Y/SUB/98-KDS15V/3

Y-12

OAK RIDGE
Y-12
PLANT

LOCKHEED MARTIN

CALENDAR YEAR 1997 ANNUAL GROUNDWATER MONITORING REPORT FOR THE UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME AT THE U.S. DEPARTMENT OF ENERGY Y-12 PLANT, OAK RIDGE, TENNESSEE

RCRA Post-Closure Permit No. TNHW-089
EPA Identification No. TN3 89 009 0001

February 1998

Prepared by

AJA TECHNICAL SERVICES, INC.
Under Purchase Order 70Y-KDS15V

for the

Surveillance and Maintenance Program
at the Oak Ridge Y-12 Plant,
Project Execution, Environmental Management
and Enrichment Facilities

Managed by

LOCKHEED MARTIN ENERGY SYSTEMS, INC.
for the U.S. Department of Energy
Under Contract No. DE-AC05-84OR21400

MANAGED BY
LOCKHEED MARTIN ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

UCN-13672 (26 6-95)

Y/SUB/98-KDS15V/3

CALENDAR YEAR 1997
ANNUAL GROUNDWATER MONITORING REPORT
FOR THE
UPPER EAST FORK POPLAR CREEK HYDROGEOLOGIC REGIME
AT THE
U.S. DEPARTMENT OF ENERGY Y-12 PLANT,
OAK RIDGE, TENNESSEE

RCRA Post-Closure Permit No. TNHW-089
EPA Identification No. TN3 89 009 0001

February 1998

Prepared by

AJA TECHNICAL SERVICES, INC.
Under Purchase Order 70Y-KDS15V

for the

Surveillance and Maintenance Program at the Oak Ridge Y-12 Plant,
Project Execution, Environmental Management and Enrichment Facilities

Managed by

LOCKHEED MARTIN ENERGY SYSTEMS, INC.
for the U.S. Department of Energy
Under Contract No. DE-AC05-84OR21400

CONTENTS

CONTENTS (cont'd)

List of Figures

List of Tables

List of Acronyms and Abbreviations

ASO	Analytical Services Organization
BCV	Bear Creek Valley
Bear Creek Regime	Bear Creek Hydrogeologic Regime
bgs	below ground surface
BT	buried tributary (Upper East Fork Poplar Creek)
CA	characterization area (CERCLA)
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CMTF	Central Mercury Treatment Facility
CY	calendar year
DNAPL	dense, nonaqueous phase liquids
DOE	U.S. Department of Energy
DQO	data quality objective
East Fork Regime	Upper East Fork Poplar Creek Hydrogeologic Regime
EMTF	East End Mercury Treatment Facility
ETTP	East Tennessee Technology Park (formerly the Oak Ridge K-25 Site)
ft	feet
ft/d	feet per day
GWPS	Groundwater Protection Standard (RCRA)
LRSPW	Lake Reality spillway
MDA	minimum detectable activity
µg/L	micrograms per liter
mgd	million gallons per day
mg/L	milligrams per liter
msl	mean sea level
NPDES	National Pollution Discharge Elimination System
ORR	Oak Ridge Reservation
PCE	tetrachloroethene
pCi/L	picoCuries per liter
PCP	post-closure permit
QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
redox	oxidation/reduction potential
RI	remedial investigation (CERCLA)
TCE	trichloroethene
TDEC	Tennessee Department of Environment and Conservation
TDS	total dissolved solids
UEFPC	Upper East Fork Poplar Creek
VOC	volatile organic compound
^{99}Tc	technetium-99
^{234}U	Uranium-234
^{238}U	Uranium-238

Certification Statement

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Lockheed Martin Energy Systems, Inc.
Co-Operator

2/25/98

Date Signed

RCRA Facility Information

Facility:	U.S. Department of Energy Oak Ridge Y-12 Plant
Identification No.:	TN3 89 009 0001
Tennessee Permit No.:	TNHW-089
Address:	P.O. Box 2001 Oak Ridge, Tennessee 37831

Executive Summary

This report contains the groundwater monitoring data obtained during calendar year (CY) 1997 in compliance with the Resource Conservation and Recovery Act (RCRA) post-closure permit (PCP) for the Upper East Fork Poplar Creek Hydrogeologic Regime (East Fork Regime) at the U.S. Department of Energy (DOE) Y-12 Plant in Oak Ridge, Tennessee. Issued by the Tennessee Department of Environment and Conservation (TDEC), the PCP defines the RCRA post-closure corrective action monitoring requirements for the portion of the groundwater contaminant plume that has migrated into the East Fork Regime from the S-3 Ponds, a closed RCRA-regulated former surface impoundment located in Bear Creek Valley near the west end of the Y-12 Plant. In addition to the RCRA post-closure corrective action monitoring results, this report contains the groundwater and surface water monitoring data obtained during CY 1997 to fulfill requirements of DOE Order 5400.1.

Groundwater and surface water samples were collected from 41 monitoring wells and one surface water station for the purposes of these monitoring programs. Sampling was performed during each quarter of the year at the frequency specified by the governing monitoring program. In July 1997, the TDEC agreed to update the technical procedure for groundwater sampling incorporated as Attachments 5 to the PCP. Along with technical updates and modifications, the revised version describes the low-flow minimal drawdown sampling method, which was used to obtain all groundwater samples collected during the fourth quarter of CY 1997. Most of the groundwater and surface water samples were analyzed for a standard suite of inorganic, organic, and radiological analytes. All groundwater samples collected for RCRA post-closure corrective action monitoring were analyzed for the Groundwater Protection Standard (GWPS) constituents listed in Attachment 3, Section E of the PCP.

Condition V.G.3 of the PCP requires annual evaluation of the groundwater flow direction and rate in the uppermost aquifer at the Eastern S-3 Ponds. The uppermost aquifer consists of two distinct hydrogeologic units: the Aquitard (primarily low-permeability shales) and the Aquifer (carbonates with solution-enhanced permeability). Construction and operation of the Y-12 Plant have substantially altered the shallow flow system throughout much of the regime, with local flow directions strongly influenced by buried drainage features, subsurface drains, and basement sumps. Based on the groundwater surface elevations determined from depth-to-water measurements recorded during April and October 1997, groundwater flow directions near the Eastern S-3 Ponds are generally southeasterly from the Aquitard toward the Aquifer, and easterly in the Aquifer toward the east end of the Y-12 Plant. Flow rates at shallow depths in both hydrogeologic units, as estimated using the modified Darcy equation, range over several orders-of-magnitude, but the lower rates probably dominate, particularly in the Aquitard.

As required under PCP condition V.G.4, evaluation of the CY 1997 RCRA post-closure corrective action monitoring data for point-of-compliance well GW-108 was based on trend analysis of results for selected GWPS constituents. This well typically yields highly contaminated calcium-magnesium-bicarbonate groundwater from the shallow bedrock (Nolichucky Shale) in the Aquitard about 800 feet (ft) southeast of the S-3 Ponds. Results for filtered and unfiltered groundwater samples collected in March and August 1997 are consistent with historical (1986-1996) data for the

well and are characterized by high levels of nitrate and technetium-99 (^{99}Tc); elevated total and dissolved concentrations of several trace metals, particularly barium; fairly moderate summed concentrations of a few volatile organic compounds (primarily acetone, chloroform, and methylene chloride); and conspicuously low gross alpha activity. The monitoring results for well GW-108 obtained since 1986 show decreasing inorganic (nitrate and barium), increasing radiologic (gross beta and ^{99}Tc), and relatively steady organic (chloroform) contaminant concentrations in the groundwater east of the S-3 Ponds Site. These long-term concentration trends do not clearly indicate a significant change in the performance of the low permeability cap at the S-3 Ponds.

Evaluation of RCRA post-closure corrective action monitoring data for the plume delineation wells specified under permit condition V.C.1 (GW-193, GW-605, GW-606, and GW-733) was based on detection of ^{99}Tc, which is the "signature" GWPS constituent unique to the S-3 Ponds. Under condition V.D.2 of the PCP, detection of ^{99}Tc concentrations above the MDA reported for groundwater samples from any of these wells is considered indicative of contaminant migration from the site. Although several of the GWPS constituents that are not unique contaminants attributable to the S-3 Ponds were detected in samples from each of the RCRA plume boundary wells, ^{99}Tc was not detected in any of the samples from these wells. Therefore, the CY 1997 RCRA post-closure corrective action monitoring data show that wells GW-193, GW-605, GW-606, and GW-733 continue to effectively serve the plume boundary monitoring purposes of the PCP.

1.0 INTRODUCTION

This annual monitoring report contains groundwater and surface water monitoring data obtained in the Upper East Fork Poplar Creek Hydrogeologic Regime (East Fork Regime) during calendar year (CY) 1997. The East Fork Regime encompasses several confirmed and suspected sources of groundwater contamination within industrialized areas of the U.S. Department of Energy (DOE) Y-12 Plant in Bear Creek Valley (BCV) southeast of Oak Ridge, Tennessee (unless otherwise noted, directions are in reference to the Y-12 Plant administrative grid) (Figure 1).

This report contains the groundwater monitoring data obtained during CY 1997 in compliance with the Resource Conservation and Recovery Act (RCRA) post-closure permit (PCP) for the East Fork Regime (permit number TNHW-089). Issued by the Tennessee Department of Environment and Conservation (TDEC), the PCP defines the post-closure care and groundwater monitoring requirements for two closed RCRA hazardous waste treatment, storage, or disposal units: the S-3 Ponds and New Hope Pond. Results of RCRA post-closure corrective action groundwater monitoring in the East Fork Regime must be reported to the TDEC semiannually. The monitoring results obtained during the first 180-day reporting period for CY 1997 were submitted to the TDEC before the September 1 deadline specified by the PCP (Lockheed Martin Energy Systems, Inc. 1997). This report contains the monitoring results obtained during the first and second 180-day reporting periods for the year, along with the signed certification statement (Page vi), the RCRA facility information (Page vii), and the annual monitoring data evaluations (Section 4.0) that must be reported to the TDEC before the March 1 deadline specified under condition II.C.6 of the PCP.

Section V of the PCP contains the permit conditions that specify the groundwater monitoring requirements for the portion of the S-3 Ponds groundwater contaminant plume that has migrated into the East Fork Regime (hereafter referenced as the Eastern S-3 Ponds Plume). In July 1997, the TDEC recognized several editorial corrections and clarifications to permit conditions II.A (Sampling, Analysis, and Monitoring) and II.C.6(c) (Recordkeeping and Reporting), and incorporated revised versions of the technical procedures contained in Attachment 3, Section D (monitoring well inspection and well depth measurement), Attachment 5 (groundwater sampling), and Attachment 6

(monitoring well plugging and abandonment) to the PCP (Tennessee Department of Environment and Conservation 1997).

The PCP does not currently specify groundwater monitoring requirements for New Hope Pond (only post-closure maintenance requirements are defined) because this site does not discernibly contribute to the extensive plume of groundwater contamination emanating from numerous sources in the East Fork Regime (including the Eastern S-3 Ponds Plume). Under the terms of the PCP, RCRA post-closure groundwater monitoring at New Hope Pond is deferred to the risk-based monitoring requirements that will be defined in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) record of decision for the Upper East Fork Poplar Creek (UEFPC) Characterization Area (CA).

In addition to the RCRA post-closure corrective action monitoring data, this report contains CY 1997 groundwater and surface water monitoring data obtained to fulfill requirements of DOE Order 5400.1. These data are collected as required under the Environmental Monitoring Plan for the Oak Ridge Reservation (ORR) (U.S. Department of Energy 1996).

The following narrative sections of the report provide background information regarding the waste management sites in the East Fork Regime, the hydrogeologic framework, and the extent of groundwater contamination (Section 2.0); summarize the CY 1997 groundwater and surface water sampling and analysis activities, including quality assurance/quality control (QA/QC) sampling and data management (Section 3.0); and present results of the RCRA monitoring data evaluations required annually under sections V.D and V.G of the PCP (Section 4.0). Documents cited for more detailed operational, regulatory, or technical information regarding the waste management sites and associated monitoring programs are listed in Section 5.0.

Narrative sections of the report reference a series of appendices. Illustrations (maps and trend graphs), tables, and monitoring well construction details are presented in Appendix A, Appendix B, and Appendix C, respectively. Results of laboratory analyses and field measurements for each groundwater and surface water sampling location are presented in several subsections of Appendix D (organized by groups of related analytical parameters/measurements). Data for the QA/QC samples associated with each groundwater and surface water sample are presented in respective subsections of Appendix E. Appendix F describes the process used to identify CY 1997 groundwater and surface water data that do not meet applicable data quality objectives (DQOs).

2.0 BACKGROUND INFORMATION

The East Fork Regime includes the section of BCV encompassing the Y-12 Plant industrial facilities and support structures located between Scarboro Road to the east of the plant and Old Bear Creek Road at the west end of the plant (Figure 1). For the purposes of this report, the East Fork Regime is divided into: (1) the Western Plant Area, defined as the portion of the regime west of the Y-12 Plant grid coordinate easting 55,000, (2) the Central Plant Area, defined as the part of the regime between grid coordinate eastings 55,000 and 62,000, and (3) the Eastern Plant Area, defined as the portion of the regime east of grid coordinate easting 62,000. The following sections provide an overview of the hydrogeologic framework in the East Fork Regime, a brief description of confirmed and suspected sources of contamination, and the extent of groundwater contamination in the regime.

2.1 Hydrogeologic Framework

The following overview of the hydrogeologic system in the East Fork Regime is based on: (1) the conceptual groundwater flow models described in the *Remedial Investigation Report for Bear Creek Valley* (U.S. Department of Energy 1997); (2) the general hydrogeologic framework and associated nomenclature described in Solomon et al. (1992); (3) hydraulic properties and flow characteristics presented in Moore (1988 and 1992), and Moore and Toran (1992); and (4) results of hydrologic studies and investigations in BCV, including Dreier et al. (1987), Shevenell (1994), Shevenell et al. (1993), and Goldstrand (1995). Key aspects of the geology in the East Fork Regime, the principal hydrogeologic units and respective groundwater flow characteristics, and the general hydrology of UEFPC are summarized in the following subsections.

2.1.1 Topography and Bedrock Geology

Bear Creek Valley is flanked to the north by Pine Ridge and to the south by Chestnut Ridge. Ground elevations range from about 1,200 feet (ft) above mean sea level (msl) on the ridge crests to 900 ft msl along the exposed channel of UEFPC. The most prominent topographic feature is the

gap in Pine Ridge cut by UEFPC northeast of the Y-12 Plant (Figure 2), which generally corresponds with a less prominent divide in Chestnut Ridge to the southeast of the plant.

Alternating sequences of clastic and carbonate strata that form the distinctive topography of the Valley and Ridge Physiographic Province characterize the bedrock geology in the East Fork Regime. Shale and siltstone beds of the Rome Formation form Pine Ridge to the north, limestone and shale formations of the Conasauga Group form BCV, and the primarily dolostone formations of the Knox Group form Chestnut Ridge to the south (Figure 2). Strike and dip of bedding are generally N 55°E and 45°SE, respectively (as referenced to true north). Bedrock is overlain by up to 40 ft of several materials, including manmade fill, alluvium, colluvium, fine-grained residuum from the weathering of the bedrock, and saprolite (weathered bedrock). Where undisturbed, the saprolite often retains primary textural features of the unweathered bedrock, including fractures (Solomon et al. 1992).

Extensive cut-and-fill areas within the Y-12 Plant have substantially altered the shallow subsurface throughout much of the East Fork Regime (Figure 3). Most of the fill, which generally consists of a heterogeneous mixture of building debris and recompacted soil/residuum that contains many voids, was placed within the tributaries and main channel of UEFPC (Sutton and Field 1995). The numerous voids, heterogeneous composition, and varying thickness (5 to 25 ft) significantly influence shallow groundwater flow directions and contaminant migration patterns. Extensive physical structures and utilities also influence shallow groundwater movement throughout a majority of the regime.

2.1.2 Groundwater System

On the ORR, the Rome Formation, the Conasauga Group, and the Knox Group comprise two basic hydrogeologic units: (1) the Aquifer, consisting of the Maynardville Limestone (upper Conasauga Group) and Knox Group, and (2) the Aquitard, consisting of the remaining Conasauga Group formations (Nolichucky Shale, Maryville Limestone, Rogersville Shale, Rutledge Limestone, and Pumpkin Valley Shale) and Rome Formation (Figure 2). The Aquifer (Maynardville Limestone) functions as a hydrologic drain in BCV, and provides the principal avenues for contaminant transport

in the East Fork Regime. The Aquitard formations underlie most of the contaminant source areas in the regime, and are hydraulically upgradient of the Aquifer.

Fractures provide the primary groundwater flowpaths in the Aquitard and the Aquifer, but dissolution of carbonates in the Aquifer has enlarged fractures and produced solution cavities and conduits that greatly enhance its hydraulic conductivity relative to the Aquitard. Although negligible in both units, flow through the porous rock matrix plays an important role in contaminant migration because of matrix diffusion processes. Most of the flow in both units is primarily parallel to bedding (along strike and dip), which in the Aquitard may or may not coincide with the direction of maximum horizontal hydraulic gradient inferred from groundwater elevation isopleths. Flow tangential to bedding occurs primarily along permeable zones formed by crosscutting fractures or fracture zones (and possibly small faults). Some of these crosscutting structures may act as barriers to lateral flow, causing groundwater from deeper intervals to upwell and discharge to the shallower flow system in each hydrogeologic unit. Others may serve as preferential pathways for migration of contaminants from the Aquitard into the Aquifer (Maynardville Limestone), particularly in the shallow flow system.

Nearly all groundwater flow in the Aquitard occurs within a highly permeable interval near the bedrock/residuum interface (the water table interval). Below the water table interval, flow is most active at depths less than 100 ft below ground surface (bgs); however, contaminants in groundwater more than 100 ft bgs clearly indicate permeable flowpaths at depth. Flow occurs in response to precipitation when flowpaths in the residual soils become saturated and rapidly transmit water laterally (stormflow) toward nearby drainage features, and vertically (recharge) to the water table interval. Inflow into the water table interval promotes strike-parallel groundwater flow toward discharge areas in nearby cross-cutting streams. Only a small percentage of total flow ultimately recharges to the deeper bedrock, where upward hydraulic gradients predominate.

Decreasing groundwater flux with depth in the Aquitard also is reflected by distinct changes in groundwater geochemistry. Most water table interval and shallow (i.e., <100 ft bgs) bedrock wells monitor calcium-magnesium-bicarbonate groundwater. Based primarily on data obtained in the Bear Creek Hydrogeologic Regime (Bear Creek Regime), a fairly abrupt change to sodium-bicarbonate groundwater occurs at a depth of about 100 ft bgs, and is interpreted to be a function of longer

groundwater residence time related to reduced fracture aperture or increased fracture spacing (Solomon et. al. 1992). Data for Aquitard wells in the East Fork Regime, however, suggest a similar but shallower (<70 ft bgs) geochemical transition to sodium-bicarbonate groundwater (AJA Technical Services, Inc. 1996a). A shallower transition to this type of groundwater may be the net effect of comparably lower recharge because of the many paved and impervious surfaces in the regime, combined with dewatering of the shallow flow system from long-term operation of basement sumps in buildings throughout the Y-12 Plant. Data for deep Aquitard wells in the Bear Creek Regime indicate a transitional change from sodium-bicarbonate groundwater to sodium-chloride groundwater at a depth of about 400 ft bgs. This transition is usually accompanied by increased total dissolved solids (TDS) and also reflects reduced groundwater flux at depth in the Aquitard.

Most groundwater flow in the Aquifer occurs at shallow depths (i.e., <100 ft bgs) in an extensively interconnected maze of solution conduits and cavities (karst network). Flow in the shallow karst network is relatively rapid, and during rainfall, may occur as "quickflow" recharge/discharge toward springs or nearby surface drainage features (Shevenell 1994). Below the shallow karst network, fractures provide the primary flowpaths, and there are important lithologic controls on groundwater flow (Goldstrand 1995). Lithologic characteristics differentiate seven distinct stratigraphic zones (numbered from bottom to top) in the Maynardville Limestone. The more permeable zones lie at the bottom (Zone 2) and top (Zone 6) of the formation (Shevenell et al. 1993). Because of vugular porosity related to dissolution of gypsum nodules, Zone 6 is the most permeable interval and probably transmits the bulk of the groundwater in this formation (Goldstrand 1995).

Active groundwater circulation occurs at greater depth in the Aquifer than in the Aquitard, and is reflected by the fairly homogeneous geochemistry of the groundwater; virtually every monitoring well in the Maynardville Limestone, regardless of depth, monitors calcium-magnesium-bicarbonate groundwater. Some shallow wells in the Aquifer monitor sulfate-enriched groundwater, which probably reflects dissolution of gypsum and/or locally disseminated sulfides. Several deep wells monitor calcium-magnesium-sulfate groundwater with TDS above 1,000 milligrams per liter (mg/L).

The water table in the East Fork Regime, under both seasonally high and low flow conditions, is a subdued replica of the ground surface, with steep gradients along the flanks of Pine Ridge and Chestnut Ridge and a gentle slope down the axis of BCV (Figure 4). Horizontal hydraulic gradients average about 0.038 across BCV (strike-normal) in the Aquitard, and about 0.011 along the axis of BCV (strike-parallel) in the Aquifer (Maynardville Limestone). Static water level data for several two- and three-well clusters indicate that vertical hydraulic gradients are predominately downward in the Aquifer and upward in the Aquitard, and often reverse in response to seasonal (or episodic) groundwater flow conditions. Strongly downward gradients (>0.1) are evident in the Aquifer near New Hope Pond and in the Aquitard along Scarboro Road at the eastern boundary of the ORR. Upward gradients in the Aquitard average about 0.05, and are highest (>0.1) in the northern Central Plant Area. Artesian monitoring wells in the Rome Formation show that gradients are also strongly upward from the deeper to shallow bedrock in the water gap through Pine Ridge. Vertical gradients (and inferred groundwater flow patterns) in this area probably reflect the hydrologic influence of the bedrock structure associated with the gap in Pine Ridge.

