butyl benzyl phthalate	10	U	UG/LITER		BQ200	
	86-30-6	N-Nitrosodiphenylamine	10	U	UG/LITER		BQ200	
	86-73-7	Fluorene	10	U	UG/LITER		BQ200	
	87-68-3	Hexachlorobutadiene	10	U	UG/LITER		BQ200	
	84-74-2	Di-n-butyl phthalate	10	U	UG/LITER		BQ200	

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TABLE 4-12
EPA CHECK SAMPLES

SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULTS	QUALIFIER	UNITS	PRODUCT CODE	SAMPLE LOCATION	FLAG
J0438	78-59-1	Isophorone	10	U	UG/LITER	ME 702	BQ200	TRG
	84-66-2	Diethyl phthalate	10	U	UG/LITER		BQ200	
	83-32-9	Acenaphthene	10	U	UG/LITER		BQ200	
	65-85-0	Benzoic acid	50	U	UG/LITER		BQ200	
	59-50-7	4-Chloro-3-methylphenol	10	U	UG/LITER		BQ200	
	56-55-3	Benzo(a)anthracene	10	U	UG/LITER		BQ200	
	51-28-5	2,4-Dinitrophenol	50	U	UG/LITER		BQ200	
	56-23-5	Carbon Tetrachloride	5	U	UG/LITER	MV 702	BQ200	
	79-01-6	Trichloroethene	5	U	UG/LITER		BQ200	
	79-34-5	1,1,2,2-Tetrachloroethane	5	U	UG/LITER		BQ200	
	100-41-4	Ethylbenzene	5	U	UG/LITER		BQ200	
	100-42-5	Styrene	5	U	UG/LITER		BQ200	
	107-06-2	1,2-Dichloroethane	5	U	UG/LITER		BQ200	
	108-10-1	4-Methyl-2-pentanone	10	U	UG/LITER		BQ200	
	108-88-3	Toluene	5	U	UG/LITER		BQ200	
	108-90-7	Chlorobenzene	5	U	UG/LITER		BQ200	
	124-48-1	Dibromochloromethane	5	U	UG/LITER		BQ200	
	127-18-4	Tetrachlorethene	5	U	UG/LITER		BQ200	
	540-59-0	1,2-Dichloroethylene	5	U	UG/LITER		BQ200	
	591-78-6	2-Hexanone	10	U	UG/LITER		BQ200	
	1330-20-7	Total xylenes	5	U	UG/LITER		BQ200	
	10061-01-5	cis-1,3-Dichloropropene	5	U	UG/LITER		BQ200	
	108-05-4	Vinyl Acetate	10	U	UG/LITER		BQ200	
	71-43-2	Benzene	5	U	UG/LITER		BQ200	
	10061-02-6	trans-1,3-Dichloropropene	5	U	UG/LITER		BQ200	
	71-55-6	1,1,1-Trichloroethane	5	U	UG/LITER		BQ200	
	75-27-4	Bromodichloromethane	5	U	UG/LITER		BQ200	
	75-34-3	1,1-Dichloroethane	5	U	UG/LITER		BQ200	
	75-35-4	1,1-Dichloroethene	5	U	UG/LITER		BQ200	
	78-87-5	1,2-Dichloropropane	5	U	UG/LITER		BQ200	
	78-93-3	2-Butanone	10	U	UG/LITER		BQ200	
	79-00-5	1,1,2-Trichloroethane	5	U	UG/LITER		BQ200	
	75-25-2	Bromoform	5	U	UG/LITER		BQ200	
	75-15-0	Carbon disulfide	5	U	UG/LITER		BQ200	
	74-83-9	Bromomethane	10	U	UG/LITER		BQ200	
	75-09-2	Methylene chloride	4	BJ	UG/LITER		BQ200	
	75-01-4	Vinyl chloride	10	U	UG/LITER		BQ200	
	75-00-3	Chloroethane	10	U	UG/LITER		BQ200	
	74-87-3	Chloromethane	10	U	UG/LITER		BQ200	
	67-66-3	Chloroform	5	U	UG/LITER		BQ200	
	67-64-1	Acetone	5	BJ	UG/LITER		BQ200	
	57-12-5	Cyanide	58		UG/LITER	WW 034	BQ200	

TABLE 4-12
EPA CHECK SAMPLES

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SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULTS	QUALIFIER	UNITS	PRODUCT CODE	SAMPLE LOCATION	FLAG
J0439	7439-92-1	Lead	3	UW	UG/LITER	AG 702	BQ300	TRG
	7782-49-2	Selenium	26	UW	UG/LITER		BQ300	
	7440-38-2	Arsenic	24	UWN	UG/LITER		BQ300	
	7440-28-0	Thallium	141	UE	UG/LITER		BQ300	
	7429-90-5	Aluminum	100000		UG/LITER	AP 703	BQ300	
	7440-09-7	Potassium	1000	U	UG/LITER		BQ300	
	7440-22-4	Silver	5	U	UG/LITER		BQ300	
	7440-23-5	Sodium	200	U	UG/LITER		BQ300	
	7440-48-4	Cobalt	20	U	UG/LITER		BQ300	
	7440-50-8	Copper	10	U	UG/LITER		BQ300	
	7440-62-2	Vanadium	10	U	UG/LITER		BQ300	
	7440-66-6	Zinc	16	B	UG/LITER		BQ300	
	7440-70-2	Calcium	30	U	UG/LITER		BQ300	
	7440-47-3	Chromium	10	U	UG/LITER		BQ300	
	7440-43-9	Cadmium	5	U	UG/LITER		BQ300	
	7440-41-7	Beryllium	1	U	UG/LITER		BQ300	
	7440-39-3	Barium	2	U	UG/LITER		BQ300	
	7440-36-0	Antimony	30	U	UG/LITER		BQ300	
	7439-96-5	Manganese	2	B	UG/LITER		BQ300	
	7440-02-0	Nickel	20	U	UG/LITER		BQ300	
	7439-95-4	Magnesium	30	U	UG/LITER		BQ300	
	7439-89-6	Iron	107000		UG/LITER		BQ300	
	7439-97-6	Mercury	.2	U	UG/LITER	AV 002	BQ300	

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TABLE 4-12
EPA CHECK SAMPLES

SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULTS	QUALIFIER	UNITS	PRODUCT CODE	SAMPLE LOCATION	FLAG
J1534	7439-92-1	Lead	2	U	UG/LITER	AG 702		TRG
	7440-38-2	Arsenic	2	UW	UG/LITER			
	7782-49-2	Selenium	2	U	UG/LITER			
	7440-28-0	Thallium	2	UW	UG/LITER			
	7429-90-5	Aluminum	40	U	UG/LITER	AP 703		
	7440-22-4	Silver	5	U	UG/LITER			
	7440-36-0	Antimony	30	U	UG/LITER			
	7440-41-7	Beryllium	1	U	UG/LITER			
	7440-47-3	Chromium	10	U	UG/LITER			
	7440-50-8	Copper	41		UG/LITER			
	7440-66-6	Zinc	13	B	UG/LITER			
	7440-70-2	Calcium	30	U	UG/LITER			
	7440-62-2	Vanadium	10	U	UG/LITER			
	7440-48-4	Cobalt	20	U	UG/LITER			
	7440-43-9	Cadmium	5	U	UG/LITER			
	7440-39-3	Barium	2	U	UG/LITER			
	7440-23-5	Sodium	200	U	UG/LITER			
	7440-09-7	Potassium	1000	U	UG/LITER			
	7439-95-4	Magnesium	30	U	UG/LITER			
	7440-02-0	Nickel	20	U	UG/LITER			
	7439-96-5	Manganese	2	U	UG/LITER			
	7439-89-6	Iron	10	U	UG/LITER			
	7439-97-6	Mercury	.2	U	UG/LITER	AV 002		
	50-32-8	Benzo(a)pyrene	10	U	UG/LITER	ME 702		
	95-48-7	2-Methylphenol	10	U	UG/LITER			
	95-57-8	2-Chlorophenol	10	U	UG/LITER			
	98-95-3	Nitrobenzene	10	U	UG/LITER			
	100-01-6	4-Nitroaniline	50	U	UG/LITER			
	100-51-6	Benzyl alcohol	10	U	UG/LITER			
	105-67-9	2,4-Dimethylphenol	10	U	UG/LITER			
	106-46-7	1,4-Dichlorobenzene	10	U	UG/LITER			
	108-60-1	bis(2-Chloroisopropyl)ether	10	U	UG/LITER			
	111-44-4	bis(2-Chloroethyl)ether	10	U	UG/LITER			
	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER			
	118-74-1	Hexachlorobenzene	10	U	UG/LITER			
	120-82-1	1,2,4-Trichlorobenzene	10	U	UG/LITER			
	121-14-2	2,4-Dinitrotoluene	10	U	UG/LITER			
	131-11-3	Dimethyl phthalate	10	U	UG/LITER			
	191-24-2	Benzo(g,h,i)perylene	10	U	UG/LITER			
	205-99-2	Benzo(b)fluoranthene	10	U	UG/LITER			
	207-08-9	Benzo(k)fluoranthene	10	U	UG/LITER			
	218-01-9	Chrysene	10	U	UG/LITER			
	541-73-1	1,3-Dichlorobenzene	10	U	UG/LITER			
	621-64-7	N-Nitroso-di-n-propylamine	10	U	UG/LITER			
	7005-72-3	4-Chlorophenylphenyl ether	10	U	UG/LITER			
	606-20-2	2,6-Dinitrotoluene	10	U	UG/LITER			
	534-52-1	4,6-Dinitro-2-methylphenol	50	U	UG/LITER			
	208-96-8	Acenaphthylene	10	U	UG/LITER			
	206-44-0	Fluoranthene	10	U	UG/LITER			
	193-39-5	Indeno(1,2,3-cd)pyrene	10	U	UG/LITER			
	132-64-9	Dibenzofuran	10	U	UG/LITER			
	129-00-0	Pyrene	10	U	UG/LITER			
	120-83-2	2,4-Dichlorophenol	10	U	UG/LITER			

TABLE 4-12
EPA CHECK SAMPLES

SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULTS	QUALIFIER	UNITS	PRODUCT CODE	SAMPLE LOCATION	FLAG
J1534	120-12-7	Anthracene	10	U	UG/LITER	ME 702		TRG
	117-84-0	Di-n-octyl phthalate	10	U	UG/LITER			
	111-91-1	bis(2-Chloroethoxy)methane	10	U	UG/LITER			
	108-95-2	Phenol	10	U	UG/LITER			
	106-47-8	4-Chloroaniline	10	U	UG/LITER			
	106-44-5	4-Methylphenol	10	U	UG/LITER			
	101-55-3	4-Bromophenyl phenyl ether	10	U	UG/LITER			
	100-02-7	4-Nitrophenol	50	U	UG/LITER			
	99-09-2	3-Nitroaniline	50	U	UG/LITER			
	95-95-4	2,4,5-Trichlorophenol	50	U	UG/LITER			
	95-50-1	1,2-Dichlorobenzene	10	U	UG/LITER			
	91-94-1	3,3'-Dichlorobenzidine	20	U	UG/LITER			
	83-32-9	Acenaphthene	10	U	UG/LITER			
	84-66-2	Diethyl phthalate	10	U	UG/LITER			
	84-74-2	Di-n-butyl phthalate	10	U	UG/LITER			
	85-68-7	Butyl benzyl phthalate	10	U	UG/LITER			
	86-30-6	N-Nitrosodiphenylamine	7	BJ	UG/LITER			
	86-73-7	Fluorene	10	U	UG/LITER			
	87-86-5	Pentachlorophenol	50	U	UG/LITER			
	88-06-2	2,4,6-Trichlorophenol	10	U	UG/LITER			
	88-74-4	2-Nitroaniline	50	U	UG/LITER			
	91-20-3	Naphthalene	10	U	UG/LITER			
	91-57-6	2-Methylnaphthalene	10	U	UG/LITER			
	91-58-7	2-Chloronaphthalene	10	U	UG/LITER			
	88-75-5	2-Nitrophenol	10	U	UG/LITER			
	87-68-3	Hexachlorobutadiene	10	U	UG/LITER			
	85-01-8	Phenanthrene	10	U	UG/LITER			
	78-59-1	Isophorone	10	U	UG/LITER			
	59-50-7	4-Chloro-3-methylphenol	10	U	UG/LITER			
	65-85-0	Benzoic acid	50	U	UG/LITER			
	67-72-1	Hexachloroethane	10	U	UG/LITER			
	77-47-4	Hexachlorocyclopentadiene	10	U	UG/LITER			
	53-70-3	Dibenzo(a,h)anthracene	10	U	UG/LITER			
	56-55-3	Benzo(a)anthracene	10	U	UG/LITER			
	51-28-5	2,4-Dinitrophenol	50	U	UG/LITER			
	56-23-5	Carbon Tetrachloride	38		UG/LITER	MV 702		
	74-83-9	Bromomethane	54		UG/LITER			
	124-48-1	Dibromochloromethane	5	U	UG/LITER			
	540-59-0	1,2-Dichloroethylene	5	U	UG/LITER			
	591-78-6	2-Hexanone	10	U	UG/LITER			
	1330-20-7	Total xylenes	5	U	UG/LITER			
	10061-02-6	trans-1,3-Dichloropropene	5	U	UG/LITER			
	10061-01-5	cis-1,3-Dichloropropene	5	U	UG/LITER			
	127-18-4	Tetrachlorethene	5	U	UG/LITER			
	75-27-4	Bromodichloromethane	5	U	UG/LITER			
	75-35-4	1,1-Dichloroethene	43		UG/LITER			
	78-87-5	1,2-Dichloropropane	42		UG/LITER			
	78-93-3	2-Butanone	10	U	UG/LITER			
	79-00-5	1,1,2-Trichloroethane	41		UG/LITER			
	79-01-6	Trichloroethene	44		UG/LITER			
	79-34-5	1,1,2,2-Tetrachloroethane	39		UG/LITER			
	100-41-4	Ethylbenzene	5	U	UG/LITER			
	100-42-5	Styrene	5	U	UG/LITER			
	108-05-4	Vinyl Acetate	10	U	UG/LITER			
	108-10-1	4-Methyl-2-pentanone	10	U	UG/LITER			

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TABLE 4-12
EPA CHECK SAMPLES

SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULTS	QUALIFIER	UNITS	PRODUCT CODE	SAMPLE LOCATION	FLAG
31534	108-88-3	Toluene	5	U	UG/LITER	MW 702		TRG
	108-90-7	Chlorobenzene	41		UG/LITER			
	107-06-2	1,2-Dichloroethane	5	U	UG/LITER			
	75-34-3	1,1-Dichloroethane	43		UG/LITER			
	75-00-3	Chloroethane	49		UG/LITER			
	75-01-4	Vinyl chloride	10	U	UG/LITER			
	75-09-2	Methylene chloride	1	J	UG/LITER			
	75-15-0	Carbon disulfide	5	U	UG/LITER			
	75-25-2	Bromoform	40		UG/LITER			
	74-87-3	Chloromethane	10	U	UG/LITER			
	67-66-3	Chloroform	43		UG/LITER			
	71-55-6	1,1,1-Trichloroethane	5	U	UG/LITER			
	71-43-2	Benzene	5	U	UG/LITER			
	67-64-1	Acetone	10	U	UG/LITER			
	57-12-5	Cyanide	44		UG/LITER	WW 034		

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TABLE 4-12
EPA CHECK SAMPLES

SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULTS	QUALIFIER	UNITS	PRODUCT CODE	SAMPLE LOCATION	FLAG
J1535	7439-92-1	Lead	12		UG/LITER	AG 702		TRG
	7782-49-2	Selenium	11		UG/LITER			
	7440-38-2	Arsenic	14	W	UG/LITER			
	7440-28-0	Thallium	9	B	UG/LITER			
	7429-90-5	Aluminum	1020		UG/LITER	AP 703		
	7439-95-4	Magnesium	723	B	UG/LITER			
	7440-39-3	Barium	96		UG/LITER			
	7440-41-7	Beryllium	10		UG/LITER			
	7440-43-9	Cadmium	14		UG/LITER			
	7440-48-4	Cobalt	53		UG/LITER			
	7440-50-8	Copper	40		UG/LITER			
	7440-62-2	Vanadium	147		UG/LITER			
	7440-66-6	Zinc	51		UG/LITER			
	7440-70-2	Calcium	30	U	UG/LITER			
	7440-47-3	Chromium	15		UG/LITER			
	7440-36-0	Antimony	136		UG/LITER			
	7440-23-5	Sodium	200	U	UG/LITER			
	7440-22-4	Silver	5	U	UG/LITER			
	7440-09-7	Potassium	1000	U	UG/LITER			
	7440-02-0	Nickel	124		UG/LITER			
	7439-96-5	Manganese	31		UG/LITER			
	7439-89-6	Iron	863		UG/LITER			
	7439-97-6	Mercury	9.6		UG/LITER	AV 002		
	50-32-8	Benzo(a)pyrene	10	U	UG/LITER	ME 702		
	56-55-3	Benzo(a)anthracene	10	U	UG/LITER			
	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER			
	117-84-0	Di-n-octyl phthalate	10	U	UG/LITER			
	118-74-1	Hexachlorobenzene	10	U	UG/LITER			
	120-82-1	1,2,4-Trichlorobenzene	10	U	UG/LITER			
	120-12-7	Anthracene	10	U	UG/LITER			
	83-32-9	Acenaphthene	10	U	UG/LITER			
	120-83-2	2,4-Dichlorophenol	10	U	UG/LITER			
	88-74-4	2-Nitroaniline	50	U	UG/LITER			
	88-75-5	2-Nitrophenol	10	U	UG/LITER			
	91-20-3	Naphthalene	10	U	UG/LITER			
	91-57-6	2-Methylnaphthalene	21		UG/LITER			
	91-58-7	2-Chloronaphthalene	10	U	UG/LITER			
	91-94-1	3,3'-Dichlorobenzidine	20	U	UG/LITER			
	121-14-2	2,4-Dinitrotoluene	10	U	UG/LITER			
	129-00-0	Pyrene	10	U	UG/LITER			
	131-11-3	Dimethyl phthalate	10	U	UG/LITER			
	191-24-2	Benzo(g,h,i)perylene	10	U	UG/LITER			
	132-64-9	Dibenzofuran	10	U	UG/LITER			
	95-48-7	2-Methylphenol	10	U	UG/LITER			
	193-39-5	Indeno(1,2,3-cd)pyrene	10	U	UG/LITER			
	205-99-2	Benzo(b)fluoranthene	10	U	UG/LITER			
	206-44-0	Fluoranthene	30		UG/LITER			
	95-57-8	2-Chlorophenol	10	U	UG/LITER			
	95-95-4	2,4,5-Trichlorophenol	50	U	UG/LITER			
	98-95-3	Nitrobenzene	10	U	UG/LITER			
	99-09-2	3-Nitroaniline	50	U	UG/LITER			
	207-08-9	Benzo(k)fluoranthene	10	U	UG/LITER			
	208-96-8	Acenaphthylene	10	U	UG/LITER			

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TABLE 4-12
EPA CHECK SAMPLES

SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULTS	QUALIFIER	UNITS	PRODUCT CODE	SAMPLE LOCATION	FLAG
J1535	534-52-1	4,6-Dinitro-2-methylphenol	50	U	UG/LITER	ME 702		TRG
	541-73-1	1,3-Dichlorobenzene	10	U	UG/LITER			
	621-64-7	N-Nitroso-di-n-propylamine	10	U	UG/LITER			
	7005-72-3	4-Chlorophenylphenyl ether	10	U	UG/LITER			
	606-20-2	2,6-Dinitrotoluene	31		UG/LITER			
	218-01-9	Chrysene	10	U	UG/LITER			
	100-01-6	4-Nitroaniline	50	U	UG/LITER			
	100-02-7	4-Nitrophenol	50	U	UG/LITER			
	100-51-6	Benzyl alcohol	10	U	UG/LITER			
	101-55-3	4-Bromophenyl phenyl ether	10	U	UG/LITER			
	105-67-9	2,4-Dimethylphenol	67		UG/LITER			
	106-46-7	1,4-Dichlorobenzene	10	U	UG/LITER			
	106-47-8	4-Chloroaniline	10	U	UG/LITER			
	108-60-1	bis(2-Chloroisopropyl)ether	10	U	UG/LITER			
	108-95-2	Phenol	28		UG/LITER			
	111-91-1	bis(2-Chloroethoxy)methane	29		UG/LITER			
	111-44-4	bis(2-Chloroethyl)ether	10	U	UG/LITER			
	106-44-5	4-Methylphenol	10	U	UG/LITER			
	95-50-1	1,2-Dichlorobenzene	10	U	UG/LITER			
	84-66-2	Diethyl phthalate	10	U	UG/LITER			
	84-74-2	Di-n-butyl phthalate	24		UG/LITER			
	85-01-8	Phenanthrene	31		UG/LITER			
	85-68-7	Butyl benzyl phthalate	10	U	UG/LITER			
	86-30-6	N-Nitrosodiphenylamine	7	BJ	UG/LITER			
	86-73-7	Fluorene	10	U	UG/LITER			
	87-68-3	Hexachlorobutadiene	10	U	UG/LITER			
	88-06-2	2,4,6-Trichlorophenol	10	U	UG/LITER			
	87-86-5	Pentachlorophenol	59		UG/LITER			
	59-50-7	4-Chloro-3-methylphenol	10	U	UG/LITER			
	65-85-0	Benzoic acid	50	U	UG/LITER			
	78-59-1	Isophorone	10	U	UG/LITER			
	77-47-4	Hexachlorocyclopentadiene	10	U	UG/LITER			
	67-72-1	Hexachloroethane	10	U	UG/LITER			
	53-70-3	Dibenzo(a,h)anthracene	10	U	UG/LITER			
	51-28-5	2,4-Dinitrophenol	50	U	UG/LITER			
	56-23-5	Carbon Tetrachloride	5	U	UG/LITER	MV 702		
	71-43-2	Benzene	5	U	UG/LITER			
	79-01-6	Trichloroethene	5	U	UG/LITER			
	79-34-5	1,1,2,2-Tetrachloroethane	5	U	UG/LITER			
	100-41-4	Ethylbenzene	5	U	UG/LITER			
	100-42-5	Styrene	5	U	UG/LITER			
	108-05-4	Vinyl Acetate	10	U	UG/LITER			
	108-10-1	4-Methyl-2-pentanone	10	U	UG/LITER			
	108-88-3	Toluene	5	U	UG/LITER			
	127-18-4	Tetrachlorethene	5	U	UG/LITER			
	540-59-0	1,2-Dichloroethylene	5	U	UG/LITER			
	591-78-6	2-Hexanone	10	U	UG/LITER			
	1330-20-7	Total xylenes	5	U	UG/LITER			
	10061-01-5	cis-1,3-Dichloropropene	5	U	UG/LITER			
	10061-02-6	trans-1,3-Dichloropropene	5	U	UG/LITER			
	124-48-1	Dibromochloromethane	5	U	UG/LITER			
	108-90-7	Chlorobenzene	5	U	UG/LITER			
	107-06-2	1,2-Dichloroethane	5	U	UG/LITER			
	71-55-6	1,1,1-Trichloroethane	5	U	UG/LITER			
	75-27-4	Bromodichloromethane	5	U	UG/LITER			

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TABLE 4-12
EPA CHECK SAMPLES

SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULTS	QUALIFIER	UNITS	PRODUCT CODE	SAMPLE LOCATION	FLAG
J1535	75-34-3	1,1-Dichloroethane	5	U	UG/LITER	MV 702		TRG
	75-35-4	1,1-Dichloroethene	5	U	UG/LITER			
	78-87-5	1,2-Dichloropropane	5	U	UG/LITER			
	78-93-3	2-Butanone	10	U	UG/LITER			
	79-00-5	1,1,2-Trichloroethane	5	U	UG/LITER			
	75-25-2	Bromoform	5	U	UG/LITER			
	75-15-0	Carbon disulfide	5	U	UG/LITER			
	74-83-9	Bromomethane	10	U	UG/LITER			
	75-09-2	Methylene chloride	2	JB	UG/LITER			
	75-01-4	Vinyl chloride	10	U	UG/LITER			
	75-00-3	Chloroethane	10	U	UG/LITER			
	74-87-3	Chloromethane	10	U	UG/LITER			
	67-66-3	Chloroform	5	U	UG/LITER			
	67-64-1	Acetone	6	JB	UG/LITER			
	57-12-5	Cyanide	20	U	UG/LITER	WW 034		

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TABLE 4-12
EPA CHECK SAMPLES

SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULTS	QUALIFIER	UNITS	PRODUCT CODE	SAMPLE LOCATION	FLAG
J1536	7439-92-1	Lead	3	UW	UG/LITER	AG 702		TRG
	7440-38-2	Arsenic	2	U	UG/LITER			
	7782-49-2	Selenium	4	UW	UG/LITER			
	7440-28-0	Thallium	143	UE	UG/LITER			
	7429-90-5	Aluminum	104000		UG/LITER	AP 703		
	7440-09-7	Potassium	1000	U	UG/LITER			
	7440-22-4	Silver	5	U	UG/LITER			
	7440-23-5	Sodium	200	U	UG/LITER			
	7440-36-0	Antimony	59		UG/LITER			
	7440-50-8	Copper	10	U	UG/LITER			
	7440-62-2	Vanadium	10	U	UG/LITER			
	7440-66-6	Zinc	11	B	UG/LITER			
	7440-70-2	Calcium	30	U	UG/LITER			
	7440-48-4	Cobalt	20	U	UG/LITER			
	7440-47-3	Chromium	10	U	UG/LITER			
	7440-43-9	Cadmium	5	U	UG/LITER			
	7440-41-7	Beryllium	1	U	UG/LITER			
	7440-39-3	Barium	4	B	UG/LITER			
	7439-96-5	Manganese	8	B	UG/LITER			
	7440-02-0	Nickel	20	U	UG/LITER			
	7439-95-4	Magnesium	30	U	UG/LITER			
	7439-89-6	Iron	112000		UG/LITER			
	7439-97-6	Mercury	25.7		UG/LITER	AV 002		

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619
TABLE 4-13

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CONDENSED VOLATILE RESULTS
FOR EXTRA SURFACE SOIL SAMPLES

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J1580 SS35	J1579 SS36	J1573 SS37	J1574 SS37	J1572 SS38	J1571 SS39
Acetone {1}	30	38	35	64	31	22
Methylene chloride {1}	29	8	13	22	10	9
Styrene					6	

PROJECT: BLUFF ROAD, S.C. NUMBER: 408619
TABLE 4-13

CONDENSED SEMI-VOLATILE AND PESTICIDE/PCB RESULTS
FOR EXTRA SURFACE SOIL SAMPLES

SAMPLE NUMBER / LOCATION IDENTIFICATION

ANALYTE (PPB)	J1580 SS35	J1579 SS36(*)	J1573 SS37	J1574 SS37	J1572 SS38(*)	J1571 SS39(*)
Benzoic acid	3800		420	1000		
bis(2-Ethylhexyl) phthalate {1}	220		230	2400		
Di-n-octyl phthalate				120		

NOTE: Only the compounds which were detected are listed on this table.
For complete analytical results, see the appendix.

FOOTNOTES: {1} The compound was found in the associated blanks, possibly at similar concentrations.
(*) Analysis not requested.

TABLE 4-14

Determination of Laboratory Contamination

For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

F CO	SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK41879	QM10B809071CB	67-64-1	Acetone	7	J	UG/KG	BLK
	QM09B909071CB	67-64-1		7	J	UG/LITER	BLK
	LWA0826881100	67-64-1		2	JB	UG/LITER	TRG
	LSE0826881100	67-64-1		110	B	UG/KG	TRG
	QM09B909071CB	75-09-2	Methylene chloride	5	U	UG/LITER	BLK
	QM10B809071CB	75-09-2		5	U	UG/KG	BLK
	LSE0826881100	75-09-2		12		UG/KG	TRG
	LWA0826881100	75-09-2		5	U	UG/LITER	TRG
	QM09B909071CB	108-88-3	Toluene	5	U	UG/LITER	BLK
	QM10B809071CB	108-88-3		5	U	UG/KG	BLK
	LSE0826881100	108-88-3		11	U	UG/KG	TRG
	LWA0826881100	108-88-3		5	U	UG/LITER	TRG
	QM13B80901S1	117-81-7	bis(2-Ethylhexyl) phthalate	860		UG/KG	BLK
	QM12B80901D1	117-81-7		10	U	UG/LITER	BLK
	LSE0826881100	117-81-7		4400	B	UG/KG	TRG
	L0826880915-2	117-81-7		1400	B	UG/KG	TRG
	LWA0826881100	117-81-7		10	U	UG/LITER	TRG
	L0826880915-1	117-81-7		980	B	UG/KG	TRG
[illegible]06	VB09282	67-64-1	Acetone	10	U	UG/LITER	BLK
	J0344	67-64-1		65		UG/LITER	TRG
	VB09282	75-09-2	Methylene chloride	1	J	UG/LITER	BLK
	J0344	75-09-2		1	JB	UG/LITER	TRG
	VB09282	108-88-3	Toluene	5	U	UG/LITER	BLK
	J0344	108-88-3		5	U	UG/LITER	TRG
ITEK42016	QM10B81006EB	67-64-1	Acetone	10		UG/KG	BLK
	QM09B81005VB	67-64-1		10	U	UG/LITER	BLK
	J0352	67-64-1		11	B	UG/KG	TRG
	J0355	67-64-1		25		UG/LITER	TRG
	J0346	67-64-1		16	B	UG/KG	TRG
	QM09B81005VB	75-09-2	Methylene chloride	5	U	UG/LITER	BLK
	QM10B81006EB	75-09-2		3	J	UG/KG	BLK
	J0346	75-09-2		32	B	UG/KG	TRG
	J0352	75-09-2		21	B	UG/KG	TRG
	J0355	75-09-2		2	J	UG/LITER	TRG
	QM09B81005VB	108-88-3	Toluene	5	U	UG/LITER	BLK
	QM10B81006EB	108-88-3		5	U	UG/KG	BLK
	J0346	108-88-3		5	U	UG/KG	TRG
	J0355	108-88-3		5	U	UG/LITER	TRG
	J0352	108-88-3		1	J	UG/KG	TRG
	QM13B80928D2	117-81-7	bis(2-Ethylhexyl) phthalate	380		UG/KG	BLK
	QM12B80928D1	117-81-7		10	U	UG/LITER	BLK

TABLE 4-14

Determination of Laboratory Contamination

For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

Case	SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK42016	J0355	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER	TRG
	J0346	117-81-7		480	B	UG/KG	TRG
	J0352	117-81-7		550	B	UG/KG	TRG
ITEK42372	QM10B81201VB	67-64-1	Acetone	3	J	UG/KG	BLK
	QM00B81201VB2	67-64-1		5	J	UG/KG	BLK
	QM10B81202VB	67-64-1		2	J	UG/KG	BLK
	J0369	67-64-1		8000	DB	UG/KG	DL
	J0369	67-64-1		2600	EB	UG/KG	TRG
	J0372	67-64-1		66	B	UG/KG	TRG
	J0368	67-64-1		47	B	UG/KG	TRG
	J0371	67-64-1		6500	DB	UG/KG	TRG
	J0370	67-64-1		59	B	UG/KG	TRG
	QM10B81201VB	75-09-2	Methylene chloride	2	J	UG/KG	BLK
	QM10B81202VB	75-09-2		2	J	UG/KG	BLK
	QM00B81201VB2	75-09-2		2	J	UG/KG	BLK
	J0369	75-09-2		360	DBJ	UG/KG	DL
	J0369	75-09-2		20	B	UG/KG	TRG
	J0371	75-09-2		26	B	UG/KG	TRG
	J0372	75-09-2		16	B	UG/KG	TRG
	J0368	75-09-2		25	B	UG/KG	TRG
	J0370	75-09-2		18	B	UG/KG	TRG
	QM10B81201VB	108-88-3	Toluene	5	U	UG/KG	BLK
	QM00B81201VB2	108-88-3		5	U	UG/KG	BLK
	QM10B81202VB	108-88-3		5	U	UG/KG	BLK
	J0369	108-88-3		680	U	UG/KG	DL
	J0369	108-88-3		112		% RECOVERY	DLD
	J0369	108-88-3		104		% RECOVERY	DLS
	J0368	108-88-3		107		% RECOVERY	MS
	J0368	108-88-3		106		% RECOVERY	MSD
	J0369	108-88-3		2	J	UG/KG	TRG
	J0372	108-88-3		2	J	UG/KG	TRG
	J0368	108-88-3		5	U	UG/KG	TRG
	J0371	108-88-3		3	J	UG/KG	TRG
	J0370	108-88-3		1	J	UG/KG	TRG
	QM13B81201P1	117-81-7	bis(2-Ethylhexyl) phthalate	150	J	UG/KG	BLK
	J0370	117-81-7		1100	BJ	UG/KG	TRG
	J0368	117-81-7		470	BJ	UG/KG	TRG
	J0369	117-81-7		880	BJ	UG/KG	TRG
	J0372	117-81-7		1500	B	UG/KG	TRG
	J0371	117-81-7		960	BJ	UG/KG	TRG