In both the Western Plant Area and Central Plant Area, groundwater generally flows south (across-strike) from the Aquitard toward the Aquifer (Maynardville Limestone), and eastward along strike in the Maynardville Limestone toward the eastern end of the Y-12 Plant. Flow directions diverge from this general pattern in the Eastern Plant Area. In the Aquitard, flow is more directly east (strike parallel) toward UEFPC; in the Aquifer, flow components are north (across strike) in the water table interval toward the water gap in Pine Ridge and east (along strike) in the intermediate and deep bedrock intervals toward Union Valley (Figure 4).

Basement sumps in several buildings within the Y-12 Plant significantly influence local groundwater flow directions. For instance, operation of sumps O-12, E-13, and E-22 in Building 9201-2, which is located near the southeast corner of the Central Plant Area, produces an elliptical, northwest-southeast oriented zone of influence in the water table beneath Building 9201-2 (Figure 4). The orientation of the zone of influence is largely controlled by the topography of the basement and the proximity of permeable fill material (Lockheed Martin Energy Systems, Inc. 1996). Also, a persistent mound in the water table corresponding with the location of a spring discharging (Outfall 51) from the Maynardville Limestone occurs at the southeast end of the building. This

mound probably restricts groundwater flow directly north from UEFPC toward the O-12 Sump, but the zone of influence may draw water northeast from the creek upstream of Building 9201-1 toward the sump (Lockheed Martin Energy Systems, Inc. 1996).

Groundwater flow directions in the Eastern Plant Area are periodically influenced when a 6 ft diameter, 20 ft deep sump is operated to reduce hydraulic pressure on the synthetic liner in Lake Reality. Water level data obtained from nearby water-table and shallow-bedrock monitoring wells during operation of the sump in July 1995 (Jago 1995) generally define an elongated water table depression in the Aquitard (Nolichucky Shale) oriented parallel with strike, and decreased water levels in the Aquifer (Maynardville Limestone) along the main channel of UEFPC (Figure 5). The elongated water-table depression in the Aquitard reflects greater strike-parallel permeability, and decreased water levels in the Aquifer indicate enhanced, cross-strike permeability along a fracture zone possibly associated with the UEFPC channel.

Shallow groundwater flow directions in the vicinity of New Hope Pond and Lake Reality are also influenced by an underdrain system beneath the concrete diversion channel of UEFPC. The underdrain consists of gravel with a slotted-plastic drain line. As part of the CERCLA remedial investigation (RI) for the UEFPC CA, a short-term pumping test was performed in May 1996 using a shallow (12 ft bgs), six-inch diameter well (GW-832) installed into the underdrain. Two hours of pumping at 60 gallons per minute produced one foot of drawdown in the well. Water levels in the Lake Reality Sump also decreased in response to pumping, indicating a direct hydraulic connection between the underdrain and sump.

2.1.3 Surface Water System

Surface water in the East Fork Regime is drained by UEFPC, which was extensively altered during construction of the Y-12 Plant. The headwaters and several thousand feet of the main channel in the upper reach of the creek, including all the northern tributaries of the creek in the Western Plant Area and Central Plant Area, were filled and replaced with an extensive network of underground storm drains (Figure 3). For reference purposes, each buried tributary (BT) of UEFPC is designated with a value representing the tributary number counted downstream from the headwaters (e.g., BT-1).

The underground network of storm drains in the Western Plant Area and Central Plant Area direct surface runoff into the exposed portion of the UEFPC channel at Outfall 21 located about 3,500 ft upstream of Lake Reality (Figure 3). Constructed to replace New Hope Pond, Lake Reality is a lined surface impoundment that serves to help regulate the flow and quality of surface water exiting the Y-12 Plant through UEFPC. During normal operations, flow in UEFPC currently bypasses Lake Reality via a temporary siphon system that has operated since December 1996 (a permanent system is scheduled to be completed in 1998); only a portion of the flow following heavy rainstorms passes through Lake Reality. Bypassing Lake Reality reduces mercury contributions to dry-weather flow in UEFPC.

The bulk (70%) of dry-weather flow in UEFPC, excluding flow augmentation, is attributable to once-through non-contact cooling water, condensate, and cooling tower blowdown, and the remaining 30% is from groundwater discharge (CDM Federal Programs Corporation 1994). Beginning in July 1996, raw water (i.e., Clinch River water from the intake lines of the DOE water treatment plant that supplies potable water to the Y-12 Plant, the Oak Ridge National Laboratory, and the City of Oak Ridge) has been discharged near Outfall 200 to augment flow in UEFPC, which decreased from 10-15 million gallons per day (mgd) to about 2.5 mgd because of reduced operations at the Y-12 Plant in recent years. Flow augmentation is needed to achieve the National Pollution Discharge Elimination System (NPDES) minimum daily flow requirement of 7 mgd at Station 17, where UEFPC exits the ORR downstream of Lake Reality (Figure 3). Flow augmentation also allows compliance with NPDES toxicity requirements and helps lower the otherwise elevated water temperature in UEFPC.

Beginning in December 1992, chlorine levels in UEFPC have been reduced using two primary dechlorination systems installed at Outfall 200 and Outfall 21 (Figure 3), and about 40 tablet dechlorinators installed on once-through cooling sources that discharge to other outfalls. Chlorine levels in UEFPC are maintained at essentially zero by the controlled addition of sodium bisulfate.

In addition to the dechlorinating operations, mercury levels in UEFPC have been reduced over the past several years under the Reduction of Mercury in Plant Effluent program, which was initiated to achieve compliance with NPDES requirements. As part of this program, the East End Mercury Treatment Facility (EMTF) located in Building 9201-2 (Figure 3) began operating in May

1996, and the Central Mercury Treatment Facility (CMTF) located in Building 9623 (Figure 3) began operating in December 1996. In addition, mercury-contaminated piping in Buildings 9201-2, 9204-4, 9201-5, and 9201-4 was replaced or bypassed and mercury-contaminated water from basement sumps in these buildings was routed to the CMTF or the EMTF. Other projects planned for UEFPC, but not mandated by the NPDES permits, include treatment of mercury-contaminated water from Outfall 51, routing contaminated storm sewer flow to the CMTF, and paving contaminated ground to prevent surface water infiltration. Along with permanently by-passing Lake Reality, these actions are intended to reduce mercury concentrations to meet the NPDES goal of 5 grams per day mercury load at Station 17 (Figure 3) by December 21, 1998, and 0.012 micrograms per liter (μg/L) by April 27, 2000. These mercury concentration goals are currently under appeal by DOE.

2.2 Contaminant Source Areas

There are multiple confirmed and suspected sources of groundwater contamination within the East Fork Regime (Figure 6), including hazardous and nonhazardous waste treatment, storage, or disposal sites; bulk product transfer, storage, and use areas, including petroleum-fuel underground storage tanks and associated dispensing facilities; waste and product spill areas; and the many process pipelines, effluent drains, and utilities associated with the industrial operations of the Y-12 Plant (Table 2). Contaminant sources include the plume of groundwater contamination in the East Fork Regime that resulted from operation of the S-3 Ponds. The S-3 Ponds are located in the Bear Creek Regime but are addressed as the Eastern S-3 Ponds Plume in the PCP. The PCP also addresses post-closure care requirements for New Hope Pond, although this site is not a discernable source of groundwater contamination in the East Fork Regime. Brief descriptions of both sites are provided below.

Eastern S-3 Ponds Plume

The S-3 Ponds are a closed RCRA-regulated surface impoundment located just west of the topographic and hydrologic divide separating the Bear Creek Regime and the East Fork Regime (Figure 6). Closed and capped in accordance with a RCRA closure plan in 1988, this site originally

consisted of four contiguous surface impoundments that were used from 1951 to 1983 primarily for percolation/evaporation of nitric acid effluent (with depleted uranium in solution) discharged into the ponds via the Abandoned Nitric Acid Pipeline, but also received technetium-99 (^{99}Tc) wastes generated at other DOE facilities. Operation of the S-3 Ponds created a mound in the water table that enabled eastward, strike-parallel contaminant migration into the East Fork Regime. The primary groundwater contaminants associated with the site are nitrate, ^{99}Tc, uranium isotopes (primarily ^{234}U and ^{238}U), trace metals (e.g., barium), and several volatile organic compounds (VOCs), including tetrachloroethene (PCE), acetone, chloroform, and methylene chloride. Because the off-site ^{99}Tc wastes were disposed only at the former S-3 Ponds, ^{99}Tc is a "signature" S-3 Ponds groundwater contaminant in the East Fork Regime. Confirmed detection of ^{99}Tc in groundwater elsewhere in the regime is, therefore, attributable to migration of the Eastern S-3 Ponds Plume.

New Hope Pond

New Hope Pond is located at the east end of the Y-12 Plant (Figure 6). Constructed in 1963, New Hope Pond served to regulate the flow and quality of surface water in UEFPC until 1988, when it was closed in accordance with a RCRA closure plan and replaced by Lake Reality. Sediments containing polychlorinated biphenols, mercury, and uranium were periodically removed from New Hope Pond, but testing indicated that they did not exhibit the characteristics of a hazardous waste. Approximately 25,000 cubic yards of sediment remained in New Hope Pond when it was closed. Closure of the site, certified by the TDEC in December 1990, involved stabilizing the remaining sediments with coarse aggregate and covering the pond with a multi-layer, low-permeability cap (Martin Marietta Energy Systems, Inc. 1988a).

2.3 Groundwater Contamination

The following overview of groundwater contamination in the East Fork Regime is based on conceptual models for groundwater flow and contaminant transport in the Aquitard and the Aquifer described in the Bear Creek Valley RI report (U.S. Department of Energy, 1997), and groundwater quality data obtained through implementation of the *Comprehensive Groundwater Monitoring Plan for the U.S. Department of Energy Y-12 Plant* (Comprehensive Monitoring Plan) (Geraghty &

Miller, Inc. 1990). As described in the following sections, the extent of nitrate essentially illustrates groundwater transport patterns in the Aquitard, dissolved VOC plumes generally reflect multiple source areas and illustrate groundwater transport patterns in the Aquifer, and transport of trace metals and radionuclides is generally less extensive compared to that of nitrate and VOCs.

Nitrate

A plume of nitrate contamination originating from the S-3 Ponds extends vertically in the Aquitard at least 150 ft bgs, and laterally at least 2,000 ft into the Western Plant Area (Figure 7). Nitrate (as N) concentrations (hereafter synonymous with "nitrate" concentrations) within the plume exceed 10,000 mg/L. Concentrations within the plume suggest the following general migration pattern in the Aquitard.

- Eastward, strike-parallel transport in the water table interval, shallow bedrock (i.e., <100 ft bgs), and deeper bedrock toward the buried headwaters of UEFPC located about 500 ft east of the former S-3 Ponds;
- Upward migration from the deep bedrock into the shallow bedrock, and from the shallow bedrock to the water table interval, and discharge from the water table interval into the buried UEFPC headwaters, which channel contaminated groundwater into the Aquifer to the southeast;
- Eastward, strike-parallel transport in the water table interval and shallow bedrock toward a buried tributary of UEFPC (BT-1) located between the Y-12 Plant Salvage Yard and the Waste Coolant Processing Area about 1,800 ft east of the S-3 Ponds (Figure 3);
- Discharge from the water table interval into BT-1, which channels the contaminated groundwater toward the southeast into the Aquifer; and eastward strike-parallel transport in the shallow bedrock beneath the buried tributary; and
- Eastward, strike-parallel transport in the shallow bedrock toward a buried tributary of UEFPC (BT-2) located between Building 9204-4 and Building 9201-5, about 2,700 ft east of the S-3 Ponds (Figure 3).

Because it is chemically stable and highly mobile in groundwater, nitrate probably traces the overall migration pattern for other groundwater contaminants from the S-3 Ponds, including ^{99}Tc.

In the Bear Creek Regime, nitrate concentrations exceed 10 mg/L in Aquifer monitoring wells more than 12,000 ft southwest of the S-3 Ponds. In the East Fork Regime, however, nitrate concentrations are below 5 mg/L in Aquifer monitoring wells only 2,500 ft southeast of the site (Figure 7). Considering the similarly high nitrate concentrations (>10,000 mg/L) in the Aquitard both east and west of the S-3 Ponds, the general lack of nitrate in the Aquifer east of the site suggests fewer directly connected migration pathways, and/or greater flux to the west during site operations. The low nitrate concentrations in the Aquifer east of the S-3 Ponds also probably reflect dilution from nitrate-free surface runoff and daily process water discharge from the Y-12 Plant (which provides the bulk of dry-weather flow in UEFPC).

Volatile Organic Compounds

Because of their relative mobility in groundwater and influx from multiple sources, several VOCs are the most pervasive contaminants in the East Fork Regime. Chloroethenes, primarily PCE, trichloroethene (TCE), and 1,2-dichloroethene, are the principal components of dissolved VOC plumes in the Western Plant Area and the Central Plant Area. Chloromethanes (primarily carbon tetrachloride and chloroform) are primary plume components in the Eastern Plant Area. Concentrations of plume constituents exceed 1% of respective maximum solubilities and indicate the presence of dense, non-aqueous phase liquids (DNAPL) in the Aquitard at the Waste Coolant Processing Area and an unspecified source area upgradient of Tank 0134-U, and in the Aquifer near unspecified source(s) of carbon tetrachloride upgradient of New Hope Pond.

The distribution of dissolved VOCs in the Aquitard generally reflects the migration patterns indicated by the nitrate plume from the S-3 Ponds, with strike-parallel transport in the water table interval and shallow bedrock toward the headwaters and buried tributaries of UEFPC, which direct the VOCs into the Aquifer (Figure 7). Limited cross-strike migration in areas between these buried drainage features, which is suggested by the apparently separate, strike-oriented plume of dissolved chloroethenes in the shallow groundwater at the Salvage Yard Drum Deheader, further indicates the strong influence that these features exert on contaminant transport patterns. Also, the vertical hydraulic gradients characteristic of the Aquitard in many areas indicate upward migration from

sources in the deeper bedrock, which further supports evidence of widespread DNAPL occurrence in the subsurface.

Although VOC data for the Central Plant Area are limited, results from the network of Aquifer monitoring wells indicate a relatively continuous plume of dissolved VOCs in the water table interval/shallow bedrock that extends eastward from the Fire Training Facility in the Western Plant Area, underneath New Hope Pond in the Eastern Plant Area, up to 2,000 ft east of the ORR boundary (Figure 7).

Available data show vertical segregation of the VOC plume in the groundwater at the east end of the Y-12 Plant near New Hope Pond. In general, chloroethenes are more prevalent in the water table and shallow bedrock intervals, whereas chloromethanes (primarily carbon tetrachloride) generally dominate the dissolved VOC plume in the deeper bedrock. The different types of VOCs in the shallow and deep groundwater suggest separate sources of chloroethenes and chloromethanes, and possibly indicate that the transport of chloroethenes is more closely associated with UEFPC (and the altered stream channel).

Radioactivity

Results for gross alpha and gross beta activity indicate groundwater contamination in: (1) the Aquitard east of the S-3 Ponds in the Western Plant Area, (2) the Aquifer at the S-2 Site and near the Tank 2331-U in the Central Plant Area, and (3) the Aquifer upgradient of New Hope Pond in the Eastern Plant Area (Figure 7). The S-3 Ponds are confirmed sources of uranium isotopes (primarily ^{234}U and ^{238}U) and ^{99}Tc in the Aquitard in the Western Plant Area. The migration of these isotopes generally mirrors that of nitrate from the site: eastward, strike-parallel transport in the water table interval, shallow bedrock, and deep bedrock toward the headwaters of UEFPC and the buried tributary (BT-1) west of the Waste Coolant Processing Area. Limited transport (or extensive dilution) in the Aquifer is indicated by the greatly decreased gross alpha and gross beta activity in the groundwater downgradient of confirmed source areas (e.g., S-2 Site), which suggests that the alpha activity in the groundwater at Tank 0134-U and the area upgradient of New Hope Pond reflect similarly limited migration of uranium isotopes from the upgradient, unspecified source areas.

Trace Metals

Low pH groundwater within about 1,000 ft of the S-3 Ponds contains a diverse mix of trace metal contaminants, including metal ions and/or ion-complexes that are usually not mobile (or more readily attenuated) in less acidic groundwater (beryllium, cadmium, cobalt, manganese, mercury, and nickel), as wells as metals that are mobile under a wider range of groundwater pH conditions (barium, boron, strontium, and uranium). Some of these metals were entrained in the acidic wastes disposed at the site (e.g., uranium), and others were dissolved from the underlying saprolite and bedrock (e.g., barium). Maximum concentrations within the plume exceed applicable drinking water standards by an order of magnitude or more.

Elevated concentrations of boron, cadmium, cobalt, copper, lead, mercury, strontium, and uranium occur in the groundwater elsewhere in the East Fork Regime, but as shown in the following summary, only the S-2 Site and the Oil Skimmer Basin are confirmed source areas.

Known/Suspected Source Area	Trace Metal								
	Bo	Cd	Co	Cu	Pb	Mn	Hg	Sr	U
S-2 Site	.	★	★	★	★	.	★	.	★
Tank 0134-U	.	.	✓	.	.	✓	.	.	✓
Tank 2331-U	.	.	.	.	.	.	.	.	✓
Unspecified (Comprehensive Monitoring Plan Grid E3 and F3)	?	.	.	.	.	.	.	.	.
Building 9754-2 Fuel Facility	.	?	?	.	.	?	.	.	.
Oil Skimmer Basin	★	.	.	.	★	.	★	★	★

★=Confirmed source; ?=Suspected source; ✓=Migration from unspecified, upgradient source

Available data do not indicate extensive transport in the groundwater from any of the above confirmed or suspected source areas.

3.0 CY 1997 GROUNDWATER MONITORING

Groundwater and surface water sampling in the East Fork Regime during CY 1997 was performed in accordance with the *Sampling and Analysis Plan for Groundwater and Surface Water Monitoring at the Y-12 Plant during Calendar Year 1997* (AJA Technical Services, Inc. 1996b), as modified by applicable addenda. The following sections provide an overview of the sampling locations and frequency; sample collection, transportation, and chain of custody control; field measurements and laboratory analytes; QA/QC sampling; and data management.

3.1 Sampling Locations and Frequency

Groundwater and surface water samples were collected from 41 monitoring wells and one surface water station during CY 1997 (Figure 8). Sampling was performed during the first (March 4-18, 1997), second (April 7- May 22, 1997), third (July 28 - August 13, 1997) and fourth (October 30 - December 10, 1997) quarters of the year (Table 3). Descriptions of the sampling locations and frequency for RCRA post-closure corrective action monitoring, DOE Order 5400.1 exit pathway/perimeter monitoring, and DOE Order 5400.1 surveillance monitoring are provided in the following sections.

3.1.1 RCRA Post-Closure Corrective Action Monitoring

As specified in the PCP, the well network for RCRA post-closure corrective action monitoring consists of background well GW-115, point-of-compliance well GW-108, and plume delineation wells GW-193, GW-605, GW-606, and GW-733 (Table 3). Background well GW-115 is located in the Bear Creek Regime, near the East Fork Regime boundary, about 500 ft north (upgradient) of the S-3 Ponds. Point-of-compliance well GW-108 is located in the Western Plant Area about 800 ft southeast of the S-3 Ponds. The plume boundary wells are located in the Central Plant Area near Tank 2331-U (GW-193), and in the Eastern Plant Area upgradient (GW-605 and GW-606) and downgradient (GW-733) of New Hope Pond (Figure 8). Information regarding the total depth, geologic formation, and aquifer zone monitored by each well is summarized below (complete well construction details are provided in Appendix C).

Well No.	Monitored Interval Depth (ft bgs)		Geologic Formation	Aquifer Zone	
	Top	Bottom		WT	BDR
GW-108	41.0	58.6	Nolichucky Shale	●	
GW-115	37.6	53.0	Maryville Limestone	●	
GW-193	5.5	18.4	Nolichucky Shale	●	
GW-605	28.2	39.9	Maynardville Limestone		●
GW-606	155.0	171.0	Maynardville Limestone		●
GW-733	240.1	256.5	Maynardville Limestone		●
WT = Water Table Interval; BDR = Bedrock Interval					

Semiannual groundwater sampling for RCRA post-closure corrective action monitoring was performed during the first and third quarters of CY 1997 (Table 3). Monitoring data from the first semiannual sampling event were submitted to the TDEC before the reporting deadline (September 1) specified in the PCP (Lockheed Martin Energy Systems, Inc. 1997). As required under permit condition II.C., this report contains all of the monitoring data from both semiannual sampling events that must be submitted to the TDEC before the corresponding reporting deadline (March 1).

3.1.2 DOE Order 5400.1 Exit Pathway/Perimeter Monitoring

Exit Pathway/Perimeter monitoring is implemented under the Y-12 Plant Groundwater Protection Program to meet the requirements of DOE Order 5400.1 for monitoring groundwater that is or could be affected by operations at DOE facilities. Compliance with most of these requirements is achieved through continued implementation of ongoing permit- and regulatory-driven monitoring programs; Exit Pathway/Perimeter monitoring is implemented to ensure monitoring where contamination is most likely to be transported beyond the ORR boundaries. Exit Pathway/Perimeter monitoring during CY 1997 involved collection of surface water samples from the Lake Reality emergency overflow spillway (LRSPW), and collection of groundwater samples from 11 monitoring wells: Aquitard monitoring wells GW-207, GW-208, and GW-816 located next to UEFPC in the gap through Pine Ridge; Aquifer monitoring wells GW-617 and GW-618 located in the Western Plant Area northeast of the S-2 Site; Aquifer monitoring wells located hydraulically upgradient (GW-153 and GW-380) and downgradient (GW-220) of New Hope Pond; and Aquifer monitoring

wells GW-722, GW-735, and GW-750 located near the ORR Boundary along Scarboro Road (Figure 8). Construction details for these wells are provided in Appendix C.

Groundwater sampling for the purposes of DOE Order 5400.1 exit pathway/perimeter monitoring was performed during the second (all wells except GW-722), third (GW-722), and fourth (all wells) quarters of CY 1997 (Table 3). During the fourth quarter sampling event, however, problems with the multi-port sampling equipment (Westbay™) installed in GW-722, which enables collection of discrete groundwater samples from multiple depth intervals in the well, precluded collection of samples from the shallowest depth interval (GW-722-33) that was sampled during the third quarter (Table 3).

3.1.3 DOE Order 5400.1 Surveillance Monitoring

Groundwater samples were collected quarterly from 24 monitoring wells to satisfy DOE Order 5400.1 Surveillance Monitoring objectives (Table 3) to evaluate impacts of Y-12 Plant operations on groundwater quality and to monitor contaminant concentrations trends. The bulk of these wells are completed at shallow depths in the Aquitard in the Central Plant Area and Eastern Plant Area (Figure 8), and include: one well each at the S-2 Site (GW-251), the Fire Training Facility (GW-620), and the Beta-4 Security Pits (GW-192); two wells near New Hope Pond, one upgradient (GW-383) and one downgradient (GW-148) of the site; and 19 wells installed in the Central Plant Area (GW-769, GW-770, GW-775, GW-776, GW-781, GW-782, GW-783, GW-788, GW-789, GW-791, and GW-792) and Eastern Plant Area (GW-744, GW-745, GW-746, GW-747, GW-748, GW-749, GW-763, and GW-817) as part of the Grid Well Network recommended in the Comprehensive Monitoring Plan (Table 3). Detailed well construction information for these wells is provided in Appendix C.

Groundwater sampling for the purposes of DOE Order 5400.1 surveillance monitoring was performed during the second and fourth quarters of CY 1997 (Table 3). Samples were collected during both sampling events from each of the wells listed above.

3.2 Sample Collection, Transportation, and Chain-of-Custody Control

Personnel from the Sampling and Environmental Support Department of the Analytical Services Organization (ASO) located at the East Tennessee Technology Park (ETTP), formerly the Oak Ridge K-25 Site, were responsible for collection, transportation, and chain-of-custody control of the groundwater and surface water samples. Sampling was performed in accordance with the *Technical Procedure for Groundwater Sampling* (Lockheed Martin Energy Systems, Inc. 1995), a copy of which is included in Attachment 5 of the PCP. As noted in Section 1.0, the TDEC approved updating Attachment 5 with a revised version of the sampling procedure. In addition to technical updates and modifications, the revised version describes the method for low-flow minimal drawdown groundwater sampling.

The conventional sampling method was used to obtain all groundwater samples during the first three quarters of CY 1997 (including all wells used for RCRA post-closure corrective action monitoring), and the low-flow minimal drawdown method was used to obtain all groundwater samples collected during the fourth quarter of CY 1997 (Table 3). Following the conventional sampling method, at least three well-volumes of groundwater were purged from each well (if it did not purge dry) before the samples were collected. Under the low-flow minimal drawdown method, groundwater samples were collected immediately after field measurements showed stable pH, conductivity, and temperature values (<10% variation over three consecutive readings) in groundwater purged at a very low flow rate (<300 milliliters per minute) with minimal drawdown (less than 0.1 foot per quarter-hour) of the water level in the well.

Dedicated bladder pumps (Well Wizard™), dedicated multi-port sampling equipment (Westbay™), portable gas-piston pumps (Bennet Pump™), and disposable bailers were used to collect groundwater samples from the monitoring wells. Well Wizards™, which enable low-flow minimal drawdown purging and sampling, were installed in all of the wells by the fourth quarter sampling event (Table 3).

Filtered and unfiltered samples were collected from each monitoring well and surface water station. Groundwater samples collected with a Well Wizard™, a Westbay™, or a Bennet Pump™ were filtered in the field using in-line 0.45 micron filters. Surface water samples, which were collected using grab sample bottles, and groundwater samples collected with bailers were filtered

in the laboratory. All samples were collected in appropriate containers, labeled, logged, placed in ice-filled coolers, and transported to the appropriate analytical laboratory in accordance with chain-of-custody control requirements.

3.3 Field Measurements and Laboratory Analytes

As required by the groundwater sampling procedure and specified in the PCP for RCRA post-closure corrective action monitoring (Table 1), sampling personnel measured the depth to water before purging and sampling groundwater in each monitoring well. Sampling personnel also recorded field measurements of pH, temperature, conductivity, redox, and dissolved oxygen for each groundwater and surface water sample (Table 4). Applicable measurements recorded for each sampling location, including groundwater elevations calculated from the depth-to-water measurements, are presented in Appendix D.1.

Laboratory analyses of the groundwater and surface water samples included the following standard suite of analytes: (1) pH, conductivity, turbidity, total suspended solids, and TDS; (2) major ions and trace metals, which is the term used hereafter to differentiate metals that are typically minor constituents in groundwater (e.g., cobalt) from metals that are usually major ionic species (e.g., magnesium); (3) VOCs; and (4) gross alpha and gross beta activity (Table 4). In addition to the standard suite of analytes, which include all of the organic and inorganic Groundwater Protection Standard (GWPS) constituents listed in Attachment 3, Section F of the PCP, groundwater samples collected for RCRA post-closure corrective action monitoring were analyzed for ^{99}Tc.

Laboratory analyses of the groundwater and surface water samples were performed in accordance with the analytical methods listed in Table 4. Inorganic and miscellaneous laboratory analyses were performed by the ASO laboratories at the ETTP, with organic and radiochemical analyses performed by the Y-12 Plant ASO laboratories. Analytical results are presented in Appendix D.1 (miscellaneous laboratory analytes), Appendix D.2 (inorganic analytes), Appendix D.3 (organic analytes), and Appendix D.4 (radiological analytes).

3.4 Quality Assurance/Quality Control Sampling

Quality assurance/quality control samples included a total of 44 laboratory blanks, 58 trip blanks, six equipment rinsate samples, and three field blanks. Laboratory blanks were samples of deionized water analyzed along with several associated groundwater and/or surface water samples. Trip blanks were samples of deionized water transported in each cooler containing groundwater and surface water samples to be analyzed for organic compounds. Field blanks were samples of deionized water prepared when groundwater samples were collected from selected monitoring wells. Equipment rinsates were samples of the deionized water used to decontaminate the portable groundwater sampling equipment, and were collected after a sampling team had completed sampling at a site or finished each administrative well group (a series of sampling locations grouped for data tracking and management purposes). If more than one sampling pump was used, an equipment rinsate sample was collected from each pump. Equipment rinsates for bailers were collected after they were unwrapped for use in the field.

Laboratory blanks, trip blanks, field blanks, and equipment rinsate samples were analyzed for VOCs; selected equipment rinsates were also analyzed for trace metals and radiochemical parameters. Analytical results for the QA/QC blanks and equipment rinsate samples are presented in respective subsections of Appendix E. A summary of organic compounds detected in the blank samples precedes the main body of this appendix.

In addition to the blank samples and equipment rinsates, duplicate groundwater samples were collected for QA/QC purposes from nine monitoring wells (see Appendix F), including at least one well in each administrative well group. Duplicate groundwater samples were analyzed for the constituents and parameters specified for the location from which they were collected; analytical results are included with the corresponding well data presented in Appendix D.

3.5 Data Management

Analytical results for the groundwater and surface water samples were downloaded directly into a SAS® database from files provided by the ASO laboratories at the ETTP and the Y-12 Plant. The database management subcontractor also manually input some data from field data sheets. Downloaded and manually input data were verified in accordance with the *Y-12 Plant Groundwater*

Protection Program - Groundwater Monitoring Program Data Management Plan (Martin Marietta Energy Systems, Inc. 1993). The database management subcontractor and the appropriate ASO laboratory personnel worked to resolve any incomplete data transfers, irregular parameter names or reporting units, and discrepancies between electronic and hardcopy versions of the data.

A standardized data screening process was used to identify CY 1997 analytical results that do not meet the DQOs defined in the above-referenced data management plan. As described in Appendix F, most of the DQO criteria apply to analytical results for inorganic analytes. Results that do not meet the applicable DQOs include: (1) duplicate filtered lead results that differ by at least an order of magnitude at well GW-769 (May 1997); (2) dissolved (filtered) results that exceed total (unfiltered) results by at least an order of magnitude for lead at well GW-782 (May 1997) and for zinc at well GW-207 (December 1997); (3) principal ion data for wells GW-108 (August 1997), GW-620 (May and December 1997), GW-722-06 (November 1997), and GW-722-14 (July 1997) that are considered qualitative because the ion charge balance errors exceed 20%; (4) 141 false-positive results for ten VOCs (primarily acetone and 2-butanone); and (5) radioanalyte results for wells GW-115 (^{238}U), GW-380 (gross alpha), GW-746 (gross alpha), and GW-747 (duplicate gross alpha) that exceed the specified minimum detectable activity (MDA), but are less than the associated counting error.

4.0 DATA EVALUATION

This section presents the evaluations of the CY 1997 RCRA post-closure corrective action monitoring data for the Eastern S-3 Ponds Plume required by the PCP. Applicable conditions of the PCP require annual evaluation of the monitoring data to: (1) determine the groundwater flow direction and rate in the uppermost aquifer (permit condition V.G.3), (2) gauge the post-closure performance of the low-permeability cap at the S-3 Ponds (permit condition V.D.3) based on concentrations of GWPS constituents in groundwater at the RCRA point-of-compliance wells (permit condition V.G.4), and (3) identify evidence for migration of the Eastern S-3 Ponds Plume based on detection of ^{99}Tc in groundwater at the RCRA plume delineation wells (permit condition V.D.2). Results of these evaluations are described in the following sections.

4.1 Groundwater Flow Direction and Rate

Groundwater surface elevations determined from depth-to-water measurements recorded for 61 monitoring wells during March 31 - April 4, 1997 (the seasonally high water table) and October 8 - 10, 1997 (the seasonally low water table) were used to evaluate groundwater flow directions in the East Fork Regime (Table 5). Depth-to-water measurements recorded during applicable sampling events were not used because they were less contemporaneous and may have been influenced by sampling activities (i.e., purging/sampling adjacent wells).

Rates of groundwater flow were estimated for the water table and shallow bedrock intervals in the Aquitard and the shallow karst network in the Aquifer. Flow rates were not estimated for the stormflow zone because the shallow subsurface throughout much of the Western Plant Area was substantially altered during construction of the Y-12 Plant. Estimated rates of flow in the intermediate and deep bedrock intervals also were not determined, but are probably as low as a few centimeters per year (Solomon et al. 1992).

Groundwater Flow Directions

Isopleths of seasonal groundwater surface elevations in the water table interval (Figure 4) generally show southeasterly (strike-normal) flow in the Aquitard toward the Aquifer (Maynardville

Limestone), the hydrologic drain for the groundwater flow system in the East Fork Regime, and easterly (strike-parallel) flow in the Maynardville Limestone toward the east end of the Y-12 Plant. Seasonal water level fluctuations during CY 1997, which ranged from zero to 14.8 ft throughout the regime (Table 5), influenced the magnitude of horizontal and vertical hydraulic gradients but did not significantly alter the overall directions of groundwater flow in the regime (Figure 4).

Water level data for selected Aquitard (GW-261 and GW-634) and Aquifer (GW-107 and GW-617) monitoring wells in the Western Plant Area were used to determine representative horizontal hydraulic gradients. Based on data for these wells, seasonal horizontal hydraulic gradients in the water table interval average about 0.047 across strike in the Aquitard, and average about 0.012 along strike in the Aquifer.

Groundwater Flow Rates

Rates of groundwater flow (V) in the Aquitard and the Aquifer were estimated using the modified Darcy equation: $V = \mathbf{K}I/\eta$, where $\mathbf{K}$ is the hydraulic conductivity of the medium, η is the effective porosity, and I is the horizontal hydraulic gradient. The calculated flow rates represent average velocities in fractured rock, assuming each hydrogeologic unit functions as an equivalent porous medium. However, depending on fracture aperture and wall roughness, flow rates in individual fractures may vary over several orders of magnitude (Freeze and Cherry 1979). Additionally, variation in the effective porosity would produce an inversely proportional variation in the calculated Darcy flow velocity.

In the Aquitard, calculated Darcy flow velocities for the water table interval range from 0.014 to about 36 ft per day (ft/d) based on: (1) a hydraulic conductivity of 0.03 to 3.25 ft/d for saturated regolith (Connell and Bailey 1989), (2) a strike-normal horizontal hydraulic gradient of 0.047, and (3) effective porosity ranging from 0.0042 (Moore 1989) to 0.099 (Dorsch et al. 1996). Calculated flow rates for the shallow bedrock interval range from 0.0005 to about 80 ft/d based on: (1) a hydraulic conductivity of 0.0008 ft/d for matrix intervals (Moore 1989), 0.15 ft/d for permeable intervals (Moore 1989), and 0.6 ft/d for the continuum of permeable intervals (Moore and Toran 1992); (2) a strike-normal hydraulic gradient of 0.047; and (3) effective porosity ranging from 0.00035 (Moore and Toran 1992) to 0.099. The relatively limited extent of contaminant migration

from the S-3 Ponds, particularly in light of its 30-year operational period, suggests that flow rates in the lower range probably dominate in the Aquitard, and that attenuation processes (e.g., matrix diffusion) greatly reduce contaminant transport rates relative to the groundwater flow velocity.

In the Aquifer, estimated rates of groundwater flow in the shallow karst network range from about 3 to 440 ft/d based on: (1) an average hydraulic conductivity of 22 ft/d determined from well test results (Geraghty & Miller, Inc. 1989a), (2) a strike-parallel horizontal hydraulic gradient of 0.012, and (3) effective porosity ranging from 0.0006 to 0.0813 (Dorsch 1997). These calculated rates are probably representative of conduit flow in the shallow karst network, and are comparable to those of typical karst terrains (Quinlan and Ewers 1985). Additionally, conduit flow rates in the middle range are supported by results of a dye-tracer test in the Bear Creek Regime, which indicated a transport rate of about 200 ft/d in the Maynardville Limestone (Geraghty & Miller, Inc. 1989b).

4.2 Point-of-Compliance Concentration Trends

This section presents results of the evaluation of CY 1997 monitoring data for point-of-compliance well GW-108. The evaluation is based on analysis of long-term concentration trends for selected inorganic, organic, and radiochemical constituents listed in the GWPS for the Eastern S-3 Ponds. Monitoring data obtained from the well since March 1986 were used for trend analysis purposes. Temporal concentration trends were evaluated within the context of the contaminant transport framework described in Section 2.0, whereby plumes of inorganic, organic, and radioactive contaminants in the Aquitard migrate primarily along strike-parallel flowpaths toward discharge areas associated with UEFPC and its buried tributaries in the Western and Central Plant Area. Without additional influx of contaminants, continued downgradient migration away from the Eastern S-3 Ponds Plume and natural attenuation in the subsurface should slowly reduce the contaminant concentrations in the groundwater at the point-of-compliance.

Point-of-compliance well GW-108 is completed at a depth of 58.6 ft bgs in the Nolichucky Shale about 800 ft southeast of the S-3 Ponds (Figure 8). Previous monitoring results show that this well yields acidic (pH <6), calcium-magnesium bicarbonate groundwater with very high nitrate (as N) levels (>10,000 mg/L) and ^{99}Tc concentrations (>10,000 picoCuries per liter [pCi/L]); elevated total and dissolved concentrations of several trace metals, particularly barium (>100 mg/L);

fairly moderate summed concentrations (<100 µg/L) of a few VOCs, primarily laboratory reagents (acetone, chloroform, and methylene chloride); and conspicuously low gross alpha (<MDA). The very high nitrate and ^{99}Tc concentrations may be attributable to contaminated groundwater being channeled toward the well through the buried headwaters of UEFPC, combined with greater contaminant flux along strike-parallel flowpaths within the middle and upper Nolichucky Shale that subcrop beneath the S-3 Ponds (AJA Technical Services, Inc. 1997).

Analytical results for the groundwater samples collected from well GW-108 in March and August 1997 are consistent with historical data. In addition to nitrate and ^{99}Tc, eight other GWPS constituents were detected in these samples: barium, lead, nickel, uranium, bromoform, chloroform, TCE, and gross beta (Table 6). All but two of the results for these constituents meet applicable DQO criteria (see Appendix F): the TCE result (2 µg/L) for the sample collected in March 1997 is a false positive because of TCE contamination in the associated laboratory blank sample, and the nitrate result reported for the sample collected in August 1997 (19,700 mg/L) is qualitative because the calculated ion charge balance error (-34%) exceeds 20%. Nitrate, barium, chloroform, gross beta, and ^{99}Tc were selected for temporal trend analysis because they are representative of the primary inorganic, organic, and radiological components of the Eastern S-3 Ponds Plume.

As shown on Figure 9, nitrate and barium (total) concentrations in the shallow groundwater at well GW-108 have generally decreased since the low permeability cap at the S-3 Ponds was completed in 1988. Both trends, however, are somewhat skewed by extreme values reported for several of the samples collected from the well. For example, excluding the anomalously high nitrate concentrations in September 1986 (40,200 mg/L) and September 1987 (46,000 mg/L), and the anomalously low concentration in November 1986 (1,200 mg/L), nitrate levels have remained fairly constant. This suggests that the concentrations of these contaminants may be approaching relatively asymptotic levels controlled by relative rates of molecular diffusion from the bedrock matrix and varying degrees of dilution from recharge of relatively uncontaminated groundwater.

Chloroform was detected in the groundwater samples collected from well GW-108 during both semiannual sampling events: 29 µg/L in March 1997 and 22 µg/L in August 1997. Historical chloroform results for the well, including a false positive result (30 µg/L) reported for the sample collected from the well in November 1996, show fairly variable temporal concentrations ranging

from a low of 11 µg/L to a high of 31 µg/L. Although a slightly increasing trend is indicated by linear regression of the chloroform data (Figure 9), it is possible that this trend is an artifact of analytical variability.

Historical data clearly show increasing gross beta activity and ^{99}Tc concentrations in the shallow groundwater at well GW-108, particularly after January 1990 (Figure 9). Gross beta activity, for example, rarely exceeded 3,000 pCi/L before January 1990, but has remained above 5,000 pCi/L since then, and the gross beta result for the sample collected in August 1997 (13,000 ± 1,100 pCi/L) is the highest reported for the well. Although other beta-emitting radionuclides may also be present in the groundwater at well GW-108, gross beta activity is primarily from ^{99}Tc, and ^{99}Tc results for the samples collected during March 1997 (18,000 ± 1,800 pCi/L) and August 1997 (14,000 ± 1,400 pCi/L) are the highest ever reported for the well. Under oxidizing conditions, ^{99}Tc occurs in groundwater as the pertechnetate anion (TcO_4^-), which is soluble and highly mobile (Gee et al. 1983). Increasing gross beta activity and ^{99}Tc concentrations potentially indicate greater flux of ^{99}Tc from the Eastern S-3 Ponds Plume.

Based on the preceding evaluation, results for point-of-compliance well GW-108 reflect decreasing inorganic (nitrate and barium), relatively steady organic (chloroform), and clearly increasing radiological (gross beta and ^{99}Tc) contaminant concentrations in the groundwater east of the S-3 Ponds. Different temporal trends probably reflect the combined effects of variable contaminant flux since closure of the site, and the relative hydrochemical transport characteristics from the large secondary source contamination within the bedrock matrix.

4.3 Plume Boundary Evaluation

Under condition V.D.2 of the PCP, detection of ^{99}Tc above MDAs in the groundwater samples from plume delineation wells GW-193, GW-605, GW-606, and GW-733 would be considered indicative of contaminant migration from the S-3 Ponds Site. Because there are multiple sources for other GWPS constituents in the Y-12 Plant and ^{99}Tc was placed only in the S-3 Ponds, ^{99}Tc serves as the best indicator parameter for S-3 Ponds source contamination. Several GWPS constituents were detected in the samples collected from each of these wells, including nitrate, barium, lead, uranium, several VOCs, gross alpha, and gross beta (Table 6). However, the ^{99}Tc

activities reported for these wells do not exceed the respective MDAs (Table 6 and Appendix D.4). The lack of ^{99}Tc in the samples from these wells suggests that they each continue to monitor groundwater unaffected by migration of contaminants from the Eastern S-3 Pond Plume and, therefore, effectively serve the plume boundary monitoring purposes of the PCP.

5.0 REFERENCES

AJA Technical Services, Inc. 1996a. *Calendar Year 1995 Groundwater Quality Report for the Upper East Fork Poplar Creek Hydrogeologic Regime, Y-12 Plant, Oak Ridge, Tennessee.* Prepared for Lockheed Martin Energy Systems, Inc. (Y/SUB/96-KDS15V/4).

AJA Technical Services, Inc. 1996b. *Sampling and Analysis Plan for Groundwater and Surface Water Monitoring at the Y-12 Plant During Calendar Year 1997.* Prepared for Lockheed Martin Energy Systems, Inc. (Y/SUB/96-KDS15V/7).

AJA Technical Services, Inc. 1997. *Evaluation of Calendar Year 1996 Groundwater and Surface Water Quality Data for the Upper East Fork Poplar Creek Hydrogeologic Regime at the U.S. Department of Energy Y-12 Plant, Oak Ridge, Tennessee.* Prepared for Lockheed Martin Energy Systems, Inc. (Y/SUB/97-KDS15V/6).

AJA Technical Services, Inc. 1998. *Calendar Year 1997 Annual Monitoring Report for the Bear Creek Hydrogeologic Regime at the U.S. Department of Energy Y-12 Plant, Oak Ridge, Tennessee.* Prepared for Lockheed Martin Energy Systems, Inc. (Y/SUB/98-KDS15V/1).

CDM Federal Programs Corporation. 1994. *Water Balance Report for the Oak Ridge Y-12 Plant.* Prepared for Martin Marietta Energy Systems, Inc. (SUB/28B-99920C/92-4).