Determination of Laboratory Contamination
For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

Code	SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK42380	QM10B81205VB3	67-64-1	Acetone	5	J	UG/KG	BLK
	QM10B81205VB	67-64-1		2	J	UG/KG	BLK
	QM10B81202VB	67-64-1		2	J	UG/KG	BLK
	QM10B81202VB2	67-64-1		2	J	UG/KG	BLK
	J0385	67-64-1		15000	DB	UG/KG	TRG
	J0375	67-64-1		1100	DB	UG/KG	TRG
	J0374	67-64-1		33	B	UG/KG	TRG
	J0384	67-64-1		6100	DB	UG/KG	TRG
	J0386	67-64-1		16	B	UG/KG	TRG
	J0376	67-64-1		580	DB	UG/KG	TRG
	J0373	67-64-1		100	B	UG/KG	TRG
	J0380	67-64-1		4800	DB	UG/KG	TRG
	J0379	67-64-1		18	B	UG/KG	TRG
	J0387	67-64-1		17000	DB	UG/KG	TRG
	J0378	67-64-1		18000	DB	UG/KG	TRG
	QM10B81205VB3	75-09-2	Methylene chloride	2	J	UG/KG	BLK
	QM10B81205VB	75-09-2		2	J	UG/KG	BLK
	QM10B81202VB	75-09-2		2	J	UG/KG	BLK
	QM10B81202VB2	75-09-2		1	J	UG/KG	BLK
	J0385	75-09-2		9	B	UG/KG	TRG
	J0386	75-09-2		12	B	UG/KG	TRG
	J0384	75-09-2		6	BJ	UG/KG	TRG
	J0374	75-09-2		11	B	UG/KG	TRG
	J0375	75-09-2		8	B	UG/KG	TRG
	J0379	75-09-2		5	BJ	UG/KG	TRG
	J0380	75-09-2		8	B	UG/KG	TRG
	J0376	75-09-2		5	BJ	UG/KG	TRG
	J0378	75-09-2		5	JB	UG/KG	TRG
	J0387	75-09-2		8	B	UG/KG	TRG
	J0373	75-09-2		13	B	UG/KG	TRG
	QM10B81205VB3	108-88-3	Toluene	5	U	UG/KG	BLK
	QM10B81202VB2	108-88-3		5	U	UG/KG	BLK
	QM10B81202VB	108-88-3		5	U	UG/KG	BLK
	QM10B81205VB	108-88-3		5	U	UG/KG	BLK
	J0384	108-88-3		6	U	UG/KG	TRG
	J0385	108-88-3		6	U	UG/KG	TRG
	J0374	108-88-3		2	J	UG/KG	TRG
	J0386	108-88-3		1	J	UG/KG	TRG
	J0387	108-88-3		6	U	UG/KG	TRG
	J0379	108-88-3		2	J	UG/KG	TRG
	J0380	108-88-3		7	U	UG/KG	TRG
	J0375	108-88-3		5	U	UG/KG	TRG
	J0373	108-88-3		24		UG/KG	TRG
	J0378	108-88-3		7	U	UG/KG	TRG
	J0376	108-88-3		7	U	UG/KG	TRG
	QM13B81202P1A	117-81-7	bis(2-Ethylhexyl) phthalate	120	J	UG/KG	BLK
	QM13B81202P1	117-81-7		170	J	UG/KG	BLK
	J0379	117-81-7		660	B	UG/KG	TRG

TABLE 4-14

Determination of Laboratory Contamination

For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

T	SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK42380	J0378	117-81-7	bis(2-Ethylhexyl) phthalate	390	BJ	UG/KG	TRG
	J0376	117-81-7		730	B	UG/KG	TRG
	J0385	117-81-7		520	B	UG/KG	TRG
	J0387	117-81-7		220	BJ	UG/KG	TRG
	J0373	117-81-7		260	BJ	UG/KG	TRG
	J0375	117-81-7		680	B	UG/KG	TRG
	J0374	117-81-7		430	B	UG/KG	TRG
	J0386	117-81-7		220	BJ	UG/KG	TRG
	J0384	117-81-7		180	BJ	UG/KG	TRG
	J0380	117-81-7		390	B	UG/KG	TRG
ITEK42388	QM10B81205CB3	67-64-1	Acetone	5	J	UG/KG	BLK
	QM10B81206CB	67-64-1		290	J	UG/KG	BLK
	J0382	67-64-1		9400	DB	UG/KG	TRG
	J0381	67-64-1		18	B	UG/KG	TRG
	J0383	67-64-1		17000	B	UG/KG	TRG
	QM10B81205CB3	75-09-2	Methylene chloride	2	J	UG/KG	BLK
	QM10B81206CB	75-09-2		300	J	UG/KG	BLK
	J0382	75-09-2		7	B	UG/KG	TRG
	J0381	75-09-2		7	B	UG/KG	TRG
	J0383	75-09-2		410	BJ	UG/KG	TRG
	QM10B81206CB	108-88-3	Toluene	620	U	UG/KG	BLK
	QM10B81205CB3	108-88-3		5	U	UG/KG	BLK
	J0383	108-88-3		760	U	UG/KG	TRG
	J0382	108-88-3		6	U	UG/KG	TRG
	J0381	108-88-3		6	U	UG/KG	TRG
	J0382	117-81-7	bis(2-Ethylhexyl) phthalate	530	BJ	UG/KG	TRG
	J0381	117-81-7		410	BJ	UG/KG	TRG
	J0383	117-81-7		720	BJ	UG/KG	TRG
ITEK42396	QM09B81206VB	67-64-1	Acetone	10	U	UG/LITER	BLK
	J0392	67-64-1		7	J	UG/LITER	TRG
	J0394	67-64-1		7	J	UG/LITER	TRG
	J0396	67-64-1		100		UG/LITER	TRG
	J0395	67-64-1		33		UG/LITER	TRG
	J0393	67-64-1		82	B	UG/KG	TRG
	J0390	67-64-1		6	J	UG/LITER	TRG
	J0391	67-64-1		100	B	UG/KG	TRG
	QM09B81206VB	75-09-2	Methylene chloride	1	J	UG/LITER	BLK
	J0393	75-09-2		27	B	UG/KG	TRG
	J0394	75-09-2		5	U	UG/LITER	TRG
	J0391	75-09-2		15	B	UG/KG	TRG
	J0395	75-09-2		5	U	UG/LITER	TRG
	J0396	75-09-2		5	U	UG/LITER	TRG
	J0390	75-09-2		5	U	UG/LITER	TRG
	J0392	75-09-2		5	U	UG/LITER	TRG

TABLE 4-14

Determination of Laboratory Contamination

For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

	SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK42396	QM09B81206VB	108-88-3	Toluene	5	U	UG/LITER	BLK
	J0390	108-88-3		102		% RECOVERY	MS
	J0393	108-88-3		104		% RECOVERY	MS
	J0390	108-88-3		104		% RECOVERY	MSD
	J0393	108-88-3		93		% RECOVERY	MSD
	J0393	108-88-3		17		UG/KG	TRG
	J0396	108-88-3		5	U	UG/LITER	TRG
	J0395	108-88-3		5	U	UG/LITER	TRG
	J0391	108-88-3		6	J	UG/KG	TRG
	J0394	108-88-3		5	U	UG/LITER	TRG
	J0390	108-88-3		5	U	UG/LITER	TRG
	J0392	108-88-3		5	U	UG/LITER	TRG
	QM12B81207C1	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER	BLK
	QM13B81206P1	117-81-7		150	J	UG/KG	BLK
	J0391	117-81-7		740	BJ	UG/KG	TRG
	J0393	117-81-7		670	BJ	UG/KG	TRG
	J0395	117-81-7		10		UG/LITER	TRG
	J0392	117-81-7		13		UG/LITER	TRG
	J0390	117-81-7		10	U	UG/LITER	TRG
	J0394	117-81-7		7	J	UG/LITER	TRG
	J0396	117-81-7		4	J	UG/LITER	TRG
ITEK42411	J0377	67-64-1	Acetone	95		UG/LITER	TRG
	J0377	75-09-2	Methylene chloride	1	JB	UG/LITER	TRG
	J0377	108-88-3	Toluene	5	U	UG/LITER	TRG
	QM12B81208C1	117-81-7	bis(2-Ethylhexyl) phthalate	4	J	UG/LITER	BLK
	J0377	117-81-7		4	BJ	UG/LITER	TRG
ITEK42412	QM09B81207VB2	67-64-1	Acetone	10	U	UG/LITER	BLK
	J0389	67-64-1		7	J	UG/LITER	TRG
	J0388	67-64-1		16		UG/LITER	TRG
	QM09B81207VB2	75-09-2	Methylene chloride	2	J	UG/LITER	BLK
	J0389	75-09-2		5	U	UG/LITER	TRG
	J0388	75-09-2		5	U	UG/LITER	TRG
	QM09B81207VB2	108-88-3	Toluene	5	U	UG/LITER	BLK
	J0389	108-88-3		5	U	UG/LITER	TRG
	J0388	108-88-3		5	U	UG/LITER	TRG

TABLE 4-14
Determination of Laboratory Contamination
For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

:T	SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK42423	QM09B81208VB2	67-64-1	Acetone	10	U	UG/LITER	BLK
	J0398	67-64-1		7	J	UG/LITER	TRG
	J0397	67-64-1		10	U	UG/LITER	TRG
	QM09B81208VB2	75-09-2	Methylene chloride	2	J	UG/LITER	BLK
	J0398	75-09-2		1	BJ	UG/LITER	TRG
	J0397	75-09-2		1	BJ	UG/LITER	TRG
	QM09B81208VB2	108-88-3	Toluene	5	U	UG/LITER	BLK
	J0398	108-88-3		5	U	UG/LITER	TRG
	J0397	108-88-3		5	U	UG/LITER	TRG
ITEK42435	QM09B81212VB	67-64-1	Acetone	10	U	UG/LITER	BLK
	J0399	67-64-1		6	J	UG/LITER	TRG
	J0401	67-64-1		9	J	UG/LITER	TRG
	J0402	67-64-1		15		UG/LITER	TRG
	J0400	67-64-1		20		UG/LITER	TRG
	J0404	67-64-1		7	J	UG/LITER	TRG
	QM09B81212VB	75-09-2	Methylene chloride	1	J	UG/LITER	BLK
	J0402	75-09-2		5	U	UG/LITER	TRG
	J0401	75-09-2		5	U	UG/LITER	TRG
	J0399	75-09-2		5	U	UG/LITER	TRG
	J0404	75-09-2		4	JB	UG/LITER	TRG
	J0400	75-09-2		5	B	UG/LITER	TRG
	QM09B81212VB	108-88-3	Toluene	5	U	UG/LITER	BLK
	J0401	108-88-3		5	U	UG/LITER	TRG
	J0402	108-88-3		5	U	UG/LITER	TRG
	J0399	108-88-3		5	U	UG/LITER	TRG
	J0404	108-88-3		5	U	UG/LITER	TRG
	J0400	108-88-3		5	U	UG/LITER	TRG
	QM12B81212C1	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER	BLK
	J0401	117-81-7		10	U	UG/LITER	TRG
	J0405	117-81-7		10	U	UG/LITER	TRG
	J0404	117-81-7		2	J	UG/LITER	TRG
ITEK42466	QM09B812161VB	67-64-1	Acetone	10	U	UG/LITER	BLK
	QM09B812191CB	67-64-1		5	J	UG/LITER	BLK
	QM09B812151CB	67-64-1		2	J	UG/LITER	BLK
	J0414	67-64-1		11	B	UG/LITER	TRG
	J0415	67-64-1		20	B	UG/LITER	TRG
	J0410	67-64-1		7800	D	UG/LITER	TRG
	J0409	67-64-1		29	B	UG/LITER	TRG
	J0411	67-64-1		9	J	UG/LITER	TRG
	J0413	67-64-1		12		UG/LITER	TRG
	J0412	67-64-1		36	B	UG/LITER	TRG

Determination of Laboratory Contamination
For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

[illegible]T	SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK42466	QM09B812161VB	75-09-2	Methylene chloride	5	U	UG/LITER	BLK
	QM09B812151CB	75-09-2		1	J	UG/LITER	BLK
	QM09B812191CB	75-09-2		2	J	UG/LITER	BLK
	J0414	75-09-2		5	U	UG/LITER	TRG
	J0410	75-09-2		1600	B	UG/LITER	TRG
	J0415	75-09-2		2	BJ	UG/LITER	TRG
	J0411	75-09-2		1	J	UG/LITER	TRG
	J0413	75-09-2		5	U	UG/LITER	TRG
	J0409	75-09-2		5	U	UG/LITER	TRG
	J0412	75-09-2		1	BJ	UG/LITER	TRG
	QM09B812161VB	108-88-3	Toluene	5	U	UG/LITER	BLK
	QM09B812151CB	108-88-3		5	U	UG/LITER	BLK
	QM09B812191CB	108-88-3		5	U	UG/LITER	BLK
	J0414	108-88-3		96		% RECOVERY	MS
	J0414	108-88-3		94		% RECOVERY	MSD
	J0414	108-88-3		5	U	UG/LITER	TRG
	J0413	108-88-3		5	U	UG/LITER	TRG
	J0411	108-88-3		5	U	UG/LITER	TRG
	J0415	108-88-3		5	U	UG/LITER	TRG
	J0409	108-88-3		5	U	UG/LITER	TRG
	J0410	108-88-3		860		UG/LITER	TRG
	J0412	108-88-3		5	U	UG/LITER	TRG
	QM12B81216C1	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER	BLK
	J0412	117-81-7		10	U	UG/LITER	TRG
	J0409	117-81-7		10	U	UG/LITER	TRG
	J0410	117-81-7		2	J	UG/LITER	TRG
ITEK42476	QM09B812201VB	67-64-1	Acetone	10	U	UG/LITER	BLK
	QM09B812192CB	67-64-1		5	J	UG/LITER	BLK
	J0420	67-64-1		220	E	UG/LITER	TRG
	J0424	67-64-1		36		UG/LITER	TRG
	J0422	67-64-1		5600	E	UG/LITER	TRG
	J0423	67-64-1		150		UG/LITER	TRG
	J0421	67-64-1		10		UG/LITER	TRG
	J0416	67-64-1		5	J	UG/LITER	TRG
	J0419	67-64-1		50	B	UG/LITER	TRG
	J0408	67-64-1		19	B	UG/LITER	TRG
	J0417	67-64-1		2200		UG/LITER	TRG
	J0418	67-64-1		2200	E	UG/LITER	TRG
	QM09B812201VB	75-09-2	Methylene chloride	5	U	UG/LITER	BLK
	QM09B812192CB	75-09-2		2	J	UG/LITER	BLK
	J0420	75-09-2		5	U	UG/LITER	TRG
	J0408	75-09-2		5	U	UG/LITER	TRG
	J0424	75-09-2		5	U	UG/LITER	TRG
	J0423	75-09-2		5	U	UG/LITER	TRG

TABLE 4-14

Determination of Laboratory Contamination
For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

	SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK42476	J0421	75-09-2	Methylene chloride	5	U	UG/LITER	TRG
	J0422	75-09-2		44	J	UG/LITER	TRG
	J0416	75-09-2		5	U	UG/LITER	TRG
	J0419	75-09-2		5	U	UG/LITER	TRG
	J0417	75-09-2		180		UG/LITER	TRG
	J0418	75-09-2		170		UG/LITER	TRG
	QM09B812201VB	108-88-3	Toluene	5	U	UG/LITER	BLK
	QM09B812192CB	108-88-3		5	U	UG/LITER	BLK
	J0420	108-88-3		5	U	UG/LITER	TRG
	J0423	108-88-3		5	U	UG/LITER	TRG
	J0422	108-88-3		410		UG/LITER	TRG
	J0421	108-88-3		5	U	UG/LITER	TRG
	J0424	108-88-3		5	U	UG/LITER	TRG
	J0416	108-88-3		5	U	UG/LITER	TRG
	J0408	108-88-3		5	U	UG/LITER	TRG
	J0419	108-88-3		4	J	UG/LITER	TRG
	J0417	108-88-3		580		UG/LITER	TRG
	J0418	108-88-3		620		UG/LITER	TRG
	QM12B812190I	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER	BLK
	QM12B812190Z	117-81-7		10	U	UG/LITER	BLK
	QM02B90104P1	117-81-7		10	U	UG/LITER	BLK
	J0418	117-81-7		25	U	UG/LITER	R
	J0418	117-81-7		10	U	UG/LITER	TRG
	J0416	117-81-7		10	U	UG/LITER	TRG
	J0408	117-81-7		10	U	UG/LITER	TRG
	J0421	117-81-7		10	U	UG/LITER	TRG
	J0422	117-81-7		12	U	UG/LITER	TRG
	J0420	117-81-7		10	U	UG/LITER	TRG
	J0417	117-81-7		10	U	UG/LITER	TRG
ITEK42563	QM09B90109CB	67-64-1	Acetone	2	J	UG/LITER	BLK
	J0433	67-64-1		35	B	UG/LITER	TRG
	J0438	67-64-1		5	BJ	UG/LITER	TRG
	J0437	67-64-1		8	BJ	UG/LITER	TRG
	QM09B90109CB	75-09-2	Methylene chloride	2	J	UG/LITER	BLK
	J0437	75-09-2		6	B	UG/LITER	TRG
	J0433	75-09-2		2	BJ	UG/LITER	TRG
	J0438	75-09-2		4	BJ	UG/LITER	TRG
	QM09B90109CB	108-88-3	Toluene	1	J	UG/LITER	BLK
	J0433	108-88-3		99		% RECOVERY	MS
	J0433	108-88-3		97		% RECOVERY	MSD
	J0438	108-88-3		5	U	UG/LITER	TRG
	J0437	108-88-3		5	U	UG/LITER	TRG
	J0433	108-88-3		2	BJ	UG/LITER	TRG

TABLE 4-14

Determination of Laboratory Contamination
For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

T	SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK42563	QM12B90110D1	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER	BLK
	J0433	117-81-7		10	U	UG/LITER	TRG
	J0437	117-81-7		10	U	UG/LITER	TRG
	J0438	117-81-7		10	U	UG/LITER	TRG
ITEK42619	QM10B90119CB	67-64-1	Acetone	8	J	UG/KG	BLK
	J0441	67-64-1		29	B	UG/KG	TRG
	J0440	67-64-1		130	B	UG/KG	TRG
	QM10B90119CB	75-09-2	Methylene chloride	4	J	UG/KG	BLK
	J0441	75-09-2		10	B	UG/KG	TRG
	J0440	75-09-2		47	B	UG/KG	TRG
	QM10B90119CB	108-88-3	Toluene	3	J	UG/KG	BLK
	J0440	108-88-3		42	*	% RECOVERY	MS
	J0440	108-88-3		13	*	% RECOVERY	MSD
	J0441	108-88-3		6	B	UG/KG	TRG
	J0440	108-88-3		55	B	UG/KG	TRG
	QM13B90120K1	117-81-7	bis(2-Ethylhexyl) phthalate	220	J	UG/KG	BLK
	J0440	117-81-7		230	BJ	UG/KG	TRG
	J0441	117-81-7		420	B	UG/KG	TRG
ITEK42626	QM10B90120CB	67-64-1	Acetone	2	J	UG/KG	BLK
	J0447	67-64-1		54	B	UG/KG	TRG
	J0449	67-64-1		67	B	UG/KG	TRG
	J0445	67-64-1		35	B	UG/KG	TRG
	J0446	67-64-1		38	B	UG/KG	TRG
	J0448	67-64-1		39	B	UG/KG	TRG
	QM10B90120CB	75-09-2	Methylene chloride	2	J	UG/KG	BLK
	J0446	75-09-2		11	B	UG/KG	TRG
	J0445	75-09-2		11	B	UG/KG	TRG
	J0448	75-09-2		10	B	UG/KG	TRG
	J0449	75-09-2		12	B	UG/KG	TRG
	J0447	75-09-2		12	B	UG/KG	TRG
	QM10B90120CB	108-88-3	Toluene	5	U	UG/KG	BLK
	J0446	108-88-3		2	J	UG/KG	TRG
	J0447	108-88-3		2	J	UG/KG	TRG
	J0445	108-88-3		2	J	UG/KG	TRG
	J0448	108-88-3		2	J	UG/KG	TRG
	J0449	108-88-3		2	J	UG/KG	TRG
	QM13B90123K1	117-81-7	bis(2-Ethylhexyl) phthalate	630		UG/KG	BLK
	J0448	117-81-7		1300	B	UG/KG	TRG

Determination of Laboratory Contamination
For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

I Cl	SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK42626	J0447	117-81-7	bis(2-Ethylhexyl) phthalate	3300		UG/KG	TRG
	J0446	117-81-7		1200	B	UG/KG	TRG
	J0445	117-81-7		1100	B	UG/KG	TRG
	J0449	117-81-7		1300	B	UG/KG	TRG
ITEK42632	QM10B90123CB	67-64-1	Acetone	3	J	UG/KG	BLK
	QM10B90124VB	67-64-1		10	U	UG/KG	BLK
	QM09B90124VB	67-64-1		10	U	UG/LITER	BLK
	J0450	67-64-1		120	B	UG/KG	TRG
	J0432	67-64-1		11		UG/LITER	TRG
	J0454	67-64-1		82	B	UG/KG	TRG
	J0455	67-64-1		95		UG/KG	TRG
	J0457	67-64-1		13	U	UG/KG	TRG
	J0431	67-64-1		6	J	UG/LITER	TRG
	J0456	67-64-1		52		UG/KG	TRG
	J0458	67-64-1		52		UG/KG	TRG
	QM09B90124VB	75-09-2	Methylene chloride	2	J	UG/LITER	BLK
	QM10B90123CB	75-09-2		2	J	UG/KG	BLK
	QM10B90124VB	75-09-2		2	J	UG/KG	BLK
	J0457	75-09-2		8	B	UG/KG	TRG
	J0458	75-09-2		10	B	UG/KG	TRG
	J0432	75-09-2		1	JB	UG/LITER	TRG
	J0455	75-09-2		6	B	UG/KG	TRG
	J0456	75-09-2		6	B	UG/KG	TRG
	J0431	75-09-2		2	BJ	UG/LITER	TRG
	J0454	75-09-2		11	B	UG/KG	TRG
	J0450	75-09-2		12	B	UG/KG	TRG
	QM09B90124VB	108-88-3	Toluene	1	J	UG/LITER	BLK
	QM10B90124VB	108-88-3		1	J	UG/KG	BLK
	QM10B90123CB	108-88-3		1	J	UG/KG	BLK
	J0457	108-88-3		3	BJ	UG/KG	TRG
	J0458	108-88-3		7	B	UG/KG	TRG
	J0431	108-88-3		5	U	UG/LITER	TRG
	J0455	108-88-3		2	BJ	UG/KG	TRG
	J0456	108-88-3		2	BJ	UG/KG	TRG
	J0450	108-88-3		3	JB	UG/KG	TRG
	J0454	108-88-3		3	JB	UG/KG	TRG
	J0432	108-88-3		5	U	UG/LITER	TRG
	QM13B90124K1	117-81-7	bis(2-Ethylhexyl) phthalate	260	J	UG/KG	BLK
	QM12B90124D1	117-81-7		10	U	UG/LITER	BLK
	J0450	117-81-7		670	B	UG/KG	TRG
	J0457	117-81-7		1100	B	UG/KG	TRG
	J0458	117-81-7		1400	B	UG/KG	TRG
	J0456	117-81-7		490	B	UG/KG	TRG
	J0454	117-81-7		1100	B	UG/KG	TRG
	J0431	117-81-7		10	U	UG/LITER	TRG
	J0432	117-81-7		10	U	UG/LITER	TRG
	J0455	117-81-7		770	B	UG/KG	TRG

Determination of Laboratory Contamination
For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

T	SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK42638	QM10B90125VB	67-64-1	Acetone	10	U	UG/KG	BLK
	QM10B90124CB	67-64-1		5		UG/KG	BLK
	J0452	67-64-1		100	B	UG/KG	TRG
	J0464	67-64-1		12	U	UG/KG	TRG
	J0460	67-64-1		600	BED	UG/KG	TRG
	J0461	67-64-1		11	U	UG/KG	TRG
	J0462	67-64-1		47		UG/KG	TRG
	J0466	67-64-1		140		UG/KG	TRG
	J0465	67-64-1		84		UG/KG	TRG
	J0451	67-64-1		57	B	UG/KG	TRG
	J0459	67-64-1		110	B	UG/KG	TRG
	J0463	67-64-1		38		UG/KG	TRG
	QM10B90125VB	75-09-2	Methylene chloride	2	J	UG/KG	BLK
	QM10B90124CB	75-09-2		2	J	UG/KG	BLK
	J0463	75-09-2		11	B	UG/KG	TRG
	J0461	75-09-2		4	BJ	UG/KG	TRG
	J0452	75-09-2		11	B	UG/KG	TRG
	J0466	75-09-2		10	B	UG/KG	TRG
	J0465	75-09-2		10	B	UG/KG	TRG
	J0462	75-09-2		12	B	UG/KG	TRG
	J0464	75-09-2		5	BJ	UG/KG	TRG
	J0459	75-09-2		10	B	UG/KG	TRG
	J0460	75-09-2		17	B	UG/KG	TRG
	J0451	75-09-2		9	B	UG/KG	TRG
	QM10B90125VB	108-88-3	Toluene	1	J	UG/KG	BLK
	QM10B90124CB	108-88-3		1	J	UG/KG	BLK
	J0464	108-88-3		91		% RECOVERY	MS
	J0464	108-88-3		94		% RECOVERY	MSD
	J0459	108-88-3		5	BJ	UG/KG	TRG
	J0464	108-88-3		4	BJ	UG/KG	TRG
	J0460	108-88-3		5	BJ	UG/KG	TRG
	J0462	108-88-3		5	B	UG/KG	TRG
	J0461	108-88-3		4	BJ	UG/KG	TRG
	J0466	108-88-3		7	B	UG/KG	TRG
	J0465	108-88-3		7	B	UG/KG	TRG
	J0452	108-88-3		6	BJ	UG/KG	TRG
	J0463	108-88-3		7	B	UG/KG	TRG
	J0451	108-88-3		6	B	UG/KG	TRG
	QM13B90124K2	117-81-7	bis(2-Ethylhexyl) phthalate	280	J	UG/KG	BLK
	QM13B90124K3	117-81-7		250	J	UG/KG	BLK
	J0451	117-81-7		440	B	UG/KG	R
	J0466	117-81-7		550	B	UG/KG	TRG
	J0461	117-81-7		690	B	UG/KG	TRG
	J0464	117-81-7		940	B	UG/KG	TRG
	J0460	117-81-7		1500	B	UG/KG	TRG

Determination of Laboratory Contamination
For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

CT	SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK42638	J0459	117-81-7	bis(2-Ethylhexyl) phthalate	500	B	UG/KG	TRG
	J0465	117-81-7		290	BJ	UG/KG	TRG
	J0463	117-81-7		620	B	UG/KG	TRG
	J0462	117-81-7		800	B	UG/KG	TRG
	J0452	117-81-7		730	B	UG/KG	TRG
ITEK42649	QM10B90126VB	67-64-1	Acetone	10	U	UG/KG	BLK
	J0468	67-64-1		74		UG/KG	TRG
	J0467	67-64-1		150		UG/KG	TRG
	QM10B90126VB	75-09-2	Methylene chloride	2	J	UG/KG	BLK
	J0468	75-09-2		4	BJ	UG/KG	TRG
	J0467	75-09-2		4	BJ	UG/KG	TRG
	QM10B90126VB	108-88-3	Toluene	1	J	UG/KG	BLK
	J0468	108-88-3		5	BJ	UG/KG	TRG
	J0467	108-88-3		4	BJ	UG/KG	TRG
	QM13B90201K1	117-81-7	bis(2-Ethylhexyl) phthalate	380		UG/KG	BLK
	J0468	117-81-7		630	B	UG/KG	TRG
	J0467	117-81-7		940	B	UG/KG	TRG
59	QM09B90206VB	67-64-1	Acetone	10	U	UG/LITER	BLK
	J0472	67-64-1		170		UG/KG	TRG
	J0477	67-64-1		6	U	UG/KG	TRG
	J0469	67-64-1		120		UG/KG	TRG
	J0427	67-64-1		10	U	UG/LITER	TRG
	J0470	67-64-1		200		UG/KG	TRG
	J0478	67-64-1		32		UG/KG	TRG
	J0471	67-64-1		67		UG/KG	TRG
	QM09B90206VB	75-09-2	Methylene chloride	1	J	UG/LITER	BLK
	J0472	75-09-2		6	B	UG/KG	TRG
	J0478	75-09-2		8	B	UG/KG	TRG
	J0469	75-09-2		5	BJ	UG/KG	TRG
	J0477	75-09-2		5	BJ	UG/KG	TRG
	J0427	75-09-2		5	U	UG/LITER	TRG
	J0470	75-09-2		3	BJ	UG/KG	TRG
	J0471	75-09-2		8	B	UG/KG	TRG
	QM09B90206VB	108-88-3	Toluene	5	U	UG/LITER	BLK
	J0472	108-88-3		6		UG/KG	TRG
	J0427	108-88-3		5	U	UG/LITER	TRG
	J0478	108-88-3		2	J	UG/KG	TRG
	J0469	108-88-3		7		UG/KG	TRG
	J0477	108-88-3		2	J	UG/KG	TRG
	J0470	108-88-3		6		UG/KG	TRG
	J0471	108-88-3		5	J	UG/KG	TRG
	QM12B90128D2	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER	BLK
	J0478	117-81-7		910	B	UG/KG	TRG

Determination of Laboratory Contamination
For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

	SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK42659	J0427	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER	TRG
	J0471	117-81-7		490	B	UG/KG	TRG
	J0469	117-81-7		710	B	UG/KG	TRG
	J0470	117-81-7		520	B	UG/KG	TRG
	J0477	117-81-7		500	B	UG/KG	TRG
ITEK42665	QM10B90206VB3	67-64-1	Acetone	10	U	UG/KG	BLK
	QM10B90206CB2	67-64-1		2	J	UG/KG	BLK
	J0480	67-64-1		380	D	UG/KG	TRG
	J0484	67-64-1		24	B	UG/KG	TRG
	J0481	67-64-1		48	B	UG/KG	TRG
	J0485	67-64-1		23	B	UG/KG	TRG
	J0479	67-64-1		11	U	UG/KG	TRG
	J0483	67-64-1		18	B	UG/KG	TRG
	QM10B90206VB3	75-09-2	Methylene chloride	1	J	UG/KG	BLK
	QM10B90206CB2	75-09-2		4	J	UG/KG	BLK
	J0483	75-09-2		16	B	UG/KG	TRG
	J0481	75-09-2		12	B	UG/KG	TRG
	J0479	75-09-2		7	B	UG/KG	TRG
	J0484	75-09-2		13	B	UG/KG	TRG
	J0480	75-09-2		5	BJ	UG/KG	TRG
	J0485	75-09-2		16	B	UG/KG	TRG
	QM10B90206VB3	108-88-3	Toluene	5	U	UG/KG	BLK
	QM10B90206CB2	108-88-3		5	U	UG/KG	BLK
	J0483	108-88-3		2	J	UG/KG	TRG
	J0484	108-88-3		4	J	UG/KG	TRG
	J0480	108-88-3		6		UG/KG	TRG
	J0479	108-88-3		2	J	UG/KG	TRG
	J0485	108-88-3		1	J	UG/KG	TRG
	J0481	108-88-3		2	J	UG/KG	TRG
	QM13B90202ZK2	117-81-7	bis(2-Ethylhexyl) phthalate	350		UG/KG	BLK
	J0484	117-81-7		620	B	UG/KG	TRG
	J0485	117-81-7		490	B	UG/KG	TRG
	J0479	117-81-7		680	B	UG/KG	TRG
	J0481	117-81-7		610	B	UG/KG	TRG
	J0483	117-81-7		790	B	UG/KG	TRG
	J0480	117-81-7		900	B	UG/KG	TRG
ITEK42675	QM10B90208VB2	67-64-1	Acetone	10	U	UG/KG	BLK
	QM10B90208VB3	67-64-1		10	U	UG/KG	BLK
	J0474	67-64-1		12	U	UG/KG	TRG
	J0487	67-64-1		12	U	UG/KG	TRG
	J0473	67-64-1		90		UG/KG	TRG
	J0486	67-64-1		160		UG/KG	TRG
	QM10B90208VB2	75-09-2	Methylene chloride	3	J	UG/KG	BLK
	QM10B90208VB3	75-09-2		2	J	UG/KG	BLK
	J0474	75-09-2		8	B	UG/KG	TRG

TABLE 4-14

Determination of Laboratory Contamination
For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