Connell, J.F. and Z.C. Bailey. 1989. *Statistical and Simulation Analysis of Hydraulic- Conductivity Data For Bear Creek and Melton Valleys, Oak Ridge Reservation, Tennessee.* U.S. Geological Survey Water-Resources Investigations Report 89-4062.

Dorsch, J., T.J. Katsube, W.E. Sanford, B.E. Dugan, and L.M. Tourkow. 1996. *Effective Porosity and Pore-Throat Sizes of Conasauga Group Mudrock: Application, Test, and Evaluation of Petrophysical Techniques.* Oak Ridge National Laboratory (ORNL-GWPO-021)

Dorsch, J. 1997. *Effective Porosity and Density of Carbonate Rocks (Maynardville Limestone and Copper Ridge Dolomite) within the Bear Creek Valley on the Oak Ridge Reservation Based on Modern Petrophysical Techniques.* Oak Ridge National Laboratory (ORNL-GWPO-026)

Dreier, R.B., D.K. Solomon, and C.M. Beaudoin. 1987. Fracture Characterization in the Unsaturated Zone of a Shallow Land Burial Facility. Reported in: *Flow and Transport through Fractured Rock.* American Geophysical Union Monograph 42.

Freeze, R.A. and J.A. Cherry. 1979. *Groundwater.* Prentice-Hall, Inc., Eaglewood Cliffs, NJ (pp. 408-409).

Gee, G.W., D. Rai, and R.J. Serne. 1983. Mobility of Radionuclides in Soil. In: *Chemical Mobility and Reactivity in Soil Systems.* Soil Science Society of America, Inc. Madison, WI (pp 203-227).

Geraghty & Miller, Inc. 1989a. *Development of Ground-Water Flow Models for the S-3 Waste Management Area, Y-12 Plant, Oak Ridge, Tennessee.* Prepared for Martin Marietta Energy Systems, Inc. (Y/SUB/89-00206C/1).

Geraghty & Miller, Inc. 1989b. *Tracer Study of the Hydrologic System of Upper Bear Creek, Y-12 Plant, Oak Ridge, Tennessee.* Prepared for Martin Marietta Energy Systems, Inc. (Y/SUB/89-00206C/4).

Geraghty & Miller, Inc. 1990. *Comprehensive Groundwater Monitoring Plan for the Oak Ridge Y-12 Plant.* Prepared for Martin Marietta Energy Systems, Inc. (Y/SUB/90-00206C/5).

Goldstrand, P.M. 1995. *Stratigraphic Variations and Secondary Porosity within the Maynardville Limestone in Bear Creek Valley, Y-12 Plant, Oak Ridge, Tennessee.* Martin Marietta Energy Systems, Inc. (Y/TS-1093).

Jago, W.K. 1995. Field notes and calculations from water-level monitoring during operation of the Lake Reality Sump.

Jones, S.B., B.K. Thompson, and S.M. Field. 1995. *Updated Subsurface Data Base for Bear Creek Valley, Chestnut Ridge, and Parts of Bethel Valley on the U.S. Department of Energy Oak Ridge Reservation.* Martin Marietta Energy Systems, Inc. (Y/TS-881/R3).

King, H.L. and C.S. Haase. 1987. *Subsurface-Controlled Geological Maps for the Y-12 Plant and Adjacent Areas of Bear Creek Valley.* Oak Ridge National Laboratory (ORNL/TM-10112).

Lockheed Martin Energy Systems, Inc. 1995. *Technical Procedure for Groundwater Sampling.* K-25 Analytical Services Organization, Procedure No. SESD-TP-8204.

Lockheed Martin Energy Systems, Inc. 1996. *The Subsurface Hydrology Around Building 9201-2: Results of the July 1994 Water Level Recovery Test, Oak Ridge Y-12 Plant, Oak Ridge Tennessee.* (Y/ER-263).

Lockheed Martin Energy Systems, Inc. 1997. *Semiannual Post-Closure Corrective Action Groundwater Monitoring Report for the Bear Creek, Chestnut Ridge, and Upper East Fork Poplar Creek Hydrogeologic Regimes, Oak Ridge Y-12 Plant (TN3 89 009 0001);* First, 180-Day Reporting Period for Calendar Year (CY) 1997. Letter to the Director of the Tennessee Department of Environment and Conservation, Division of Solid Waste Management, August 27, 1997.

Martin Marietta Energy Systems, Inc. 1988a. *Revised RCRA Closure Plan for New Hope Pond.* (Y/TS-389).

Martin Marietta Energy Systems, Inc. 1988b. *Environmental Surveillance Procedures Quality Control Program.* (ES/ESH/INT-14).

Martin Marietta Energy Systems, Inc. 1993. *Y-12 Plant Groundwater Protection Program-Groundwater Monitoring Program Data Management Plan.* (Y/SUB/93-TK532C/1).

Moore, G.K. 1988. *Concepts of Groundwater Occurrence and Flow Near Oak Ridge National Laboratory.* Oak Ridge National Laboratory (ORNL/TM-10969).

Moore, G.K. 1989. *Groundwater Parameters and Flow System near the Oak Ridge National Laboratory.* Oak Ridge National Laboratory (ORNL/TM-11368).

Moore, G.K. 1992. *Hydrograph Analysis in Fractured Rock Terrain.* Ground Water, Vol. 30, No. 3, pp. 390-395.

Moore, G.K. and L.E. Toran. 1992. *Supplement to Hydrogeologic Framework for the Oak Ridge Reservation, Oak Ridge, Tennessee.* Oak Ridge National Laboratory (ORNL/TM-12191).

Quinlan, J.F., and R.O. Ewers. 1985. Groundwater Flow in Limestone Terrains: Strategy, Rationale and Procedure for Reliable, Efficient Monitoring of Groundwater Quality in Karst Areas. *National Symposium and Exposition on Aquifer Restoration and Groundwater Monitoring.* Proceedings, National Water Well Association, Worthington, Ohio (pp. 197-234).

Shevenell, L.A. 1994. *Chemical Characteristics of Waters in Karst Formations at the Oak Ridge Y-12 Plant.* Oak Ridge National Laboratory (Y/TS-1001).

Shevenell, L.A., R.B Dreier, and W.K. Jago. 1993. *Summary of Fiscal Years 1991 and 1992 Construction, Hydrologic, and Geological Data Obtained from the Maynardville Limestone Exit Pathway Monitoring Program.* Oak Ridge National Laboratory. (Y/TS-814).

Solomon, D.K., G.K. Moore, L.E. Toran, R.B. Dreier, and W.M. McMaster. 1992. *Status Report - A Hydrologic Framework for the Oak Ridge Reservation.* Oak Ridge National Laboratory (ORNL/TM-12053).

Sutton, G.E., and S.M. Field. 1995. *Distribution of Anthropogenic Fill Material within the Y-12 Plant Area, Oak Ridge, Tennessee.* Prepared for Lockheed Martin Energy Systems, Inc. (Y/TS-1387).

Tennessee Department of Environment and Conservation. 1997. *Recognition of Class 1 and Class 1 Modifications, New Hope Pond and Eastern S-3 Pond Units (Post Closure Permit), Y-12, Upper East Fork Poplar Creek Hydrogeologic Regime.* Letter to the U.S. Department of Energy and Lockheed Martin Energy Systems, Inc. (July 26, 1997).

U.S. Department of Energy. 1996. *Environmental Monitoring Plan for the Oak Ridge Reservation.* (DOE/OR-1066R1).

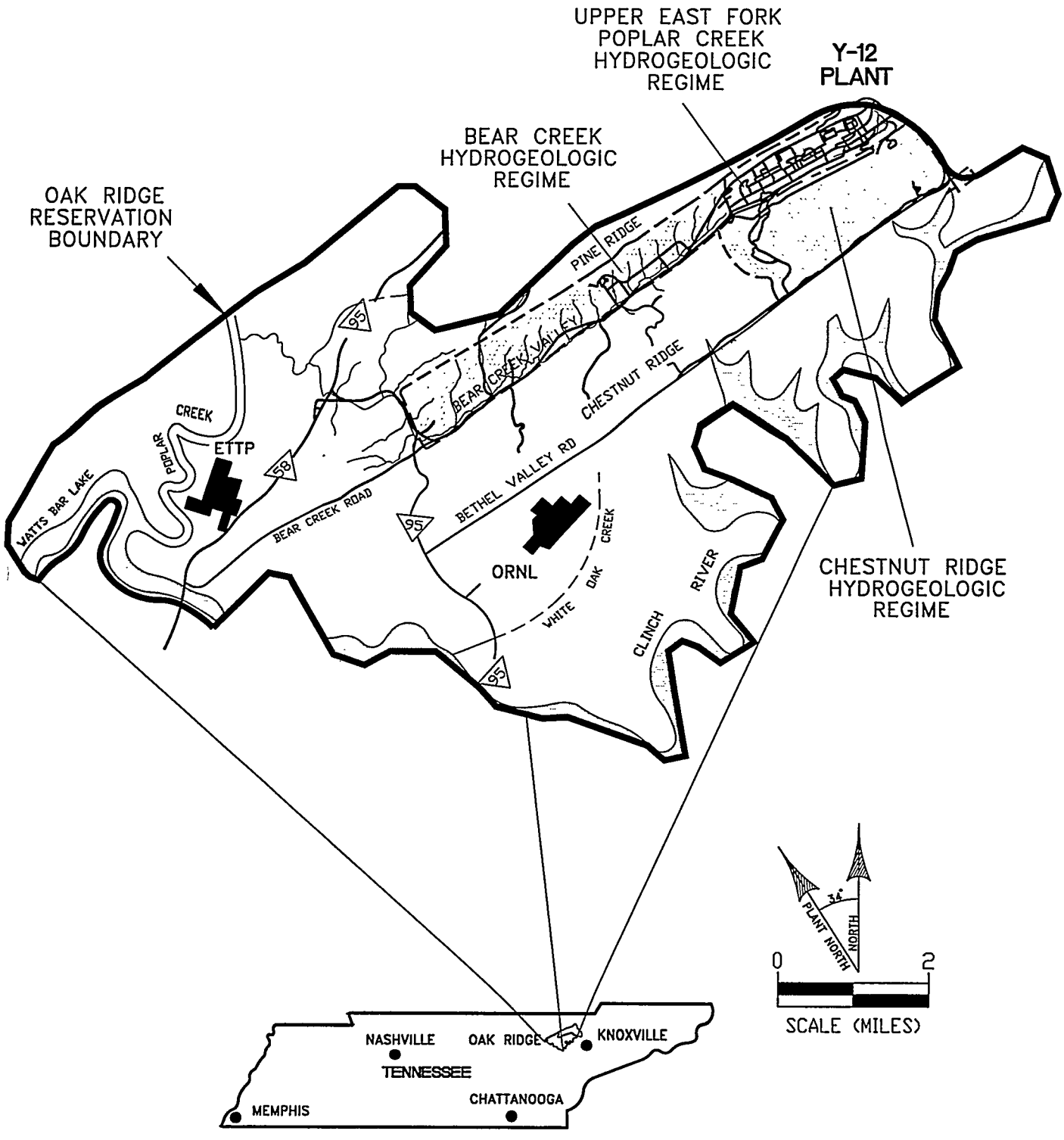
U.S. Department of Energy. 1997. *Report on the Remedial Investigation of Bear Creek Valley at the Oak Ridge Y-12 Plant, Oak Ridge, Tennessee.* Volume 1. (DOE/OR/01-1455/V1&D2).

U.S. Environmental Protection Agency. 1983. *Methods for Chemical Analysis of Water and Wastes.*

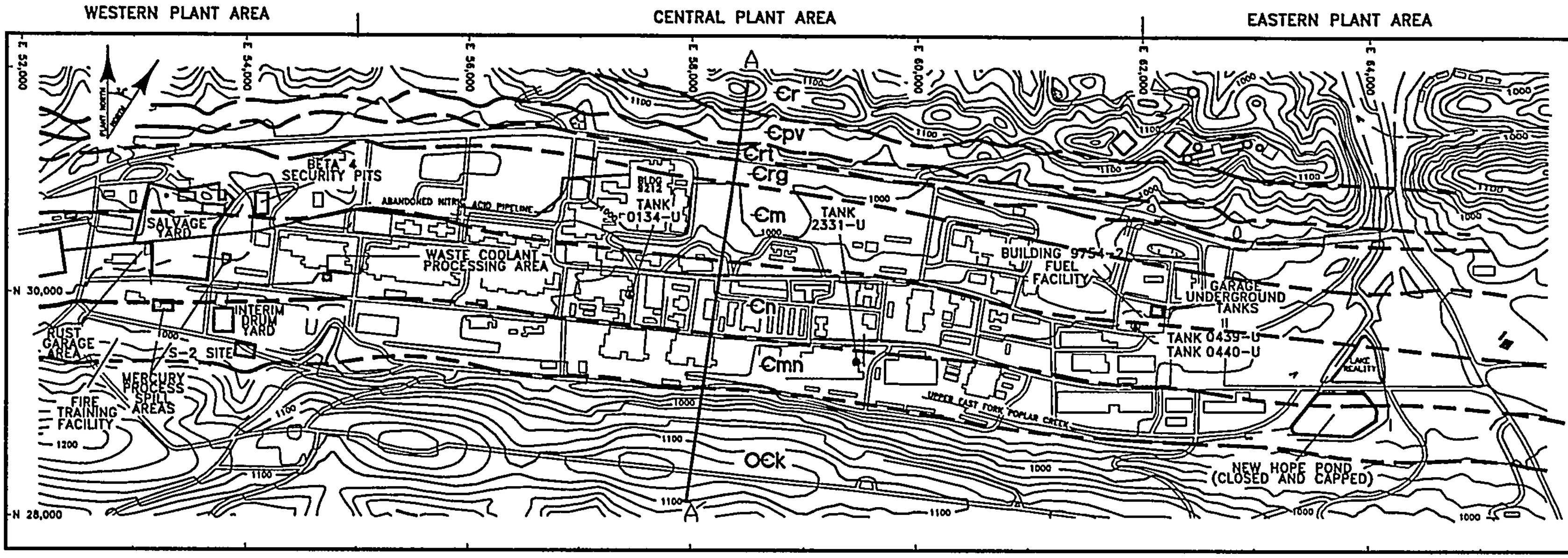
U.S. Environmental Protection Agency. 1986. *Test Methods for Evaluating Solid Waste Physical/Chemical Methods.*

APPENDIX A

FIGURES

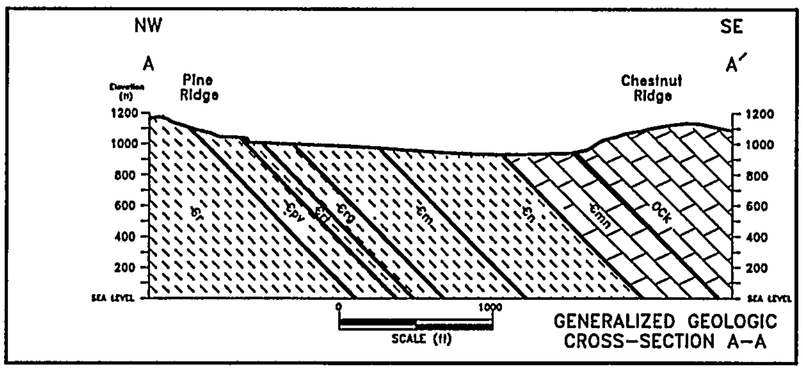


PREPARED FOR: LOCKHEED MARTIN ENERGY SYSTEMS, INC.	LOCATION:	Y-12 PLANT OAK RIDGE, TN.	FIGURE 1
PREPARED BY: AJA TECHNICAL SERVICES, INC.	DOC NUMBER:	98-D003	HYDROGEOLOGIC REGIMES AT THE Y-12 PLANT
	DWG ID.:	97-007	
	DATE:	1-2-98	



SOURCE: King and Haase, 1987

0 2000
SCALE (ft)



ORR AQUITARDS
KNOX AQUIFER

SYSTEM		GROUP	HYDRO UNIT	FORMATION	MAP SYMBOL	THICKNESS (ft)
CAMBRIAN	UPPER	KNOX	KNOX AQUIFER	COPPER RIDGE DOLOMITE	OЄk	NOT DETERMINED
		CONASAUGA		MAYNARDVILLE LIMESTONE	Єmn	418–450
	MIDDLE		ORR AQUITARDS	NOLICHUCKY SHALE	Єn	422–550
				MARYVILLE LIMESTONE	Єm	346–445
				ROGERSVILLE SHALE	Єrg	90–120
				RUTLEDGE LIMESTONE	Єrt	90–120
				PUMPKIN VALLEY SHALE	Єpv	260–320
	LOWER			ROME FORMATION	Єr	NOT DETERMINED

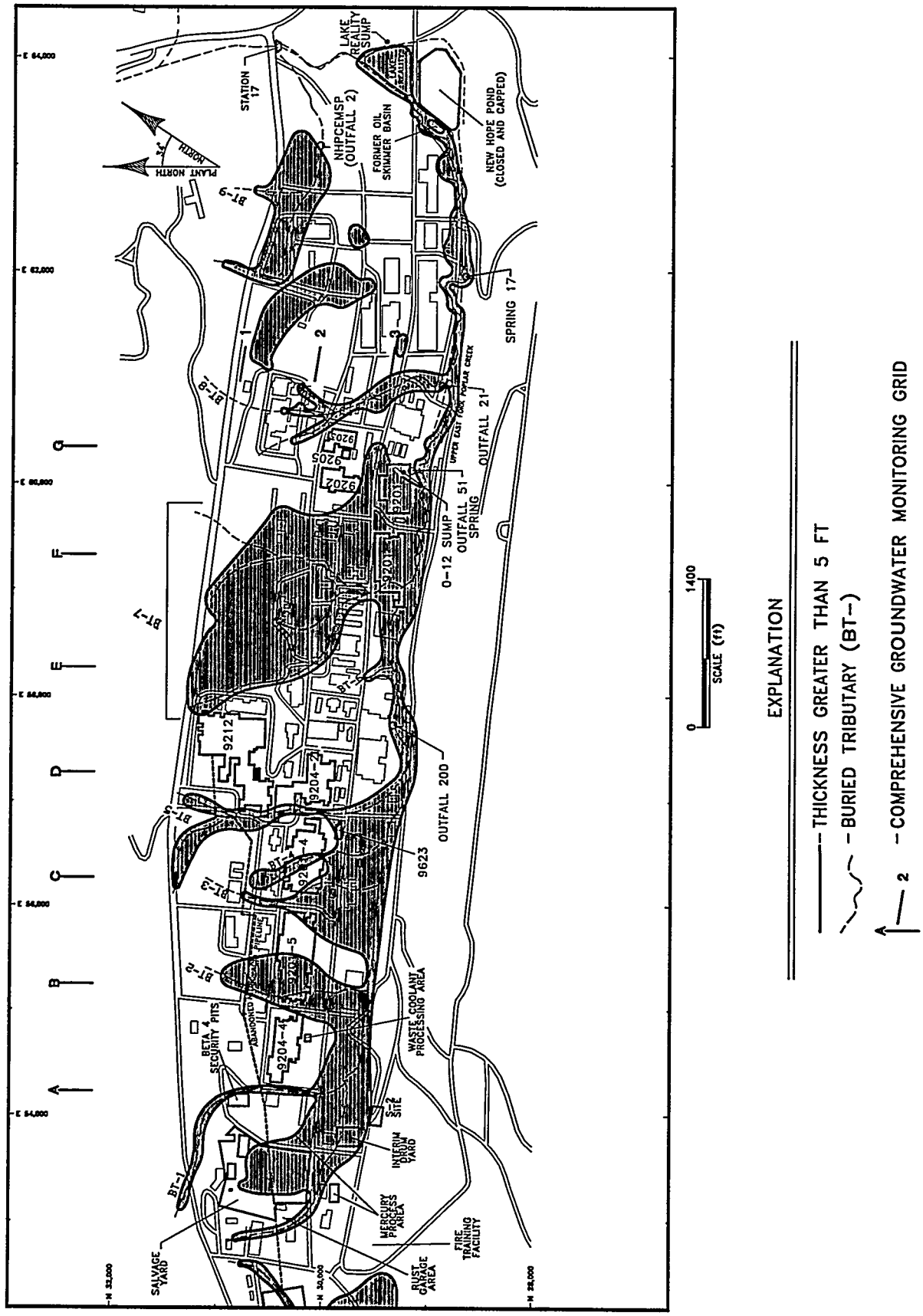
PREPARED FOR:
LOCKHEED MARTIN ENERGY SYSTEMS, INC.

PREPARED BY:
AJA TECHNICAL SERVICES, INC.

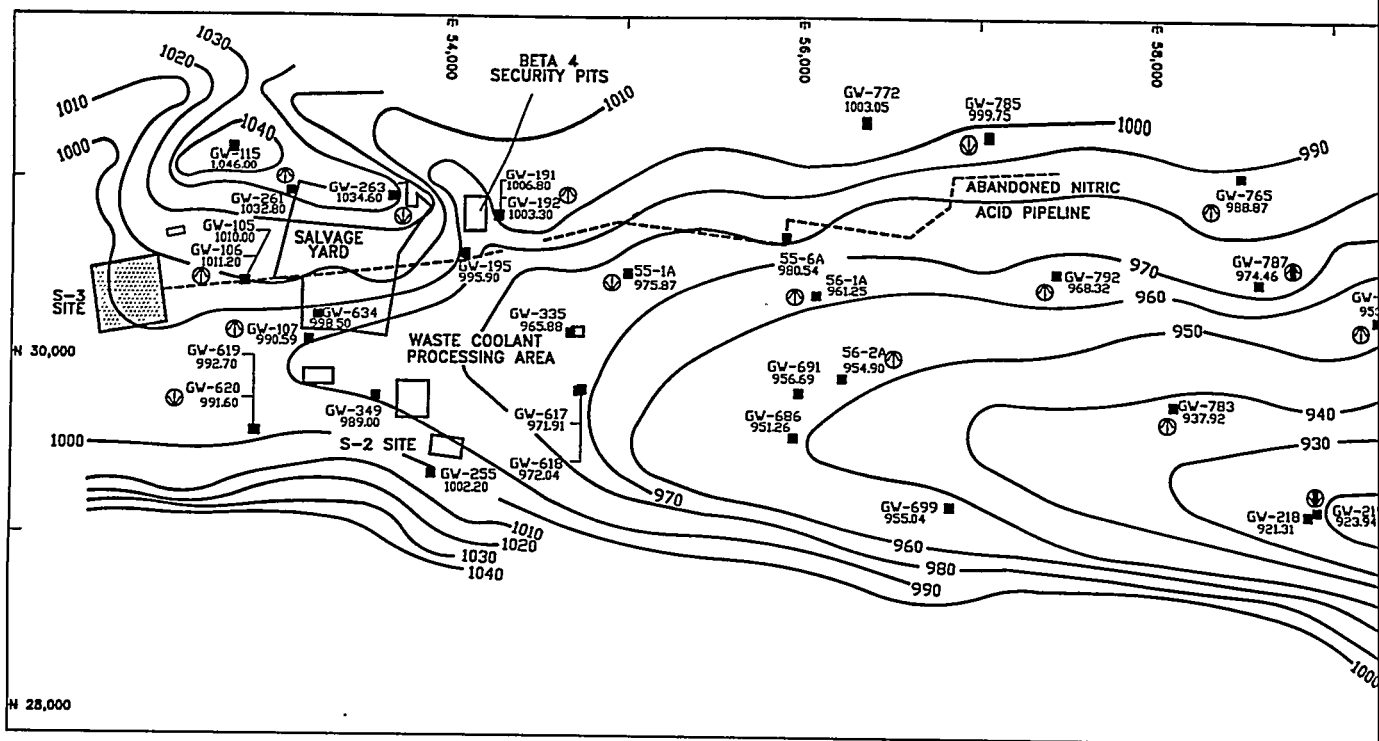
LOCATION:	Y-12 PLANT OAK RIDGE, TN.
DOC NUMBER:	98-D003
DWG ID.:	96-071
DATE:	1-2-98

FIGURE 2

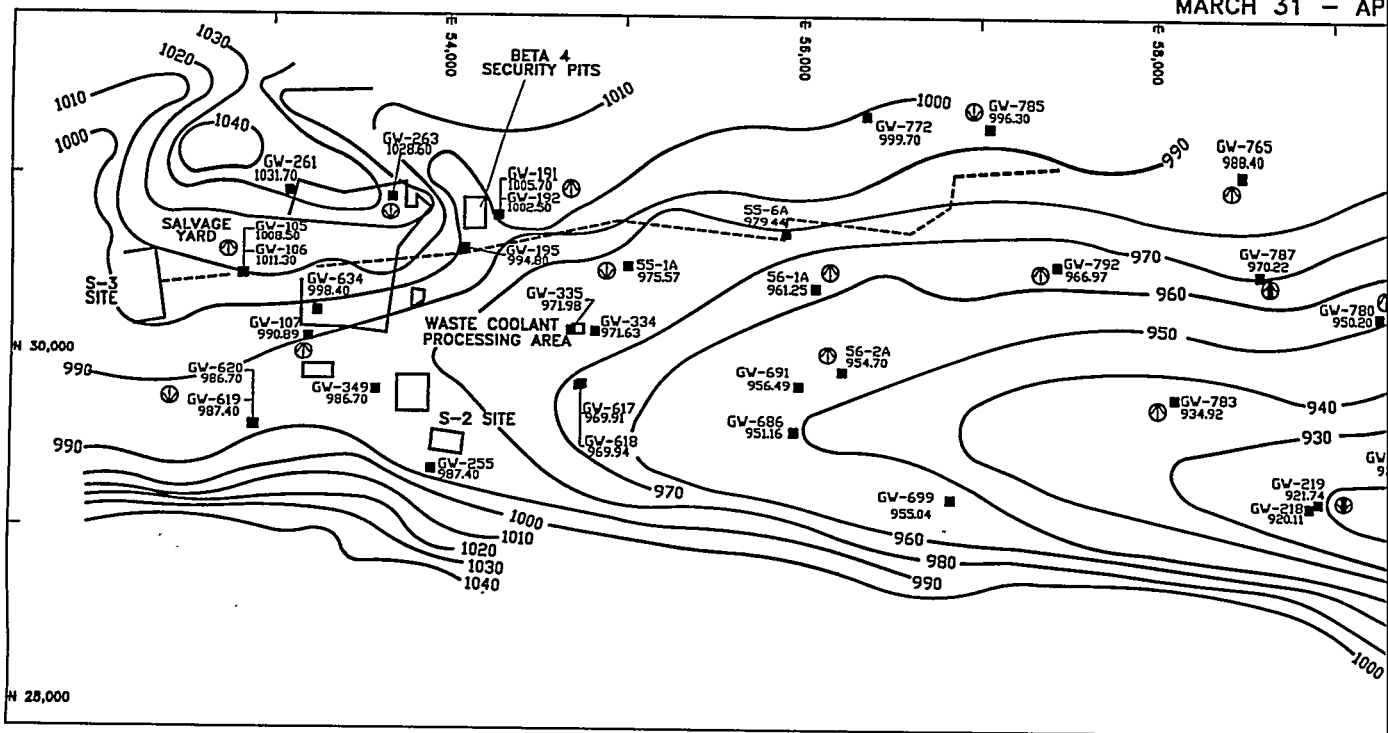
TOPOGRAPHY AND BEDROCK GEOLOGY IN THE EAST FORK REGIME



PREPARED FOR: LOCKHEED MARTIN ENERGY SYSTEMS, INC.	LOCATION:	Y-12 PLANT OAK RIDGE, TN.	FIGURE 3
PREPARED BY: AJA TECHNICAL SERVICES, INC.	DOC NUMBER:	96-D007	FILL AREAS IN THE Y-12 PLANT AND PRECONSTRUCTION DRAINAGE FEATURES
	DWG ID.:	96-068	
	DATE:	7-7-97	



MARCH 31 – AP



OCTOBER 8 –

0
SCALE (ft)

EXPLANATION

GW-618 969-94 — Water Table Monitoring Well and Water-Level Elevation (ft msl)

— Approximate Water-Level Isopleth (ft msl)

— Surface Drainage Feature

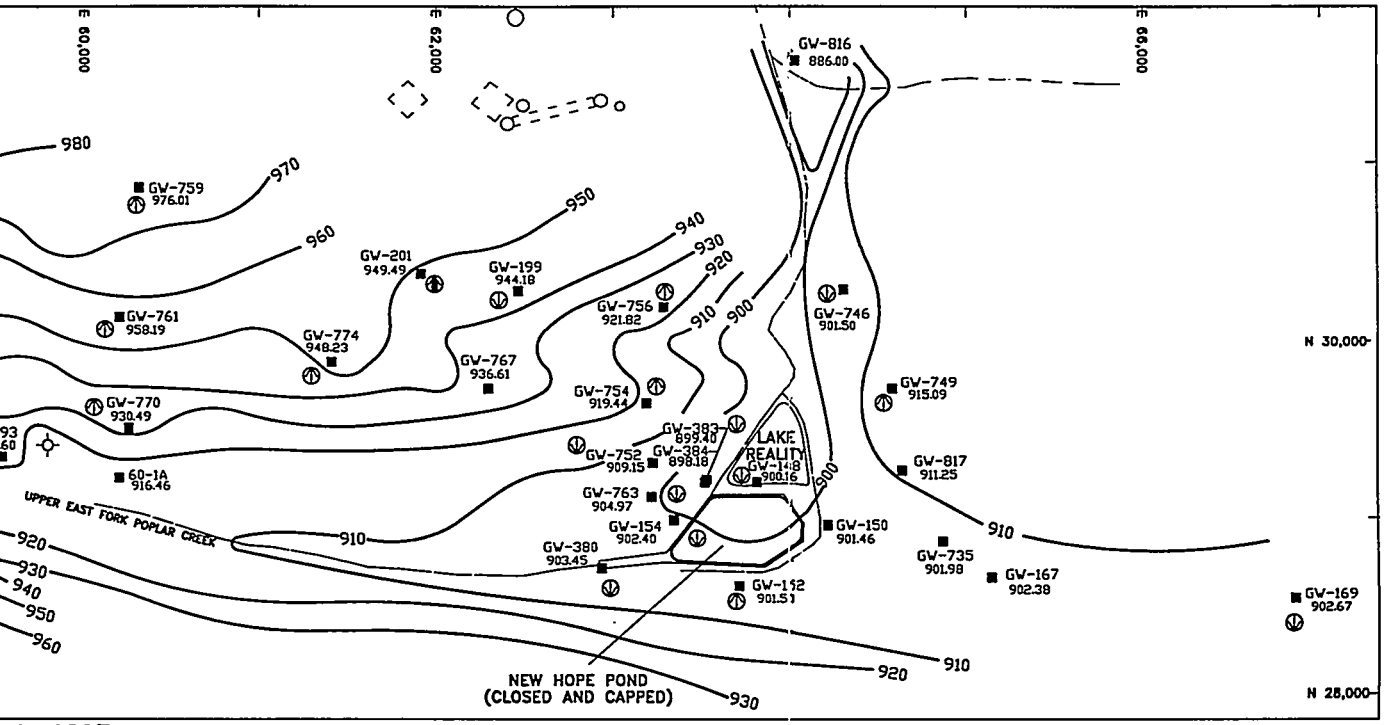
— 0-12 Sump (Building 9201-2)

Vertical Hydraulic Gradient Determined From Data For Paired Wells

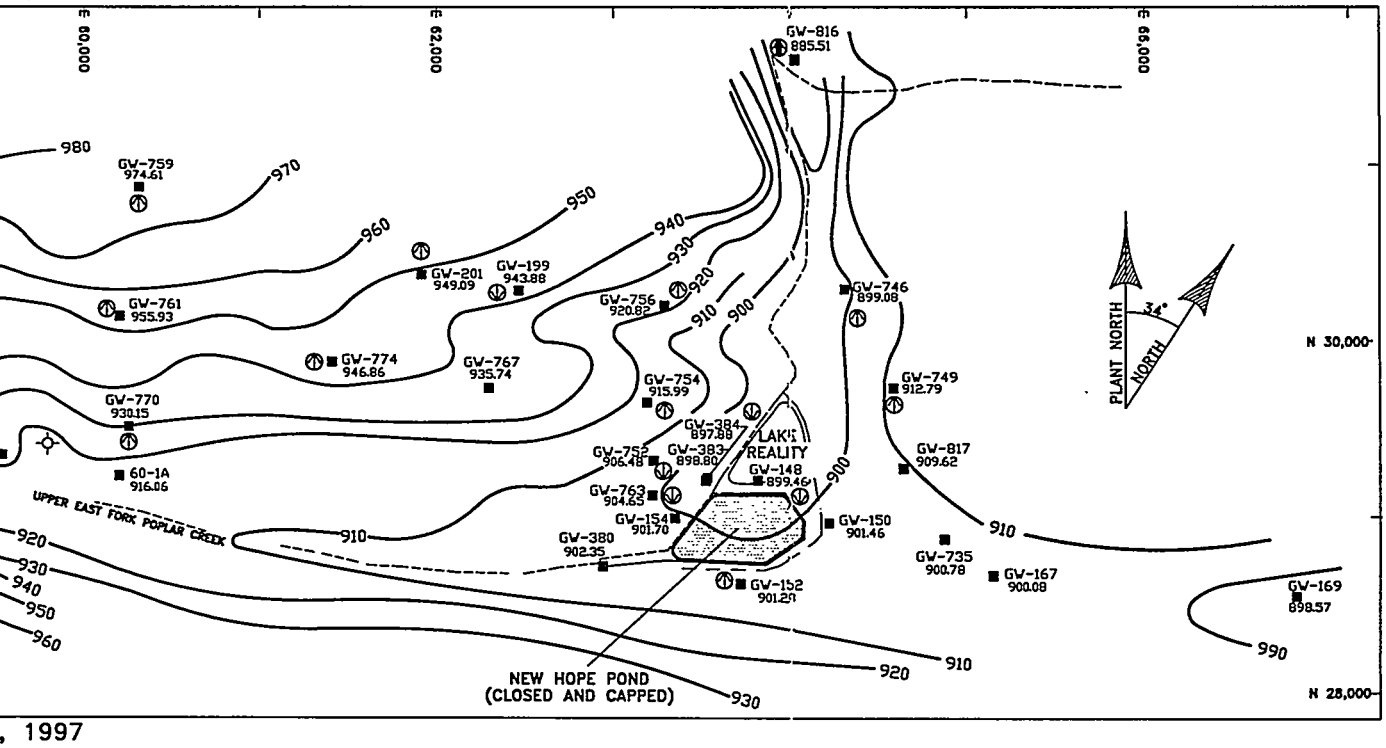
0.01–0.09 0.1–0.9 — Less Than 0.01 was Considered Insignificant

— Upward Gradient

— Downward Gradient



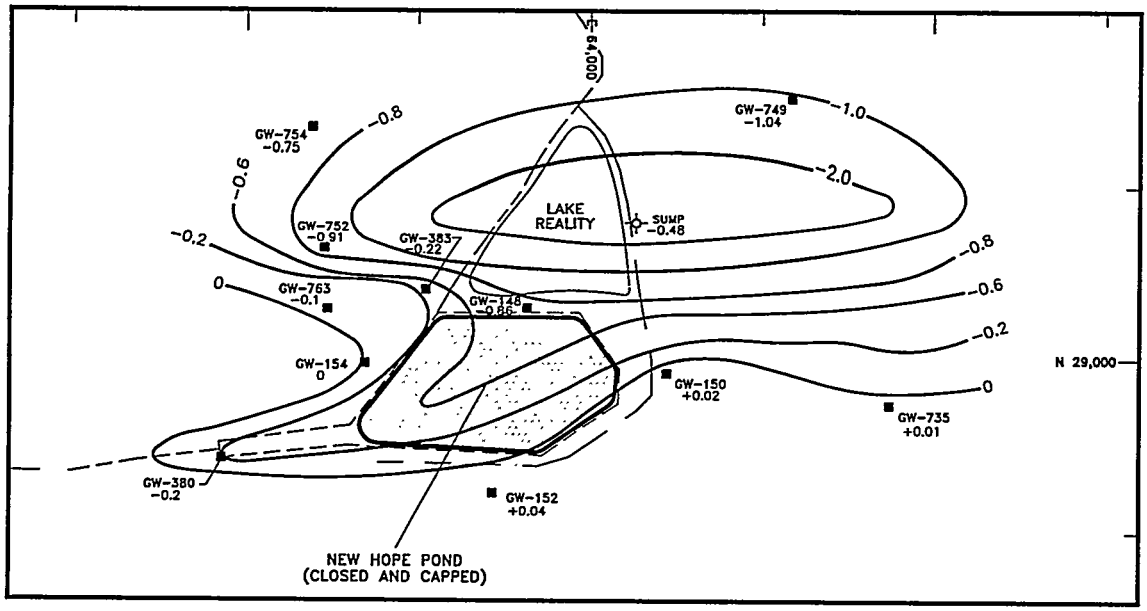
4, 1997



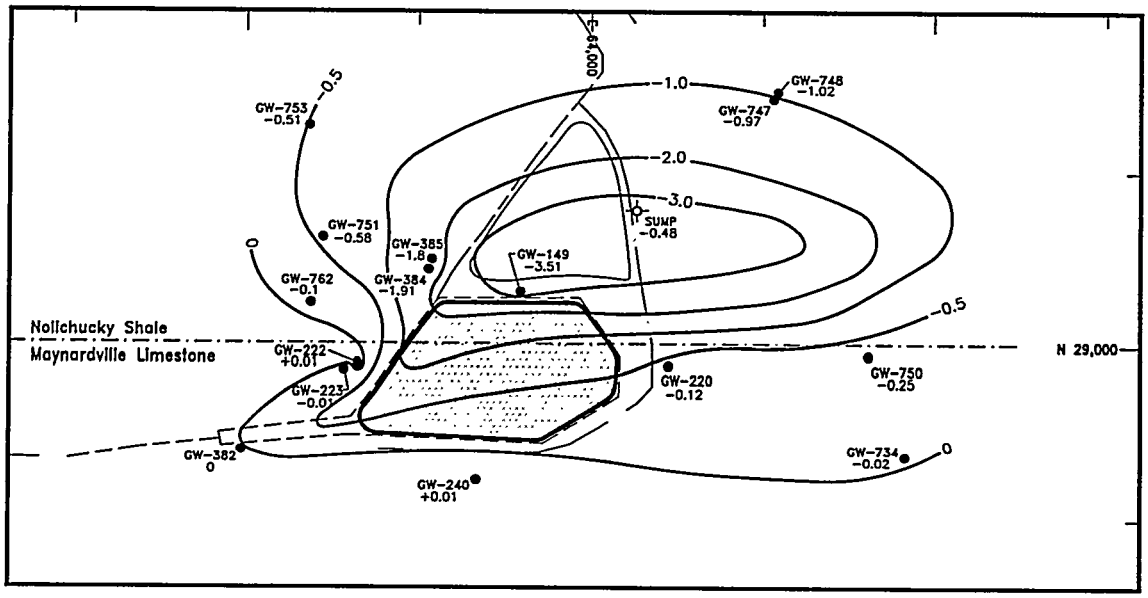
, 1997

00

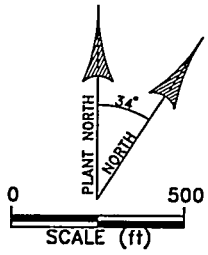
PREPARED FOR: *LOCKHEED MARTIN ENERGY SYSTEMS, INC.*	LOCATION:	Y-12 PLANT OAK RIDGE, TN.	FIGURE 4
PREPARED BY: *AJA TECHNICAL SERVICES, INC.*	DOC NUMBER:	97-003	SEASONAL GROUNDWATER ELEVATIONS IN THE WATER TABLE INTERVAL, CY 1997
	DWG ID.:	97-010	
	DATE:	1-2-98	



WATER TABLE INTERVAL



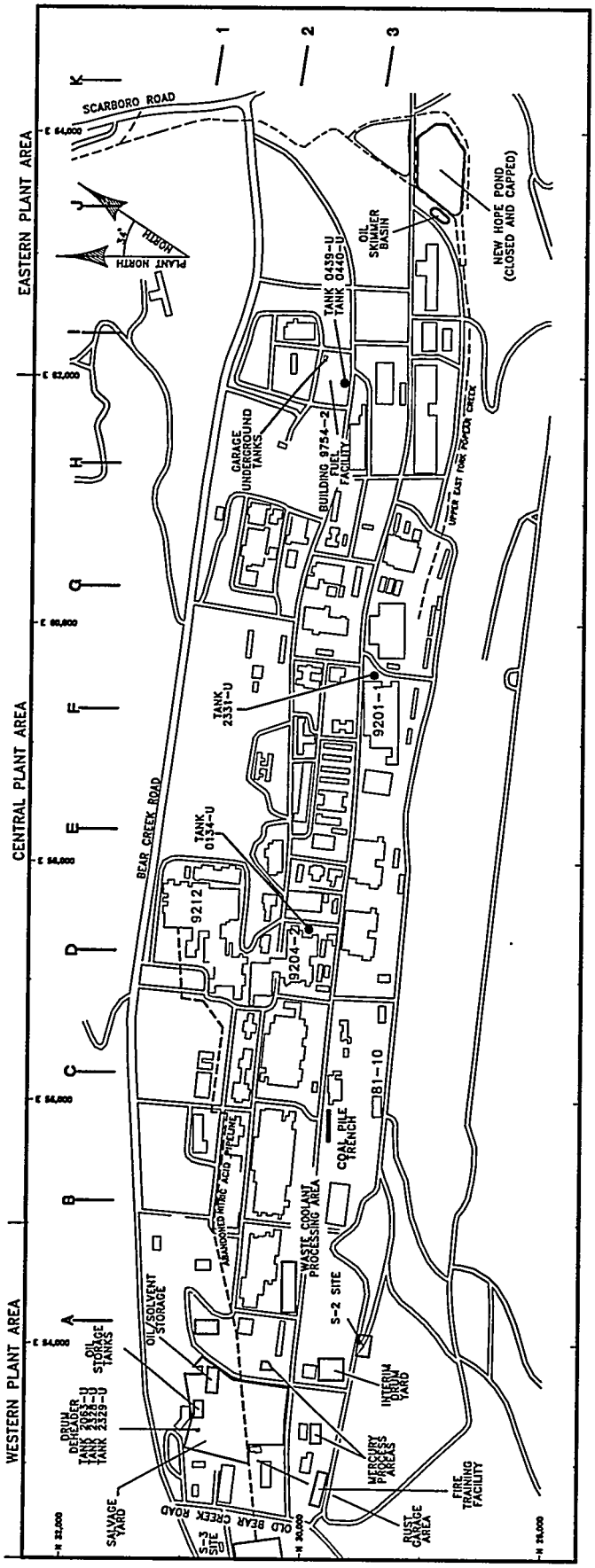
BEDROCK INTERVAL



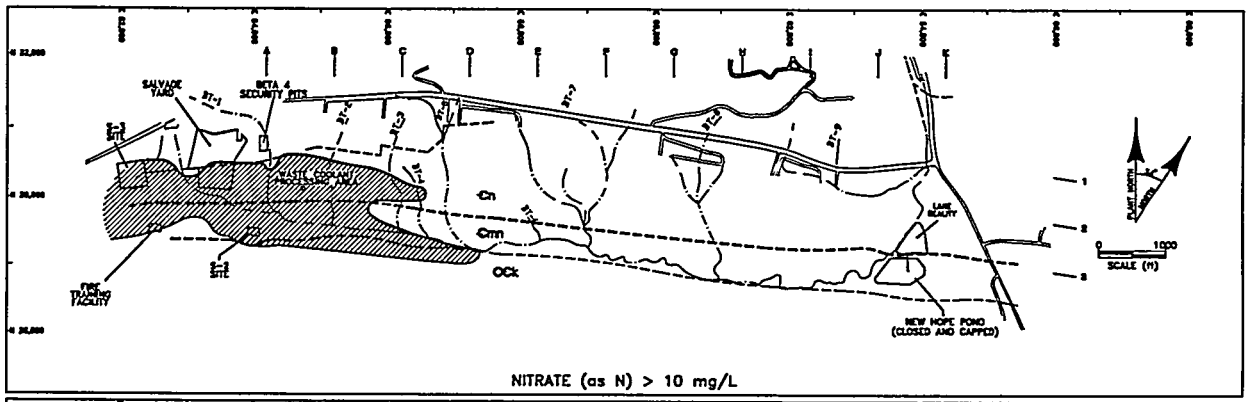
EXPLANATION

- ■ — Water Table Interval Monitoring Well
- ● — Bedrock Interval Monitoring Well
- — — — Upper East Fork Poplar Creek
- ±3.51 — Drawdown: Change in Water Level (ft) After 20 Days of Pumping From the Sump (+ Denotes a Water Level Increase)
- -0.5 — Approximate Line of Equal Drawdown in ft
- —·—·— Approximate Geologic Contact