CT	SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK42675	J0473	75-09-2	Methylene chloride	12	B	UG/KG	TRG
	J0486	75-09-2		10	B	UG/KG	TRG
	J0487	75-09-2		13	B	UG/KG	TRG
	QM10B90208VB2	108-88-3	Toluene	5	U	UG/KG	BLK
	QM10B90208VB3	108-88-3		5	U	UG/KG	BLK
	J0473	108-88-3		95		% RECOVERY	MS
	J0473	108-88-3		102		% RECOVERY	MSD
	J0474	108-88-3		2	J	UG/KG	TRG
	J0486	108-88-3		2	J	UG/KG	TRG
	J0473	108-88-3		2	J	UG/KG	TRG
	J0487	108-88-3		2	J	UG/KG	TRG
	J0487	117-81-7	bis(2-Ethylhexyl) phthalate	770	B	UG/KG	TRG
	J0474	117-81-7		770	B	UG/KG	TRG
	J0486	117-81-7		970	B	UG/KG	TRG
	J0473	117-81-7		840	B	UG/KG	TRG
700	QM10B90208CB3	67-64-1	Acetone	1	J	UG/KG	BLK
	QM10B90208CB4	67-64-1		2	J	UG/KG	BLK
	QM10B90209CB3	67-64-1		1	J	UG/KG	BLK
	QM09B90209CB2	67-64-1		1	J	UG/LITER	BLK
	QM10B90209CB	67-64-1		3	J	UG/KG	BLK
	J0482	67-64-1		44	B	UG/KG	TRG
	J0497	67-64-1		30	B	UG/KG	TRG
	J0498	67-64-1		24	B	UG/KG	TRG
	J0489	67-64-1		73	B	UG/KG	TRG
	J1500	67-64-1		220	B	UG/KG	TRG
	J1501	67-64-1		110	B	UG/KG	TRG
	J0425	67-64-1		3	JB	UG/LITER	TRG
	J0492	67-64-1		360	B	UG/KG	TRG
	J0493	67-64-1		32	B	UG/KG	TRG
	J0495	67-64-1		42	B	UG/KG	TRG
	J0496	67-64-1		15	B	UG/KG	TRG
	J0494	67-64-1		39	B	UG/KG	TRG
	J0491	67-64-1		250	B	UG/KG	TRG
	J0490	67-64-1		170	B	UG/KG	TRG
	J0488	67-64-1		43	B	UG/KG	TRG
	QM10B90208CB3	75-09-2	Methylene chloride	2	J	UG/KG	BLK
	QM10B90209CB	75-09-2		2	J	UG/KG	BLK
	QM10B90209CB3	75-09-2		2	J	UG/KG	BLK
	QM10B90208CB4	75-09-2		2	J	UG/KG	BLK
	QM09B90209CB2	75-09-2		2	J	UG/LITER	BLK
	J0482	75-09-2		16	B	UG/KG	TRG
	J0498	75-09-2		14	B	UG/KG	TRG
	J0492	75-09-2		100	B	UG/KG	TRG
	J1500	75-09-2		9	B	UG/KG	TRG

TABLE 4-14

Determination of Laboratory Contamination
For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK42700 J1501	75-09-2	Methylene chloride	20	B	UG/KG	TRG
J0425	75-09-2		5	U	UG/LITER	TRG
J0490	75-09-2		140	B	UG/KG	TRG
J0491	75-09-2		64	B	UG/KG	TRG
J0493	75-09-2		6	B	UG/KG	TRG
J0497	75-09-2		14	B	UG/KG	TRG
J0496	75-09-2		11	B	UG/KG	TRG
J0495	75-09-2		12	B	UG/KG	TRG
J0494	75-09-2		14	B	UG/KG	TRG
J0489	75-09-2		10	B	UG/KG	TRG
J0488	75-09-2		11	B	UG/KG	TRG
QM10B90208CB3	108-88-3	Toluene	5	U	UG/KG	BLK
QM10B90209CB	108-88-3		5	U	UG/KG	BLK
QM09B90209CB2	108-88-3		5	U	UG/LITER	BLK
QM10B90209CB3	108-88-3		5	U	UG/KG	BLK
QM10B90208CB4	108-88-3		5	U	UG/KG	BLK
J1501	108-88-3		104		% RECOVERY	MS
J1501	108-88-3		104		% RECOVERY	MSD
J0482	108-88-3		5	J	UG/KG	TRG
J1500	108-88-3		2	J	UG/KG	TRG
J1501	108-88-3		140		UG/KG	TRG
J0425	108-88-3		5	U	UG/LITER	TRG
J0490	108-88-3		1000	D	UG/KG	TRG
J0491	108-88-3		520	D	UG/KG	TRG
J0492	108-88-3		110		UG/KG	TRG
J0493	108-88-3		1	J	UG/KG	TRG
J0494	108-88-3		2	J	UG/KG	TRG
J0498	108-88-3		3	J	UG/KG	TRG
J0497	108-88-3		3	J	UG/KG	TRG
J0496	108-88-3		2	J	UG/KG	TRG
J0495	108-88-3		2	J	UG/KG	TRG
J0489	108-88-3		5	J	UG/KG	TRG
J0488	108-88-3		6	J	UG/KG	TRG
QM12B90201J1	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER	BLK
QM13B90207K1	117-81-7		180	J	UG/KG	BLK
J0425	117-81-7		10	U	UG/LITER	TRG
J0498	117-81-7		880	B	UG/KG	TRG
J0499	117-81-7		1400	BJ	UG/KG	TRG
J1500	117-81-7		1200	B	UG/KG	TRG
J1501	117-81-7		2400	B	UG/KG	TRG
J0488	117-81-7		1000	B	UG/KG	TRG
J0489	117-81-7		350	BJ	UG/KG	TRG
J0494	117-81-7		1200	B	UG/KG	TRG
J0495	117-81-7		1000	B	UG/KG	TRG
J0497	117-81-7		1700	B	UG/KG	TRG
J0496	117-81-7		820	B	UG/KG	TRG
J0493	117-81-7		1000	BJ	UG/KG	TRG

Determination of Laboratory Contamination
For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

	SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK42700	J0492	117-81-7	bis(2-Ethylhexyl) phthalate	1400	BJ	UG/KG	TRG
	J0491	117-81-7		1100	BJ	UG/KG	TRG
	J0490	117-81-7		710	B	UG/KG	TRG
	J0482	117-81-7		910	B	UG/KG	TRG
ITEK42707	QM09B90209VB	67-64-1	Acetone	10	U	UG/LITER	BLK
	QM10B90210VB	67-64-1		10	U	UG/KG	BLK
	QM10B90209VB2	67-64-1		10	U	UG/KG	BLK
	J1513	67-64-1		140000	U	UG/KG	TRG
	J1514	67-64-1		24000		UG/KG	TRG
	J0428	67-64-1		10	U	UG/LITER	TRG
	J1508	67-64-1		210		UG/KG	TRG
	J1506	67-64-1		2000	D	UG/KG	TRG
	J1505	67-64-1		5400	DE	UG/KG	TRG
	J1510	67-64-1		700		UG/KG	TRG
	J1511	67-64-1		10	U	UG/LITER	TRG
	J1512	67-64-1		160000		UG/KG	TRG
	J1509	67-64-1		740	D	UG/KG	TRG
	J1507	67-64-1		390		UG/KG	TRG
	QM09B90209VB	75-09-2	Methylene chloride	2	J	UG/LITER	BLK
	QM10B90210VB	75-09-2		6		UG/KG	BLK
	QM10B90209VB2	75-09-2		2	J	UG/KG	BLK
	J1511	75-09-2		2	BJ	UG/LITER	TRG
	J1514	75-09-2		6500	BJ	UG/KG	TRG
	J1507	75-09-2		22	B	UG/KG	TRG
	J1512	75-09-2		5100	BJ	UG/KG	TRG
	J1513	75-09-2		39000	BJ	UG/KG	TRG
	J1509	75-09-2		18	D	UG/KG	TRG
	J0428	75-09-2		5	U	UG/LITER	TRG
	J1506	75-09-2		36	B	UG/KG	TRG
	J1510	75-09-2		22	BJ	UG/KG	TRG
	J1508	75-09-2		15	B	UG/KG	TRG
	J1505	75-09-2		8	B	UG/KG	TRG
	QM09B90209VB	108-88-3	Toluene	5	U	UG/LITER	BLK
	QM10B90209VB2	108-88-3		5	U	UG/KG	BLK
	QM10B90210VB	108-88-3		5	U	UG/KG	BLK
	J1514	108-88-3		108		% RECOVERY	MS
	J1514	108-88-3		108		% RECOVERY	MSD
	J1512	108-88-3		340000	D	UG/KG	TRG
	J1513	108-88-3		340000		UG/KG	TRG
	J1514	108-88-3		9600		UG/KG	TRG
	J1508	108-88-3		2	J	UG/KG	TRG
	J1507	108-88-3		12	U	UG/KG	TRG
	J1506	108-88-3		29	U	UG/KG	TRG
	J1510	108-88-3		28	U	UG/KG	TRG
	J1505	108-88-3		2	J	UG/KG	TRG

Determination of Laboratory Contamination
For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

Loc	SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK42707	J0428	108-88-3	Toluene	5	U	UG/LITER	TRG
	J1509	108-88-3		2	J	UG/KG	TRG
	J1511	108-88-3		5	U	UG/LITER	TRG
	QM13B90208K1	117-81-7	bis(2-Ethylhexyl) phthalate	480		UG/KG	BLK
	QM12B90202J1	117-81-7		10	U	UG/LITER	BLK
	QM13B90208K2	117-81-7		440		UG/KG	BLK
	J1507	117-81-7		910	B	UG/KG	TRG
	J1508	117-81-7		970	B	UG/KG	TRG
	J1506	117-81-7		740	B	UG/KG	TRG
	J1512	117-81-7		1800	BJ	UG/KG	TRG
	J1509	117-81-7		740	B	UG/KG	TRG
	J1511	117-81-7		10	U	UG/LITER	TRG
	J1510	117-81-7		560	B	UG/KG	TRG
	J1514	117-81-7		840	B	UG/KG	TRG
	J1505	117-81-7		790	B	UG/KG	TRG
	J1513	117-81-7		1900	B	UG/KG	TRG
	J0428	117-81-7		10	U	UG/LITER	TRG
ITEK42721	QM10B90214CB	67-64-1	Acetone	10	U	UG/KG	BLK
	J0475	67-64-1		38		UG/KG	TRG
	J0476	67-64-1		62		UG/KG	TRG
	QM10B90214CB	75-09-2	Methylene chloride	3	J	UG/KG	BLK
	J0476	75-09-2		9	B	UG/KG	TRG
	J0475	75-09-2		11	B	UG/KG	TRG
	QM10B90214CB	108-88-3	Toluene	5	U	UG/KG	BLK
	J0475	108-88-3		2	J	UG/KG	TRG
	J0476	108-88-3		6	U	UG/KG	TRG
	QM13B90206K2	117-81-7	bis(2-Ethylhexyl) phthalate	350		UG/KG	BLK
	J0476	117-81-7		370	B	UG/KG	TRG
	J0475	117-81-7		630	B	UG/KG	TRG
ITEK42839	QM10B90222VB	67-64-1	Acetone	10	U	UG/KG	BLK
	QM09B90222VB	67-64-1		10	U	UG/LITER	BLK
	J1516	67-64-1		27		UG/KG	TRG
	J1517	67-64-1		10	U	UG/LITER	TRG
	J1518	67-64-1		8	J	UG/LITER	TRG
	QM10B90222VB	75-09-2	Methylene chloride	5	U	UG/KG	BLK
	QM09B90222VB	75-09-2		5	U	UG/LITER	BLK
	J1516	75-09-2		27		UG/KG	TRG
	J1517	75-09-2		5	U	UG/LITER	TRG
	J1518	75-09-2		5	U	UG/LITER	TRG
	QM10B90222VB	108-88-3	Toluene	5	U	UG/KG	BLK
	QM09B90222VB	108-88-3		5	U	UG/LITER	BLK
	J1516	108-88-3		98		% RECOVERY	MS

Determination of Laboratory Contamination
For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

	SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK42839	J1517	108-88-3	Toluene	92		% RECOVERY	MS
	J1516	108-88-3		111		% RECOVERY	MSD
	J1517	108-88-3		94		% RECOVERY	MSD
	J1516	108-88-3		6	U	UG/KG	TRG
	J1517	108-88-3		5	U	UG/LITER	TRG
	J1518	108-88-3		5	U	UG/LITER	TRG
	QM12B90222D2	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER	BLK
	QM13B90223K1B	117-81-7		150	J	UG/KG	BLK
	J1518	117-81-7		10	U	UG/LITER	TRG
	J1516	117-81-7		510	B	UG/KG	TRG
	J1517	117-81-7		10	U	UG/LITER	TRG
ITEK42865	QM09B90224VB2	67-64-1	Acetone	4	J	UG/LITER	BLK
	J1519	67-64-1		5	JB	UG/LITER	TRG
	QM09B90224VB2	75-09-2	Methylene chloride	5	U	UG/LITER	BLK
	J1519	75-09-2		2	J	UG/LITER	TRG
	QM09B90224VB2	108-88-3	Toluene	5	U	UG/LITER	BLK
	J1519	108-88-3		5	U	UG/LITER	TRG
	QM12B90228D1	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER	BLK
	J1519	117-81-7		10	U	UG/LITER	TRG
ITEK42894	QM10B90301CB	67-64-1	Acetone	5	J	UG/KG	BLK
	J1520	67-64-1		71	B	UG/KG	TRG
	QM10B90301CB	75-09-2	Methylene chloride	5	U	UG/KG	BLK
	J1520	75-09-2		9		UG/KG	TRG
	QM10B90301CB	108-88-3	Toluene	5	U	UG/KG	BLK
	J1520	108-88-3		1	J	UG/KG	TRG
	QM13B90302K1	117-81-7	bis(2-Ethylhexyl) phthalate	90	J	UG/KG	BLK
	J1520	117-81-7		420	B	UG/KG	TRG
ITEK42911	QM09B90303CB	67-64-1	Acetone	5	J	UG/LITER	BLK
	J1525	67-64-1		17	B	UG/LITER	TRG
	J1523	67-64-1		65	BJ	UG/LITER	TRG
	J1524	67-64-1		54	B	UG/LITER	TRG
	J1522	67-64-1		53	BJ	UG/LITER	TRG

Determination of Laboratory Contamination
For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

Co...	SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK42911	QM09B90303CB	75-09-2	Methylene chloride	5	U	UG/LITER	BLK
	J1524	75-09-2		5	U	UG/LITER	TRG
	J1523	75-09-2		22	J	UG/LITER	TRG
	J1525	75-09-2		5	U	UG/LITER	TRG
	J1522	75-09-2		35	J	UG/LITER	TRG
	QM09B90303CB	108-88-3	Toluene	5	U	UG/LITER	BLK
	J1524	108-88-3		5	U	UG/LITER	TRG
	J1523	108-88-3		50	U	UG/LITER	TRG
	J1522	108-88-3		50	U	UG/LITER	TRG
	J1525	108-88-3		5	U	UG/LITER	TRG
ITEK42912	QM09B90303VB	67-64-1	Acetone	8	J	UG/LITER	BLK
	J1526	67-64-1		4	JB	UG/LITER	TRG
	J1521	67-64-1		9	JB	UG/LITER	TRG
	QM09B90303VB	75-09-2	Methylene chloride	5	U	UG/LITER	BLK
	J1526	75-09-2		5	U	UG/LITER	TRG
	J1521	75-09-2		5	U	UG/LITER	TRG
	QM09B90303VB	108-88-3	Toluene	5	U	UG/LITER	BLK
	J1526	108-88-3		5	U	UG/LITER	TRG
	J1521	108-88-3		2	J	UG/LITER	TRG
	QM12B90307D1	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER	BLK
	J1524	117-81-7		10	U	UG/LITER	TRG
	J1523	117-81-7		10	U	UG/LITER	TRG
	J1525	117-81-7		10	U	UG/LITER	TRG
	J1522	117-81-7		10	U	UG/LITER	TRG
	J1526	117-81-7		10	U	UG/LITER	TRG
	J1521	117-81-7		10	U	UG/LITER	TRG
ITEK42947	QM10B90309CB	67-64-1	Acetone	4	J	UG/KG	BLK
	QM09B90309CB	67-64-1		4	J	UG/LITER	BLK
	J1528	67-64-1		3	BJ	UG/LITER	TRG
	J1527	67-64-1		86	B	UG/KG	TRG
	QM10B90309CB	75-09-2	Methylene chloride	3	J	UG/KG	BLK
	QM09B90309CB	75-09-2		3	J	UG/LITER	BLK
	J1528	75-09-2		5	U	UG/LITER	TRG
	J1527	75-09-2		14	B	UG/KG	TRG
	QM09B90309CB	108-88-3	Toluene	5	U	UG/LITER	BLK
	QM10B90309CB	108-88-3		5	U	UG/KG	BLK
	J1527	108-88-3		100		% RECOVERY	MS
	J1527	108-88-3		100		% RECOVERY	MSD
	J1527	108-88-3		6	U	UG/KG	TRG

Determination of Laboratory Contamination
For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

[illegible]	SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK42947	J1528	108-88-3	Toluene	5	U	UG/LITER	TRG
	QM13B90310K1	117-81-7	bis(2-Ethylhexyl) phthalate	100	J	UG/KG	BLK
	QM12B90310D1	117-81-7		10	U	UG/LITER	BLK
	J1528	117-81-7		10	U	UG/LITER	TRG
	J1527	117-81-7		260	BJ	UG/KG	TRG
ITEK42990	QM09B90320EB	67-64-1	Acetone	2	J	UG/LITER	BLK
	J1529	67-64-1		3	JB	UG/LITER	TRG
	QM09B90320EB	75-09-2	Methylene chloride	1	J	UG/LITER	BLK
	J1529	75-09-2		5	U	UG/LITER	TRG
	QM09B90320EB	108-88-3	Toluene	5	U	UG/LITER	BLK
	J1529	108-88-3		5	U	UG/LITER	TRG
	QM12B90320D1	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER	BLK
	J1529	117-81-7		10	U	UG/LITER	TRG
ITEK43006	QM09B90323VB	67-64-1	Acetone	3	J	UG/LITER	BLK
	J1530	67-64-1		12	B	UG/LITER	TRG
	J0430	67-64-1		2	BJ	UG/LITER	TRG
	QM09B90323VB	75-09-2	Methylene chloride	5	U	UG/LITER	BLK
	J0430	75-09-2		5	U	UG/LITER	TRG
	J1530	75-09-2		5	U	UG/LITER	TRG
	QM09B90323VB	108-88-3	Toluene	5	U	UG/LITER	BLK
	J1530	108-88-3		5	U	UG/LITER	TRG
	J0430	108-88-3		5	U	UG/LITER	TRG
ITEK43008	QM09B90323EB	67-64-1	Acetone	5	J	UG/LITER	BLK
	J0426	67-64-1		5	BJ	UG/LITER	TRG
	J0429	67-64-1		25	B	UG/LITER	TRG
	QM09B90323EB	75-09-2	Methylene chloride	2	J	UG/LITER	BLK
	J0426	75-09-2		5	U	UG/LITER	TRG
	J0429	75-09-2		5	U	UG/LITER	TRG
	QM09B90323EB	108-88-3	Toluene	5	U	UG/LITER	BLK
	J0429	108-88-3		5	U	UG/LITER	TRG
	J0426	108-88-3		5	U	UG/LITER	TRG
ITEK43010	QM09B903233VB	67-64-1	Acetone	5	J	UG/LITER	BLK
	J1531	67-64-1		12	B	UG/LITER	TRG
	J1534	67-64-1		10	U	UG/LITER	TRG
	J1535	67-64-1		6	JB	UG/LITER	TRG
	QM09B903233VB	75-09-2	Methylene chloride	1	J	UG/LITER	BLK

Determination of Laboratory Contamination
For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

CODE	SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK43010	J1534	75-09-2	Methylene chloride	1	J	UG/LITER	TRG
	J1531	75-09-2		5	U	UG/LITER	TRG
	J1535	75-09-2		2	JB	UG/LITER	TRG
	QM09B903233VB	108-88-3	Toluene	5	U	UG/LITER	BLK
	J1535	108-88-3		100		% RECOVERY	MS
	J1535	108-88-3		96		% RECOVERY	MSD
	J1535	108-88-3		5	U	UG/LITER	TRG
	J1531	108-88-3		5	U	UG/LITER	TRG
	J1534	108-88-3		5	U	UG/LITER	TRG
	QM12B90324K1	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER	BLK
	J1535	117-81-7		10	U	UG/LITER	TRG
	J1530	117-81-7		10	U	UG/LITER	TRG
	J1534	117-81-7		10	U	UG/LITER	TRG
ITEK43018	QM09B90324VB	67-64-1	Acetone	5	J	UG/LITER	BLK
	QM09B90324CB	67-64-1		2	J	UG/LITER	BLK
	J1532	67-64-1		10	B	UG/LITER	TRG
	J1533	67-64-1		80	B	UG/LITER	TRG
	QM09B90324VB	75-09-2	Methylene chloride	5	U	UG/LITER	BLK
	QM09B90324CB	75-09-2		2	J	UG/LITER	BLK
	J1533	75-09-2		5	U	UG/LITER	TRG
	J1532	75-09-2		2	J	UG/LITER	TRG
	QM09B90324CB	108-88-3	Toluene	5	U	UG/LITER	BLK
	QM09B90324VB	108-88-3		5	U	UG/LITER	BLK
	J1533	108-88-3		96		% RECOVERY	MS
	J1533	108-88-3		104		% RECOVERY	MSD
	J1532	108-88-3		5	U	UG/LITER	TRG
	J1533	108-88-3		5	U	UG/LITER	TRG
ITEK43019	QM09B90327VB	67-64-1	Acetone	3	J	UG/LITER	BLK
	J1515	67-64-1		4	BJ	UG/LITER	TRG
	QM09B90327VB	75-09-2	Methylene chloride	1	J	UG/LITER	BLK
	J1515	75-09-2		5	U	UG/LITER	TRG
	QM09B90327VB	108-88-3	Toluene	5	U	UG/LITER	BLK
	J1515	108-88-3		5	U	UG/LITER	TRG
	QM12B90327D1	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER	BLK

Determination of Laboratory Contamination
For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

LO	SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK43019	J1515	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER	TRG
ITEK43055	QM09B90404CB	67-64-1	Acetone	10	U	UG/LITER	BLK
	J1539	67-64-1		3	J	UG/LITER	TRG
	QM09B90404CB	75-09-2	Methylene chloride	1	J	UG/LITER	BLK
	J1539	75-09-2		2	JB	UG/LITER	TRG
	QM09B90404CB	108-88-3	Toluene	5	U	UG/LITER	BLK
	J1539	108-88-3		5	U	UG/LITER	TRG
	QM12B90405D1	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER	BLK
	J1540	117-81-7		2	J	UG/LITER	TRG
ITEK43109	QM09B904172VB	67-64-1	Acetone	10	U	UG/LITER	BLK
	J1541	67-64-1		6	J	UG/LITER	TRG
	QM09B904172VB	75-09-2	Methylene chloride	1	J	UG/LITER	BLK
	J1541	75-09-2		1	BJ	UG/LITER	TRG
	QM09B904172VB	108-88-3	Toluene	5	U	UG/LITER	BLK
	J1541	108-88-3		94		% RECOVERY	MS
	J1541	108-88-3		94		% RECOVERY	MSD
	J1541	108-88-3		5	U	UG/LITER	TRG
	QM12B90411D1B	117-81-7	bis(2-Ethylhexyl) phthalate	3	J	UG/LITER	BLK
	J1542	117-81-7		10	U	UG/LITER	TRG
ITEK43156	QM09B904212VB	67-64-1	Acetone	5	J	UG/LITER	BLK
	QM09B904202CB	67-64-1		2	J	UG/LITER	BLK
	J1547	67-64-1		200	B	UG/LITER	TRG
	J1548	67-64-1		6	BJ	UG/LITER	TRG
	QM09B904202CB	75-09-2	Methylene chloride	3	J	UG/LITER	BLK
	QM09B904212VB	75-09-2		1	J	UG/LITER	BLK
	J1547	75-09-2		5	U	UG/LITER	TRG
	J1548	75-09-2		2	BJ	UG/LITER	TRG
	QM09B904202CB	108-88-3	Toluene	5	U	UG/LITER	BLK
	QM09B904212VB	108-88-3		5	U	UG/LITER	BLK
	J1548	108-88-3		90		% RECOVERY	MS
	J1547	108-88-3		94		% RECOVERY	MS

Determination of Laboratory Contamination
For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

CODE	SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK43156	J1548	108-88-3	Toluene	92		% RECOVERY	MSD
	J1547	108-88-3		96		% RECOVERY	MSD
	J1548	108-88-3		5	U	UG/LITER	TRG
	J1547	108-88-3		5	U	UG/LITER	TRG
	QM12B90418D1B	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER	BLK
	J1547	117-81-7		12		UG/LITER	TRG
	J1549	117-81-7		2	J	UG/LITER	TRG
ITEK43206	J1551	67-64-1	Acetone	11		UG/LITER	TRG
	J1551	75-09-2	Methylene chloride	3	JB	UG/LITER	TRG
	J1551	108-88-3	Toluene	5	U	UG/LITER	TRG
	QM12B90426D1C	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER	BLK
	J1550	117-81-7		2	J	UG/LITER	TRG
ITEK43246	QM09B905033VB	67-64-1	Acetone	10	U	UG/LITER	BLK
	J1554	67-64-1		18000	D	UG/LITER	TRG
	J1555	67-64-1		14		UG/LITER	TRG
	J1553	67-64-1		640	D	UG/LITER	TRG
	QM09B905033VB	75-09-2	Methylene chloride	1	J	UG/LITER	BLK
	J1555	75-09-2		5	U	UG/LITER	TRG
	J1554	75-09-2		2	BJ	UG/LITER	TRG
	J1553	75-09-2		4	BJ	UG/LITER	TRG
	QM09B905033VB	108-88-3	Toluene	5	U	UG/LITER	BLK
	J1553	108-88-3		5	U	UG/LITER	TRG
	J1555	108-88-3		5	U	UG/LITER	TRG
	J1554	108-88-3		980	D	UG/LITER	TRG
	QM12B90503D1B	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER	BLK
	J1555	117-81-7		10	U	UG/LITER	TRG
ITEK43299	QM09B905122VB	67-64-1	Acetone	10	U	UG/LITER	BLK
	J1557	67-64-1		20		UG/LITER	TRG
	J1538	67-64-1		36		UG/LITER	TRG
	J1556	67-64-1		24		UG/LITER	TRG
	J1537	67-64-1		36		UG/LITER	TRG
	QM09B905122VB	75-09-2	Methylene chloride	5		UG/LITER	BLK
	J1557	75-09-2		5	U	UG/LITER	TRG
	J1537	75-09-2		5	U	UG/LITER	TRG
	J1538	75-09-2		5	U	UG/LITER	TRG

Determination of Laboratory Contamination
For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

T	SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK43299	J1556	75-09-2	Methylene chloride	5	U	UG/LITER	TRG
	QM09B905122VB	108-88-3	Toluene	5	U	UG/LITER	BLK
	J1557	108-88-3		106		% RECOVERY	MS
	J1557	108-88-3		106		% RECOVERY	MSD
	J1557	108-88-3		5	U	UG/LITER	TRG
	J1537	108-88-3		5	U	UG/LITER	TRG
	J1538	108-88-3		5	U	UG/LITER	TRG
	J1556	108-88-3		5	U	UG/LITER	TRG
	QM12B905110D3	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER	BLK
	J1556	117-81-7		10	U	UG/LITER	TRG
ITEK43318	QM09B905164VB	67-64-1	Acetone	10	U	UG/LITER	BLK
	J1559	67-64-1		170		UG/LITER	TRG
	J1560	67-64-1		90		UG/LITER	TRG
	J1558	67-64-1		18		UG/LITER	TRG
	QM09B905164VB	75-09-2	Methylene chloride	3	J	UG/LITER	BLK
	J1559	75-09-2		5	U	UG/LITER	TRG
	J1560	75-09-2		5	U	UG/LITER	TRG
	J1558	75-09-2		5	U	UG/LITER	TRG
	QM09B905164VB	108-88-3	Toluene	5	U	UG/LITER	BLK
	J1558	108-88-3		5	U	UG/LITER	TRG
	J1559	108-88-3		6		UG/LITER	TRG
	J1560	108-88-3		5	U	UG/LITER	TRG
ITEK43356	QM09B90523VB	67-64-1	Acetone	10	U	UG/LITER	BLK
	J1563	67-64-1		47		UG/LITER	TRG
	QM09B90523VB	75-09-2	Methylene chloride	3	J	UG/LITER	BLK
	J1563	75-09-2		2	JB	UG/LITER	TRG
	QM09B90523VB	108-88-3	Toluene	5	U	UG/LITER	BLK
	J1563	108-88-3		5	U	UG/LITER	TRG
ITEK43358	QM09B905233VB	67-64-1	Acetone	10	U	UG/LITER	BLK
	J1564	67-64-1		15		UG/LITER	TRG
	J1561	67-64-1		34		UG/LITER	TRG
	J1562	67-64-1		22		UG/LITER	TRG
	QM09B905233VB	75-09-2	Methylene chloride	15		UG/LITER	BLK
	J1564	75-09-2		5	U	UG/LITER	TRG
	J1561	75-09-2		5	U	UG/LITER	TRG
	J1562	75-09-2		5	U	UG/LITER	TRG

Determination of Laboratory Contamination
For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

CODE	SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK43358	QM09B905233VB	108-88-3	Toluene	5	U	UG/LITER	BLK
	J1564	108-88-3		5	U	UG/LITER	TRG
	J1561	108-88-3		5	U	UG/LITER	TRG
	J1562	108-88-3		5	U	UG/LITER	TRG
	QM12B90518D1	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER	BLK
	J1561	117-81-7		10	U	UG/LITER	TRG
ITEK43397	QM09B90525EB	67-64-1	Acetone	10	U	UG/LITER	BLK
	J1568	67-64-1		12		UG/LITER	TRG
	J1566	67-64-1		8	J	UG/LITER	TRG
	J1567	67-64-1		7	J	UG/LITER	TRG
	J1570	67-64-1		13		UG/LITER	TRG
	QM09B90525EB	75-09-2	Methylene chloride	3	J	UG/LITER	BLK
	J1568	75-09-2		5	U	UG/LITER	TRG
	J1566	75-09-2		5	U	UG/LITER	TRG
	J1570	75-09-2		5	U	UG/LITER	TRG
	J1567	75-09-2		5	U	UG/LITER	TRG
	QM09B90525EB	108-88-3	Toluene	5	U	UG/LITER	BLK
	J1566	108-88-3		5	U	UG/LITER	TRG
	J1567	108-88-3		5	U	UG/LITER	TRG
	J1570	108-88-3		5	U	UG/LITER	TRG
	J1568	108-88-3		5	U	UG/LITER	TRG
ITEK43398	QM12B90522D2	117-81-7	bis(2-Ethylhexyl) phthalate	10	U	UG/LITER	BLK
	J1568	117-81-7		10	U	UG/LITER	TRG
	J1566	117-81-7		10	U	UG/LITER	TRG
	J1567	117-81-7		10	U	UG/LITER	TRG
ITEK43409	QM09B90531CB	67-64-1	Acetone	2	J	UG/LITER	BLK
	J1578	67-64-1		3	JB	UG/LITER	TRG
	J1577	67-64-1		19	B	UG/LITER	TRG
	J1582	67-64-1		4	JB	UG/LITER	TRG
	QM09B90531CB	75-09-2	Methylene chloride	3	J	UG/LITER	BLK
	J1578	75-09-2		5	U	UG/LITER	TRG
	J1577	75-09-2		1	JB	UG/LITER	TRG
	J1582	75-09-2		5	U	UG/LITER	TRG
	QM09B90531CB	108-88-3	Toluene	5	U	UG/LITER	BLK
	J1582	108-88-3		104		% RECOVERY	MS
	J1582	108-88-3		90		% RECOVERY	MSD
	J1578	108-88-3		5	U	UG/LITER	TRG

Determination of Laboratory Contamination
For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

L	SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK43409	J1577	108-88-3	Toluene	5	U	UG/LITER	TRG
	J1582	108-88-3		5	U	UG/LITER	TRG
ITEK43410	QM09B90602VB	67-64-1	Acetone	10	U	UG/LITER	BLK
	QM10B906022VB	67-64-1		10	U	UG/KG	BLK
	QM10B90602CB	67-64-1		6	J	UG/KG	BLK
	J1579	67-64-1		38		UG/KG	TRG
	J1571	67-64-1		22		UG/KG	TRG
	J1575	67-64-1		110		UG/LITER	TRG
	J1576	67-64-1		40		UG/LITER	TRG
	J1583	67-64-1		27		UG/LITER	TRG
	J1581	67-64-1		16		UG/LITER	TRG
	J1573	67-64-1		35	B	UG/KG	TRG
	J1572	67-64-1		31		UG/KG	TRG
	J1580	67-64-1		30		UG/KG	TRG
	J1574	67-64-1		64		UG/KG	TRG
	QM10B90602CB	75-09-2	Methylene chloride	7		UG/KG	BLK
	QM10B906022VB	75-09-2		3	J	UG/KG	BLK
	QM09B90602VB	75-09-2		3	J	UG/LITER	BLK
	J1579	75-09-2		8	B	UG/KG	TRG
	J1580	75-09-2		29	B	UG/KG	TRG
	J1572	75-09-2		10	B	UG/KG	TRG
	J1571	75-09-2		9	B	UG/KG	TRG
	J1583	75-09-2		5	U	UG/LITER	TRG
	J1575	75-09-2		5	U	UG/LITER	TRG
	J1576	75-09-2		5	U	UG/LITER	TRG
	J1581	75-09-2		5	U	UG/LITER	TRG
	J1573	75-09-2		13	B	UG/KG	TRG
	J1574	75-09-2		22	B	UG/KG	TRG
	QM10B90602CB	108-88-3	Toluene	5	U	UG/KG	BLK
	QM10B906022VB	108-88-3		5	U	UG/KG	BLK
	QM09B90602VB	108-88-3		5	U	UG/LITER	BLK
	J1580-	108-88-3		90		% RECOVERY	MS
	J1580-	108-88-3		88		% RECOVERY	MSD
	J1579	108-88-3		4	J	UG/KG	TRG
	J1575	108-88-3		5	U	UG/LITER	TRG
	J1576	108-88-3		5	U	UG/LITER	TRG
	J1583	108-88-3		5	U	UG/LITER	TRG
	J1581	108-88-3		5	U	UG/LITER	TRG
	J1580	108-88-3		6	U	UG/KG	TRG
	J1572	108-88-3		6	U	UG/KG	TRG
	J1571	108-88-3		2	J	UG/KG	TRG
	J1573	108-88-3		6	U	UG/KG	TRG
	J1574	108-88-3		6	U	UG/KG	TRG
	QM13B90524T2	117-81-7	bis(2-Ethylhexyl) phthalate	110	J	UG/KG	BLK

Determination of Laboratory Contamination
For Methylene Chloride, Acetone, Toluene, and bis(2-Ethylhexyl) phthalate

[illegible]	SAMPLE NUMBER	PARAMETER CODE	COMPOUND/ANALYTE	RESULT	QUALIFIER	UNITS	FLAG
ITEK43410	QM12B9052401	117-81-7	bis(2-Ethylhexyl) phthalate	2	J	UG/LITER	BLK
	J1580	117-81-7		220	BJ	UG/KG	TRG
	J1583	117-81-7		10	U	UG/LITER	TRG
	J1573	117-81-7		230	BJ	UG/KG	TRG
	J1574	117-81-7		2400	B	UG/KG	TRG

1061 records selected.