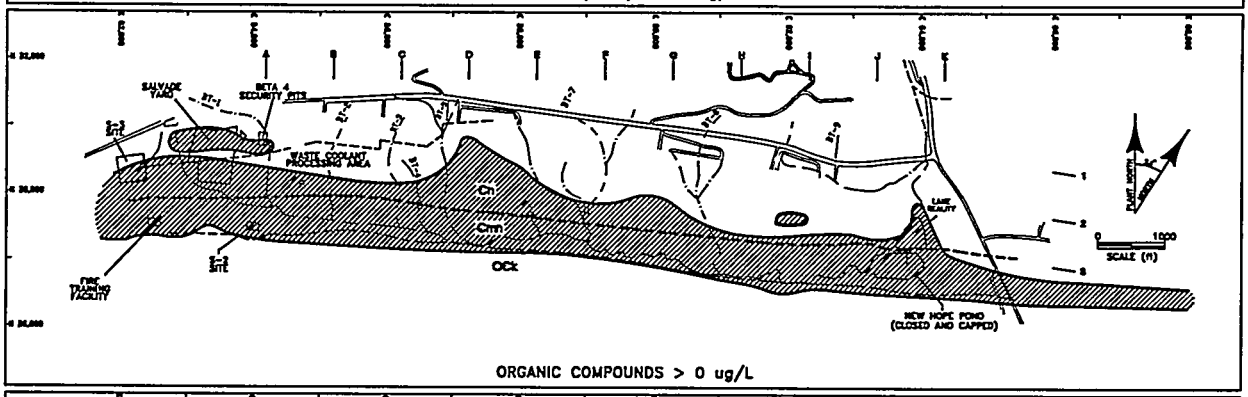
PREPARED FOR: *LOCKHEED MARTIN ENERGY SYSTEMS, INC.*	LOCATION:	Y-12 PLANT OAK RIDGE, TN.	FIGURE 5
PREPARED BY: *AJA TECHNICAL SERVICES, INC.*	DOC NUMBER:	98-D003	INFLUENCE ON GROUNDWATER FLOW DURING OPERATION OF THE LAKE REALITY SUMP
	DWG ID.:	96-066	
	DATE:	1-2-98	



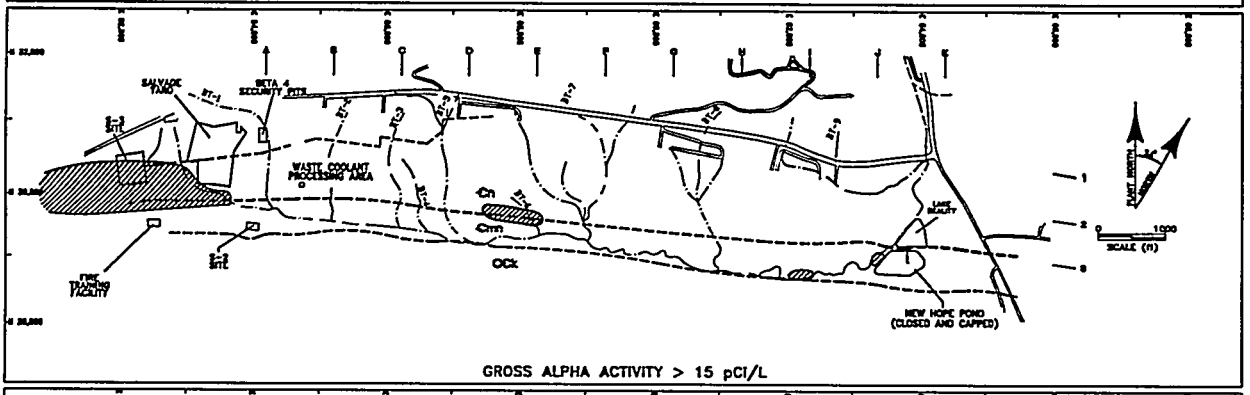
PREPARED FOR: *LOCKHEED MARTIN ENERGY SYSTEMS, INC.*	LOCATION:	Y-12 PLANT OAK RIDGE, TN.	FIGURE 6
PREPARED BY: *AJA TECHNICAL SERVICES, INC.*	DOC NUMBER:	97-003	CONFIRMED AND SUSPECTED SOURCES OF GROUNDWATER CONTAMINATION IN THE EAST FORK REGIME
	DWG ID.:	96-070	
	DATE:	2-6-97	



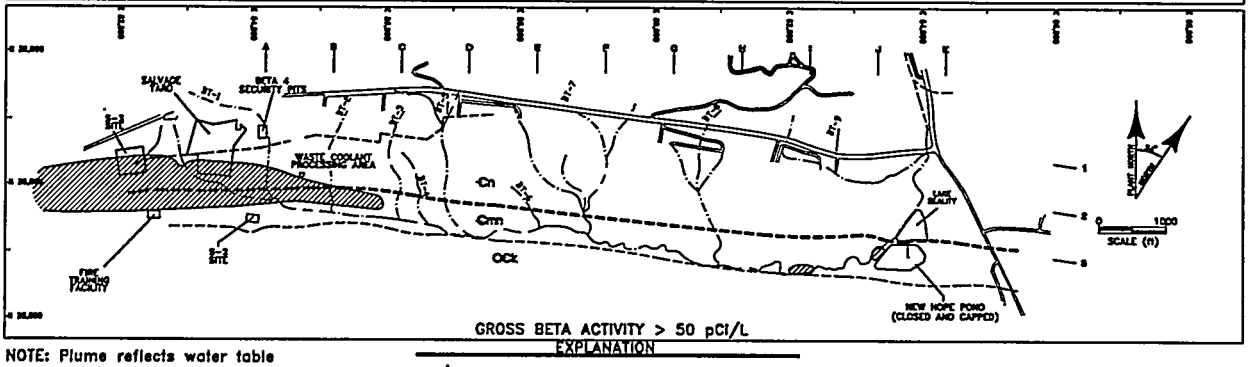
NITRATE (as N) > 10 mg/L



ORGANIC COMPOUNDS > 0 ug/L



GROSS ALPHA ACTIVITY > 15 pCi/L



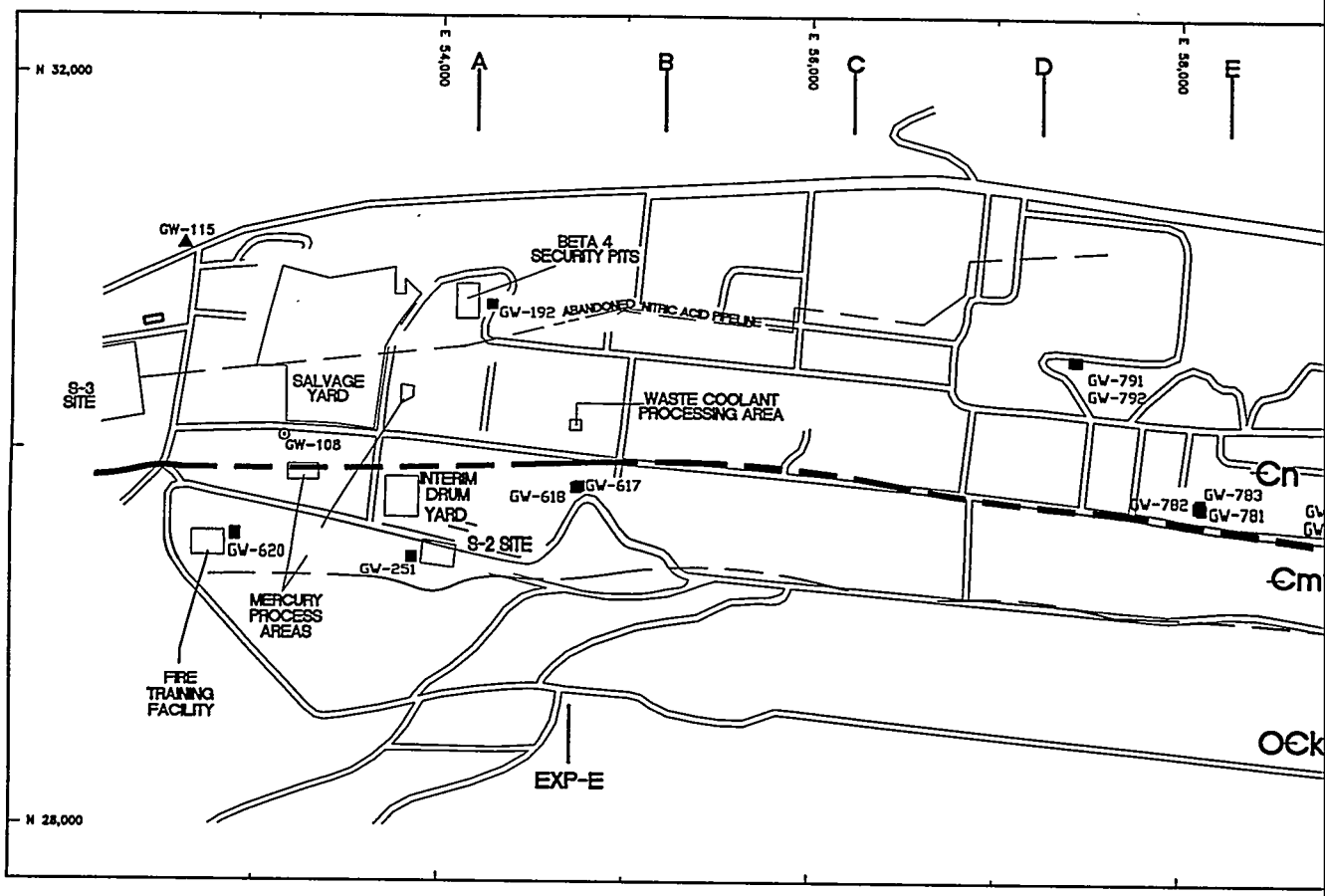
GROSS BETA ACTIVITY > 50 pCi/L

NOTE: Plume reflects water table and bedrock intervals.

EXPLANATION

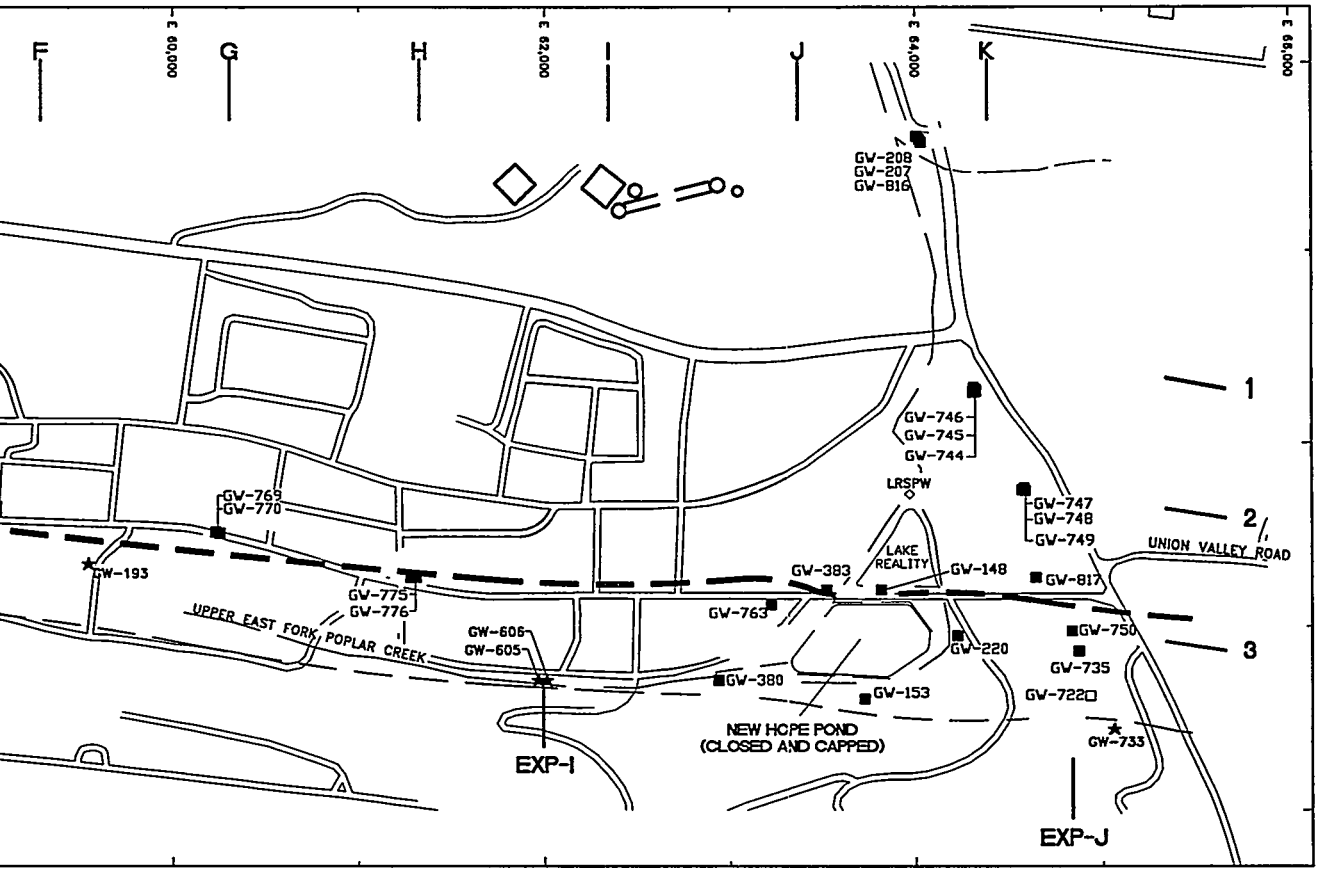
- 8 – COMPREHENSIVE GROUNDWATER MONITORING GRID
- Kn – NOLICHUCKY SHALE — AQUITARD
- Cm – MAYNARDVILLE — AQUIFER
- OCk – KNOX — AQUIFER
- BURIED TRIBUTARY (BT)

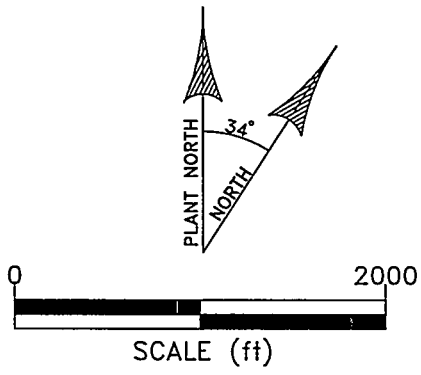
PREPARED FOR: *LOCKHEED MARTIN ENERGY SYSTEMS, INC.*	LOCATION:	Y-12 PLANT OAK RIDGE, TN.	FIGURE 7
PREPARED BY: *AJA TECHNICAL SERVICES, INC.*	DOC NUMBER:	98-D003	OVERALL EXTENT OF GROUNDWATER CONTAMINATION IN THE EAST FORK REGIME
	DWG ID.:	96-074	
	DATE:	1-2-98	



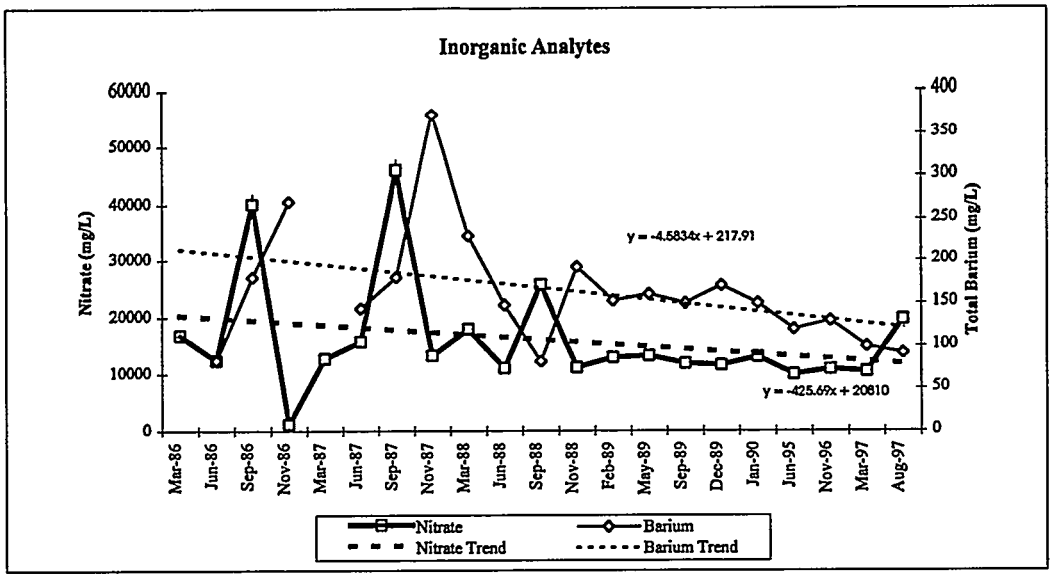
EXPLANATION

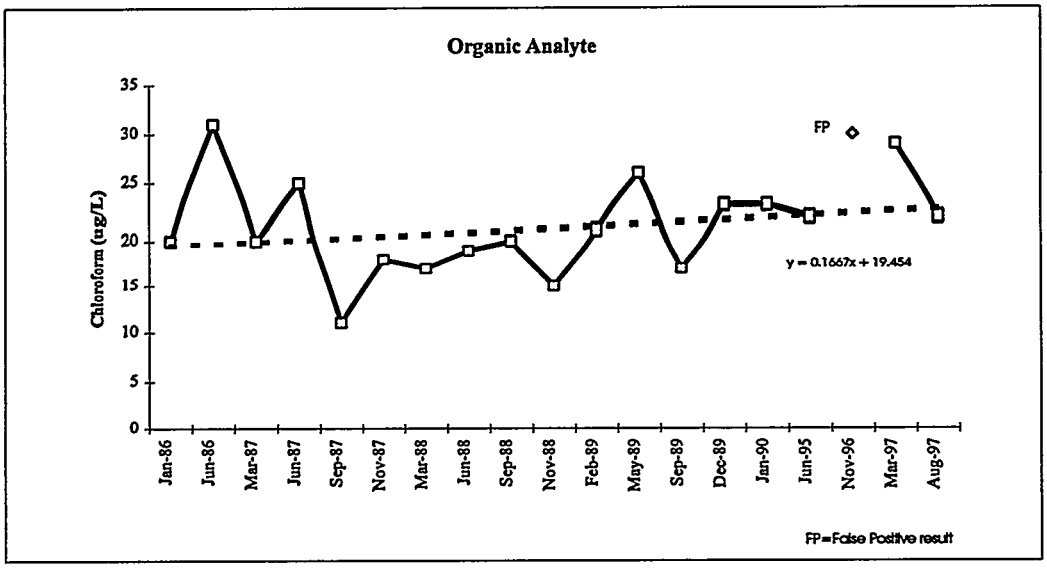
- ■ — Monitoring Well
- ▲ — RCRA Background Well
- ⊙ — RCRA Point-of-Compliance Well
- ★ — RCRA Plume Boundary Well
- □ — Monitoring Well equipped with a Westbay Multiport Sampling System.
- LRSPW ◇ — Lake Reality Emergency Spillway
- EXP-J — Exit Pathway, Maynardville Limestone Picket
- K — 1 — Comprehensive Groundwater Monitoring Grid
- Cn — NOLICHUCKY SHALE — AQUITARD
- Cmn — MAYNARDVILLE LIMESTONE
- OCk — KNOX GROUP — AQUIFER

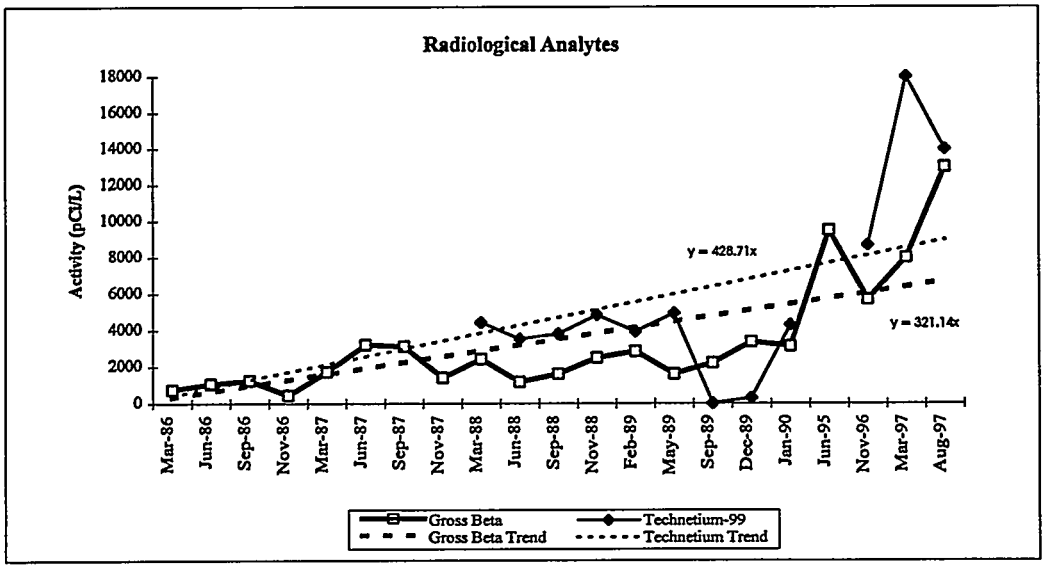




PREPARED FOR: *LOCKHEED MARTIN ENERGY SYSTEMS, INC.*	LOCATION:	Y-12 PLANT OAK RIDGE, TN.	FIGURE 8
PREPARED BY: *AJA TECHNICAL SERVICES, INC.*	DOC NUMBER:	98-003	CY 1997 GROUNDWATER AND SURFACE WATER SAMPLING LOCATIONS
	DWG ID.:	97-009	







PREPARED FOR: *LOCKHEED MARTIN ENERGY SYSTEMS, INC.*	LOCATION:	Y-12 PLANT OAK RIDGE, TN.	FIGURE 9
PREPARED BY: *AJA TECHNICAL SERVICES, INC.*	DOC No.:	98-D003	CONCENTRATIONS OF SELECTED GWPS CONSTITUENTS IN GROUNDWATER AT POINT-OF-COMPLIANCE WELL GW-108, 1986 - 1997
	DWG ID.:	PC PT197	
	DATE:	1/10/97	

APPENDIX B

TABLES

Table 1.
Index of Post-Closure Permit Conditions for Groundwater Monitoring in the East Fork Regime

Monitoring Requirement	Permit Condition	Section of Annual Monitoring Report
Monitoring Well Network	V.A	3.0
Well Location, Installation, and Construction	V.B	Figure 8; Appendix C
Background Wells	V.C.1	3.1.1
Point-of-Compliance Wells	V.C.2	3.1.1
Plume Boundary Wells	V.C.1	3.1.1
Sampling and Analysis	V.E	3.0
Sampling Frequency	V.C.1 and C.2	3.1.1
Sample Collection	V.E.1	3.2
Sample Preservation	V.E.2	3.2
Sample Transportation	V.E.3	3.2
Sample Chain-of-Custody Control	V.E.4	3.2
Analytical Parameters	V.C	3.3
Analytical Methods	V.E.5	3.3
Groundwater Surface Elevation	V.F	3.3
Data Evaluation	V.G	4.0
Groundwater Flow Rate/Direction	V.G.3	4.1
Point-of-Compliance	V.D.3; V.G.4	4.2
Plume Boundary	V.D.2; V.G.2	4.3

Table 2.
Confirmed and Suspected Sources of Groundwater Contamination in the East Fork Regime

Confirmed (★) or Suspected (?) Contaminant Source Area[1]	Type of Groundwater Contaminant				WESTERN PLANT AREA	CENTRAL PLANT AREA	EASTERN PLANT AREA
	Inorganics	Trace Metals	VOCs	Radioactivity			
S-3 Ponds	★	★	★	★	●		
Abandoned Nitric Acid Pipeline	?	.	.	?	●		
Rust Garage Area	.	.	★	.	●		
Y-12 Plant Salvage Yard	.	★	★	.	●		
Mercury Process Spill Areas	.	?	.	.	●		
Interim Drum Yard	.	.	★	.	●		
Fire Training Facility	.	.	★	.	●		
S-2 Site	★	★	★	★	●		
Waste Coolant Processing Area	.	.	★	.	●		
Tank 0134-U	.	.	?	?		●	
Tank 2331-U	.	.	★	.		●	
Building 9212 Complex (CMP GRID D2)	?	?	★	.		●	
Unspecified Source (CMP GRID E2)	?	?	?	.		●	
Unspecified Source (CMP GRID E3)	?	?	?	.		●	
Unspecified Source (CMP GRID F3)	?	?	?	.		●	
Unspecified Source (CMP GRID G3)	?	?	?	.		●	
Unspecified Source (CMP GRID H3)	?	?	?	.		●	
Building 9754-2 Fuel Facility	.	.	★	.			●
Unspecified Source (CMP GRID J3)	.	.	?	.			●
Unspecified Source (EXP-I)	.	.	?	.			●
Unspecified Source (EXP-J)	.	.	?	.			●
Oil Skimmer Basin	.	★	★	★			●

<u>Note</u>:

1 Unspecified sources of contamination indicated by groundwater quality data for Comprehensive Monitoring Plan (CMP) Grid Network monitoring wells, and Maynardville Limestone Exit-Pathway (EXP) Picket I and Picket J monitoring wells.

. - Not applicable

Table 3.
CY 1997 Groundwater and Surface Water Sampling Dates

MONITORING PROGRAM		RCRA Post-Closure Corrective Action Monitoring								
		DOE Order 5400.1 Exit Pathway/Perimeter Monitoring								
		DOE Order 5400.1 Surveillance Monitoring								
Sampling Point		Sampling Equipment[3]		Sampling Date[4]						
No.[1]	Location[2]	Dedicated	Portable	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.			
GW-108	S3	●	.	03/04/97	.	08/11/97	.	.	.	●
GW-115	S3	●	.	03/18/97	.	08/11/97	.	.	.	●
GW-148	NHP	Q4	●	.	05/20/97	.	12/03/97	●	.	.
GW-153	NHP	Q4	●	.	05/21/97D	.	12/03/97	.	●	.
GW-192	B4	Q4	●	.	04/07/97	.	10/30/97	●	.	.
GW-193	T2331	●	.	03/05/97	.	08/13/97	.	.	.	●
GW-207	EXP-SR	Q4	●	.	04/08/97	.	12/02/97	.	●	.
GW-208	EXP-SR	Q4	●	.	04/10/97	.	12/02/97	.	●	.
GW-220	NHP	Q4	●	.	05/22/97	.	12/08/97	.	●	.
GW-251	S2	●	.	.	05/07/97	.	11/05/97	●	.	.
GW-380	NHP	Q4	●	.	05/21/97	.	12/02/97D	.	●	.
GW-383	NHP	Q4	●	.	05/22/97	.	12/04/97	●	.	.
GW-605	EXP-I	●	.	03/18/19D	.	08/11/97	.	.	.	●
GW-606	EXP-I	.	●	03/06/97	.	07/31/97D	.	.	.	●
GW-617	EXP-E	●	.	.	05/07/97	.	11/05/97	.	●	.
GW-618	EXP-E	Q4	●	.	05/06/97D	.	11/04/97	.	●	.
GW-620	FTF	Q4	●	.	05/06/97	.	12/01/97	●	.	.
GW-722-06	EXP-J	●	.	.	.	07/28/97	11/24/97	.	●	.
GW-722-10	EXP-J	●	.	.	.	07/29/97	11/24/97	.	●	.
GW-722-14	EXP-J	●	.	.	.	07/29/97	11/25/97	.	●	.
GW-722-17	EXP-J	●	.	.	.	07/30/97	11/25/97	.	●	.
GW-722-20	EXP-J	●	.	.	.	07/30/97	12/02/97	.	●	.
GW-722-22	EXP-J	●	.	.	.	07/31/97	12/02/97	.	●	.
GW-722-26	EXP-J	●	.	.	.	08/04/97	12/02/97	.	●	.
GW-722-30	EXP-J	●	.	.	.	08/04/97	12/04/97	.	●	.
GW-722-32	EXP-J	●	.	.	.	08/05/97	12/04/97	.	●	.
GW-722-33	EXP-J	●	.	.	.	08/05/97D	.	.	●	.
GW-733	EXP-J	Q3	●	03/05/97	.	07/30/97	.	.	.	●
GW-735	EXP-J	●	.	.	04/15/97	.	12/03/97D	.	●	.
GW-744	GRIDK1	●	.	.	04/16/97	.	12/08/97	●	.	.
GW-745	GRIDK1	●	.	.	04/17/97	.	12/09/97	●	.	.
GW-746	GRIDK1	●	.	.	04/17/97	.	12/09/97	●	.	.
GW-747	GRIDK2	●	.	.	04/17/97D	.	12/09/97	●	.	.
GW-748	GRIDK2	●	.	.	04/17/97	.	12/10/97	●	.	.
GW-749	GRIDK2	●	.	.	04/17/97	.	12/10/97	●	.	.
GW-750	EXP-J	Q4	●	.	04/14/97	.	12/03/97	.	●	.
GW-763	GRIDJ3	Q4	●	.	05/20/97	.	12/02/97	●	.	.

Table 3 (cont'd)

MONITORING PROGRAM		RCRA Post-Closure Corrective Action Monitoring DOE Order 5400.1 Exit Pathway/Perimeter Monitoring DOE Order 5400.1 Surveillance Monitoring								
Sampling Point		Sampling Equipment [3]		Sampling Date [4]						
No. [1]	Location [2]	Dedicated	Portable	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.			
GW-769	GRIDG3	Q4	●	.	05/13/97D	.	11/17/97	●	.	.
GW-770	GRIDG3	Q4	●	.	05/12/97	.	11/17/97	●	.	.
GW-775	GRIDH3	Q4	●	.	05/12/97	.	11/19/97	●	.	.
GW-776	GRIDH3	Q4	●	.	05/12-13/97	.	12/02/97	●	.	.
GW-781	GRIDE3	Q4	●	.	05/15/97	.	11/19/97	●	.	.
GW-782	GRIDE3	●	.	.	05/14/97	.	11/24/97	●	.	.
GW-783	GRIDE3	Q4	●	.	05/15/97	.	11/25/97	●	.	.
GW-788	GRIDF3	Q4	●	.	05/13/97	.	11/18/97	●	.	.
GW-789	GRIDF3	Q4	●	.	05/14/97	.	11/18/97	●	.	.
GW-791	GRIDD2	Q4	●	.	04/08/97	.	11/20/97	●	.	.
GW-792	GRIDD2	Q4	●	.	04/08/97	.	11/20/97	●	.	.
GW-816	EXP-SR	●	.	.	04/16/97	.	12/04/97	.	●	.
GW-817	GRIDK3	●	.	.	04/17/97	.	12/04/97	●	.	.
LRSPW	EXP-SW	.	●	.	04/22-23/97	.	12/01/97	.	●	.

Notes:

1 Locations of monitoring wells and surface water station (LRSPW) shown on Figure 8. See Table 4 for a complete list of field measurements and laboratory analytes.

2
- B4 - Beta-4 Security Pits
- EXP - Exit Pathway (Maynardville Limestone) monitoring location
  - -E, -I, or -J: Maynardville Limestone Picket monitoring well.
  - -SW: Onsite spring or surface water station
  - -SR: Along Scarboro Road in the gap through Pine Ridge
- FTF - Fire Training Facility
- GRID - Comprehensive Groundwater Monitoring Plan Grid Location
- NHP - New Hope Pond
- S2 - S-2 Site
- S3 - S-3 Ponds Site
- T2331 - Tank 2331-U

3 Dedicated: Well Wizard™ (bladder pump that remains in the well) or Westbay™ (multiport sampling equipment; GW-722 only); Q3 = only third quarter samples collected with a well wizard; Q4 = only fourth quarter samples collected with a Well Wizard™.

Portable: Bennet Pumps™ and disposable bailers (monitoring wells); grab sample bottles (surface water).

4 "D" used to denote sampling locations from which duplicate samples were collected on the specified sampling date.

Table 4.
Laboratory Analytes and Field Measurements for CY 1997
Groundwater and Surface Water Samples

MONITORING PROGRAM		RCRA Post-Closure Corrective Action Monitoring[1]				
		DOE Order 5400.1 Monitoring[2]				
PRINCIPAL IONS	**Analytical Method[3]**	**GWPS Constituent[4]**	**Sample Type[5]**			
			Filtered	**Unfiltered**		
Alkalinity - HCO3	EPA-310.1	.	.	●	●	●
Alkalinity - CO3	EPA-310.1	.	.	●	●	●
Calcium	EPA-6010A	.	●	●	●	●
Chloride	EPA-300.0	.	.	●	●	●
Fluoride	EPA-340.2	.	.	●	●	●
Magnesium	EPA-6010A	.	●	●	●	●
Nitrate (as N)	EPA-300.0	●	.	●	●	●
Potassium	EPA-6010A	.	●	●	●	●
Sodium	EPA-6010A	.	●	●	●	●
Sulfate	EPA-300.0	.	.	●	●	●
TRACE METALS	**Analytical Method**	**GWPS Constituent**	**Sample Type**			
			Filtered	**Unfiltered**		
Aluminum	EPA-6010A	.	●	●	●	●
Antimony	EPA-6010A	.	●	●	●	●
Arsenic	EPA-200.8	.	●	●	●	●
Barium	EPA-6010A	●	●	●	●	●
Beryllium	EPA-6010A	.	●	●	●	●
Boron	EPA-6010A	.	●	●	●	●
Cadmium	EPA-6010A	●	●	●	●	●
Chromium	EPA-6010A	●	●	●	●	●
Cobalt	EPA-6010A	.	●	●	●	●
Copper	EPA-6010A	.	●	●	●	●
Iron	EPA-6010A	.	●	●	●	●
Lead	EPA-200.8	●	●	●	●	●
Lithium	EPA-6010A	.	●	●	●	●
Manganese	EPA-6010A	.	●	●	●	●
Mercury	EPA-7470	●	●	●	●	●
Molybdenum	EPA-6010A	.	●	●	●	●
Nickel	EPA-6010A	●	●	●	●	●
Selenium	EPA-6010A	.	●	●	●	●
Silver	EPA-6010A	.	●	●	●	●
Strontium	EPA-6010A	.	●	●	●	●
Thallium	EPA-200.8	.	●	●	●	●
Thorium	EPA-6010A	.	●	●	●	●

Table 4 (cont'd)

MONITORING PROGRAM		RCRA Post-Closure Corrective Action Monitoring[1]				
		DOE Order 5400.1 Monitoring[2]				
TRACE METALS (cont'd)	Analytical Method[3]	GWPS Constituent[4]	Sample Type[5]			
			Filtered	Unfiltered		
Uranium	EPA-200.8	●	●	●	●	●
Vanadium	EPA-6010A	.	●	●	●	●
Zinc	EPA-6010A	.	●	●	●	●
VOLATILE ORGANIC COMPOUNDS	Analytical Method	GWPS Constituent	Sample Type			
			Filtered	Unfiltered		
Acetone	EPA-8260	.	.	●	●	●
Acrolein	EPA-8260	.	.	●	●	●
Acrylonitrile	EPA-8260	.	.	●	●	●
Benzene	EPA-8260	●	.	●	●	●
Bromochloromethane	EPA-8260	.	.	●	●	●
Bromodichloromethane	EPA-8260	.	.	●	●	●
Bromoform	EPA-8260	●	.	●	●	●
Bromomethane	EPA-8260	.	.	●	●	●
2-Butanone	EPA-8260	.	.	●	●	●
Carbon disulfide	EPA-8260	.	.	●	●	●
Carbon tetrachloride	EPA-8260	●	.	●	●	●
Chlorobenzene	EPA-8260	.	.	●	●	●
Chloroethane	EPA-8260	.	.	●	●	●
2-Chloroethyl vinyl ether	EPA-8260	.	.	●	●	●
Chloroform	EPA-8260	●	.	●	●	●
Chloromethane	EPA-8260	.	.	●	●	●
Dibromochloromethane	EPA-8260	.	.	●	●	●
1,2-Dibromo-3-chloropropane	EPA-8260	.	.	●	●	●
1,2-Dibromoethane	EPA-8260	.	.	●	●	●
Dibromomethane	EPA-8260	.	.	●	●	●
1,2-Dichlorobenzene	EPA-8260	.	.	●	●	●
1,4-Dichlorobenzene	EPA-8260	.	.	●	●	●
1,4-Dichloro-2-butene	EPA-8260	.	.	●	●	●
trans-1,4-Dichloro-2-butene	EPA-8260	.	.	●	●	●
Dichlorodifluoromethane	EPA-8260	.	.	●	●	●
1,1-Dichloroethane	EPA-8260	.	.	●	●	●
1,2-Dichloroethane	EPA-8260	.	.	●	●	●
1,1-Dichloroethene	EPA-8260	●	.	●	●	●
1,2-Dichloroethene	EPA-8260	.	.	●	●	●
cis-1,2-Dichloroethene	EPA-8260	.	.	●	●	●
trans-1,2-Dichloroethene	EPA-8260	●	.	●	●	●
1,2-Dichloropropane	EPA-8260	.	.	●	●	●

Table 4 (cont'd)

MONITORING PROGRAM		RCRA Post-Closure Corrective Action Monitoring[1]				
		DOE Order 5400.1 Monitoring[2]				
VOLATILE ORGANIC COMPOUNDS (cont'd)	Analytical Method[3]	GWPS Constituent[4]	Sample Type[5]			
			Filtered	Unfiltered		
cis-1,3-Dichloropropene	EPA-8260	.	.	●	●	●
trans-1,3-Dichloropropene	EPA-8260	.	.	●	●	●
Dimethylbenzene	EPA-8260	.	.	●	●	●
Ethanol	EPA-8260	.	.	●	●	●
Ethylbenzene	EPA-8260	.	.	●	●	●
Ethyl methacrylate	EPA-8260	.	.	●	●	●
2-Hexanone	EPA-8260	.	.	●	●	●
Iodomethane	EPA-8260	.	.	●	●	●
4-Methyl-2-pentanone	EPA-8260	.	.	●	●	●
Methylene chloride	EPA-8260	.	.	●	●	●
Styrene	EPA-8260	.	.	●	●	●
1,1,1,2-Tetrachloroethane	EPA-8260	.	.	●	●	●
1,1,2,2-Tetrachloroethane	EPA-8260	.	.	●	●	●
Tetrachloroethene	EPA-8260	●	.	●	●	●
Toluene	EPA-8260	.	.	●	●	●
1,1,1-Trichloroethane	EPA-8260	●	.	●	●	●
1,1,2-Trichloroethane	EPA-8260	.	.	●	●	●
Trichloroethene	EPA-8260	●	.	●	●	●
Trichlorofluoromethane	EPA-8260	.	.	●	●	●
1,2,3-Trichloropropane	EPA-8260	.	.	●	●	●
Vinyl acetate	EPA-8260	.	.	●	●	●
Vinyl chloride	EPA-8260	.	.	●	●	●
RADIOLOGICAL ANALYTES	Analytical Method	GWPS Constituent	Sample Type			
			Filtered	Unfiltered		
Gross Alpha Activity	EPA-900.0	●	.	●	●	●
Gross Beta Activity	EPA-900.0	●	.	●	●	●
Technetium-99	Y/P65-7154	●	.	●	.	●
MISC. LABORATORY ANALYTES	Analytical Method[3]	GWPS Constituent[4]	Sample Type[5]			
			Filtered	Unfiltered		
pH	EPA-150.1	.	.	●	●	●
Conductivity	EPA-129.1	.	.	●	●	●
Total Dissolved Solids	EPA-160.1	.	.	●	●	●
Total Suspended Solids	EPA-160.2	.	.	●	●	●
Turbidity	EPA-180.1	.	.	●	●	●

Table 4 (cont'd)

MONITORING PROGRAM		RCRA Post-Closure Corrective Action Monitoring[1]				
		DOE Order 5400.1 Monitoring[2]				
FIELD MEASUREMENTS	Analytical Method[3]	GWPS Constituent[4]	Sample Type[5]			
			Filtered	Unfiltered		
Depth-to-Water	ESP 302-1	.	.	.	●	●
Water Temperature	ESP 307-1	.	.	●	●	●
pH	ESP 307-2	.	.	●	●	●
Conductivity	ESP 307-8	.	.	●	●	●
Dissolved Oxygen	ESP 307-5	.	.	●	●	●
Redox	ESP 307-5	.	.	●	●	●

Notes:

1 Monitoring per the requirements of the Resource Conservation and Recovery Act (RCRA) Post-Closure Permit for the East Fork Regime (Permit No. TNHW-089). Samples from well GW-115 were analyzed for additional isotopes (not listed on this table) to meet requirements of the RCRA Post-Closure Permit for the Bear Creek Regime (Permit No. TNHW-087). Results for these isotopes are presented in the annual monitoring report for the Bear Creek Regime (AJA Technical Services, Inc. 1998).

2 Surveillance monitoring and exit pathway/perimeter monitoring per the requirements of U.S. Department of Energy (DOE) Order 5400.1.

3 Organics analyses were performed using method EPA-8240 during the first quarter sampling event; method EPA-8260 was used for the rest of the year. Analytical/field methods/procedures from:

- *Test Methods for Evaluating Solid Waste Physical/Chemical Methods* (U.S. Environmental Protection Agency 1986)
- *Methods for Chemical Analysis of Water and Wastes* (U.S. Environmental Protection Agency 1983)
- *Environmental Surveillance Procedures Quality Control Program* (Martin Marietta Energy Systems, Inc. 1988b)
- Analytical Services Organization homepage on the internet

4 Groundwater protection standard (GWPS) constituent specified in the RCRA Post-Closure Permit for the East Fork Regime.

5 Groundwater samples for metals analysis collected with dedicated sampling equipment or portable Bennet Pumps™ were filtered in the field; samples collected with bailers and surface water samples were filtered in the laboratory.