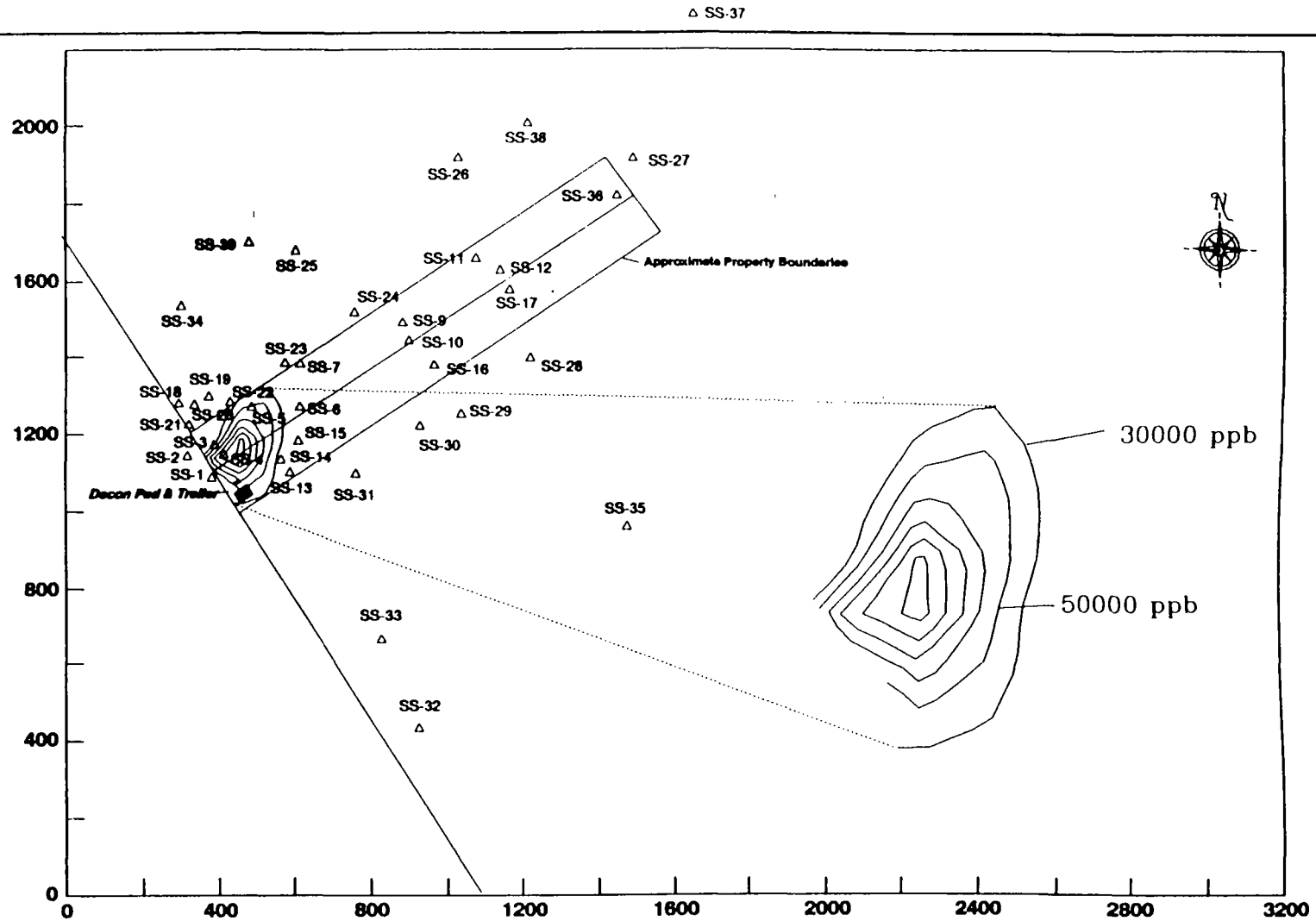
NOTES:

QM - analytical blank
U - Not detected at detection limit value noted
J - estimated value
B - flag identifying that analyte was found in associated blank
E - concentration exceeds calibration range
D - analysis at secondary dilution factor

Table 4-15. Summary of Suspected Laboratory Contaminants

Compound	Lower Blank Conc. (ppb)	Upper Blank Conc. (ppb)	Analytical Level	Matrix	CRDL (ppb)	5x CRDL (ppb)[a]
Methylene chloride	1	7	Low	Soil	5	25
		300	Medium	Soil	625	3,125
		15	Low	Water	5	25
Acetone	1	10	Low	Soil	10	50
		290	Medium	Soil	1,250	6,250
	1	8	Low	Water	10	50
Toluene	1	3	Low	Soil	5	25
	1	1	Low	Water	5	25
bis(2-Ethylhexyl) phthalate	90	680	Low	Soil	330	1,650
		860	Medium	Soil	41,250	206,250
	2	4	Low	Water	10	50

[a]5x CRDL is based upon the following calculations:
Low: 5x CRDL
Medium: 5x (CRDL x 125)[b]
[b]For medium level analysis there is essentially a 1 to 125 dilution factor.



LEGEND

128.6 CHEMICAL CONCENTRATION CONTOUR LINE (Concentration in parts per billion)

△ SURFACE SOIL SAMPLE

SCALE: 1" = 435 ft

NOTE: CONTOUR INTERVAL = 20000 ppb

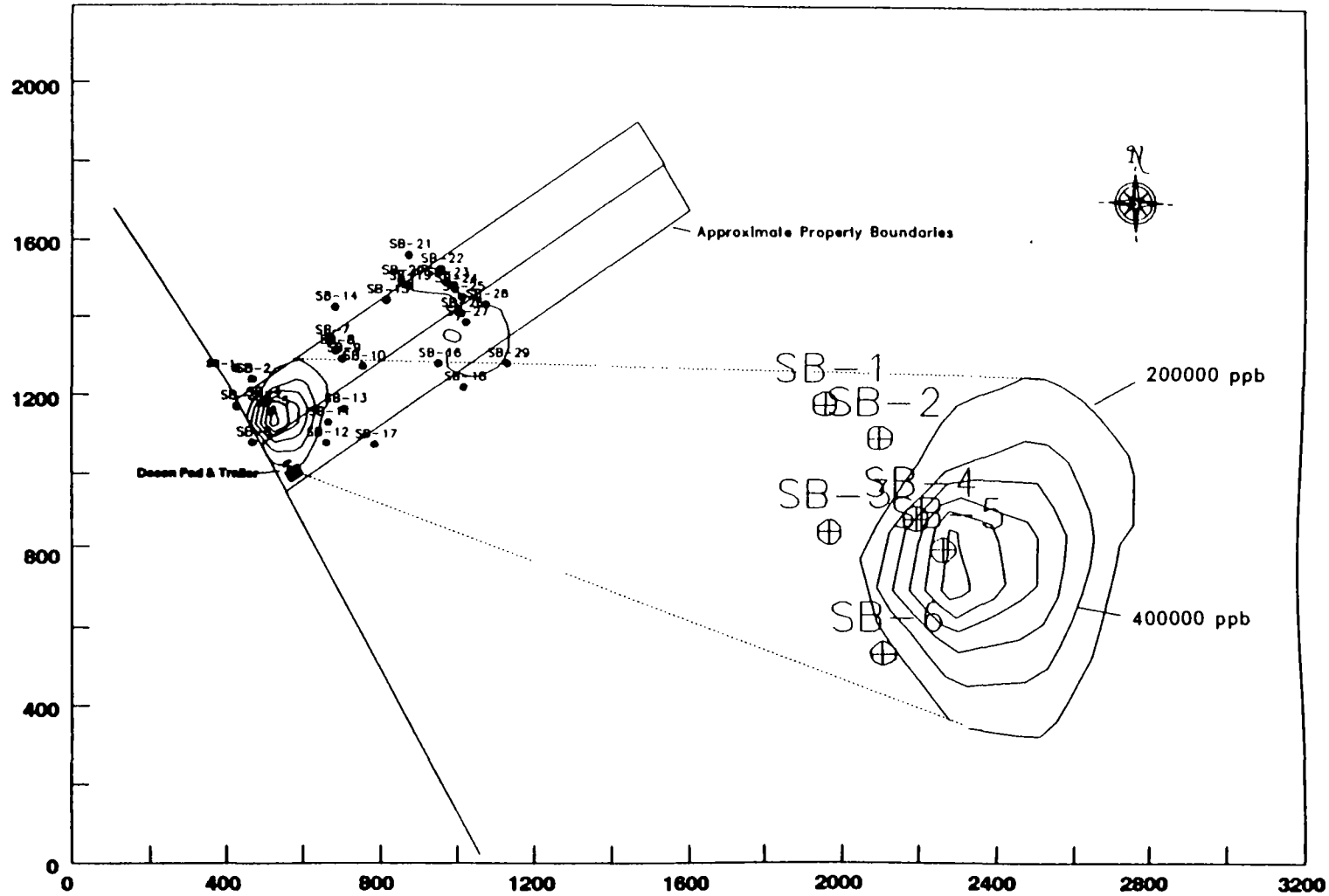
FIGURE 4-1

CHEMICAL CONCENTRATION DISTRIBUTION MAP FOR TOTAL VOAs* IN SURFACE SOIL SAMPLES

* EXCLUDES ACETONE AND METHYLENE CHLORIDE

INTERNATIONAL TECHNOLOGY CORPORATION

3 10 00702



LEGEND

CHEMICAL CONCENTRATION CONTOUR LINE (Concentration in parts per billion)

IT SOIL BORING (Installed 1989)

SCALE: 1" = 435 ft

NOTE: CONTOUR INTERVAL = 200000 ppb

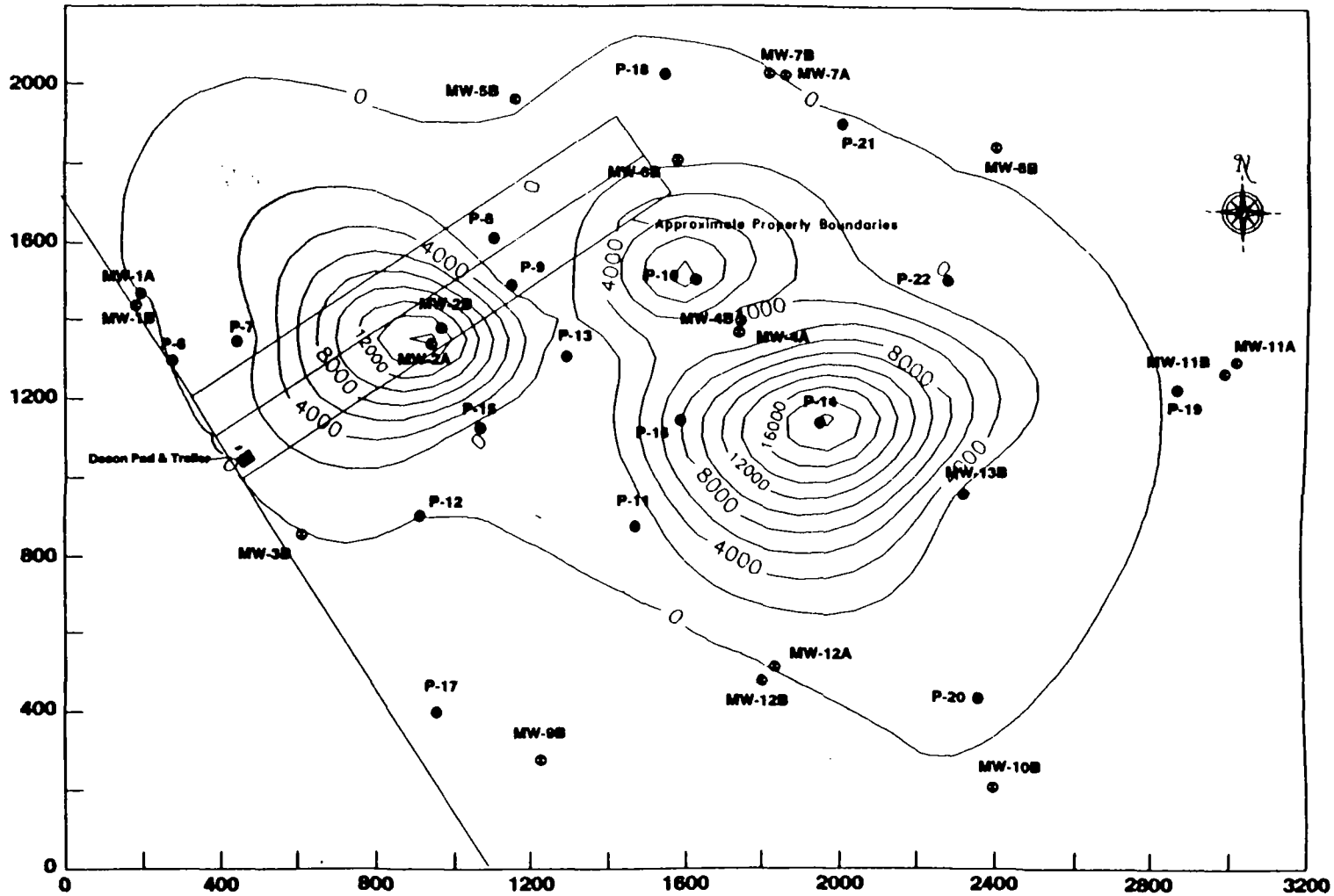
FIGURE 4-2

CHEMICAL CONCENTRATION DISTRIBUTION MAP FOR TOTAL VOAs* IN SOIL BORINGS

*EXCLUDES ACETONE AND METHYLENE CHLORIDE

INTERNATIONAL TECHNOLOGY CORPORATION

3 10 00703



LEGEND

4000 CHEMICAL CONCENTRATION CONTOUR LINE (Concentration in parts per billion)

IT WELL (Installed 1988)

GOLDER WELL (Installed 1986)

SCALE: 1" = 435 ft

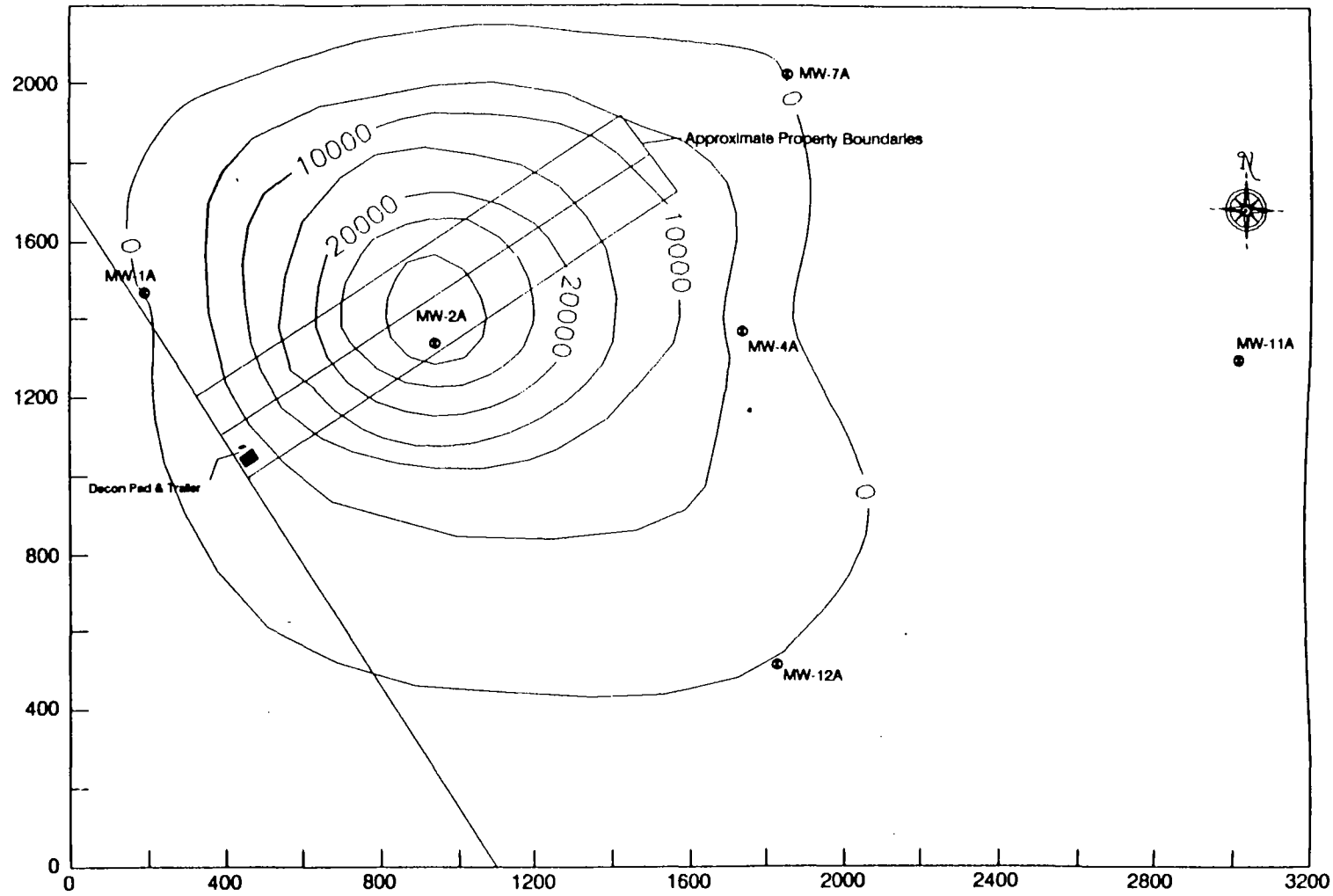
NOTE: CONTOUR INTERVAL = 2000 ppb

FIGURE 4-3

CHEMICAL CONCENTRATION DISTRIBUTION MAP FOR TOTAL VOAS IN ALL UPPER AQUIFER WELLS

INTERNATIONAL TECHNOLOGY CORPORATION

3 10 00704



LEGEND

128 — CHEMICAL CONCENTRATION CONTOUR LINE (Concentration in parts per billion)

IT WELL (Installed 1989)

SCALE: 1" = 435 ft

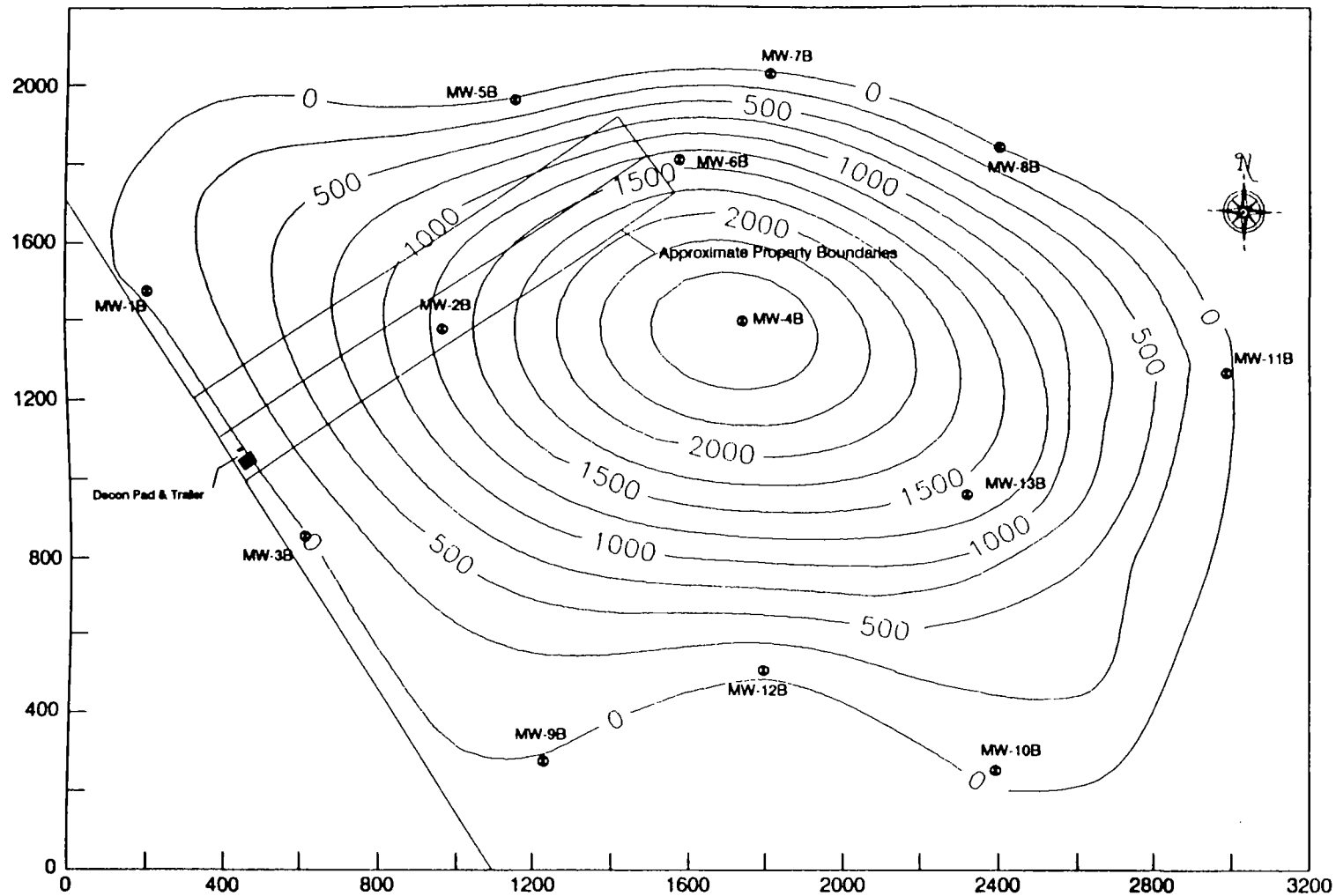
NOTE: CONTOUR INTERVAL = 5000 ppb

FIGURE 4-4

CHEMICAL CONCENTRATION DISTRIBUTION MAP FOR TOTAL VOAS IN A-WELLS

INTERNATIONAL TECHNOLOGY CORPORATION

3 10 00705



LEGEND

128 — CHEMICAL CONCENTRATION CONTOUR LINE (Concentration in parts per billion)

IT WELL (Installed 1989)

SCALE: 1" = 435 ft

NOTE: CONTOUR INTERVAL = 250 ppb

FIGURE 4-5

CHEMICAL CONCENTRATION DISTRIBUTION MAP FOR TOTAL VOAS IN B-WELLS

INTERNATIONAL TECHNOLOGY CORPORATION

3 10 00706

5.0 RISK ASSESSMENT

5.1 INTRODUCTION

The purpose of this risk assessment is to evaluate the potential impact upon public health and/or the environment of chemicals in the soil and ground water related to past operations at the SCRDI site. For the purposes of this assessment, the SCRDI site is defined as the area previously owned and used by SCRDI for the operation of its business (Figure 1-3). In addition, the area immediately adjacent to the property that extends to South Carolina Highway 48 (Bluff Road) will be included in this evaluation. Figure 5-1 is a flow chart illustrating the sequential approach taken in evaluating the possible risks associated with the off-site migration of chemicals at the SCRDI site.

To assess the potential impact of the off-site migration of site-related chemicals from the SCRDI site, appropriate "indicator chemicals" are selected (Section 5.2 and Appendix F). Indicator chemicals for both soil and ground water are selected by evaluating the quantity, frequency, physicochemistry, and toxicity of the chemicals found in the soils and ground water. The indicator chemicals include all chemicals which are classified as Class A, B, or C carcinogens by the Carcinogen Assessment Group (CAG) of the U.S. Environmental Protection Agency (EPA, 1986a, 1989c). Noncarcinogenic indicator chemicals are chosen to be representative of all chemical classes which are identified in the on-site soil and ground water samples.

Land-use activities, demographic data and other types of population information are used to identify potential human receptor populations which may be potentially exposed to site-related chemicals under current site use scenarios (Section 5.3.1). The potential routes for off-site migration of the SCRDI site-related chemicals for these scenarios are identified (Section 5.3.2). Appropriate models are used to estimate the potential concentration of chemicals at an identified exposure point for each current use scenario. Current use exposure scenarios are developed for both a maximally exposed individual (MEI) and the average exposed individual (AEI). These scenarios are specific to the identified receptor populations. These are used in conjunction with data from the exposed pathway analysis estimate potential human exposure to site-related chemicals (Sections 5.3.3 and 5.3.4).

Potential future use scenarios have been developed to estimate exposures, if any, associated with the presence of site-related chemicals in the shallow aquifer and in surficial soils (Section 5.4). Analagous to the approach for the current use scenarios, future use exposure scenarios have been developed for both an MEI and an AEI.

The potential applied daily intakes (ADIs) for carcinogens are used to estimate excess incremental lifetime cancer risk for both current use and future use scenarios. Estimated daily intakes for all scenarios for noncarcinogenic indicators are compared with published reference levels [Sections 5.6 (current use) and 5.7 (future use)].

A similar approach is used to evaluate the potential risk to environmental populations (Section 5.8). Potential wildlife and aquatic receptor populations are identified. Quantitative estimates of potential exposures to these populations to site-related chemicals are compared to acceptable levels derived from the scientific literature.

5.2 SELECTION OF INDICATOR CHEMICALS

Because of the number of site-related chemicals, indicator chemicals are selected for each environmental matrix. The purpose of selecting indicator chemicals is to characterize potential risks associated with the site in terms of the prevalency, environmental persistence, mobility, or toxicity. The indicator chemical selection process is based on the procedure given in the Superfund Public Health Evaluation Manual (EPA, 1986a).

For the long-term exposure scenarios, the chemicals are first divided into two groups - confirmed and suspected human or animal carcinogens and noncarcinogens. All chemicals which are classified by the Carcinogen Assessment Group (CAG) of EPA in Classes A (Human Carcinogen), B (Probable Human Carcinogen), or C (Possible Human Carcinogen) are considered to be indicator chemicals and are evaluated in the risk assessment. A list of these indicator chemicals found in the environmental samples is given in Table 5-1. Chemicals in CAG classifications below C (i.e., D, E) are not evaluated because these classifications are reserved for those chemicals for which there is limited, inadequate, or no evidence of carcinogenicity in animal models.

Noncarcinogenic chemicals found at or above detection limits in each medium (e.g. soil or ground water) are grouped by structural similarities and indicator chemicals are selected from each group. Four major groups can be identified. These groups are:

- Volatile organics
- Semivolatile organics
- Heavy metals and cyanide
- Pesticides and polychlorinated biphenyls (PCBs).

The parameters selected for ranking provide a value which reflects either the medium-specific relative toxicity, prevalence, mobility, or possible persistence of a chemical at the site.

The chemicals are ranked in descending order in each category and assigned a point value for each relative ranking. For example, if a group contains six chemicals and the parameter being evaluated is water solubility, the chemical with the highest water solubility would be given six points; second highest, five points, and so on. If two chemicals have the same value for a particular parameter category (such as frequency), then the chemicals are ranked equally for that parameter. In a group of six chemicals, if two chemicals were detected in all the samples and the other chemicals were detected in only some of the samples, the two most prevalent chemicals would be given six points each and the next most prevalent chemical would be be given four points. Not all of the chemicals have values for each category. The weighting factor is the number of categories for which a value could be found for each chemical. If the chemicals were ranked in six categories and a chemical had a published value for each category, then the weighting factor is six; if only five values were found, then the weighting factor is five, etc. For each chemical the weighted averages are calculated by dividing the total score for each chemical by the respective weighting factor. These scores are not absolutes. Rather, they are reviewed in light of the available data and site-specific considerations. The final indicators chosen on this basis are given in

Tables 5-2, 5-3, and 5-4. A detailed discussion of the selection of these indicator chemicals is given in Appendix F.

Noncarcinogenic indicators were selected in this manner for all long-term current and future use exposure scenarios. For the short-term future use scenario, an identical method was used. However, the chemical database used for selection was broadened to include the Class A, B, and C carcinogens.

5.3 EXPOSURE ASSESSMENT FOR CURRENT USE SCENARIOS

The purpose of the exposure assessment is to describe site-specific pathways related to chemical transport and the potential exposure to human receptors and to provide estimates of these exposures. The four components of an exposure assessment are:

- Receptor survey
- Migration pathway analysis
- Exposure pathway analysis
- Exposure estimation.

Each of these elements is addressed separately below. The receptor survey identifies the human populations which potentially may be exposed to chemicals either on site or as a result of migration off site. The analysis of possible migration pathways identifies possible routes of migration of chemicals in environmental media, either on site or off site, which may result in potential exposures to human receptors. The exposure pathway analysis identifies potential pathways from these exposure points to receptors. Finally, the applied intake of a chemical to a receptor is estimated.

The design and approach of the exposure assessment are biased toward health protection. In the modeling efforts health-protective assumptions are used consistently. The resulting exposure estimates made using these models are not intended to represent existing conditions at the SCRDI site. Rather, they are projections of possible exposures that may occur only if all the assumptions of the models are fully realized.

5.3.1 Receptor Survey

The objective of the receptor survey is to identify potential receptor populations that may be exposed to site-related chemicals in the surficial soils or in the ground water at the SCRDI site.

The SCRDI site is located approximately 12 miles from Columbia, South Carolina, on State Highway 48 (Bluff Road). The 2.3-acre plot of land is located in a mixed land use area in rural Richland County (Figure 3-10). All of the land adjacent to the site is woodlands with the exception of the grassy fields located across the road from the site. The soils in the area primarily are sandy with very high permeability. However, there are many areas with a clay layer near the surface. The water table in the area is found at a depth of approximately 10 feet, thus the water stands instead of percolating through to lower strata. Because of the poor drainage, the majority of the area surrounding the site is swampy (ESRI, 1989b).

Drainage is predominantly eastward, away from the topographic high at Bluff Road. Drainage is mainly sheetflow across the land surface and flows into Myers Creek, 3,200 feet northeast of the site boundary. Myers Creek flows into Cedar Creek, a tributary of the Congaree River, approximately 5 miles away (ESRI, 1989b). Myers Creek is a black-water stream. The water is of poor quality and very shallow and the banks are heavily overgrown. Recreational use of this stream is primarily limited to fishing. Due to the physical setting, it is unlikely people use the stream for swimming or other recreational activities. IT personnel on site have reported a number of venomous snakes (e.g., rattlesnakes) in the area which would provide an additional deterrent to swimming.

The area is sparsely populated, with only 47 homes located in scattered housing clusters within a one-mile radius of the site. The closest residence is approximately 0.8 mile away (ESRI, 1989b). The population in the area is not expected to increase significantly during the next 20 years (Central Midlands Regional Planning Council, 1986).

The Westinghouse Nuclear Fuels plant is directly across the road from the site, and is situated approximately 2,000 feet back from the road. The only

other commercial establishment within one mile of the site is a bar located approximately one mile southeast of the site on Bluff Road (ESRI, 1989b).

The only additional activities which occur in the area are farming and hunting. Hay is grown on several fields near and around the Westinghouse industrial complex (ESRI, 1989b). These fields are upgradient from the SCRDI site. The area surrounding the site supports an abundant population of whitetail deer. A local hunting club frequently hunts the area for whitetail deer by both still hunting and dog drive (ESRI, 1989a).

5.3.2 Migration Pathway Analysis

The purpose of this section is to describe the site-specific pathways related to chemical transport which may result in potential exposure points for human receptors. The major routes of migration off site are via the air, surface water runoff, and leaching into ground water. Analysis of each of these environmental pathways is discussed below.

The SCRDI site is closely bounded by trees on three sides, with only a small section along the front of the property open to unrestricted air movement. Furthermore, the nearest receptor is 0.8 miles south of the site, in a direction for which the wooded areas around the site act as a windbreaker. The transport of particulate-bound chemicals off site via resuspension and dispersion in air is not considered a viable pathway. Therefore, the air pathway will not be evaluated as part of this baseline assessment.

Rain may result in the erosion of soil containing site-related chemicals into runoff water. If chemicals were being transported off site via surface runoff water, elevated concentrations of these chemicals would be expected to be found in the surface soils surrounding the site or in nearby drainage features which would collect runoff water from the site. Water and sediment samples from a drainage ditch located just south-southeast of the property did not have elevated concentrations of chemicals which may have originated from the site (Appendix A). This ditch originates on the side of the site and collects and channels surface water from the site to Myers Creek. Chemical concentrations in the off-site surface soil samples were also low, with the exception of one location near the southwest corner of the property (Appendix A). This

area was used for staging drums during the cleanup of the site, thus the source of these chemicals is not likely to be from off-site migration of chemicals (EBASCO, 1988). Acetone and benzoic acid were present at concentrations higher than the background samples; however, both of these chemicals are produced by bacteria and plants and the presence of these chemicals may not be the result of migration of chemicals off site (Verschueren, 1983).

There are at least two aquifers located under the SCRDI site (ESRI, 1989b). The two aquifers are separated by a clay and silt layer which ranges in thickness from 1.5 to 25 feet (Section 3.6.3). Sampling of both the shallow and deep aquifer confirms that chemicals have migrated into the shallow aquifer but not into the deep aquifer. It is unlikely that the chemicals will migrate into the deep aquifer because of the relatively impermeable clay/silt layer between the aquifers.

Myers Creek may be recharged by the shallow aquifer (ESRI, 1989b). Results of this study indicate that site-related chemicals have not migrated into Myers Creek at this time (Section 4.4).

5.3.3 Exposure Pathway Analysis

Potential human exposures may occur by primary pathways, e.g. direct consumption of drinking water, dermal contact or inhalation, or through secondary pathways involving the transfer of site-related chemicals through a food chain or web. Both primary and secondary pathways will be analyzed in this section to evaluate their applicability to the SCRDI site.

5.3.3.1 Primary Pathways

The wooded area surrounding the site is remote and routine foot travel in this area is uncommon. The nearest homes are approximately one mile away in all directions (ESRI, 1989b). The marshy terrain of this site is not conducive to foot trails or other recreational hiking activities. Easy access to the site is possible only from Bluff Road. However, control measures exist to prevent general access to the property from Bluff Road. Easy access to the SCRDI site is limited either through natural or man-made barriers. Direct dermal contact by the general population with on-site soils is very unlikely.

Hunting in the area is done primarily by still shooting, i.e. the hunter stays in one location and waits for his quarry to move within range. Hunters generally do not walk through the area stalking deer (the primary target) or other game. The deer season in South Carolina runs from August 15 to January 1 (ESRI, 1989a). In addition, apparel worn by hunters tends to limit the surface area of exposed skin. Coupled with the still-shooting approach, the potential exposure to soils is limited both in likelihood and range.

Resuspension of particulate-bound chemicals from the site has been shown to be limited by the forestation which is surrounding the site (Section 5.3.2). Furthermore, this site is isolated from areas of human activity. As stated above, there are no homes near the site. Because the population in the area is expected to continue at its slow rate of growth during the next 20 years (Central Midlands Regional Planning Council, 1986), it appears unlikely that any homes will be built near this area in the near future. Analysis of the U.S. Geologic Survey topographic map for this area shows that less than five homes were built within 1 mile of the site between 1971 and 1988. If new homes were to be built in the area, the most likely location would be near the present housing clusters, all of which are at least one mile away (ESRI, 1989b). The only work-related activities in the area are at the Westinghouse plant and scattered farming (ESRI, 1989b). The Westinghouse plant is an indoor, climate-controlled operation. The nearest fields under cultivation are located almost one mile away (ESRI, 1989b). There are no human activities near the site that would require a person to spend lòng periods of time outside on site or adjacent to the site. Therefore, direct inhalation of site-related particulate-bound chemicals is not considered a viable exposure pathway.

Well surveys show that no known domestic wells exist that draw water from the shallow aquifer. Four private wells in the deep aquifer were identified approximately one mile downgradient of the site (ESRI, 1989b). However, the migration of chemicals into the deep aquifer does not appear to have occurred and is not considered likely (Section 5.3.2). Therefore, direct exposure through drinking water is not considered a viable exposure pathway.

The shallow aquifer may recharge Myers Creek (ESRI, 1989b). As previously discussed (Section 5.3.2), recreational activities in Myers Creek are limited to fishing. Swimming or other water sports activities do not occur due to the physical nature of the area. Prolonged contact of large areas of exposed skin with the waters of Myers Creek does not appear to occur. Therefore, dermal contact with this medium is not considered a viable exposure pathway.

5.3.3.2 Secondary Pathways

The secondary pathways represent biological routes by which chemicals accumulate from environmental matrices into the tissues of plants and animals, which then are consumed by man. Aquatic life has been identified as a secondary pathway for a number of water-borne chemicals which have affected human populations (Goyer, 1986). Fishing activity in Myers Creek has been noted by IT personnel working at the SCRDI site. If the site-related chemicals reach Myers Creek, these chemicals may concentrate in fish tissues, which then may be consumed by humans. The possible migration of site-related chemicals into Myers Creek at some future date may establish a potential secondary exposure pathway for man.

As was previously discussed, hunting takes place on the land which surrounds the SCRDI site and whitetail deer are the primary game hunted there (ESRI, 1989a). Deer may not only be exposed to site-related chemicals from the water, but they may also be exposed through a secondary pathway of their own. Uptake of site-related chemicals by plants growing on the SCRDI site may also occur. Deer feeding on this vegetation may be exposed to these chemicals.

Deer are vegetarians and, depending on the size and the age of the deer, may consume from 0.8 to 2.0 kilograms of dry matter per day (Verne and Ulrey, 1984). Furthermore, deer are browsers and travel a home range, eating while roaming through an area. Whitetails consume a variety of foods including grasses, sedges, fruits, nuts, forbs and mushrooms, as well as portions of shrubs and trees (Verne and Ulrey, 1984).

Deer may use Myers Creek as a source of water. If chemicals migrating in the shallow ground water reach Myers Creek, this may become a potential source of exposure to deer. Deer also may obtain a significant amount of their water from plants. When succulent browse is available, deer may drink only 0.7 liters of water per day, in comparison to 1.4 liters during the dry season (Marchinton and Hirth, 1984). Deer in the eastern United States will often drink mostly from a surface source such as a stream or pond, but they also will drink from temporary rain puddles (Marchinton and Hirth, 1984).

South Carolina has the longest deer season of all the states (ESRI, 1989a). The dedicated hunter may only kill one or two deer per season for food because even a family which eats deer often (once or twice a week) will only consume one or two deer in a year (Sikes, 1989). Therefore, the consumption of deer meat that contains site-related chemicals is a potential secondary exposure pathway to human receptors.

5.3.4 Estimated Exposure to Humans

Consumption of fish and deer represents the only identified pathway of potential long-term exposure to humans. To estimate the possible level of bioconcentration of chemicals in the animal tissue, the concentrations of indicator chemicals in the water in Myers Creek and the vegetation growing on the SCRDI site must be estimated.

While beryllium, cadmium, chromium, and nickel were identified as Class A or B carcinogens in Section 5.2, they have been classified as carcinogens by the inhalation pathway only. Since inhalation has not been shown to be a viable exposure pathway at the SCRDI site, these chemicals will not be evaluated as carcinogens in the exposure and risk assessment.

5.3.4.1 Chemical Concentrations in Waters of Myers Creek

A simple model was used to estimate the potential chemical concentrations in Myers Creek. This model used the Darcy equation to estimate the amount of discharge into Myers Creek. The range of discharges to Myers Creek ranged from 2.2 gallons/day to 95.5 gallons/day. The flow in Myers Creek was estimated to range from 307,000 gallons/day to 1,534,000 gallons/day. Using these values, it is possible to estimate a range of dilution values from a minimum

of 3.11×10^{-4} to 1.41×10^{-6}. To estimate the potential concentrations of site-related chemicals entering Myers Creek, the 75th percentile concentrations from those samples taken from within the plume are used. The 75th percentile concentrations are multiplied by the above dilution factors to provide estimates of chemical concentrations. Where 75th percentile values are below the method detection limit, the first value above the detection limit is used. Rank order statistics were calculated using PCSAS (SAS Institute, 1988) and the analytical database presented in Section 4.0.

A complete discussion of the models used is presented in Appendix G. The estimated concentrations of indicator chemicals in Myers Creek are given in Table 5-5

5.3.4.2 Estimated Concentrations of Chemical in Vegetation

The concentration of chemicals in the vegetation growing on the site was estimated using the model of Baes and co-workers (1984). This model estimates the bioaccumulation of chemicals in the soil into the aerial parts of the plant. Further discussion on this model and the assumptions used in this model is given in Appendix G. The chemical-specific concentrations in soils are assumed to be equal to the 75th percentile concentration for the specific chemical in all all the on-site soil samples. Where 75th percentile values are below the method detection limit, the first value above the detection limit is used. Rank order statistics were calculated using PCSAS (SAS Institute, 1988) and the analytical database presented in Section 4.0. The estimated concentrations of indicator chemicals in vegetation are given in Table 5-5.

5.3.4.3 Estimated Bioconcentration in Fish

The potential concentrations of indicator chemicals in fish are estimated using the model given in the Superfund Public Health Evaluation Manual (EPA, 1986a) (Appendix G) and the estimated concentrations of chemicals in Myers Creek (Table 5-5). The results of these estimations are given in Table 5-6.

5.3.4.4 Estimated Bioconcentration in Deer

Deer which may be hunted in the area may be exposed from eating vegetation containing site-related chemicals as well as drinking water from Myers Creek. Possible bioconcentration in deer meat from both these potential sources is evaluated to estimate levels of site-related chemicals in deer. The behavior of deer may vary significantly in different areas. Therefore, data concerning deer herds in Richland County, South Carolina, are used when available.

A detailed discussion of the models used for estimating the concentration of chemicals in deer meat is given in Appendix G. The concentrations of the chemicals in venison from the consumption of vegetation on site and the consumption of water from Myers Creek is given in Table 5-6.

5.3.4.5 Estimation of Human Exposure

The only viable pathway of exposure of people to the chemicals at the SCRDI site has been shown to be from the consumption of deer and fish caught in the area. Therefore, the only potentially exposed populations are those individuals who consume venison and fish from animals taken in the area. There is limited physical access to Myers Creek, reducing its desirability as a fishing spot for large numbers of people. The abundance of rivers and lakes in the area (e.g. the Congaree River, the Saluda River, and Lake Murray) makes it likely that sport fishermen would choose these more favorable and accessible locations. Hunting in the area is limited to members of the local hunting club. This assessment addresses the potential exposures to the small number of individuals who either hunt or fish regularly in the area or consume the results of these sportsmen's efforts.

Potential human exposures due to ingestion of meat from deer hunted on the surrounding property and from fish taken from Myers Creek depend on the concentration of the chemicals in the meat and the amount of fish and venison consumed. Because people may consume significantly different amounts of fish and venison, two different exposure scenarios are used. These scenarios are for an AEI who hunts and fishes in the area and a MEI who hunts fishes in the area. A complete discussion of the exposure model and the assumptions used in this model is presented in Appendix G.

The estimated applied daily intake (ADI) for the AEI ranges from 3.29×10^{-6} mg/kg-day for mercury to 1.15×10^{-11} mg/kg-day for xylene. The estimated ADI for the MEI ranges from 6.59×10^{-6} mg/kg-day to 2.29×10^{-11} mg/kg-day for mercury and xylene, respectively (Tables 5-7 and 5-8).

5.4 EXPOSURE ASSESSMENT FOR POTENTIAL FUTURE USE SCENARIOS

Potential future use scenarios have been developed to estimate any risks associated with the presence of site-related chemicals in the shallow aquifer and in surficial soils. At present, within the study area, there are no known drinking water wells located within the shallow aquifer (ESRI, 1989b).

No foot travel by trespassers has been observed by site personnel. The terrain is not conducive to this activity; furthermore, the SCRDI site is currently fenced. Trespassing, if it occurs, would be a random event at a site such as the Bluff Road site. No specific objective (e.g., swimming pool, playground, etc.) exists to make this site a 12-year-old child's destination.

5.4.1 Exposure Scenarios for Drinking Water

The purpose of this scenario is to evaluate the potential impact upon human health of chemicals in the shallow ground water aquifer, should the shallow aquifer be used as a source of residential drinking water at some point in the future. This assessment will address the possible health effects upon an average exposed individual (AEI) and a maximal exposed individual (MEI) for both children and adults. For the purposes of this risk assessment, it was assumed that the drinking water well was located within the chemical plume and that the concentration of the indicator chemicals in the tap water are equal to the 75th percentile concentration from the shallow wells which are presently located within the plume (Section 4.4.4). The carcinogenic and noncarcinogenic indicator chemicals for ground water are listed in Tables 5-1 and 5-3. A discussion of the selection of indicator chemicals for the ground water is given in Appendix F3.

As discussed in Section 5.5.3, it is assumed that the adult will move into the area at approximately age 25 and stay for the remainder of his assumed life span of 70 years. The risk assessment for children will address a child which

is born into this household and grows up in the same house, living there until age 18.

5.4.2 Estimation of Intakes From Drinking Water

Potential human exposures due to drinking water from a shallow drinking water well depends on the amount of tap water a person drinks and how much time a person spends at home. If a person spends only a small percentage of his time in the house, the amount of tap water he drinks at the house will be less.

The models (see Appendix G) used to estimate the applied intakes to a growing child took into account the differences in the amount of tap water consumed, the amount of time spent at home, and the average weight of children at different ages. The model used to estimate potential adult exposures considered the same parameters as applied to an adult aged 18 and older. For the purposes of this risk assessment, the appropriate values (EPA, 1989a) for each of these factors were assumed for the following age groups:

- Infant: To 1 year
- Preschool: 1 to 5 years
- School-aged child: 5 to 10 years
- Early adolescence: 10 to 15 years
- Late adolescence: 15 to 18 years
- Adult: >18 years

The estimated values used in the exposure models are given in Table 5-9.

5.4.2.1 Estimated Intakes of Carcinogens From Drinking Water

Carcinogenicity does not occur as the result of a single dose of a chemical, but occurs as the result of repeated dosages over an extended period of time (Kunz et al., 1983). Therefore, carcinogenicity is a function of time as well as dosage (Section 5.5.3). To estimate potential exposures for an entire exposure period (i.e., 18 years for children and adolescents and 45 years for adults), the appropriate intakes for each of the previously described age groups were estimated. To provide an estimate of the potential intakes from age 0 to 18, each pertinent age group's estimated potential intakes were summed.

To account for variability in the amounts of tap water people drink, an AEI and MEI was used for each child age group and the adult in the carcinogen assessment models. A complete discussion of the exposure models and the assumptions used in these models are presented in Appendix G.

The applied daily intakes for each stage of childhood and adolescence are given in Tables 5-10 through 5-14. The applied daily intake for infant AEI ranged from 1.9 x 10^{-5} mg/kg-day for bis (2-ethyl hexyl) phthalate (BEHP) to 1.2 x 10^{-2} mg/kg-day for 1,1-dichloroethane (1,1-DCA). The range for the infant MEI was 3.33 x 10^{-5} mg/kg-day for BEHP to 2.1 x 10^{-2} mg/kg-day for 1,1-DCA (Table 5-10). The applied daily intake for the preschool child AEI ranged from 3.07 x 10^{-5} mg/kg-day for BEHP to 1.94 x 10^{-2} mg/kg-day for 1,1-DCA. The applied daily intake ranges for the preschool child MEI were 3.51 x 10^{-5} mg/kg-day for BEHP to 2.21 x 10^{-2} mg/kg-day for 1,1-DCA (Table 5-11). The applied daily intake for the school-aged child AEI ranged from 1.72 x 10^{-5} mg/kg-day for BEHP to 1.08 x 10^{-2} mg/kg-day for 1,1-DCA. The range for the school-aged child MEI was 1.90 x 10^{-5} mg/kg-day for 1,1,2-TCA to 1.19 x 10^{-2} mg/kg-day for 1,1-DCA (Table 5-12).

Early adolescent AEI estimated intakes ranged from 1.13 x 10^{-5} mg/kg-day for BEHP to 7.14 x 10^{-3} mg/kg-day for 1,1-DCA. For the corresponding MEI, the range was 1.22 x 10^{-5} mg/kg-day for BEHP to 7.71 x 10^{-3} mg/kg-day for 1,1-DCA (Table 5-13). The range of applied daily intakes for the late adolescent AEI was 8.05 x 10^{-6} mg/kg-day for BEHP to 5.07 x 10^{-3} mg/kg-day for 1,1-DCA. For the late adolescent MEI, the applied daily intakes were 8.68 x 10^{-6} mg/kg-day for BEHP to 5.47 x 10^{-3} mg/kg-day for 1,1-DCA (Table 5-14).

The range for the adult AEI ranged from 1.28 x 10^{-5} mg/kg-day for BEHP to 8.26 x 10^{-3} mg/kg-day for 1,1-DCA. The estimated daily intake range for the adult MEI was 1.83 x 10^{-5} mg/kg-day for 1,1,2-TCA to 1.15 x 10^{-2} mg/kg-day for 1,1-DCA (Table 5-15).

5.4.2.2 Estimated Intakes of Noncarcinogens From Drinking Water

Potential human health risk from oral exposure to noncarcinogens was estimated for the infant, child, and late adolescent. These age groups are at the

beginning, middle, and end of childhood and "bracket" the development process. If acceptable levels of intake are met for these groups, it can be assumed that the "bracketed" groups are also not at risk.

To account for variability in the amounts of tap water people drink, an AEI and MEI were used for each child age group and the adult in the noncarcinogen assessment models. A complete discussion of the exposure models and the assumptions used in these models are presented in Appendix G.

The applied daily intake for infant AEI ranged from 6.65×10^{-6} mg/kg-day for mercury to 2.25×10^{-2} mg/kg-day for acetone. The range for the infant MEI was 1.17×10^{-5} mg/kg-day for mercury to 3.98×10^{-2} mg/kg-day for acetone (Table 5-16). The applied daily intake for the school-aged child AEI ranged from 6.03×10^{-6} mg/kg-day for mercury to 2.04×10^{-2} mg/kg-day for acetone. The range for the school-aged child MEI was 6.64×10^{-6} mg/kg-day for mercury to 2.25×10^{-2} mg/kg-day for acetone (Table 5-16). The range of applied daily intakes for the late adolescent AEI were 2.83×10^{-6} mg/kg-day for mercury to 9.57×10^{-3} mg/kg-day for acetone. For the late adolescent MEI, the applied daily intakes were 3.05×10^{-6} mg/kg-day and 1.03×10^{-2} mg/kg-day, respectively (Table 5-16). The range for the AEI and the MEI for the adult ranged from 4.48×10^{-6} mg/kg-day for mercury to 1.52×10^{-2} mg/kg-day for acetone and 6.40×10^{-6} mg/kg-day for mercury and 2.17×10^{-2} mg/kg-day for acetone, respectively (Table 5-17).

5.4.3 Trespasser Scenario

The purpose of this scenario is to evaluate the potential impact upon human health of dermal exposure to soil-bound chemicals which would occur if a person trespassed on the SCRDI property. For the purposes of this risk assessment, it will be assumed that the trespasser is a 12-year-old male child.

This exposure scenario involves an acute exposure (less than 12 days) since the person will only spend a short amount of time on the property. It is assumed that a maximum of 1 hour will be spent on the property because the property can be easily traversed in that time period. A child would not be expected to make repeated trips to this area because it is isolated and lacks

any type of recreational benefits. Carcinogenicity, which is most likely to result from chronic exposure to a chemical carcinogen, was not considered a reasonable toxicological endpoint because of the acute exposure scenario (Kunz et al., 1983). New indicator chemicals were selected for this scenario based on their relative acute toxicity to laboratory animals. These indicator chemicals are listed in Table 5-4. The selection of indicator chemicals is discussed in Appendix F5.

Estimation of Exposure From Dermal Contact With Soils

Exposure scenarios were developed for an AEI wearing shoes, long-sleeve shirt, and long pants and an MEI wearing shoes, short-sleeve shirt, and shorts (EPA, 1989). A discussion of the exposure model and the assumptions used are presented in Appendix G.

The estimated applied daily intakes for the AEI range from 3.28×10^{-10} for chloroform to 4.11×10^{-6} for chromium. For the MEI, the range of estimated intakes is 1.59×10^{-9} for chloroform to 1.90×10^{-5} for chromium (Table 5-18).

5.5 TOXICITY ASSESSMENT

The evaluation of the potential exposure of humans to site-related chemicals requires that the toxicity of each indicator chemical be reviewed to establish a toxicological basis for estimating limits or ranges of concentrations that may cause concern. Site-specific toxicity reviews have been assembled for each indicator chemical (Appendix H). The purpose of these toxicity profiles is to provide brief reviews of the toxicology of these chemicals with respect to exposures to humans. The reviews are site-specific rather than generic in that only those toxic properties that are relevant to the potential pathways of migration and exposure identified at the SCRDI site are included. These reviews are not intended to be comprehensive.

5.6 RISK CHARACTERIZATION FOR CURRENT USE SCENARIOS

This section characterizes the potential risks, if any, associated with the exposure to chemicals from the SCRDI site. In particular, potential risks that may be associated with the ingestion of potential bioaccumulated chemicals in animal tissue are characterized.

5.6.1 Approach

The risk characterization estimates potential incremental cancer risks and compares estimated daily intake with reference levels for noncarcinogens. The approach that is used to characterize the estimated magnitude of the potential risk to the specific populations associated with potential exposures to the chemicals migrating off site is based on the approaches described in recent agency guidance (EPA, 1989a). This assessment employs a health-protective bias that leads to the overestimation of risks rather than an underestimation. Reasonable scenarios for maximally exposed and average exposed individuals in specific populations (i.e. hunters and fishermen) were developed in Section 5.3. These were evaluated in Section 5.3.4.5 to provide estimates of oral daily intakes. If the estimations of risks made here for specific populations are found to be acceptable, then the potential risks that may be associated with the general population would be expected to be even lower and specific risk estimation will not be necessary for these populations.

5.6.2 Perspectives on an Appropriate Incremental Lifetime Cancer Risk

In weighing acceptable residential exposures to potentially carcinogenic compounds, an acceptable level of risk must be determined. Cancer is a significant cause of death in the United States with a background incidence of about 3 in 10 (280,000 cases in a population of 1,000,000) (American Cancer Society, 1988). Approximately 80 percent of these cases result in death directly attributable to the disease. Incremental lifetime cancer risk (also referred to as excess cancer risk) is defined as the estimated increased risk that occurs over an assumed average lifespan of 70 years (EPA, 1986a) as the result of exposure to a specific known carcinogen. Thus, an incremental lifetime cancer risk of one in a million (1×10^{-6}) may be interpreted as an increase in the baseline cancer incidence from 280,000 per million population to 280,001 per million population.

The Food and Drug Administration (FDA) considers incremental lifetime cancer risk of one in a million to be a de minimis or insignificant risk (FDA 1985a, 1985b). Similarly, EPA uses a incremental lifetime risk level of one in a million as the lower bound of an acceptable range for developing drinking water standards (EPA, 1987b). The upper bound for acceptable incremental

lifetime cancer risk recommended by the EPA for drinking water is one in 10,000 (1×10^{-4}) (EPA, 1987b). In addition, the agency specifies a risk range of 1×10^{-7} to 1×10^{-4} associated with the consideration and selection of remedial alternatives in Superfund site cleanups (EPA, 1988f).

Travis et al. (1987) reviewed 132 federal regulatory decisions concerning environmental carcinogens to determine levels of risk that lead to agency action. For small populations, the individual de manifestis risk level (i.e. the level of "obvious risk" that always led to regulatory action) was about 3×10^{-4}. Similarly, the effective de minimis level below which no action was ever taken was 1×10^{-4}. For example, Travis and Hattemer-Frey (1988) have published data which show that upper-bound risk levels for public exposure to benzene after regulation range from 6.2×10^{-6} (paint strippers) to 4.5×10^{-4} (resulting from equipment leaks).

To add some additional perspective to the validity of selecting an appropriate incremental lifetime cancer risk, Crouch and Wilson (1984) estimated incremental lifetime cancer risk associated with common natural exposures to cancer-causing sources. For example, incremental lifetime cancer risks attributed to exposure to:

- Natural background radiation is about 1.4×10^{-3}.
- Cosmic radiation as a result of frequent air travel is on the order of 7.0×10^{-4}.
- Polynuclear aromatics in ambient urban air is about 1.1×10^{-3}.

Based on the scientific evidence and the regulatory precedence of the acceptable risk ranges set for exposures to carcinogens in drinking water and at Superfund site cleanups, rigid adherence to an incremental lifetime cancer risk of 1×10^{-6} may be unwarranted in the exposure scenario developed in the current risk assessment.

5.6.3 Estimation of Incremental Excess Cancer Risks

Potential carcinogens associated with the SCRDI site have been identified (Section 5.2). Estimations of the bioconcentration in animal tissue have been

discussed, and estimations of potential exposure via the oral pathway have been determined (Section 5.3).

For potential carcinogens, risks are estimated as probabilities. Incremental risks are calculated for each chemical using a chemical-specific carcinogenic potency factor (an upper-bound confidence limit on the probability of a response) and the chemical's estimated ADI. The carcinogenic potency factors (CPFs) used to estimate the carcinogenic potency of site-related chemicals were developed by the Carcinogen Assessment Group (CAG) of EPA. Chemical-specific CPFs are derived using the upper 95 percent confidence limits on the slope of the dose-response curve for carcinogenic responses. The oral CPFs in use for this assessment are drawn from the EPA Integrated Risk Information System (IRIS) (EPA, 1989c) and the EPA Superfund Public Health Evaluation Manual (EPA, 1986a).

Previously, the incremental lifetime cancer risk was defined as the estimated increased risk that occurs over an assumed average lifespan of 70 years as the result of exposure to a specific known carcinogen. The estimate of an incremental lifetime cancer risk is the probability of the occurrence of one additional case of cancer above background as a result of the estimated exposures to a chemical. A lifetime correction factor is used to adjust the risk estimates to the specific length of the lifetime exposure period. The resulting probability is interpreted as the lifetime risk of a single cancer occurrence based on the specific exposure period. This probability is given by:

$$R_i = (CPF_i)ADI_i C$$

where

R_i = excess lifetime cancer risk for the ith chemical, $i = 1,\ldots,17$,

$(CPF)_i$ = cancer potency factor for the ith chemical $(mg/kg\text{-}day)^{-1}$, $i = 1,\ldots,17$,

$(ADI)_i$ = estimated applied daily intake of the ith chemical (mg/kg-day), $i = 1,\ldots,17$,

C = lifetime correction factor.

Analysis of the census data indicates that this area of Richland County has a population which consists primarily of people who have taken permanent residence in the area. From 1970 to 1980, the number of people over the age of 64 increased by 42 percent, while the number of people under the age of 19 decreased by 21 percent. According to the U.S. Geological Survey Topography map, less than 5 homes were built within 1 mile of the site between 1971 and 1980. The lack of development and the increased age of the population within the census tract indicate that the population in this area is not dynamic and consist primarily of people who have resided in this area for an extended number of years. It is assumed based on the demographic analysis that the average person would move into the area at approximately age 25 and stay for the remainder of his assumed life span of 70 years. For this risk assessment, the lifetime correction factor (C) is equal to 0.64 or 45 years of potential exposure.

The incremental risk values for potential site-related chemical exposure for the AEI ranged from 1.59×10^{-8} for 1,1-dichloroethylene to 3.36×10^{-12} for methylene chloride. The comparable incremental risk values for MEIs ranged from 3.17×10^{-8} to 6.72×10^{-12} for these chemicals, respectively (Table 5-7). These risk factors may be interpreted as implying that there is at most, a risk of the occurrence of less than three additional cancers per one hundred million. The upper bound of summed cancer risks is 8.95×10^{-8}, or less than one excess case in ten million population.

5.6.4 Estimation of Risk for Noncarcinogens

The risk assessment methodology used by EPA for chemicals with threshold effects (i.e. noncarcinogens) generally results in the derivation of an exposure level which is not anticipated to cause significant adverse effects. These "acceptable levels" may be expressed in a variety of ways such as acceptable daily intakes, reference doses, levels associated with various margins of safety or acceptable concentrations in various media. Levels of exposure are estimates obtained following the current regulatory guidelines.

The Superfund Public Health Evaluation Manual (EPA, 1986a) describes a method for deriving an individual hazard index (HI) and a total HI. The individual HI is the ratio of the estimated ADD to the reference level. The HI formula

for a mixture of components based on the assumption of dose addition are discussed in the following paragraphs. The formula is (EPA, 1986a):

$$HI_T = [(ADI)/AIC)_i] + [(ADI)_2/(AIC)_2] + \ldots + [ADI)_i/(AIC)_i] + \ldots + [(ADI)_{11}/(AIC)_{11}]$$

where

HI_T = total hazard,

$(ADI)_i$ = estimated applied daily intake for the ith chemical, $i = 1,\ldots,11$,

$(AIC)_i$ = acceptable intake for chronic exposure for the ith chemical, $i = 1,\ldots,11$.

Because the assumption of intake addition is properly applied to compounds that induce the same effect by similar modes of action, a separate HI_T should be generated for each endpoint of concern. The HI does not define dose-response relationships and its numerical value should not be construed to be a direct estimate of risk. The HI is only a numerical indication of the nearness to acceptable limits of exposure or the degree to which acceptable exposure levels are exceeded. As this index approaches unity, concern for the potential hazard of the mixture increases. Exceeding unity does not in itself imply a potential hazard. It does suggest that a given situation should be more closely scrutinized (EPA, 1986a).

The HI for a given chemical may be defined as the ratio between the estimated daily intake of that chemical and the reference level for that chemical. The reference level is commonly derived from animal experiments and is frequently obtained by estimating the NOAEL and applying a safety factor to extrapolate to man (EPA, 1986a).

Usually both chronic and subchronic exposures are considered. Chronic exposure in humans is considered to be a significant part of that person's natural life, while subchronic exposure is defined as 10 to 90 days (EPA, 1986a). In general, the body can tolerate higher levels of exposure to a chemical over a shorter exposure period than over a long period.

The AIC is defined as the acceptable intake for chronic exposure, and the AIS is the acceptable intake for subchronic exposure (EPA, 1986a). These values are based on empirical data and have not been adjusted for site-specific conditions. For some chemicals, separate critical toxicity values are available for ingestion and inhalation routes of exposure.

The AIC and AIS values are derived from quantitative information available from studies in animals (or observations made in human epidemiologic studies) on the relationship between intake and noncarcinogenic toxic effects. They are designed to be protective of sensitive populations (EPA, 1986a).

The HIs for the AEI ranged from 1.65×10^{-3} for mercury to 1.15×10^{-10} for xylene. For the MEI, none of the HI estimates exceed 3.29×10^{-3} (mercury) (Table 5-8), which is significantly below the benchmark value of unity. The HIs of noncarcinogenic indicators which have the same or similar mechanisms of toxicity may be summed in order to derive an HI_T for the exposure of an individual to a mixture of chemicals (EPA, 1986a). Many of the noncarcinogenic indicators (e.g., barium, 1,2-dichloroethylene, lead, mercury, phenol, and xylene), are neurotoxins (ASTDR 1988f; ASTDR 1988g; ASTDR, 1988i; EPA, 1984d; EPA, 1988a; EPA, 1988b; EPA 1988e); therefore, the HIs for these chemicals may be summed.

Di-n-butyl phthalate acts primarily as a teratogenic agent (Thomas and Thomas, 1984), while the target organ for nickel is the hematological system (ATSDR, 1988h). The mechanisms of toxicity for acetone, 2-chlorophenol, and chromium could not be found in the available literature. These last three chemicals could not be classified with any other chemicals because they either have unique mechanisms of toxicity or information concerning their mechanisms of action could not be found.

From Table 5-7, the HI_T for the six neurotoxic indicators is estimated to be 3.44×10^{-3} for the hypothetical MEI. This value is nearly three orders of magnitude below the benchmark value of unity. According to criteria discussed in recent guidance documents (EPA, 1989a), any chemical that has an HI_T less than unity does not present a public health concern. When the indicator chemicals with similar mechanisms of toxicity are summed, the oral HI is

substantially below unity, clearly indicating that there is a significant margin of safety even at the maximum exposure.

5.7 RISK CHARACTERIZATION FOR POTENTIAL FUTURE USE SCENARIOS

This section estimates the potential risks, if any, associated with the possible use of the shallow ground water aquifer as a source of drinking water. The risk characterization compares estimated potential risks with appropriate levels of risk for potential carcinogens and estimated daily intake with reference levels for noncarcinogens. The approach that is used to characterize the estimated magnitude of the potential risk to the specific populations associated with potential exposures to the chemicals in the ground water is based on the approaches described in the available guidance documents (EPA, 1986a, 1989a, 1989b). This assessment employs a health-protective bias that leads to the overestimation of risks rather than an underestimation. If the estimations of risks made here for specific age groups are found to be acceptable (see Section 5.5.2), then the potential risks that may be associated with the general population would be expected to be even lower and specific risk estimation will not be necessary for these populations.

5.7.1 Estimation of Incremental Excess Cancer Risks From Drinking Water Scenarios

As discussed in Section 5.5.3, the incremental lifetime cancer risk is defined as the estimated increased risk that occurs over an assumed average lifespan of 70 years as the result of exposure to a specific known carcinogen. The estimate of an incremental lifetime cancer risk is the probability of the occurrence of one additional case of cancer risk above background as a result of the estimated exposures to a chemical. A lifetime correction factor is used to adjust the risk estimates to the specific length of the lifetime exposure period. The resulting probability is interpreted as the lifetime risk of a single cancer occurrence based on the specific exposure period. This probability is given by:

$$R_i = (CPF_i)ADI_iC$$

where

R_i = excess lifetime cancer risk for the ith chemical, $i = 1,...,13$,

$(CPF)_i$ = cancer potency factor for the ith chemical $(mg/kg\text{-}day)^{-1}$, $i = 1,...,17$,

$(ADI)_i$ = estimated applied daily intake of the ith chemical (mg/kg-day), $i = 1,...,17$,

C = lifetime correction factor.

The age groups and their respective lifetime correction factors (C) are given in Table 5-9.

In determining the incremental cancer risk for a child and adolescent, consideration must be given to the changes in the applied intakes resulting from changes in weight, the amount of water consumed, and the amount of time spent at home. To address these factors, the incremental cancer risk was determined for different age groups and the incremental cancer risk for the duration of childhood and adolescence was determined by summing the cancer risk for each age group using the following formula:

$$(R_i)_c = (R_i)_{in} + (R_i)_{Ps} + (R_i)_{Ch} + (R_i)_{ea} + (R_i)_{LA}$$

where

$(R_i)_c$ Excess lifetime cancer risk for a child exposed for 18 years since birth, $i = 1,...,14$,

$(R_i)_{in}$ Excess lifetime cancer risk for an infant exposed for 1 year since birth, $i = 1,...,14$,

$(R_i)_{Ps}$ Excess lifetime cancer risk for a preschooler exposed for 4 years beginning at the age of 1, $i = 1,...,14$,

$(R_i)_{Ch}$ Excess lifetime cancer risk for a school-aged child exposed for 5 years beginning at the age of 5, i = 1,...,14,

$(R_i)_{ea}$ Excess lifetime cancer risk for an early adolescent exposed for 5 years beginning at the age of 10, i = 1,...,14,

$(R_i)_{LA}$ Excess lifetime cancer risk for a late adolescent exposed for 3 years beginning at the age of 14, i = 1,...,14.

The estimated incremental lifetime cancer risks for childhood and adolescence are given in Table 5-19. The estimated incremental lifetime cancer risks for AEI for children ranged from 7.67×10^{-4} for 1,1-dichloroethylene to 3.02×10^{-9} for bis (2-ethylhexyl) phthalate. The incremental cancer risk for the MEI ranged from 8.94×10^{-4} for 1,1-dichloroethylene to 3.48×10^{-9} for bis (2-ethylhexyl) phthalate.

The estimated incremental lifetime cancer risks for adults are given in Table 5-15. The estimated incremental lifetime cancer risks for AEI for adults ranged from 1.43×10^{-3} for 1,1-dichloroethylene to 5.63×10^{-9} for bis (2-ethylhexyl) phthalate. The incremental cancer risk for the MEI ranged from 2.50×10^{-3} for 1,1-dichloroethylene to 8.04×10^{-9} for bis (2-ethylhexyl) phthalate.

5.7.2 Estimation of Risk for Noncarcinogens for Drinking Water Scenarios

The risk assessment methodology used for estimating risk for noncarcinogens (HI) is discussed in Section 5.5.4. The estimation of risk for the child was done for three different age groups to account for differences in the physiology and behavior of children at different ages.

The HIs for the AEI ranged from 3.33×10^{-3} for mercury to 2.28×10^{0} for 2-chlorophenol for infants; 3.01×10^{-3} for mercury to 2.07×10^{0} for 2-chlorophenol for a school-aged child; and 1.41×10^{-3} for mercury to 8.69×10^{-1} for 2-chlorophenol for late adolescents (Table 5-16). The range of MEI

hazard indices for the previous chemicals ranged from 5.83×10^{-3} to 4.00×10^{0} for infants; 3.32×10^{-3} to 2.8×10^{0} for a child; and 1.52×10^{-3} to 1.04×10^{0} for the late adolescent (Table 5-16). The HI for 2-chlorophenol was above the benchmark value of 1×10^{0} for the AEI in the infant and school-aged child groups and for the MEI in each of the age groups. The HI for 1,2-dichloroethylene was above unity for the infant and the child, but not the late adolescent.

The HIs for the adult AEI ranged from 2.24×10^{-3} for mercury to 1.54×10^{0} for 2-chlorophenol (Table 5-17). The HI for 1,2-dichloroethene is also above the benchmark value of unity (1). The range for the MEI is 3.20×10^{-3} for mercury to 2.19×10^{0} for 2-chlorophenol (Table 5-17). Both 2-chlorophenol and 1,2-dichloroethene had HIs above one.

5.7.3 Risk Characterization for the Trespasser Scenario

This section characterizes the potential risks, if any, associated with the possible acute dermal contact with the soils on the SCRDI site. The risk characterization compares the estimated daily intake first with reference levels for acute exposure to chemicals. If no reference levels have been published for acute exposures RfDs for chronic exposures were used although this is an unnecessarily very health-protective approach. Chronic RfDs are generally orders of magnitude lower than similar levels derived for acute exposure scenarios. If no acute or chronic RfDs were available, reference levels for acute exposure to the indicator chemicals are taken from the EPA one-day Health Advisories (HA) for drinking water. It should be recognized that certain compounds that may be readily absorbed in solubilized states may have very low or no chemical dermal absorption potential.

Only two chemicals - arsenic and tetrachloroethylene - did not have agency-verified RfDs for chronic or acute exposure. Therefore, 1-day HAs were used to provide acceptable intakes for these chemicals. The 1-day HA is the concentration of a chemical in drinking water that is not expected to cause any adverse effects up to 5 days of exposure. A margin of safety is built into this value (EPA, 1988g). The model used in deriving the 1-day HA assumes that a 10-kilogram child will drink 1 liter of water per day (EPA, 1988g). To convert the HA from mg/L to a reference dose for acute exposure, the following formula is used:

$$AIA = (HA)(C_w)/(BW)$$

where

AIA = the acceptable intake for acute exposure, (mg/kg-day)
HA = the 1-day Health Advisory (mg/L)
C_w = the amount of water consumed in 1-day (L/day)
BW = the body weight of the child (kg).

The estimated AIAs are given in Table 5-18.

The HI for these chemicals was calculated using the following formula:

$$HI = (ADI)/AIA)_i$$

where

HI = hazard index
$(ADI)_i$ = estimated applied daily intake for the ith chemical, i = 1,..,13,
$(AIA)_i$ = acceptable intake for acute exposure for the ith chemical, i = 1,...,13.

The risk assessment methodology used for estimating risk for noncarcinogens (HI) is discussed in Section 5.5.4.

The HI for the AEI ranged from 3.28×10^{-8} for chloroform to 3.41×10^{-4} for trichloroethylene (TCE) (Table 5-18). The HI range for the MEI is 1.51×10^{-7} for chloroform to 1.58×10^{-3} for TCE. The highest HI was almost three orders of magnitude below the benchmark value of one. Therefore, the presence of site-related chemicals in the soils at the SCRDI site do not present a potential risk to the health of potential adult or child trespassers on the site.

5.8 ENVIRONMENTAL ASSESSMENT

The possible impact of the presence and off-site migration of chemicals at the SCRDI site upon aquatic and terrestrial organisms must also be addressed. The possible routes of exposure to these populations along with the estimation of chemical concentrations at the points of exposure have been discussed in previous sections. Using conservative assumptions to provide an environmentally protective approach, this section will address the possible impact of the exposure of aquatic and deer populations to these levels of chemicals.

5.8.1 Aquatic Toxicity Considerations

The potential contributions of site-related chemicals to concentrations in Myers Creek have been previously discussed in Section 5.3.4.1. Since aquatic populations in Myers Creek potentially may be affected, acceptable concentrations of these chemicals in the water have been estimated based upon data published in the current scientific literature. The acceptable concentrations for water derived in this section represent an upper-bound concentration. Above these levels, there may be adverse effects on aquatic organisms living in Myers Creek.

Data are used that apply directly to or present reasonable approximations for organisms which may potentially live in the creek. For example, Myers Creek has not been classified as a trout stream by the South Carolina Department of Health and Environmental Control (SCDHEC, 1985). Toxicity data on these fish are not used in the risk evaluation. Chronic toxicity data are used, when available, to determine the recommended water concentrations. In the absence of chronic toxicity data, the recommended water concentration was estimated from the acute toxicity data for the most sensitive aquatic species.

The predicted water concentrations for all chemicals in Myers Creek were over three orders of magnitude less than the derived acceptable levels (Table 5-20). This means that the amount of chemicals assumed to be entering the creek would have to increase well over 1,000 times before an adverse impact upon indigenous aquatic animals would be expected. A detailed discussion of the models and data used is given in Appendix G.

5.8.2 Toxicity Assessment for Deer

The environmental risk assessment for deer is based upon the estimated ADI of each indicator chemical that the deer potentially receives from drinking the water in Myers Creek and eating vegetation on site. These estimates are compared with acceptable levels derived from the scientific literature (Appendix G). The model used to estimate the ADI for deer is given in Appendix G. The estimated daily intakes to deer are given in Table 5-21.

The estimated acceptable and incurred ADIs of site-related chemicals to deer are given in Table 5-21. All of the chemicals except mercury, phenol, 1,1,2,2-tetrachloroethane, tetrachloroethylene, trichloroethylene, and vinyl chloride are at least two orders of magnitude below the acceptable daily intakes which would have adverse effects upon chronically exposed deer. However, this is based on a single soil sample with a concentration of 100 mg/kg (Section 4.0). An acceptable daily intake for 1,1-dichloroethane could not be estimated because a NOAEL could not be found in the literature reviewed. If the acceptable daily intake were to be assumed to be equal to the lowest acceptable intake for a site-related organic compound (0.0008 mg/kg-day) (for hexachlorobenzene), the intake of 1,1-dichloroethane by the deer would still be over two orders of magnitude less than the acceptable dose.

The deer HI for 1,1,2,2-tetrachloroethane was estimated to be 1.41×10^0. The major route of exposure to 1,1,2,2-tetrachloroethane was from eating vegetation growing on the SCRDI site. Food plots planted with grain are maintained by the hunting club in the area of the site for the purpose of attracting deer (ESRI, 1989a). The SCRDI site is located near a major road; thus, the deer would not be expected to spend a significant amount of time on the site relative to other areas within their range. Hence, the actual applied dosages to deer of these chemicals are probably much lower than estimated here because the environmentally protective estimates used in determining the environmental concentrations in water and plants and the overestimation of the deer's reliance upon these food and water sources would overestimate the possible environmental risk to deer. It is unlikely that the chemicals which are in the soils and ground water will have significant adverse effect upon the deer population in the area.

Table 5-1. Confirmed and Suspected Carcinogens Found in Environmental Media at Bluff Road[a]

Surface Soils		Ground Water	
Chemical	CAG Classification	Chemical	CAG Classification
Volatile Organics		Volatile Organics	
Benzene	A	Benzene	A
Chloroform	B2	Carbon tetrachloride	B2
1,1-Dichloroethane	B2	Chloroform	B2
1,2-Dichloroethane	B2	1,1-Dichloroethane	B2
1,1-Dichloroethylene	C	1,2-Dichloroethane	B2
Methylene chloride	B2	1,1-Dichloroethylene	C
1,1,2,2-Tetrachloroethane	C	Methylene chloride	B2
Tetrachloroethylene	B2	1,1,2,2-Tetrachloroethane	C
Trichloroethylene	B2	Tetrachloroethylene	B2
Vinyl chloride	A	1,1,2-Trichloroethane	C
		Trichloroethylene	B2
		Vinyl chloride	A
Semivolatile Organics		Semivolatile Organics	
Hexachlorobenzene	B2	Bis-2-chloroethyl ether	B2
Bis (2-ethylhexyl) phthalate	B2	Bis-(2-ethylhexyl) phthalate	B2
Heavy Metals			
Arsenic	A		
Beryllium	B1 (Inhal.)		
Cadmium	B1 (Inhal.)		
Chromium	A (Inhal.)		
Nickel	A (Inhal.)		
Pesticides			
DDT and related compounds	B2		

[a]U.S. Environmental Protection Agency (EPA), 1986a, 1989c.
Explanation of EPA Carcinogen Assessment Group classifications:
Group A (Human Carcinogen): Sufficient evidence from epidemologic studies to support a causal association between exposure and cancer.

3 10 00737

Table 5-1. (Continued)

Group B1 (Probable Human Carcinogen): Limited evidence of carcinogenicity in humans from epidemologic studies.

Group B2 (Probable Human Carcinogen): Sufficient evidence of carcinogenicity in animals, inadequate evidence of carcinogenicity in humans.

Group C (Possible Human Carcinogen): Limited evidence of carcinogenicity in animals.

3 10 00738

Table 5-2. Selection of Noncarcinogenic Indicator Chemicals for On-Site Surface Soils

Volatile Organics	Maximum Concentration (mg/kg)[a]	Rank	Frequency[b]	Rank	Vapor Pressure (mm Hg)[c]	Rank	K_{oc}[d]	Rank	AIC (mg/kg-day)[e]	Rank	Weighting Factor	Weighted Average
*Xylene	5,200	4	4	5	1.00E+01	6	2.40E+02	5	1.00E-02	7	5	5.4
1,1,1-Trichloroethane	14,000	5	4	5	1.23E+02	3	1.52E+02	4	9.00E-02	4	4	5.25
Toluene	29,000	6	8	6	2.81E+01	5	3.00E+02	6	3.00E-01	1	5	4.8
Ethyl benzene	710	3	3	3	7.00E+00	7	1.10E+03	7	1.00E-01	3	5	4.6
Acetone	45,000	7	12	7	2.70E+02	1	2.20E+00	1	1.00E-01	3	5	3.8
1,2-Dichloroethene	48	1	2	2	2.66E+02	2	5.40E+01	3	1.00E-02	7	5	3
2-Butanone (MEK)	55	2	2	2	7.75E+01	4	4.50E+00	2	5.00E-02	5	5	3

3 10 00739

Table 5-2. (Continued)

Semivolatile Organics	Maximum Concentration (mg/kg)[a]	Rank	Frequency[b]	Rank	K_{oc}[d]	Rank	AIC (mg/kg-day)[e]	Rank	Weighting Factor	Weighted Average
*Phenol	210,000	3	3	2	1.42E+01	2	1.00E-01	3	4	2.50
*Di-n-butyl phthalate	2,200	1	7	3	1.70E+05	3	1.00E-01	3	4	2.50
*Di-n-actyl phthalate	44,000	2	3	2					2	2.00

3 10 00740

Table 5-2. (Continued)

Heavy Metals and Cyanide	Maximum Concentration (mg/kg)[a]	Background Concentration (mg/kg)[f]	Ratio[f]	Rank	Frequency[b]	Rank	AIC (mg/kg-day)[e]	Rank	Weighting Factor	Weighted Average
*Mercury	6.56	0.09	72.89	9	7	16	2.00E-03	15	3	13.33
*Nickel	229	ND	U	16	5	11	2.00E-02	11	3	12.67
*Chromium	1,610	9	178.89	10	6	13	5.00E-03	12	3	11.67
Thallium	0.7	ND	U	16	2	3	4.00E-04	16	3	11.67
Cyanide (-CN)	9.1	ND	U	16	4	8	2.00E-02	11	3	11.67
Silver	164	ND	U	16	2	3	3.00E-03	14	3	11.00
Calcium	454,000	600	756.67	11	5	11			2	11.00
Selenium	1.7	ND	U	16	2	3	3.00E-03	14	3	11.00
Copper	205	7	29.29	7	7	16	3.70E-02	8	3	10.33
Cobalt	34	4	8.50	6	6	13			2	9.50
Sodium	1,020	236	4.32	3	7	16			2	9.50
Zinc	738	24	30.75	8	4	8	2.10E-01	7	3	7.67
Iron	39,000	8,130	4.80	4	5	11			2	7.50
Vanadium	64	20	3.20	2	4	8	2.00E-02	11	3	7.00
Potassium	2,690	407	6.61	5	3	5			2	5.00
Magnesium	813	338	2.41	1	3	5			2	3.00

[a]Maximum concentration is the highest concentration of the chemical found in a single sample.
[b]Frequency is the number of samples which have concentrations above either the method detection limit or the highest background concentration from naturally occurring elements.
[c]EPA, 1986a.
[d]EPA, 1986a.
[e]EPA, 1986a, 1988g, 1989c.
[f]Ratio = The maximum concentration/background.

Note: * = Selected Indicators
AIC = Acceptable daily intake for chronic exposure.
K_{oc} = Organic carbon partition coefficient.

3 10 00741

Table 5-3. Selection of Noncarcinogenic Indicator Chemicals for Ground Water

Volatile Organics	Maximum Concentration (mg/kg)[a]	Rank	Frequency[b]	Rank	Water Solubility (mg/l)[c]	Rank	Henry's Law Constant (atm-m^3/mol)[d]	Rank	AIC (mg/kg-day)[e]	Rank	Weighting Factor	Weighted Average
Acetone	9,320	9	16	9	1.00E+6	9	2.00E-02	9	1.00E-01	4	5	8.00
*1,2-Dichloroethene	3,400	8	12	7	4.90E+03	7	7.07E+00	3	1.00E-02	9	5	6.80
2-Butanone (MEK)	1,050	6	3	2	2.68E+05	8	3.00E-02	8	5.00E-02	7	5	6.20
1,1,1-Trichloroethane	1,900	7	15	8	1.50E+03	5	1.44E+01	2	9.00E-02	5	5	5.40
Xylene	180	3	6	6	1.98E+02	3	7.04E+00	4	1.00E-02	9	5	5.00
Toluene	860	5	6	6	5.35E+02	4	6.37E+00	6	3.00E-01	2	5	4.60
1,2-Dichloropropane	31	1	5	4	2.70E+03	6	2.31E+00	7			4	4.50
4-Methyl-2-pentanone (MIK)	270	4	3	2					5.00E-02	7	3	4.33
Ethylbenzene	160	2	5	4	1.52E+02	2	6.43E+00	5	1.00E-01	4	5	3.40

Table 5-3. (Continued)

Semivolatile Organics	Maximum Concentration (mg/kg)[a]	Rank	Frequency[b]	Rank	Water Solubility (mg/l)[c]	Rank	AIC (mg/kg-day)[e]	Rank	Weighting Factor	Weighted Average
*2-Chlorophenol	800	5	3	4	2.85E+04	3	5.00E-03	5	4	4.25
*Phenol	260	4	3	4	9.30E+04	5	1.00E-01	2	4	3.75
1,2-Dichlorobenzene	250	3	4	5	1.00E+02	2	8.90E-02	3	4	3.25
o-Cresol	3	1	2	1	3.10E+04	4	5.00E-02	4	4	2.5
1,4-Dichlorobenzene	13	2	3	4	7.90E+01	1	1.00E-01	2	4	2.25

3 10 00743

Table 5-3. (Continued)

Metals and Cyanide	Maximum Concentration (mg/kg)[a]	Background Concentration (mg/kg)[f]	Ratio[f]	Rank	Frequency[b]	Rank	AIC (mg/kg-day)[e]	Rank	Weighting Factor	Weighted Average
Potassium	2.19	ND	U	18	15	15			2	16.50
*Lead	0.195	ND	U	18	8	11	1.40E-03	18	3	15.67
*Mercury	0.0128	ND	U	18	8	11	2.00E-03	17	3	15.33
Cobalt	0.09	ND	U	18	7	9			2	13.50
Beryllium	0.038	ND	U	18	5	7	5.00E-03	15	3	13.33
Vanadium	0.563	ND	U	18	6	8	2.00E-02	13	3	13.00
Nickel	0.132	ND	U	18	5	7	2.00E-02	13	3	12.67
Silver	0.02	ND	U	18	4	3	3.00E-03	16	3	12.33
*Barium	3.04	0.031	98	8	17	18	5.00E-02	10	3	12.00
Magnesium	11.25	0.45	25	6	17	18			2	12.00
Calcium	37.6	2.05	18	5	16	16			2	10.50
Iron	107	0.883	121	9	9	12			2	10.50
Mangnese	6.25	0.043	145	10	11	13	2.20E-01	8	3	10.33
Sodium	25	4.77	5	2	12	14			2	8.00
Copper	0.257	0.027	10	3	5	7	3.70E-02	11	3	7.00
Aluminum	259	3.53	73	7	5	7			2	7.00
Chromium	0.238	0.015	16	4	2	1	5.00E-03	15	3	6.67
Zinc	0.405	0.075	5	2	4	3	2.10E-01	9	3	4.67

[a]Maximum concentration is the highest concentration of the chemical found in a single sample.
[b]Frequency is the number of samples which have concentrations above either the method detection limit or the highest background concentration for for naturally occurring elements.
[c]EPA, 1986a.
[d]EPA, 1986a.
[e]EPA, 1986a, 1988g, 1989c.
[f]Ratio = Maximum concentration/background.
Notes: * = Selected Indicators
AIC = Acceptable daily intake for chronic exposure.

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3 10 00744

Table 5-4. Bluff Road Indicator Chemicals for On-Site Surface Soils - Short-Term (Trespasser) Exposure Scenario

Volatile Organics	Maximum Concentration (µg/kg)[a]	Rank	Frequency (12 Samples)[b]	Rank	Vapor Pressure (mm Hg)[c]	Rank	K_{oc} (ml/g)[d]	Rank	RAT ORAL LD_{50} (mg/kg)[e]	Rank	Weight[f]	Weighted Average
*Tetrachloroethylene	56,000	12	7	9	1.78E+01	10	3.64E+02	11	3,005	9	5	10.20
*Toluene	29,000	9	8	10	2.81E+01	9	3.00E+02	10	5,000	5	5	8.60
*Trichloroethylene	44,000	10	6	8	5.79E+01	8	1.26E+02	7			4	8.25
Ethyl benzene	710	4	3	4	7.00E+00	12	1.10E+03	12	3,500	7	5	7.80
Xylene	5,200	6	4	7	1.00E+01	11	2.40E+02	9	4,300	6	5	7.80
*Chloroform	10,000	7	4	7	1.51E+02	5	3.10E+01	3	908	11	5	6.60
*1,1,1 Trichloroethane	14,000	8	4	7	1.23E+02	6	1.52E+02	8	10,300	3	5	6.40
Acetone	45,000	11	12	12	2.70E+02	3	2.20E+00	1	5,800	4	5	6.20
Methylene chloride	4,700	5	11	11	3.62E+02	2	8.80E+00	2	2,136	10	5	6.00
Benzene	590	3	2	3	9.52E+01	7	8.30E+01	6	3,306	8	5	5.40
1,2-Dichloroethylene	48	1	2	3	2.66E+02	4	5.40E+01	4	770	12	5	4.80
1,1-Dichloroethylene	240	2	2	3	6.00E+02	1	6.50E+01	5			4	2.75

3 10 00745

Table 5-4. (Continued)

Semivolatile Organics	Maximum Concentration (µg/kg)[a]	Rank	Frequency (12 Samples)[b]	Rank	K_{oc} (ml/g)[d]	Rank	RAT ORAL LD_{50} (mg/kg-day)[e]	Rank	Weight[f]	Weighted Average
*Phenol	210,000	5	3	3	1.42E+01	3	317	5	4	4.00
*Bis (2-ethylhexyl) phthalate	7,600	3	11	5			30,600	3	3	3.67
*Di-n-actyl phthalate	44,000	4	3	3					2	3.50
*Di-n-butyl phthalate	2,200	1	7	4	1.70E+05	5	80,000	2	4	3.00
Hexachlorobenzene	7,200	2	2	1	3.90E+03	4	10,000	4	4	2.75

3 10 00746

Table 5-4. (Continued)

Heavy Metals and Cyanide	Maximum Concentration (mg/kg)[a]	Background Concentration (mg/kg)	Ratio[g]	Rank	Frequency Above Background (12 Samples)[b]	Rank	AIC (mg/kg-day)[h]	Rank	Weight[f]	Weighted Average
*Arsenic	8.2	ND[i]	U[j]	17	5	12			2	14.50
*Mercury	6.56	0.09	72.89	9	8	17	2.00E-03	16	3	14.00
*Nickel	229	ND	U	17	5	12	1.00E-02	12	3	13.67
Thallium	0.7	ND	U	17	2	3	4.00E-04	17	3	12.33
*Chromium	1610	9	178.89	10	6	14	5.00E-03	13	3	12.33
Cyanide	9.1	ND	U	17	4	8	2.00E-02	11	3	12.00
Silver	164	ND	U	17	2	3	3.00E-03	15	3	11.67
Selenium	1.7	ND	U	17	2	3	3.00E-03	15	3	11.67
Calcium	454,000	600	756.67	11	5	12			2	11.50
*Copper	205	7	29.29	7	7	16	3.70E-02	9	3	10.67
Cobalt	34	4	8.50	6	6	14			2	10.00
Sodium	1,020	236	4.32	3	7	16			2	9.50
Iron	39,000	8,130	4.80	4	5	12			2	8.00
Zinc	738	24	30.75	8	4	8	2.10E-01	8	3	8.00
Vanadium	64	20	3.20	2	4	8	2.00E-02	11	3	7.00
Potassium	2,690	407	6.61	5	3	5			2	5.00
Magnesium	813	338	2.41	1	3	5			2	3.00

3 10 00747

Table 5-4. (Continued)

Pesticides	Maximum Concentration (µg/kg)[a]	Rank	Frequency (12 Samples)[b]	Rank	K_{oc} (ml/g)[d]	Rank	RAT ORAL LD_{50} (mg/kg-day)[e]	Rank	Weight[f]	Weighted Average
*DDT	220	2	2	2	2.43E+05	1	87	2	4	1.75
DDE	85	1	2	2	4.40E+06	2	880	1	4	1.50

[a]Maximum concentration is the highest concentration of the chemical found in a single sample. See test for sample locations.
[b]Frequency is the number of samples which have concentrations above either the method detection limit or the highest background concentration from naturally occurring elements.
[c]EPA, 1986a.
[d]EPA, 1986a.
[f]Weight = The number of parameters in which values were found for each specific chemical.
[g]Ratio = Maximum concentration/background.
[h]AIC = Acceptable daily intake for chronic exposure, EPA, 1986a, 1989c.
[i]ND = Not detected.
[j]U = Undefined. Metals for which background levels were below method detection limits were asssumed to have backgrounds of zero.

* = Indicator chemical.

3 10 00748

Table 5-5. Estimated Concentrations of Indicator Chemicals in Vegetation and in Myers Creek

Chemical	Concentration in Soil (mg/kg)[a]	Log K_{ow}[b]	Plant Bioconcentration Factor[c]	Estimated Concentration in Plants (mg/kg)[d]	Concentration in Shallow Aquifer (mg/l)[e]	Estimated Concentration in Myers Creek (mg/l)[f]
Acetone	NA	-2.4E-01	5.33E-01	NA	1.19E+00	3.69E-04
Arsenic	1.35E+00	ND	4.00E-02	5.40E-02	NA	NA
Barium	NA	ND	NA	NA	6.38E-01	1.98E-04
Benzene	6.00E-03	2.12E+00	2.30E+00	1.38E-02	1.85E-02	5.75E-06
Bis-(2-chloroethyl) ether	NA	1.50E+00	5.26E+00	NA	6.50E-03	2.02E-06
Bis-(2-ethylhexyl) phthalate	1.73E+00	4.88E+00	5.85E-02	1.01E-01	1.00E-03	3.11E-07
Carbon tetrachloride	NA	2.64E+00	1.15E+00	NA	8.60E-02	2.67E-05
Chloroform	2.37E-03	1.97E+00	2.81E+00	6.68E-03	4.55E-01	1.42E-04
2-Chlorophenol	NA	2.17E+00	2.16E+00	NA	6.00E-01	1.87E-04
Chromium	2.98E+01	ND	7.50E-03	2.23E-01	NA	NA
DDT	3.80E-02	6.19E+00	1.02E-02	3.89E-04	NA	NA
Di-n-butyl phthalate	1.85E-01	5.60E+00	2.24E-02	4.15E-03	NA	NA
1,1-Dichloroethane	360E-01	1.79E+00	3.58E+00	1.29E+00	6.30E-01	1.96E-04
1,1-Dichloroethylene	1.30E-02	1.84E+00	3.35E+00	4.35E-02	2.90E-01	9.02E-05
1,2-Dicloroethane	1.20E-01	1.48E+00	5.40E+00	6.48E-01	3.65E-02	1.14E-05
1,2-Dichloroethylene	NA	6.00E-01	1.74E+01	NA	8.90E-01	2.77E-04
Hexachlorobenzene	2.80E-01	5.23E+00	3.67E-02	1.03E-02	NA	NA
Lead	NA	ND	NA	NA	4.00E-02	1.24E-05
Mercury	3.10E+00	ND	9.00E-01	2.79E+00	3.50E-04	1.09E-07
Methylene chloride	1.10E-01	1.30E+00	6.86E+00	7.53E-01	1.70E-02	5.29E-06
Nickel	2.48E+01	ND	6.00E-02	1.48E+01	NA	NA
Phenol	7.05E+00	1.46E+00	5.55E+00	3.91E+01	1.74E-01	5.43E-05
1,1,2,2-Tetrachloroethane	1.00E+02	2.39E+00	1.61E+00	1.61E+02	1.25E-01	3.89E-05
Tetrachloroethylene	1.09E+01	2.60E+00	1.22E+00	1.33E+01	7.05E-02	2.19E-05
1,1,2-Trichloroethane	NA	2.47E+00	1.45E+00	NA	2.00E-03	6.22E-07
Trichloroethylene	1.73E+01	2.38E+00	1.63E+00	2.82E+01	1.10E-01	3.42E-05
Vinyl chloride	2.40E-02	1.38E+00	6.17E+00	1.48E-01	1.30E-02	4.04E-06
Xylene	1.15E-01	3.26E+00	5.05E-01	5.81E-02	NA	NA

[a]Appendix B.
[b]EPA, 1986a.
[c]Section 5.3.4.2.
[d]Section 5.4.3.2.
[e]Appendix B.
[f]Section 5.3.4.1.

Notes: NA = Not applicable.
ND = No data available.
K_{ow} = Octanol-water partition coefficient.

3 10 00749

Table 5-6. Estimated Concentrations of Indicator Chemicals in Deer Meat and Fish

Chemical	Estimated Concentration In Plants (mg/kg)[a]	Estimated Concentration In Myers Creek (mg/l)[b]	Log K_{ow}[c]	Deer Bioaccumulation Factor (day/kg)[d]	Estimated Concentration in Deer Meat (mg/kg)[d]	Fish Bioaccumulation Factor (mg/l)[e]	Estimated Concentration in Fish (mg/l)[e]
Acetone	NA	3.69E-04	-2.4E-01	1.04E-08	9.58E-13	2.65E-02	9.78E-06
Arsenic	5.40E-02	NA	ND	2.00E-03	1.81E-06	4.40E+01	NA
Barium	NA	1.98E-04	ND	1.50E-04	7.44E-09	4.70E+01	9.33E-03
Benzene	1.38E-02	5.75E-06	2.12E+00	2.85E-06	6.67E-10	6.08E+00	3.50E-05
Bis-(2-chloroethyl) ether	NA	2.02E-06	1.50E+00	6.52E-07	3.30E-13	1.46E+00	2.95E-06
Bis-(2-ethylhexyl) phthalate	1.01E-01	3.11E-07	4.88E+00	2.02E-03	3.43E-06	3.50E+03	1.09E-03
Carbon tetrachloride	NA	2.67E-05	2.64E+00	9.82E-06	6.57E-11	2.01E+01	5.39E-04
Chloroform	6.68E-03	1.42E-04	1.97E+00	2.00E-06	2.95E-10	4.31E+00	6.09E-04
2-Chlorophenol	NA	1.87E-04	2.17E+00	3.21E-06	1.50E-10	6.82E+00	1.27E-03
Chromium	2.23E-01	NA	ND	5.50E-03	2.06E-05	1.60E+01	NA
DDT	3.89E-04	NA	6.19E+00	4.56E-02	2.98E-07	7.14E+04	NA
Di-n-butyl phthalate	4.15E-03	NA	5.60E+00	1.12E-02	7.83E-07	1.84E+04	NA
1,1-Dichloroethane	1.29E+00	1.96E-04	1.79E+00	1.30E-06	2.82E-08	2.84E+00	5.57E-04
1,1-Dichloroethylene	4.35E-02	9.02E-05	1.84E+00	1.46E-06	1.10E-09	3.19E+00	2.88E-04
1,2-Dicloroethane	6.48E-01	1.14E-05	1.48E+00	6.22E-07	6.78E-09	1.39E+00	1.58E-05
1,2-Dichloroethylene	NA	2.77E-04	6.00E-01	7.67E-08	5.31E-12	1.84E-01	5.08E-05
Hexachlorobenzene	1.03E-02	NA	5.23E+00	4.65E-03	8.04E-07	7.83E+03	NA
Lead	NA	1.24E-05	ND	3.00E-04	9.33E-10	4.90E+01	6.10E-04
Mercury	2.79E+00	1.09E-07	ND	2.50E-01	1.17E-02	5.50E+03	5.99E-04
Methylene chloride	7.53E-01	5.29E-06	1.30E+00	4.05E-07	5.13E-09	9.20E-01	4.87E-06
Nickle	1.48E+00	NA	ND	6.00E-03	1.50E-04	4.70E+01	NA
Phenol	3.91E+01	5.43E-05	1.46E+00	5.93E-07	3.90E-07	1.33E+00	7.22E-05
1,1,2,2-Tetrachloroethane	1.61E+02	3.89E-05	2.39E+00	5.42E-06	1.47E-05	1.13E+01	4.40E-04
Tetrachloroethylene	1.33E+01	2.19E-05	2.60E+00	8.93E-06	1.99E-06	1.84E+01	4.03E-04
1,1,2-Trichloroethane	NA	6.22E-07	2.47E+00	6.55E-06	1.02E-12	1.36E+01	8.47E-06
Trichloroethylene	2.82E+01	3.42E-05	2.38E+00	5.29E-06	2.51E-06	1.11E+01	3.79E-04
Vinyl chloride	1.48E-01	4.04E-06	1.38E+00	4.90E-07	1.22E-09	1.11E+00	4.47E-06
Xylene	5.81E-02	NA	3.26E+00	4.29E-05	4.19E-08	8.39E+01	NA

[a]Section 5.3.4.2.
[b]Section 5.4.3.1.
[c]EPA, 1986a.
[d]Section 5.3.4.4.
[e]EPA, 1986
[f]Section 5.3.4.4.

Notes: NA = Not applicable
ND = No data available.
K_{ow} = Octanol-water partition coefficient.

3 10 00470

Table 5-7. Estimated Applied Intake and Associated Incremental Lifetime Cancer Risks for Current Use Scenarios

Chemical	Cancer Potency Factor (mg/kg-day)[a]	Estimated Concentration in Deer Meat (mg/kg)[b]	Estimated Concentration in Fish (mg/kg)[c]	Applied Daily Intake for the AEI (mg/kg-day)[d]	Applied Daily Intake for the MEI (mg/kg-day)[d]	Incremental Lifetime Cancer Risk for the AEI[e]	Incremental Lifetime Cancer Risk for the MEI[e]
Arsenic	1.50E+00	1.81E-06	NA	4.96E-10	9.93E-10	4.79E-10	9.57E-10
Benzene	5.20E-02	6.67E-10	3.50E-05	5.00E-09	1.00E-08	1.67E-10	3.34E-10
Bis-(2-chloroethyl) ether	1.10E+00	3.30E-13	2.95E-06	4.21E-10	8.43E-10	2.98E-10	5.96E-10
Bis-(2-ethylhexyl) phthalate	6.84E-04	3.43E-06	1.09E-03	1.56E-07	3.13E-07	6.88E-11	1.38E-10
Carbon tetrachloride	1.30E-01	6.57E-11	5.39E-04	7.69E-08	1.54E-07	6.43E-09	1.29E-08
Chloroform	8.10E-02	2.95E-10	6.09E-04	8.70E-08	1.74E-07	4.53E-09	9.06E-09
DDT	3.40E-01	2.98E-07	NA	8.16E-11	1.63E-10	1.78E-11	3.57E-11
1,2-Dichloroethane	9.10E-02	2.82E-08	5.57E-04	7.96E-08	1.59E-07	4.66E-09	9.32E-09
1,1-Dichloroethylene	6.00E-01	1.10E-09	2.88E-04	4.11E-08	8.22E-08	1.59E-08	3.17E-08
1,2-Dichloroethane	9.10E-02	6.78E-09	1.58E-05	2.26E-09	4.52E-09	1.32E-10	2.65E-10
Hexacylorobenzene	1.69E+00	8.04E-07	NA	2.20E-10	4.40E-10	2.39E-10	4.78E-10
Methylene chloride	7.50E-03	5.13E-09	4.87E-06	6.97E-10	1.39E-09	3.36E-12	6.72E-12
1,1,2,2-Tetrachloroethane	2.00E-01	1.47E-05	4.40E-04	6.69E-08	1.34E-07	8.60E-09	1.72E-08
Tetrachloroethylene	5.10E-02	1.99E-06	4.03E-04	5.81E-08	1.16E-07	1.90E-09	3.81E-09
1,1,2-Trichloroethane	5.73E-02	1.02E-12	8.47E-06	1.21E-09	2.42E-09	4.46E-11	8.91E-11
Trichloroethylene	1.10E-02	2.51E-06	3.79E-04	5.48E-08	1.10E-07	3.87E-10	7.75E-10
Vinyl chloride	2.30E+00	1.22E-09	4.47E-06	6.39E-10	1.28E-09	9.46E-10	1.89E-09

[a]EPA, 1986a, 1989c.
[b]Section 5.4.3.4.
[c]Section 5.4.3.3.
[d]Section 5.4.3.5.
[e]Section 5.5.3.

Notes: AEI = Average exposed individual.
MEI = Maximally exposed individual.
NA = Not applicable.

Table 5-8. Estimated Applied Intake and Noncarcinogenic Hazard Indices for Current Use Scenarios

Chemical	AIC (mg/kg-day)[a]	Estimated Concentration in Deer Meat (mg/kg)[b]	Estimated Concentration in Fish (mg/kg)[c]	Applied Daily Intake for the AEI (mg/kg-day)[d]	Applied Daily Intake for the MEI (mg/kg-day)[d]	Hazard Index for the AEI[e]	Hazard Index for the MEI[e]
Acetone	1.00E-01	9.58E-13	9.78E-06	1.40E-09	2.80E-09	1.40E-08	2.80E-08
Barium	5.10E-02	7.44E-09	9.33E-03	1.33E-06	2.66E-06	2.61E-05	5.22E-05
2-Chlorophenol	5.00E-03	1.50E-10	1.27E-03	1.82E-07	3.64E-07	3.64E-05	7.28E-05
Chromium	5.00E-03	2.06E-05	NA	5.64E-09	1.13E-08	1.13E-06	2.26E-06
Di-n-butyl phthalate	1.00E-01	7.83E-07	NA	2.14E-10	4.28E-10	2.14E-09	4.28E-09
1,2-Dichloroethylene	1.00E-02	5.31E-12	5.08E-05	7.26E-09	1.45E-08	7.26E-07	1.45E-06
Lead	1.40E-03	9.33E-10	6.10E-04	8.71E-08	1.74E-07	6.22E-05	1.24E.04
Mercury	2.00E-03	1.17E-02	5.99E-04	3.29E-06	6.59E-06	1.65E-03	3.29E-03
Nickel	2.00E-02	1.50E-04	NA	4.09E-08	8.19E-08	2.05E--6	4.09E-06
Phenol	1.00E-01	3.90E-07	7.22E-05	1.04E-08	2.08E-08	1.04E-07	2.08E-07
Xylene	1.00E-02	4.19E-08	NA	1.15E-11	2.29E-11	1.15E-09	2.29E-09

[a]EPA, 1986a, 1988g, and 1989c.
[b]Section 5.4.3.4.
[c]Section 5.4.3.3.
[d]Section 5.4.3.5.
[e]Section 5.5.4.

Notes: AEI = Average exposed individual.
AIC = Acceptable daily intake for chronic exposure.
MEI = Maximally exposed individual.
NA = Not applicable.

3 10 00752

Table 5-9. Factors Used in Determining the Incremental Lifetime Cancer Risks and Hazard Indices for the Potential Future Use Drinking Water Scenario

Age Group	Range of Ages	Weight (kg)[a]	Percent Time Home[a]	Average Tap Water Intake(L)[a]	Maximum Tap Water Intake(L)[a]	Lifetime Correction Factor[b]
Infant	to age 1	9.00	1	0.17	0.30	0.014
Preschool	1 to 5	14.2	1	0.43	0.50	0.057
Child	5 to 10	25.1	0.83	0.52	0.57	0.071
Early adolescent	10 to 15	45.4	0.83	0.62	0.67	0.071
Late adolescent	15 to 18	61.1	0.74	0.67	0.72	0.043
Adult	>18	70.0	0.64	1.40	2.00	0.643

[a]EPA, 1989a.
[b]Lifetime correction factor = the amount of time in years that a person is exposed to a carcinogen divided by the average lifetime in years (70), EPA, 1986.

Table 5-10. Estimated Applied Intakes and Associated Incremental Lifetime Cancer Risks for Infants - Potential Future Use Drinking Water Scenario

Chemical	Concentration[a] (mg/L)	Estimated Daily Intake for AEI[b] (mg/kg-day)	Estimated Daily Intake for MEI[c] (mg/kg-day)	CPF[d] (mg/kg-day)-1	Incremental Cancer Risk for AEI[b]	Incremental Cancer Risk for MEI[c]
Benzene	1.85E-02	3.52E-04	6.17E-04	5.20E-02	2.61E-07	4.58E-07
Bis-(2-chloroethyl) ether	6.50E-03	1.24E-04	2.17E-04	1.10E+00	1.94E-06	3.40E-06
Bis-(2-ethylhexyl) phthalate	1.00E-03	1.90E-05	3.33E-05	6.84E-04	1.86E-10	3.26E-10
Carbon tetrachloride	8.60E-02	1.63E-03	2.87E-03	1.30E-01	3.03E-06	5.32E-06
Chloroform	4.55E-01	8.65E-03	1.52E-02	8.10E-02	1.00E-05	1.76E-05
1,1-Dichloroethane	6.30E-01	1.20E-02	2.10E-02	9.10E-02	1.56E-05	2.73E-05
1,1-Dichloroethylene	2.90E-01	5.51E-03	9.67E-03	6.00E-01	4.72E-05	8.29E-05
1,2-Dichloroethane	3.65E-02	6.94E-04	1.22E-03	9.10E-02	9.02E-07	1.58E-06
Methylene chloride	1.70E-02	3.23E-04	5.67E-04	7.50E-03	3.46E-08	6.07E-08
1,1,2,2-Tetrachloroethane	1.25E-01	2.38E-03	4.17E-03	2.00E-01	6.79E-06	1.19E-05
Tetrachloroethylene	7.05E-02	1.34E-03	2.35E-03	5.10E-02	9.76E-07	1.71E-06
1,1,2-Trichloroethane	2.00E-03	3.80E-05	6.67E-05	5.73E-02	3.11E-08	5.46E-08
Trichloroethylene	1.10E-01	2.09E-03	3.67E-03	1.10E-02	3.28E-07	5.76E-07
Vinyl chloride	1.30E-02	2.47E-04	4.33E-04	2.30E+00	8.12E-06	1.42E-05

[a]The concentration in the drinking well water was assumed to be equal to the 75th percentile of the concentrations found in ground water samples from the chemical plume.
[b]AEI = Average exposed individual.
[c]MEI = Maximal exposed individual.
[d]CPF = Cancer potency factor, EPA, 1986a, 1989c.

Table 5-11. Estimated Applied Intakes and Associated Incremental Lifetime Cancer Risks for Preschool Children - Potential Future Use Drinking Water Scenario

Chemical	Concentration[a] (mg/L)	Estimated Daily Intake for AEI[b] (mg/kg-day)	Estimated Daily Intake for MEI[c] (mg/kg-day)	CPF[d] (mg/kg-day)-1	Incremental Cancer Risk for AEI[b]	Incremental Cancer Risk for MEI[c]
Benzene	1.85E-02	5.68E-04	6.49E-04	5.20E-02	1.69E-06	1.93E-06
Bis-(2-chloroethyl) ether	6.50E-03	2.00E-04	2.28E-04	1.10E+00	1.26E-05	1.43E-05
Bis-(2-ethylhexyl) phthalate	1.00E-03	3.07E-05	3.51E-05	6.84E-04	1.20E-09	1.37E-09
Carbon tetrachloride	8.60E-02	2.64E-03	3.02E-03	1.30E-01	1.96E-05	2.24E-05
Chloroform	4.55E-01	1.40E-02	1.60E-02	8.10E-02	6.47E-05	7.39E-05
1,1-Dichloroethane	6.30E-01	1.94E-02	2.21E-02	9.10E-02	1.01E-04	1.15E-04
1,1-Dichloroethylene	2.90E-01	8.91E-03	1.02E-02	6.00E-01	3.05E-04	3.49E-04
1,2-Dichloroethane	3.65E-02	1.12E-03	1.28E-03	9.10E-02	5.83E-06	6.66E-06
Methylene chloride	1.70E-02	5.22E-04	5.97E-04	7.50E-03	2.24E-07	2.56E-07
1,1,2,2-Tetrachloroethane	1.25E-01	3.84E-03	4.39E-03	2.00E-01	4.39E-05	5.01E-05
Tetrachloroethylene	7.05E-02	2.17E-03	2.47E-03	5.10E-02	6.31E-06	7.21E-06
1,1,2-Trichloroethane	2.00E-03	6.14E-05	7.02E-05	5.73E-02	2.01E-07	2.30E-07
Trichloroethylene	1.10E-01	3.38E-03	3.86E-03	1.10E-02	2.12E-06	2.43E-06
Vinyl chloride	1.30E-02	3.99E-04	4.56E-04	2.30E+10	5.25E-05	6.00E-05

[a]The concentration in the drinking well water was assumed to be equal to the 75th percentile of the concentrations found in ground water samples from the chemical plume.
[b]AEI = Average exposed individual.
[c]MEI = Maximal exposed individual.
[d]CPF = Cancer potency factor, EPA, 1986a, 1989c.

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Table 5-12. Estimated Applied Intakes and Associated Incremental Lifetime Cancer Risks for Primary School Age Children - Potential Future Use Drinking Water Scenario

Chemical	Concentration[a] (mg/L)	Estimated Daily Intake for AEI[b] (mg/kg-day)	Estimated Daily Intake for MEI[c] (mg/kg-day)	CPF[d] (mg/kg-day)-1	Incremental Cancer Risk for AEI[b]	Incremental Cancer Risk for MEI[c]
Benzene	1.85E-02	3.18E-04	3.51E-04	5.20E-02	1.18E-06	1.30E-06
Bis-(2-chloroethyl) ether	6.50E-03	1.12E-04	1.23E-04	1.10E+00	8.79E-06	9.69E-06
Bis-(2-ethylhexyl) phthalate	1.00E-03	1.72E-05	1.90E-05	6.84E-04	8.41E-10	9.27E-10
Carbon tetrachloride	8.60E-02	1.48E-03	1.63E-03	1.30E-01	1.37E-05	1.51E-05
Chloroform	4.55E-01	7.83E-03	8.63E-03	8.10E-02	4.53E-05	4.99E-05
1,1-Dichloroethane	6.30E-01	1.08E-02	1.19E-02	9.10E-02	7.05E-05	7.77E-05
1,1-Dichloroethylene	2.90E-01	4.99E-03	5.50E-03	6.00E-01	2.14E-04	2.36E-04
1,2-Dichloroethane	3.65E-02	6.28E-04	6.92E-04	9.10E-02	4.08E-06	4.50E-06
Methylene chloride	1.70E-02	2.93E-04	3.22E-04	7.50E-01	1.57E-07	1.73E-07
1,1,2,2-Tetrachloroethane	1.25E-01	2.15E-03	2.37E-03	2.00E-01	3.07E-05	3.39E-05
Tetrachloroethylene	7.05E-02	1.21E-03	1.34E-03	5.10E-02	4.42E-06	4.87E-06
1,1,2-Trichloroethane	2.00E-03	3.44E-05	3.79E-05	5.73E-02	1.41E-07	1.55E-07
Trichloroethylene	1.10E-01	1.89E-03	2.09E-03	1.10E-02	1.49E-06	1.64E-06
Vinyl chloride	1.30E-02	2.24E-04	2.47E-04	2.30E+00	3.68E-05	4.05E-05

[a]The concentration in the drinking well water was assumed to be equal to the 75th percentile of the concentrations found in ground water samples from the chemical plume.
[b]AEI = Average exposed individual.
[c]MEI = Maximal exposed individual.
[d]CPF = Cancer potency factor, EPA, 1986a, 1989c.

3 10 00756

Table 5-13. Estimated Applied Intakes and Associated Incremental Lifetime Cancer Risks for Early Adolescent - Potential Future Use Drinking Water Scenario

Chemical	Concentration[a] (mg/L)	Estimated Daily Intake for AEI[b] (mg/kg-day)	Estimated Daily Intake for MEI[c] (mg/kg-day)	CPF[d] (mg/kg-day)-1	Incremental Cancer Risk for AEI[b]	Incremental Cancer Risk for MEI[c]
Benzene	1.85E-02	2.10E-04	2.26E-04	5.20E-02	7.78E-07	8.41E-07
Bis-(2-chloroethyl) ether	6.50E-03	7.36E-05	7.96E-05	1.10E+00	5.79E-06	6.25E-06
Bis-(2-ethylhexyl) phthalate	1.00E-03	1.13E-05	1.22E-05	6.84E-04	5.53E-10	5.98E-10
Carbon tetrachloride	8.60E-02	9.74E-04	1.05E-03	1.30E-01	9.05E-06	9.78E-06
Chloroform	4.55E-01	5.15E-03	5.57E-03	8.10E-02	2.98E-05	3.22E-05
1,1-Dichloroethane	6.30E-01	7.14E-03	7.71E-03	9.10E-02	4.64E-05	5.01E-05
1,1-Dichloroethylene	2.90E-01	3.28E-03	3.55E-03	6.00E-01	1.41E-04	1.52E-04
1,2-Dichloroethane	3.65E-02	4.13E-04	4.47E-04	9.10E-02	2.69E-06	2.90E-06
Methylene chloride	1.70E-02	1.93E-04	2.08E-04	7.50E-03	1.03E-07	1.11E-07
1,1,2,2-Tetrachloroethane	1.25E-01	1.42E-03	1.53E-03	2.00E-01	2.02E-05	2.19E-05
Tetrachloroethylene	7.05E-02	7.99E-04	8.63E-04	5.10E-02	2.91E-06	3.14E-06
1,1,2-Trichloroethane	2.00E-03	2.27E-05	2.45E-05	5.73E-02	9.27E-08	1.00E-07
Trichloroethylene	1.10E-01	1.25E-03	1.35E-03	1.10E-02	9.79E-07	1.06E-06
Vinyl chloride	1.30E-02	1.47E-04	1.59E-04	2.30E+00	2.42E-05	2.61E-05

[a]The concentration in the drinking well water was assumed to be equal to the 75th percentile of the concentrations found in ground water samples from the chemical plume.
[b]AEI = Average exposed individual.
[c]MEI = Maximal exposed individual.
[d]CPF = Cancer potency factor, EPA, 1986a, 1989c.

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Table 5-14. Estimated Applied Intakes and Associated Incremental Lifetime Cancer Risks for Late Adolescent - Potential Future Use Drinking Water Scenario

Chemical	Concentration[a] (mg/L)	Estimated Daily Intake for AEI[b] (mg/kg-day)	Estimated Daily Intake for MEI[c] (mg/kg-day)	CPF[d] (mg/kg-day)-1	Incremental Cancer Risk for AEI[b]	Incremental Cancer Risk for MEI[c]
Benzene	1.85E-02	1.49E-04	1.61E-04	5.20E-02	3.32E-07	3.58E-07
Bis-(2-chloroethyl) ether	6.50E-03	5.23E-05	5.64E-05	1.10E+00	2.47E-06	2.66E-06
Bis-(2-ethylhexyl) phthalate	1.00E-03	8.05E-06	8.68E-06	6.84E-04	2.36E-10	2.54E-10
Carbon tetrachloride	8.60E-02	6.92E-04	7.46E-04	1.30E-01	3.86E-06	4.16E-06
Chloroform	4.55E-01	3.66E-03	3.95E-03	8.10E-02	1.27E-05	1.37E-05
1,1-Dichloroethane	6.30E-01	5.07E-03	5.47E-03	9.10E-02	1.98E-05	2.13E-05
1,1-Dichloroethylene	2.90E-01	2.33E-03	2.52E-03	6.00E-01	6.00E-05	6.47E-05
1,2-Dichloroethane	3.65E-02	2.94E-04	3.17E-04	9.10E-02	1.15E-06	1.24E-06
Methylene chloride	1.70E-02	1.37E-04	1.48E-04	7.50E-03	4.40E-08	4.74E-08
1,1,2,2-Tetrachloroethane	1.25E-01	1.01E-03	1.08E-03	2.00E-01	8.63E-06	9.30E-06
Tetrachloroethylene	7.05E-02	5.68E-04	6.12E-04	5.10E-02	1.24E-06	1.34E-06
1,1,2-Trichloroethane	2.00E-03	1.61E-05	1.74E-05	5.73E-02	3.95E-08	4.26E-08
Trichloroethylene	1.10E-01	8.86E-04	9.55E-04	1.10E-02	4.17E-07	4.50E-07
Vinyl chloride	1.30E-02	1.05E-04	1.13E-04	2.30E+00	1.03E-05	1.11E-05

[a]The concentration in the drinking well water was assumed to be equal to the 75th percentile of the concentrations found in ground water samples from the chemical plume.
[b]AEI = Average exposed individual.
[c]MEI = Maximal exposed individual.
[d]CPF = Cancer potency factor, EPA, 1986a, 1989c.

Table 5-15. Estimated Applied Intakes and Associated Incremental Lifetime Cancer Risks for Adults - Potential Future Use Drinking Water Scenario

Chemical	Concentration[a] (mg/L)	Estimated Daily Intake for AEI[b] (mg/kg-day)	Estimated Daily Intake for MEI[c] (mg/kg-day)	CPF[d] (mg/kg-day)-1	Incremental Cancer Risk for AEI[b]	Incremental Cancer Risk for MEI[c]
Benzene	1.85E-02	2.37E-04	3.38E-04	5.20E-02	7.92E-06	1.13E-05
Bis-(2-chloroethyl) ether	6.50E-03	8.32E-05	1.19E-04	1.10E+00	5.88E-05	8.40E-05
Bis-(2-ethylhexyl) phthalate	1.00E-03	1.28E-05	1.83E-05	6.84E-04	5.63E-09	8.04E-09
Carbon tetrachloride	8.60E-02	1.10E-03	1.57E-03	1.30E-01	9.20E-05	1.31E-04
Chloroform	4.55E-01	5.82E-03	8.32E-03	8.10E-02	3.03E-04	4.33E-04
1,1-Dichloroethane	6.30E-01	8.06E-03	1.15E-02	9.10E-02	4.72E-04	6.74E-04
1,1-Dichloroethylene	2.90E-01	3.71E-03	5.30E-03	6.00E-01	1.43E-03	2.05E-03
1,2-Dichloroethane	3.65E-02	4.67E-04	6.67E-04	9.10E-02	2.73E-05	3.90E-05
Methylene chloride	1.70E-02	2.18E-04	3.11E-04	7.50E-03	1.05E-06	1.50E-06
1,1,2,2-Tetrachloroethane	1.25E-01	1.60E-03	2.29E-03	2.00E-01	2.06E-04	2.94E-04
Tetrachloroethylene	7.05E-02	9.02E-04	1.29E-03	5.10E-02	2.96E-05	4.23E-05
1,1,2-Trichloroethane	2.00E-03	2.56E-05	3.66E-05	5.73E-02	9.43E-07	1.35E-06
Trichloroethylene	1.10E-01	1.41E-03	2.01E-03	1.10E-02	9.96E-06	1.42E-05
Vinyl chloride	1.30E-02	1.66E-04	2.38E-04	2.30E+00	2.46E-04	3.51E-04
				Total Cancer Risk =	2.89E-03	4.12E-03

[a]The concentration in the drinking well water was assumed to be equal to the 75th percentile of the concentrations found in ground water samples from the chemical plume.
[b]AEI = Average exposed individual.
[c]MEI = Maximal exposed individual.
[d]CPF = Cancer potency factor, EPA, 1986; IRIS, 1989.

Table 5-16. Estimated Applied Intakes and Noncarcinogenic Hazard Indices for the Potential Future Use Drinking Water Scenario - Children

Chemical	Concentration[a] (mg/L)	Estimated Daily Intake for AEI[b] (mg/kg-day)	Estimated Daily Intake for MEI[c] (mg/kg-day)	AIC[d] (mg/kg-day)	Hazard Index for AEI[b]	Hazard Index for MEI[c]
			Age <1			
Acetone	1.19E+00	2.25E-02	3.95E-02	1.00E-01	2.25E-01	3.95E-01
Barium	6.38E-01	1.21E-02	2.13E-02	5.10E-02	2.38E-01	4.17E-01
2-Chlorophenol	6.00E-01	1.14E-02	2.00E-02	5.00E-03	2.28E+00	4.00E+00
1,2-Dichloroethylene	8.90E-01	1.69E-02	2.97E-02	1.00E-02	1.69E+00	2.97E+00
Lead	4.00E-02	7.60E-04	1.33E-03	1.40E-03	5.43E-01	9.52E-01
Mercury	3.50E-04	6.65E-06	1.17E-05	2.00E-03	3.33E-03	5.83E-03
Phenol	8.70E-02	1.65E-03	2.90E-03	1.00E-01	1.65E-02	2.90E-03
			Ages 5 to 10			
Acetone	1.19E+00	2.04E-02	2.25E-02	1.00E-01	2.04E-01	2.25E-01
Barium	6.38E-01	1.10E-02	1.21E-02	5.10E-02	2.15E-01	2.37E-01
2-Chlorophenol	6.00E-01	1.03E-02	1.14E-02	5.00E-03	2.07E+00	2.28E+00
1,2-Dichloroethylene	8.90E-01	1.53E-02	1.69E-02	1.00E-02	1.53E+00	1.69E+00
Lead	4.00E-02	6.89E-04	7.59E-04	1.40E-03	4.92E-01	5.42E-01
Mercury	3.50E-04	6.03E-06	6.64E-06	2.00E-03	3.01E-03	3.32E-03
Phenol	8.70E-02	1.50E-03	1.65E-03	1.00E-01	1.50E-02	1.65E-02

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Table 5-16. (Continued)

Chemical	Concentration[a] (mg/L)	Daily Intake for AEI[b] (mg/kg-day)	Daily Intake for MEI[c] (mg/kg-day)	AIC[d] (mg/kg-day)	Hazard Index for AEI[b]	Hazard Index for MEI[c]
		Ages 15 to 18				
Acetone	1.19E+00	9.57E-03	1.03E-02	1.00E-01	9.57E-02	1.03E-01
Barium	6.38E-01	5.15E-03	5.56E-03	5.10E-02	1.01E-01	1.09E-01
2-Chlorophenol	6.00E-01	4.85E-03	5.22E-03	5.00E-03	9.69E-01	1.04E+00
1,2-Dichloroethylene	8.90E-01	7.19E-03	7.75E-03	1.00E-02	7.19E-01	7.75E-01
Lead	4.00E-02	3.23E-04	3.48E-04	1.40E-03	2.31E-01	2.49E-01
Mercury	3.50E-04	2.83E-06	3.05E-06	2.00E-03	1.41E-03	1.52E-03
Phenol	8.70E-02	7.03E-04	7.58E-04	1.00E-01	7.03E-03	7.58E-03

[a]The concentration in the drinking well water was assumed to be equal to the 75th percentile of the concentrations found in ground water samples from the chemical plume.
[b]AEI = Average exposed individual.
[c]MEI = Maximal exposed individual.
[d]AIC = Acceptable daily intake for chronic exposure, EPA, 1986a, 1989c.

Table 5-17. Estimated Applied Intakes and Noncarcinogenic Hazard Indices for the Potential Future Use Drinking Water Scenario - Adults

Chemical	Concentration[a] (mg/L)	Estimated Daily Intake for AEI[b] (mg/kg-day)	Estimated Daily Intake for MEI[c] (mg/kg-day)	AIC[d] (mg/kg-day)	Hazard Index for AEI[b]	Hazard Index for MEI[c]
Acetone	1.19E+00	1.52E-02	2.17E-02	1.00E-01	1.52E-01	2.17E-01
Barium	6.38E-01	8.17E-03	1.17E-02	5.10E-02	1.60E-01	2.29E-01
2-Chlorophenol	6.00E-01	7.68E-03	1.10E-02	5.00E-03	1.54E+00	2.19E+00
1,2-Dichloroethylene	8.90E-01	1.14E-02	1.63E-02	1.00E-02	1.14E+00	1.63E+00
Lead	4.00E-02	5.12E-04	7.31E-04	1.40E-03	3.66E-01	5.22E-01
Mercury	3.50E-04	4.48E-06	6.40E-06	2.00E-03	2.24E-03	3.20E-03
Phenol	1.74E-01	2.23E-03	3.19E-03	1.00E-01	2.23E-02	3.19E-02

[a]The concentration in the drinking well water was assumed to be equal to the 75th percentile of the concentrations found in ground water samples from the chemical plume.
[b]AEI = Average exposed individual.
[c]MEI = Maximal exposed individual.
[d]AIC = Acceptable daily intake for chronic exposure, EPA, 1986a, 1989c.

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Table 5-18. Estimated Applied Intakes and Noncarcinogenic Hazard Indices for the Potential Trespasser Scenario

Chemical	Concentration in Soil[a] (mg/kg)	Applied Daily Intake for AEI[b] (mg/kg-day)	Applied Daily Intake for MEI[c] (mg/kg-day)	AIS/AIC[d] (mg/kg-day)	Hazard Index for AEI[b]	Hazard Index for MEI[c]
Arsenic	1.35E+00	1.86E-07	8.61E-07	1.00E-03[e]	1.86E-04	8.61E-04
Bis(2-ethylhexyl) phthalate	1.73E+00	2.38E-07	1.10E-06	2.00E-02	1.19E-05	5.50E-05
Chloroform	2.37E-03	3.28E-10	1.51E-09	1.00E-02	3.28E-08	1.51E-07
Chromium	2.98E+01	4.11E-06	1.90E-05	2.50E-02	1.64E+04	7.59E-04
Copper	1.80E+01	2.49E-06	1.15E-05	3.70E-02	6.72E-05	3.10E-04
DDT	3.80E-02	5.25E-09	2.42E-08	5.00E-03	1.05E-06	4.85E-06
Mercury	3.10E+00	4.28E-07	1.98E-06	2.00E-03	2.14E-04	9.89E-04
Nickel	2.48E+01	3.42E-06	1.58E-05	2.00E-02	1.71E-04	7.89E-04
Phenol	7.05E+00	9.73E-07	4.50E-06	1.00E-01	9.73E-06	4.50E-05
Tetrachloroethylene	1.09E+01	1.51E-06	6.97E-06	2.00E-01[e]	7.54E-06	3.48E-05
Toluene	8.38E-01	1.16E-07	5.34E-07	4.30E-01	2.69E-07	1.24E-06
1,1,1-Trichloroethane	3.67E-02	5.07E-09	2.34E-08	9.00E-02	5.64E-08	2.60E-07
Trichloroethylene	1.73E+01	2.39E-06	1.10E-05	7.00E-03	3.41E-04	1.58E-03

[a]The concentration in the drinking well water was assumed to be equal to the 75th percentile of the concentrations found in ground water samples from the chemical plume.
[b]AEI = Average exposed individual.
[c]MEI = Maximal exposed individual.
[d]EPA, 1986a, 1989c.
[e]Neither AIS nor AIC available. Estimated AIA (see Section 5.7.3).

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Table 5-19. Estimated Incremental Lifetime Cancer Risks for an Individual Exposed from Birth to Age 18: Potential Future Use Drinking Water Scenario

Chemical	Infant[a] Incremental Cancer Risk	Preschool[b] Incremental Cancer Risk	School-Aged Child[c] Incremental Cancer Risk	Early Adolescent[d] Incremental Cancer Risk	Late Adolescent[e] Incremental Cancer Risk	Total Incremental Cancer Risk
			Average Exposed Individual (AEI)			
Benzene	2.61E-07	1.69E-06	1.18E-06	7.78E-07	3.32E-07	4.24E-06
Bis-(2-chloroethyl) ether	1.94E-06	1.26E-05	8.79E-06	5.79E-06	2.47E-06	3.15E-05
Bis-(2-ethylhexyl) phthalate	1.86E-10	1.20E-09	8.41E-10	5.53E-10	2.36E-10	3.02E-09
Carbon tetrachloride	3.03E-06	1.96E-05	1.37E-05	9.05E-06	3.86E-06	4.93E-05
Chloroform	1.00E-05	6.47E-05	4.53E-05	2.98E-05	1.27E-05	1.63E-04
1,1-Dichloroethane	1.56E-05	1.01E-04	7.05E-05	4.64E-05	1.98E-05	2.53E-04
1,1-Dichloroethylene	4.72E-05	3.05E-04	2.14E-04	1.41E-04	6.00E-05	7.67E-04
1,2-Dichloroethane	9.02E-07	5.83E-06	4.08E-06	2.69E-06	1.15E-06	1.46E-05
Methylene chloride	3.46E-08	2.24E-07	1.57E-07	1.03E-07	4.40E-08	5.62E-07
1,1,2,2-Tetrachloroethane	6.79E-06	4.39E-05	3.07E-05	2.02E-05	8.63E-06	1.10E-04
Tetrachloroethylene	9.76E-07	6.31E-06	4.42E-06	2.91E-06	1.24E-06	1.59E-05
1,1,2-Trichloroethane	3.11E-08	2.01E-07	1.41E-07	9.27E-08	3.95E-08	5.05E-07
Trichloroethylene	3.28E-07	2.12E-06	1.49E-06	9.79E-07	4.17E-07	5.34E-06
Vinyl chloride	8.12E-06	5.25E-05	3.68E-05	2.42E-05	1.03E-05	1.32E-04

Total Cancer Risk = 1.55E-03

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Table 5-19. (Continued)

Chemical	Infant[a] Incremental Cancer Risk	Preschool[b] Incremental Cancer Risk	School-Aged Child[c] Incremental Cancer Risk	Early Adolescent[d] Incremental Cancer Risk	Late Adolescent[e] Incremental Cancer Risk	**Total Incremental Cancer Risk**
			Maximal Exposed Individual (MEI)			
Benzene	4.58E-07	1.93E-06	1.30E-06	8.41E-07	3.58E-07	4.89E-06
Bis-(2-chloroethyl) ether	3.40E-06	1.43E-05	9.69E-06	6.25E-06	2.66E-06	3.63E-05
Bis-(2-ethylhexyl) phthalate	3.26E-10	1.37E-09	9.27E-10	5.98E-10	2.54E-10	3.48E-09
Carbon tetrachloride	5.32E-06	2.24E-05	1.51E-05	9.78E-06	4.16E-06	5.68E-05
Chloroform	1.76E-05	7.39E-05	4.99E-05	3.22E-05	1.37E-05	1.87E-04
1,1-Dichloroethane	2.73E-05	1.15E-04	7.77E-05	5.01E-05	2.13E-05	2.91E-04
1,1-Dichloroethylene	8.29E-05	3.49E-04	2.36E-04	1.52E-04	6.47E-05	8.84E-04
1,2-Dichloroethane	1.58E-06	6.66E-06	4.50E-06	2.90E-06	1.24E-06	1.69E-05
Methylene chloride	6.07E-08	2.56E-07	1.73E-07	1.11E-07	4.74E-08	6.48E-07
1,1,2,2-Tetrachloroethane	1.19E-05	5.01E-05	3.39E-05	2.19E-05	9.30E-06	1.27E-04
Tetrachloroethylene	1.71E-06	7.21E-06	4.87E-06	3.14E-06	1.34E-06	1.83E-05
1,1,2-Trichloroethane	5.46E-08	2.30E-07	1.55E-07	1.00E-07	4.26E-08	5.82E-07
Trichloroethylene	5.76E-07	2.43E-06	1.64E-06	1.06E-06	4.50E-07	6.15E-06
Vinyl chloride	1.42E-05	6.00E-05	4.05E-05	2.61E-05	1.11E-05	1.52E-04
					Total Cancer Risk =	1.78E-03

[a]Table 5-10.
[b]Table 5-11.
[c]Table 5-12.
[d]Table 5-13.
[e]Table 5-14.

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Table 5-20. Aquatic MATCs and Aquatic Hazard Indices

Chemical	Type Toxicity Test-Organism[a]	Toxicity Test Value (mg/l)	Acute Chronic Ratio	Aquatic MATC (mg/l)	Estimated Concentration in Myers Creek (mg/l)	Freshwater Chronic Criteria[d] (mg/l)	Aquatic Hazard Index[e]	References
Acetone	16d NOEC - Waterflea	1.43E+03	NA	1.43E+03	3.69E-04		2.58E-07	Hermens et al., 1985
Barium	48h NOEC - Waterflea	6.80E+01	NA	6.80E+01	1.98E-04		1.81E-06	LeBlanc, 1980
Benzene	96h LC_{50} - Bluegill	2.30E-+02	0.051	1.17E+01[b]	5.75E-06		7.43E-07	Mayerand Eltersleck, 1986; Suter et al., 1986
Bis-(2-chloroethyl) ether	96h LC_{50} - Bluegill	6.00E+02	0.051	3.06E+01[b]	2.02E-06		5.10E-08	Buccafusco et al., 1981; Suter et al., 1986
Bis-(2-ethylhexyl) phthalate	MATC - Waterflea	3.00E-03	NA	3.00E-03	3.11E-07		5.20E-04	Sanders et al., 1973
Carbon tetrachloride	96h LC_{50} - Bluegill	1.25E+02	0.051	6.40E+00[b]	2.67E-05		4.86E-06	Dill et al., 1987; Suter et al., 1986
Chloroform	16d NOEC - Waterflea	1.50E+01	NA	1.50E+01	1.42E-04		1.10E-05	Hermans et al., 1985
2-Chlorophenol	MATC - Fathead minnow	5.70E+00	NA	5.70E+00	1.87E-04	2.00E+00	1.56E-05	Le Blanc, 1984
1,1-Dichloroethane	7d LC_{50} - Guppy	2.02E+02	0.051	1.03E+01[b]	1.96E-04		3.02E-05	Konemann, 1981; Suter et al., 1986
1,1-Dichloroethylene	Calculated NOEC - Waterflea	ND		15.67[c]	9.02E-05		5.76E-06	Hermens et al., 1985
1,2-Dichloroethane	48h LC_{50} - Waterflea	2.20E+02	0.033	7.26E+00[b]	1.14E-05	2.00E+01	2.62E-06	LeBlanc, 1980; Kenega, 1982
1,2-Dichloroethylene	NOEC - Waterflea	1.48E+01	NA	1.48E+01	2.77E-04		2.63E-05	Ahmed et al., 1984
Lead	MATC - Bluegill	9.00E-02	NA	9.00E-02	1.24E-05	3.20E-03	1.00E-04	Etneir et al., 1987
Mercury	MATC - Fathead minnow	9.00E-04	NA	9.00E-04	1.09E-07	1.20E-05	1.04E-04	Spehar and Fiandt, 1986
Methylene chloride	MATC - Fathead minnow	1.08E+02	NA	1.08E+02	5.29E-06		8.35E-08	Dill et al., 1987
Phenol	48h LC_{50} - Waterflea	4.00E+00	0.2	8.00E-01[b]	5.43E-05	2.56E+00	3.04E-05	Ewell et al., 1986; Kenega, 1982
1,1,2,2-Tetrachloroethane	MATC - Fathead minnow	2.70E+00	NA	2.7	3.89E-05		1.44E-05	Ahmed et al., 1984
Tetrachloroethene	NOEC - Waterflea	7.50E-01	NA	0.75	2.19E-05	0.84	2.92E-05	Ahmed et al., 1984
1,1,2-Trichloroethane	Calculated NOEC - Waterflea	ND		8.13[c]	6.22E-07		7.65E-08	Hermens et al., 1985
Trichloroethene	48h LC_{50} - Waterflea	4.50E+00	1.00	4.50E+00[b]	3.42E-05	2.19E+01	8.29E-06	Canton and Adema, 1987; Kenega, 1982
Vinyl chloride	Calculated NOEC - Waterflea	ND	NA	4.20E-01	4.04E-06		3.71E-06	Hermens et al. 1985

[a]Bluegill - Lepomis macrochirus; Fathead minnow - Pimephales promelas; Guppy - Poecilia reticulata; Waterflea - Daphnia magna.

[b]The maximum allowable toxicant concentration (MATC) was determined by multiplying the acute toxicity value by the acute-chronic ratio.

[c]The no-observed-effect concentration (NOEC) was determined using a quantitative structure activity relationship equation: log (1/NOEC) = 0.952 log Kow - 3.96 (Hermens et al., 1985).

[d]EPA, 1986b.

[e]Aquatic HI = (Concentration in Myers Creek)/MATC. Aquatic HIs less than or equal to unity indicate that the aquatic MATC is not expected to be exceeded. In that case, no adverse impact on aquatic life is predicted.

Notes: NA = Not applicable.

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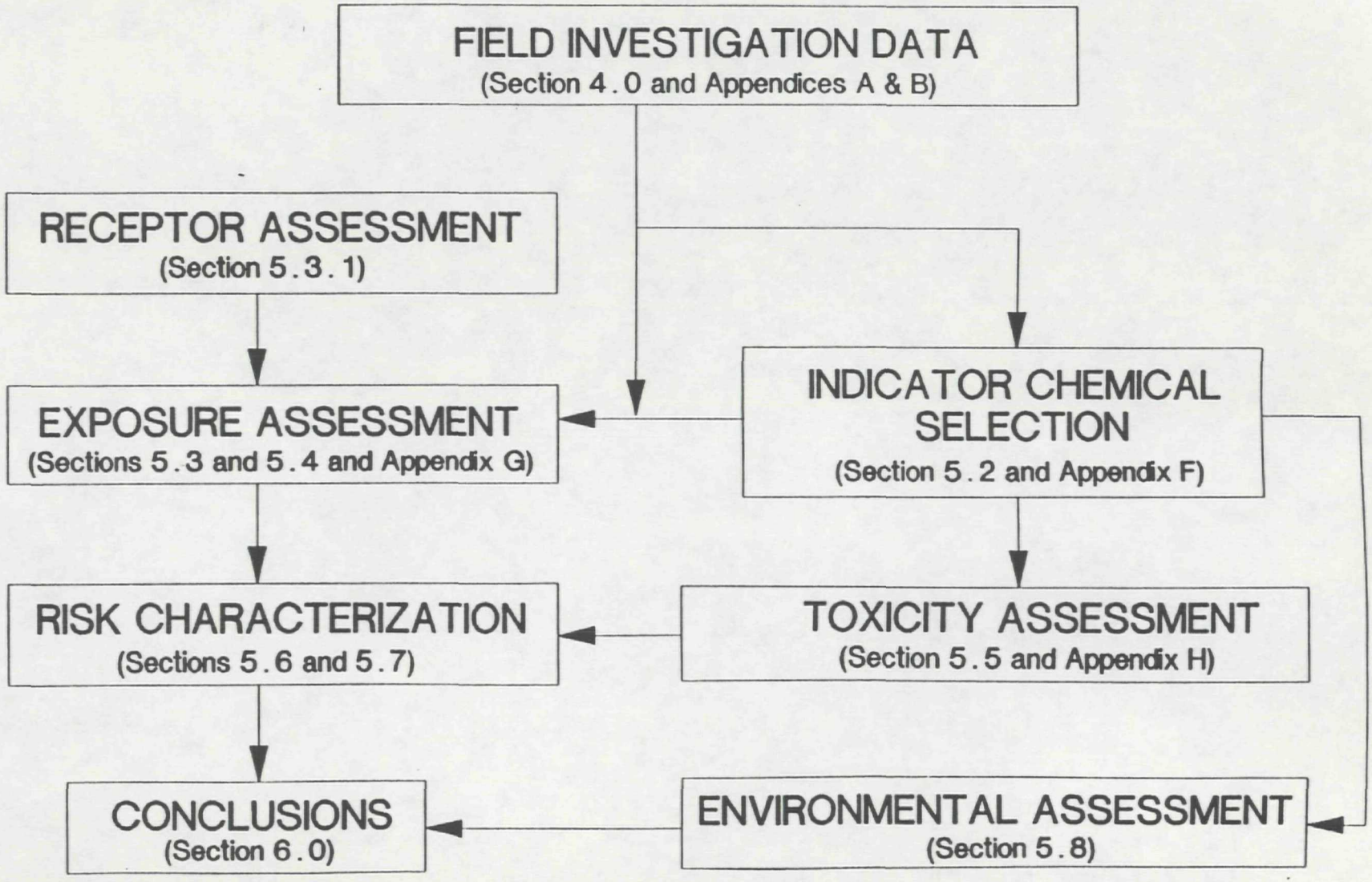
Table 5-21. Estim. Applied Daily Intake to Deer

Chemical	Estimated Concentration in Plants (mg/kg)[a]	Estimated Concentration in Myers Creek (mg/l)[b]	NOAEL (mg/kg-day)[c]	Maximum Tolerable Level (mg/kg-day)[d]	Acceptable Daily Intake for Deer (mg/kg-day)[e]	Applied Daily Intake for Deer (mg/kg-day)[e]	Deer Hazard Index[f]
Acetone	NA	3.69E-04	2.50E+00		2.50E-02	1.54E-06	6.14E-05
Arsenic	5.40E-02	NA		5.00E+01	2.50E-01	1.51E-05	6.05E-05
Barium	NA	1.98E-04		2.00E+01	1.00E-01	8.27E-07	8.27E-06
Benzene	1.38E-02	5.75E-06	1.00E+00		1.00E-02	3.90E-08	3.90E-04
Bis-(2-chloroethyl) ether	NA	2.02E-06	2.50E+01		2.50E-01	8.42E-09	3.37E-08
Bis-(2-ethylhexyl) phthalate	1.01E-01	3.11E-07	1.90E+01		1.90E-01	2.83E-05	1.49E-04
Carbon tetrachloride	NA	2.67E-05	1.00E+01		1.00E-01	1.11E-07	1.11E-06
Chloroform	6.68E-03	1.42E-04	1.70E+01		1.70E-01	2.46E-06	1.45E-05
2-Chlorophenol	NA	1.87E-04	5.00E+00		5.00E-02	7.78E-07	1.56E-05
Chromium	2.23E-01	NA		1.00E+03	5.00E-00	6.25E-05	1.25E-05
DDT	3.89E-04	NA	1.00E+00		1.00E-02	1.09E-07	1.09E-05
Di-butyl phthalate	4.15E-03	NA	3.70E+02		3.70E+00	1.16E-06	3.14E-07
1,1-Dichloroethane	1.29E+00	1.96E-04	ND			3.61E-04	NA
1,1-Dichloroethylene	4.35E-02	9.02E-05	9.00E+00		9.00E-02	1.26E-05	1.40E-04
1,2-Dichloroethane	6.48E-01	1.14E-05	2.50E+01		2.50E-01	1.82E-04	7.26E-04
1,2-Dichloroethylene	NA	2.77E-04	1.00E+01		1.00E-01	1.15E-06	1.15E-05
Hexachlorobenzene	1.03E-02	NA	8.00E-02		8.00E-04	2.88E-06	3.60E-03
Lead	NA	1.24E-05		3.00E+01	1.50E-01	5.18E-08	3.46E-07
Mercury	2.79E+00	1.09E-07		2.00E+00	1.00E-02	7.82E-04	7.82E-02
Methylene chloride	7.53E-01	5.29E-06	5.00E+00		5.00E-02	2.11E-04	4.22E-03
Nickel	1.48E+00	NA		5.00E+01	2.50E-01	4.16E-04	1.66E-03
Phenol	3.91E+01	5.43E-05	6.00E+01		6.00E-01	1.10E-02	1.83E-02
1,1,2,2-Tetrachloroethane	1.61E+02	3.89E-05	3.20E+00		3.20E-02	4.51E-02	1.41E+00
Tetrachloroethylene	1.33E+01	2.19E-05	2.00E+01	NA	2.00E-01	3.72E-03	1.86E-02
1,1,2-Trichloroethane	NA	6.22E-07	9.20E+01		9.20E-01	2.59E-09	2.82E-09
Trichloroethylene	2.82E-01	3.42E-05	1.80E+01	NA	1.80E-01	7.90E-03	4.39E-02
Vinyl chloride	1.48E-01	4.04E-06	1.30E-01	NA	1.30E-03	4.15E-05	3.19E-02
Xylene	5.81E-02	NA	5.00E+02	NA	5.00E+00	1.63E-05	3.26E-06

[a]Section 5.4.3.2.
[b]Section 5.4.3.1.
[c]Section 5.4.
[d]Nuclear Regulatory Commission (NRC), 1980.
[e] Section 5.6.
[f]Deer hazard index = (Applied Daily Intake)/(Acceptable Daily Intake). An HI less than or equal to unity indicates that the acceptable daily dose is not expected to be exceeded. In that case, no adverse impact on deer is predicted.

Notes: NA = Not applicable
ND = No data available.
NOAEL = No-observed-adverse-effect level.

FIGURE 5-1. BASELINE RISK ASSESSMENT PROCESS



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6.0 SUMMARY AND RECOMMENDATIONS

6.1 SUMMARY

6.1.1 Nature and Extent of Contamination

The RI involved sampling of the soil, surface waters, sediments, ground water, and air was conducted at the SCRDI site to define the character and extent of contamination at the site.

Lagoons and soils on the SCRDI site are source areas contributing volatile organics to the surficial aquifer. A contaminant plume approximately 1,000 feet wide has migrated from the SCRDI site in a southeasterly direction and extends approximately 2,200 feet from the eastern edge of the wet lagoon. The maximum ground water concentration of total volatile chemicals found at any one location was in excess of 20,000 ppb. The plume apparently has not moved from its December 1985 position. No other off-site contributors to the surficial ground water contamination could be identified. Well pairs indicate that the contamination in the surficial aquifer is uniform with depth, with only a slightly higher incidence of denser chlorinated organics found in the deeper of the well pair.

Four deep wells (75 to 100 feet) were installed in the confined aquifer to check for contamination, to determine the direction of ground water flow, and to determine the extent and thickness of the confining clay layer. No contamination was found in any of the four newly installed wells. Ground water flow is in a southerly direction toward Bluff Road. The confining clay layer extends throughout the site area and varies in thickness. Thickness ranges from 30 feet along Bluff Road to approximately 1½ feet in the area of MW-5 upgradient from the site.

Soil contamination caused by the presence of organic chemicals is prevalent in the cleared portions of both the SCRDI and Roof properties. In the SCDHEC drum staging areas, the contamination is limited to the top 3 feet of soil. The SCRDI property itself is contaminated with organics in the top 11 feet

(the water table) from Bluff Road to the wet lagoon area. Metals, PCB, and pesticide contamination appear to be localized on the site.

Sediments from both lagoons on the SCRDI property are contaminated with a variety of organic chemicals and metals, although heavy metals are limited. Water in the wet lagoon is contaminated with metals, although no organic chemicals were found. No significant contamination was found in either the surface water drainage system downgradient from the site or in the ambient air samples collected on the site during the field investigation.

As part of the RI an aboveground tank which contained approximately 100 gallons of phenolic sludge was removed. The sludge was removed from the tank and incinerated, and the tank was cut up and disposed of by burial.

All of the SCDHEC monitoring wells that could be located were abandoned.

6.1.2 Risk Assessment

A risk assessment was conducted to evaluate the potential for off-site migration of chemicals from the SCRDI site and the impacts, if any, on public health and/or the environment. The risk analysis evaluated the potential impact upon public health and/or the environment of all chemicals which are classified by CAG as Class A or B carcinogens and selected noncarcinogenic indicator chemicals.

6.1.2.1 Migration and Exposure Pathway Analysis

The extent of chemicals in environmental media at the SCRDI site was shown to be limited to the on-site soils and the shallow ground water aquifer underlying the site (Section 4.0). Elevated levels of site-related chemicals were not found in off-site soil samples, sediment samples from drainage ditches, the deep ground water aquifer, or in surface water samples from drainage ditches or local creeks (Appendix A). The only potential route of off-site migration was shown to be via the shallow ground water aquifer. This aquifer may recharge Myers Creek, 3,200 feet northeast of the site boundary, but site-related chemicals have not migrated into Myers Creek.

The wooded area surrounding the site is remote and routine foot travel in this area is uncommon. Access to the SCRDI site is limited either through natural or man-made barriers; therefore, the likelihood of direct dermal contact with the soils is unlikely. There are no human activities near the site that would require a person to spend long periods of time on site or adjacent to the site. Therefore, direct inhalation of site-related, particulate-bound chemicals was not considered in the risk assessment.

Well surveys within the study area, have shown that no known domestic wells exist that draw water from the shallow aquifer. The shallow aquifer may recharge Myers Creek and migration into this creek remains possible under current conditions. Recreational activities in Myers Creek are limited to fishing. The creek is a shallow, black-water creek and is not used for swimming or water sports activities. Prolonged contact of large areas of exposed skin with the waters of Myers Creek does not appear to occur.

Deer hunting is a major activity in the area and under a potential exposure scenario deer may ingest site-related chemicals from drinking water in Myers Creek and by consuming vegetation growing on the SCRDI site. Bioconcentration in the tissue of deer and fish was shown to be a potential exposure pathway to people who eat venison or fish caught in the area. Site-specific exposure models were developed for potential food-chain exposure for humans and applied daily doses were estimated.

6.1.2.2 Exposure Assessment for Current Use Scenarios

Two exposure scenarios were used to estimate the intake of venison and fish, based upon consumption surveys and other data. Both scenarios represented a specific subset of the general population - a dedicated hunter, or a person who spends a large amount of his leisure time hunting and fishing. It was assumed that an individual potentially receiving an average exposure (AEI) would consume venison about once weekly at the evening meal. Half of the AEI's average daily fish consumption of 20 grams (USDA, 1985) would come from fish caught in Myers Creek. A maximally exposed individual (MEI) was assumed to consume venison about twice weekly at the evening meal. All of the MEI's fish intake was assumed to come from fish caught in Myers Creek. The estimated applied daily intakes for an AEI ranged from 1.15×10^{-11} mg/kg-day for xylene

to 1.82 x 10^{-7} mg/kg-day for 2-chlorophenol. The analogous range of estimated intakes for a MEI was 2.29 x 10^{-11} mg/kg-day for xylene to 3.64 x 10^{-7} mg/kg-day for 2-chlorophenol.

6.1.2.3 Risk Characterization for Current Use Scenario

In weighing acceptable residential exposures to potentially carcinogenic compounds, an acceptable level of risk must be determined. Cancer is a significant cause of death in the United States with a background incidence of about 3 in 10 (280,000 cases in a population of 1,000,000) (American Cancer Society, 1988). Approximately 80 percent of these cases result in death directly attributable to the disease. Incremental lifetime cancer risk (also referred to as excess cancer risk) is defined as the estimated increased risk that occurs over an assumed average lifespan of 70 years (EPA, 1986) as the result of exposure to a specific known carcinogen. Thus, an incremental lifetime cancer risk of one in a million (1 x 10^{-6}) may be interpreted as an increase in the baseline cancer incidence from 280,000 per million population to 280,001 per million population. Based on the scientific evidence and the regulatory precedence of the acceptable risk ranges set for exposures to carcinogens in drinking water and at Superfund site cleanups, rigid adherence to an incremental lifetime cancer risk of 1 x 10^{-6} may be unwarranted in the exposure scenario developed in the current risk assessment.

The incremental cancer risk estimates for chemicals classified as Class A, B, or C carcinogens are the estimated probabilities of increase in the number of cancer cases within a population. For example, if the incremental cancer risk value is 1 x 10^{-6}, this is equivalent to the occurrence of one additional cancer within a population of one million people. The incremental cancer risk estimates for potential current use exposures to site-related chemicals classified as carcinogens ranged from 1.59 x 10^{-8} for 1,1-dichloroethylene 3.36 x 10^{-12} for methylene chloride for the AEI. The incremental risk values for potential MEIs ranged from 3.17 x 10^{-8} to 6.72 x 10^{-12} for these chemicals, respectively (Table 5-7).

The hazard index (HI) was used to evaluate the risk associated with exposure to noncarcinogenic chemicals. The HI does not define dose-response relationships and its numerical value should not be construed to be a direct

estimate of risk. The HI is only a numerical indication of the nearness to acceptable limits of exposure or the degree to which acceptable exposure levels are exceeded. As this index approaches unity, concern for the potential hazard of the mixture increases. Exceeding unity does not in itself imply a potential hazard. It does suggest that a given situation should be more closely scrutinized (EPA, 1986).

The HIs for the AEI ranged from 1.65×10^{-3} for mercury to 1.15×10^{-9} for xylene. For the MEI, none of the HIs exceeds that estimated for mercury (3.29×10^{-3}) (Table 5-8). This value approaches nearly three orders of magnitude below the benchmark value of unity.

6.1.2.4 Exposure Assessment for Potential Future Use Scenarios

Potential future use scenarios have been developed to estimate any risks associated with the presence of site-related chemicals in the shallow aquifer and in surficial soils.

The estimated values used in the exposure models for these scenarios are given in Table 5-9. The applied daily intakes for known or suspected carcinogens for each stage of childhood and adolescence are given in Tables 5-10 through 5-14. The values for adults are found in Table 5-15. Estimated daily intakes for noncarcinogens for infants, children and late adolescents are found in Table 5-16, while estimated adult intakes are found in Table 5-17.

No foot travel by trespassers has been observed by site personnel. The terrain is not conducive to this activity; furthermore, the SCRDI site is currently fenced.

Exposure scenarios were developed for an average exposed individual (AEI) wearing shoes, long-sleeve shirt and long pants and a maximally exposed individual (MEI) wearing shoes, short-sleeve shirt and shorts (EPA, 1989). A discussion of the exposure model and the assumptions used are presented in Appendix G.

The estimated applied daily intakes for the AEI range from 3.18×10^{-10} mg/kg-day for chloroform to 4.11×10^{-6} mg/kg-day for chromium. For the MEI, the

range of estimated intakes is 1.5 X 10^{-9} mg/kg-day for chloroform to 1.90 x 10^{-5} mg/kg-day for chromium (Table 5-18).

6.1.2.5 Risk Characterization for Potential Future Use Scenarios

The estimated incremental lifetime cancer risks for childhood and adolescence for the drinking water scenario are given in Table 5-19. The estimated incremental lifetime cancer risks for AEI for children ranged from 7.67 x 10^{-4} for 1,1-dichloroethylene to 3.02 x 10^{-9} for bis (2-ethylhexyl) phthalate. The incremental cancer risk for the MEI ranged from 8.84 x 10^{-4} for 1,1-dichloroethylene to 3.48 x 10^{-9} for bis (2-ethylhexyl) phthalate.

The estimated incremental lifetime cancer risks for the drinking water scenario for adults are given in Table 5-15. The estimated incremental lifetime cancer risks for AEI for adults ranged from 1.43 x 10^{-3} for 1,1-dichloroethylene to 5.63 X 10^{-9} for bis (2-ehtylhexyl)phthalate. The incremental cancer risk for the MEI ranged from 2.05 X 10^{-3} for 1,1-dichloroethylene to 8.04 X 10^{-9} for bis (2-ethylhexyl) phthlalate.

The hazard indices for noncarcinogens for the drinking water scenario for the AEI ranged from 3.33 X 10^{-3} for mercury to 2.28 x 10^{0} for 2-chlorophenol for the infant; 3.01 x 10^{-3} for mercury to 2.07 X 10^{0} for 2-chlorophenol for a child; and 1.41 X 10^{-3} for mercury to 9.69 X 10^{-1} for 2-chlorophenol for late adolescents. The range of MEI health indices for the previous chemicals ranged from 5.83 X 10^{-3} to 4.00 X 10^{0} for infants; 3.32 X 10^{-3} to 2.28 x 10^{0} for a child; and 1.52 X 10^{-3} to 1.04 X 10^{0} for the late adolescent.

The hazard indices for the drinking water scenario for the adult AEI ranged from 2.24 X 10^{-3} for mercury to 1.54 X 10^{0} for 2-chlorophenol. The range for the MEI is 3.20 X 10^{-3} for mercury to 2.19 X 10^{0} for 1,2-chlorophenol.

The HI for the trespasser scenario for the AEI ranged from 3.28 X 10^{-8} for chloroform to 3.41 X 10^{-4} for trichloroethylene (TCE). The HI range for the MEI is 1.51 X 10^{-7} for chloroform to 1.58 X 10^{-3} for TCE. The highest HI was nearly three orders of magnitude below the benchmark value of one. Therefore the presence of site-related chemicals in the soils at the SCRDI site do not

present a potential risk to the health of potential adult or child trespassers on the site.

6.1.2.6 Environmental Assessment

Chemical concentrations to which aquatic populations in Myers Creek may be exposed ranged from 3.69×10^{-4} mg/L for acetone to 1.09×10^{-7} mg/L for mercury. The predicted chemical concentrations in Myers Creek, will not have a significant impact upon indigenous aquatic populations. To assess the possible impact of chemicals migrating into Myers Creek the maximum acceptable toxicant concentration (MATC) was determined for the most sensitive species which may be found in Myers Creek. The MATC is the calculated concentration of a chemical which will not have an adverse effect upon a chronically exposed population. The predicted chemical concentrations in Myers Creek are over three orders of magnitude lower than the respective MATCs (Table 5-20). The contribution from the SCRDI site would have to be over 1,000 times higher than the predicted rate to have an adverse effect upon aquatic populations.

Acceptable daily doses for deer were determined based upon the available published literature. The applied daily dose for deer ranged from 4.51×10^{-2} mg/kg-day for 1,1,2,2-tetrachloroethane to 2.59×10^{-9} mg/kg-day for 1,1,2-trichloroethane. All of the applied daily intakes for deer except 1,1,2,2-tetrachloroethane are more than an order of magnitude below the acceptable daily intakes. However, this chemical occurred in only one soil sample. Frequent exposure to this level is improbable. Therefore, the predicted exposure intakes for deer would be expected to be below those intakes which may have an adverse effect upon the deer populations in the area.

6.1.2.7 Conclusions

The overall conclusions for the current site uses are that based on current knowledge of the site no significant levels of public health or environmental risks are associated with the off-site migration of chemicals at the SCRDI site. For the hypothetical future use scenarios, there appear to be concentrations of site-related chemicals in the shallow aquifer that may result in elevated levels of exposure only if all the health protective assumptions of the scenario are realized.

The assumptions used in this assessment were health- and environmentally-protective, and estimations in this assessment of potential intakes to both humans and wildlife may be greater than any actual exposures, should they occur.

6.2 RECOMMENDATIONS

6.2.1 RI Recommended Remedial Action Technologies

40 CFR 300.68(e)(2)(i) specifies that the population, environmental, and welfare concerns at risk be assessed, as appropriate, to determine what type of remedial and/or removal actions will be considered. Management of migration remedial actions will be required to ensure that contaminated ground water does not pose in the future an unacceptable risk to the surrounding population. Source control remedial measures also will be required to eliminate release of contaminants via leaching to the ground water.

A complete list of local, state of South Carolina, and Federal ARARs will be identified as part of the FS to develop cleanup standards for the site and in developing the ultimate remedy.

Following is a list of remedial action technologies and alternatives that have been identified for the Bluff Road site. This list is preliminary only, but will serve as a basis for EPA Region IV, the State of South Carolina, local government officials, and the public to be made aware of potential remedial measures that may be considered for site remediation.

In accordance with the RI/FS guidance, the no-action remedial alternative will be considered in the FS. Other alternatives/technologies may include:

Source Control Technologies	Management of Migration Technologies
• In situ biodegradation or flushing	• Ground water extraction
• Thermal treatment	• Ground water treatment
• Soil venting, aeration, or vapor recovery	- Air stripping - Carbon adsorption - Biological treatment

- Publicly owned treatment works (POTW) utilization

- **Excavation and off-site disposal**

The FS will include a list of all technologies and alternatives considered along with a detailed review and screening of each. A total of up to five potential remedial alternative groups will be screened in detail. They may include the following categories:

- Treatment or disposal at an off-site facility
- Alternatives that attain applicable or relevant standards
- Alternatives that exceed applicable or relevant standards
- Alternatives that do not attain applicable or relevant standards but will reduce the likelihood of present or future threats to the public
- A no-action alternative.

From these alternatives that have been screened in detail, the most appropriate remedial alternative for the site will be selected.

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[2]The parties on whose behalf this report is submitted do not necessarily agree with or adopt the findings, conclusions, or results contained in these reported studies.

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