Table 5.
Groundwater Elevations in the East Fork Regime, March 31 - April 4 and October 8 - 10, 1997

Well No.[1]	Location[2]	Hydrogeologic Unit		Top of Casing Elevation[3]	Depth-to-Water (ft below Top of Casing)		Groundwater Elevation (ft msl)		Seasonal Fluctuation (+/- ft)
		Aquifer	Aquitard		March 31 - April 4, 1997	October 8 - 10, 1997	March 31 - April 4, 1997	October 8 - 10, 1997	
55-1A	Y12		●	986.67	10.8	11.1	-0.3	975.87	975.57
55-6A	Y12		●	989.04	8.5	9.6	-1.1	980.54	979.44
56-1A	Y12		●	969.25	8.0	8.0	0.0	961.25	961.25
56-2A	Y12		●	963.30	8.4	8.6	-0.2	954.90	954.70
60-1A	Y12	●		929.66	13.2	13.6	-0.4	916.46	916.06
GW-105	S3		●	1017.40	7.4	8.9	-1.5	1010.00	1008.50
GW-106	S3		●	1016.00	4.8	4.7	0.1	1011.20	1011.30
GW-107	S3		●	998.19	7.6	7.3	0.3	990.59	990.89
GW-148	NHP	●		907.36	7.2	7.9	-0.7	900.16	899.46
GW-150	NHP	●		915.56	14.1	14.1	0.0	901.46	901.46
GW-152	NHP	●		921.18	19.6	19.9	-0.3	901.58	901.28
GW-154	NHP	●		911.50	9.1	9.8	-0.7	902.40	901.70
GW-167	EXP	●		931.38	29.0	31.3	-2.3	902.38	900.08
GW-169	EXP-UV	●		931.87	29.2	33.3	-4.1	902.67	898.57
GW-171	EXP-UV	●		920.10	8.9	13.6	-4.7	911.20	906.50
GW-191	B4		●	1011.10	4.3	5.4	-1.1	1006.80	1005.70
GW-192	B4		●	1008.60	5.3	6.1	-0.8	1003.30	1002.50
GW-193	T2331		●	934.00	8.4	9.0	-0.6	925.60	925.00
GW-195	B4		●	1002.90	7.0	8.1	-1.1	995.90	994.80
GW-199	GRIDI1		●	961.08	16.9	17.2	-0.3	944.18	943.88
GW-201	RDS		●	968.89	19.4	19.8	-0.4	949.49	949.09
GW-218	UOV	●		935.81	14.5	15.7	-1.2	921.31	920.11
GW-219	UOV	●		935.64	11.7	13.9	-2.2	923.94	921.74
GW-255	S2	●		1027.10	24.9	39.7	-14.8	1002.20	987.40
GW-261	SY		●	1050.00	17.2	18.3	-1.1	1032.80	1031.70
GW-263	SY		●	1057.70	23.1	29.1	-6.0	1034.60	1028.60
GW-334	WC		●	983.73	11.7	12.1	-0.4	972.03	971.63
GW-335	WC		●	981.88	10.4	9.9	0.5	971.48	971.98
GW-349	S2	●		993.50	4.5	6.8	-2.3	989.00	986.70
GW-380	NHP	●		913.55	10.1	11.2	-1.1	903.45	902.35
GW-383	NHP		●	908.50	9.1	9.7	-0.6	899.40	898.80
GW-384	NHP		●	908.38	10.2	10.5	-0.3	898.18	897.88

Table 5 (cont'd)

Well No.[1]	Location[2]	Hydrogeologic Unit: Aquifer	Hydrogeologic Unit: Aquitard	Top of Casing Elevation[3]	Depth-to-Water (ft below Top of Casing): March 31 - April 4, 1997	Depth-to-Water (ft below Top of Casing): October 8 - 10, 1997	Seasonal Fluctuation (+/- ft)	Groundwater Elevation (ft msl): March 31 - April 4, 1997	Groundwater Elevation (ft msl): October 8 - 10, 1997
GW-617	EXP-E	●		985.11	13.2	15.2	-2.0	971.91	969.91
GW-618	EXP-E	●		984.94	12.9	15.0	-2.1	972.04	969.94
GW-619	FTF	●		1015.20	22.5	27.8	-5.3	992.70	987.40
GW-620	FTF	●		1015.30	23.7	28.6	-4.9	991.60	986.70
GW-634	RG		●	1007.20	8.7	8.8	-0.1	998.50	998.40
GW-686	CPT	●		963.76	12.5	12.6	-0.1	951.26	951.16
GW-691	CPT	●		968.59	11.9	12.1	-0.2	956.69	956.49
GW-699	B8110	●		971.14	16.1	16.1	0.0	955.04	955.04
GW-735	EXP-J		●	924.28	22.3	23.5	-1.2	901.98	900.78
GW-746	GRIDK1		●	906.88	5.4	7.8	-2.4	901.50	899.08
GW-749	GRIDK2		●	921.19	6.1	8.4	-2.3	915.09	912.79
GW-752	GRIDJ3		●	912.78	3.6	6.3	-2.7	909.15	906.48
GW-754	GRIDJ2		●	928.59	9.2	12.6	-3.5	919.44	915.99
GW-756	GRIDJ1		●	927.92	6.1	7.1	-1.0	921.82	920.82
GW-759	GRIDG1		●	994.01	18.0	19.4	-1.4	976.01	974.61
GW-761	GRIDG2		●	968.23	10.0	12.3	-2.3	958.19	955.93
GW-763	GRIDJ3		●	914.85	9.9	10.2	-0.3	904.97	904.65
GW-765	GRIDE1		●	1008.50	19.6	20.1	-0.5	988.87	988.40
GW-767	GRIDI2		●	948.54	11.9	12.8	-0.9	936.61	935.74
GW-770	GRIDG3		●	944.55	14.1	14.4	-0.3	930.49	930.15
GW-772	GRIDC1		●	1012.70	9.7	13.0	-3.4	1003.05	999.70
GW-774	GRIDH2		●	963.16	14.9	16.3	-1.4	948.23	946.86
GW-780	GRIDF2		●	963.40	12.7	13.2	-0.5	950.72	950.20
GW-783	GRIDE3		●	948.32	10.4	13.4	-3.0	937.92	934.92
GW-785	GRIDD1		●	1009.40	9.7	13.1	-3.5	999.75	996.30
GW-787	GRIDE2		●	987.85	13.4	17.6	-4.2	974.46	970.22
GW-792	GRIDD2		●	992.57	24.3	25.6	-1.4	968.32	966.97
GW-816	EXP-SR		●	898.21	12.2	12.7	-0.5	886.00	885.51
GW-817	GRIDK3		●	918.12	6.9	8.5	-1.6	911.25	909.62

Table 5 (cont'd)

Notes:

1 Bold typeface denotes wells sampled during CY 1997 (see Table 3).

2
- B4 - Beta-4 Security Pits
- B8110 - Building 8110
- CPT - Coal Pile Trench
- EXP - Exit Pathway (Maynardville Limestone) monitoring well
  - -E or -J: Maynardville Limestone Picket
  - -UV: Offsite in Union Valley
  - -SR: Along Scarboro Road in the gap through Pine Ridge
- FTF - Fire Training Facility
- GRID - Comprehensive Groundwater Monitoring Plan Grid Location
- NHP - New Hope Pond
- RDS - Ravine Disposal Site
- RG - Rust Garage Area
- S2 - S-2 Site
- S3 - S-3 Ponds Site
- SY - Y-12 Plant Salvage Yard
- T2331 - Tank 2331-U
- UOV - Uranium Oxide Vault
- WC - Waste Coolant Processing Area
- Y12 - Y-12 Plant Complex

3 Measuring point (top of casing) elevation in feet above mean sea level.

Table 6.
Summary of CY 1997 RCRA Post-Closure Corrective Action Monitoring Results

RCRA GROUNDWATER PROTECTION STANDARD CONSTITUENTS[1]									
Inorganic Analytes[2] (mg/L)	Reporting Limits (mg/L)	Point-of-Compliance Well GW-108				Background Well GW-115			
		03/04/97		08/11/97		03/18/97		08/11/97	
		TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
Barium	0.001	100	100	92	96	0.22	0.22	0.21	0.2
Cadmium	0.003	.	.	.	.	.	.	.	.
Chromium	0.01	.	.	.	.	.	.	.	.
Lead	0.0005	0.0018	0.001	0.0017	0.0014	.	.	.	.
Mercury	0.0002	.	.	.	.	.	.	.	.
Nickel	0.01	.	.	0.26	0.35	.	.	.	.
Nitrate	0.028	10,500	.	[19,700]	.	0.032	.	.	.
Uranium	0.0005	0.015	0.015	0.015	0.016	.	.	.	.
Organic Analytes[3] (µg/L)	Reporting Limits (µg/L)								
Benzene	5	.		.		.		.	
Bromoform	5	2 J		2 J		.		.	
Carbon Tetrachloride	5	.		.		.		.	
Chloroform	5	29		22		.		.	
1,1-Dichloroethene	5	.		.		.		.	
Trans-1,2-Dichloroethene	5	.		.		.		.	
Tetrachloroethene	5	.		.		.		.	
Trichloroethene	5	2 J(FP)		2 J		.		.	
1,1,1-Trichloroethane	5	.		.		.		.	
Radiological Analytes[4] (pCi/L)									
Gross Alpha		<MDA		<MDA		<MDA		<MDA	
Gross Beta		8,000 ± 600		13,000 ± 1,100		<MDA		<MDA	
Technetium-99		18,000 ± 1,800		14,000 ± 1,400		<MDA		<MDA	

Table 6 (cont'd)

RCRA GROUNDWATER PROTECTION STANDARD CONSTITUENTS[1]									
Inorganic Analytes[2] (mg/L)	Reporting Limits (mg/L)	Plume Delineation Well GW-193				Plume Delineation Well GW-605			
		03/05/97		08/13/97		03/18/97		08/11/97	
		TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
Barium	0.001	0.078	0.081	0.11	0.076	0.057	0.056	0.054	0.066
Cadmium	0.003	.	.	.	.	.	.	.	.
Chromium	0.01	.	.	.	.	.	.	.	.
Lead	0.0005	0.0012	.	.	.	.	.	.	.
Mercury	0.0002	.	.	.	.	.	.	.	.
Nickel	0.01	.	.	.	.	.	.	.	.
Nitrate (as N)	0.028	.	.	.	.	0.221	.	0.28	.
Uranium	0.0005	0.012	0.014	0.0042	0.0043	0.24	0.23	0.23	0.22
Organic Analytes[3] (µg/L)	Reporting Limits (µg/L)								
Benzene	5	180		120		.		.	
Bromoform	5	.		.		.		.	
Carbon Tetrachloride	5	.		.		100		170	
Chloroform	5	.		.		11(FP)		16	
1,1-Dichloroethene	5	.		.		.		.	
Trans-1,2-Dichloroethene	5	.		.		.		.	
Tetrachloroethene	5	.		.		3 J		7 J	
Trichloroethene	5	.		.		1 J		2 J	
1,1,1-Trichloroethane	5	.		.		.		.	
Radiological Analytes[4] (pCi/L)									
Gross Alpha		7.6 ± 3.8		4.4 ± 2.8		170 ± 22		120 ± 39	
Gross Beta		<MDA		<MDA		80 ± 13		<MDA	
Technetium-99		<MDA		<MDA		<MDA		<MDA	

Table 6 (cont'd)

RCRA GROUNDWATER TARGET COMPOUNDS [1]									
Inorganic Analytes [2] (mg/L)	Reporting Limits (mg/L)	Plume Delineation Well GW-606				Plume Delineation Well GW-733			
		03/06/97		07/31/97		03/05/97		07/30/97	
		TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
Barium	0.001	0.093	0.091	0.087	0.087	0.027	0.028	0.031	0.026
Cadmium	0.003	.	.	.	.	.	.	.	.
Chromium	0.01	.	.	.	.	.	.	.	.
Lead	0.0005	0.00058	0.00056	0.0016	.	0.0019	0.0093	0.0042	.
Mercury	0.0002	.	.	.	.	.	.	.	.
Nickel	0.01	.	.	.	.	.	.	.	.
Nitrate (as N)	0.028	1.05	.	1.14	.	0.366	.	0.38	.
Uranium	0.0005	0.0068	0.0065	0.0074	0.0076	0.0008	0.00066	0.00088	0.00087
Organic Analytes [3] (µg/L)	Reporting Limits (µg/L)								
Benzene	5	.		.		.		.	
Bromoform	5	.		.		.		.	
Carbon Tetrachloride	5	810		67		31		26	
Chloroform	5	210		66		2 J		2 J	
1,1-Dichloroethene	5	.		.		.		.	
Trans-1,2-Dichloroethene	5	.		.		.		.	
Tetrachloroethene	5	.		5 J		1 J		.	
Trichloroethene	5	16		.		.		.	
1,1,1-Trichloroethane	5	.		.		.		.	
Radiological Analytes [4] (pCi/L)									
Gross Alpha		8.5 ± 3.6		5.5 ± 3.1		2.4 ± 1.8		<MDA	
Gross Beta		<MDA		<MDA		<MDA		<MDA	
Technetium-99		<MDA		<MDA		<MDA		<MDA	

Table 6 (cont'd)

Notes:

1 As specified in Attachment 3, Section F, of the RCRA post-closure permit for the Upper East Fork Poplar Creek Hydrogeologic Regime (Permit No. TNHW-089).

2 Total (TOT) and dissolved (DIS) concentrations in milligrams per liter (mg/L) reported for unfiltered and filtered groundwater samples; "." = not detected above the specified analytical reporting limit (detection limit); [19,700] = qualitative result based on ion charge balance (see Appendix F.4).

3 Concentrations in micrograms per liter (µg/L) reported for unfiltered groundwater samples; "." = not detected above the specified analytical reporting limit (contract required quantitation limit); J = estimated value below the quantitation limit; (FP) = false-positive result (see Appendix F.5).

4 Concentrations in picoCuries per liter (pCi/L) ± counting error reported for unfiltered groundwater samples; <MDA = less than the minimum detectable activity (see Appendix D.4).

APPENDIX C

MONITORING WELL CONSTRUCTION DETAILS

EXPLANATION

LOCATION:

B4	-	Beta-4 Security Pits
EXP	-	Exit Pathway Monitoring Location:
		Maynardville Limestone Picket (-E, -I, -J)
		In the gap through Pine Ridge along Scarboro Road (-SR)
FTF	-	Fire Training Facility
GRID	-	Comprehensive Groundwater Monitoring Plan Grid Location
NHP	-	New Hope Pond
S2	-	S-2 Site
S3	-	S-3 Site
T2331	-	Underground Storage Tank T2331-U

PROGRAM:

CMP	-	RCRA Corrective Action Monitoring
		Background well (-B)
		Point-of-compliance well (-C)
		Plume delineation well (-E)
EXP	-	DOE Order 5400.1 Monitoring: exit pathway
SMP	-	DOE Order 5400.1 Monitoring: surveillance

GENERAL INFORMATION:

Coordinates	-	Y-12 Plant grid system
Elevations	-	Feet above mean sea level
Depths	-	Feet below ground surface
AQF	-	Knox Aquifer
AQT	-	ORR Aquitards
BDR	-	Bedrock Interval
WT	-	Water Table Interval
OCk	-	Knox Group
Cm	-	Maryville Limestone
Cn	-	Nolichucky Shale
Cmn	-	Maynardville Limestone
Cpv	-	Pumpkin Valley Shale
Crg	-	Rogersville Shale
.	-	Not Applicable or not available

EXPLANATION (cont'd)

CASING:

Diameters	-	Outside dimensions, in inches (nominal)
Casing Material:		
PVC/#40	-	Polyvinyl chloride, schedule 40
SS/#304	-	Stainless steel, schedule 304
Steel	-	Carbon steel
F25/J55	-	American Petroleum Institute Grade

MONITORED INTERVAL:

Top	-	Depth to top of filter pack or open-hole
Bottom	-	Depth to bottom of filter pack or open-hole
Screen Material:		
PVC/sl	-	PVC/slotted
PVC/sw/.01	-	PVC, spiral wound, 0.01 inch slot size
SS/sw/.01	-	Stainless steel, spiral wound, 0.01 inch slot size
SS/pp/.01	-	Stainless steel prepack screen, spiral wound, 0.01 inch slot size

Length of screen and open hole interval is in feet.

Groundwater samples were collected during the third and fourth quarter sampling events from ten sampling ports of a Westbay® multiport system installed in well GW-722. The following table shows the depths and elevations of the sampling ports: overall construction details are provided in the appendix.

Port	Depth (ft)	Elevation (ft, msl)
GW-722-33	90	863.71
GW-722-32	110	843.71
GW-722-30	153.9	799.81
GW-722-26	218.9	734.81
GW-722-22	315.8	637.91
GW-722-20	335.8	617.91
GW-722-17	387.7	566.01
GW-722-14	427.7	526.01
GW-722-10	502.6	451.11
GW-722-06	562.6	391.11

NOTE:

Data Compiled from *Updated Subsurface Data Base for Bear Creek Valley, Chestnut Ridge, and parts of Bethel Valley on the U.S. Department of Energy Oak Ridge Reservation* (Jones et al. 1995).

APPENDIX C
Monitoring Well Construction Details

Well Number	GW-108	GW-115	GW-148	GW-153	GW-192	GW-193	GW-207
Location	S3	S3	NHP	NHP	B4	Y12	EXP-SR
Program	CMP-C	CMP-B	SMP	EXP	SMP	CMP-E	EXP
GENERAL INFORMATION	.	.	.	.	.	.	.
East Coordinate	53207.00	52685.00	63817.00	63728.00	54277.00	59536.17	64023.00
North Coordinate	30069.00	31073.00	29202.00	28613.00	30772.00	29343.93	31596.00
Measuring Pt. Elevation	998.18	1054.40	907.36	921.44	1008.60	934.00	898.36
Surface Elevation	995.61	1051.90	904.53	918.53	1006.00	931.11	894.61
Hydrostratigraphic Unit	AQT	AQT	AQF	AQF	AQT	AQT	AQT
Geologic Formation	Cn	Cm	Cmn	Cmn	Cm	CON	Cr
Aquifer Zone	WT	WT	WT	BDR	WT	WT	BDR
Weathered Rock - Depth	4.0	.	11.1	.	17.5	2.5	.
Weathered Rock - Elevation	991.61	.	893.43	.	988.50	928.61	.
Fresh Rock - Depth	.	.	.	14.0	.	.	.
Fresh Rock - Elevation	.	.	.	904.53	.	.	.
Total Depth Drilled	58.6	53.0	11.1	60.0	17.5	18.5	109.6
SURFACE/CONDUCTOR CASING	.	.	.	.	.	.	.
Casing Depth	20.7	.	.	14.0	.	.	17.0
Casing Diameter	10.63	.	.	12.50	.	.	8.63
Casing Material	PVC/#40	none	none	PVC/#40	none	none	PVC/#40
WELL CASING	.	.	.	.	.	.	.
Borehole Depth	58.6	53.0	11.1	60.0	17.5	18.5	100.0
Borehole Diameter	9.00	.	8.00	11.00	6.00	8.00	7.87
Well Casing Depth	46.7	42.0	5.6	49.5	7.5	8.2	100.0
Well Casing Diameter	4.50	2.37	4.50	4.50	4.50	4.50	4.38
Well Casing Material	PVC/#40	SS/#304	PVC/#40	PVC/#40	PVC/#40	SS/#304	PVC/#40
MONITORED INTERVAL	.	.	.	.	.	.	.
Top - Depth	41.0	37.6	4.6	45.0	6.5	5.5	100.0
Top - Elevation	954.61	1014.30	899.93	873.53	999.50	925.61	794.61
Midpoint - Depth	49.8	45.3	7.9	52.5	12.0	12.0	104.8
Midpoint - Elevation	945.81	1006.60	896.68	866.03	994.00	919.16	789.81
Bottom - Depth	58.6	53.0	11.1	60.0	17.5	18.4	109.6
Bottom - Elevation	937.01	998.90	893.43	858.53	988.50	912.71	785.01
Screen Material	PVC/sl/.01	SS/sw/.01	PVC/sw/.01	PVC/sw/.01	PVC/sw/.01	SS/sw/.01	.
Screen Length	10.1	10.0	5.0	10.0	10.0	10.3	.
Open-Hole Length	.	.	.	.	.	.	9.6
Open-Hole Diameter	.	.	.	.	.	.	3.88

(CONTINUED)

APPENDIX C
Monitoring Well Construction Details

Well Number	GW-208	GW-220	GW-251	GW-380	GW-383	GW-605	GW-606
Location	EXP-SR	NHP	S2	NHP	NHP	EXP-I	EXP-I
Program	EXP	EXP	SMP	EXP	SMP	CMP-E	CMP-E
GENERAL INFORMATION							
East Coordinate	64007.00	64225.00	53843.00	62938.00	63522.00	62001.50	61951.42
North Coordinate	31612.00	28949.00	29467.00	28714.00	29201.00	28706.83	28708.32
Measuring Pt. Elevation	897.72	915.64	1003.60	913.55	908.50	918.88	919.39
Surface Elevation	894.38	912.74	1001.60	913.66	906.00	916.97	916.98
Hydrostratigraphic Unit	AQT	AQF	AQF	AQF	AQT	AQF	AQF
Geologic Formation	Cr	Cmn	Cmn	Cmn	Cn	Cmn	Cmn
Aquifer Zone	BDR	BDR	BDR	WT	WT	BDR	BDR
Weathered Rock - Depth	.	.	.	15.5	11.5	.	.
Weathered Rock - Elevation	.	.	.	898.16	894.50	.	.
Fresh Rock - Depth	12.0	11.0	32.5	.	.	9.5	10.8
Fresh Rock - Elevation	882.38	901.74	969.10	.	.	907.47	906.18
Total Depth Drilled	412.8	45.2	51.0	15.5	24.1	40.5	175.0
SURFACE/CONDUCTOR CASING							
Casing Depth	24.0	13.0	.	.	5.0	9.5	10.8
Casing Diameter	8.63	12.50	.	.	10.75	11.75	16.00
Casing Material	PVC/#40	PVC/#40	none	none	unknown	Steel/J55	Steel/J55
WELL CASING							
Borehole Depth	404.0	45.2	51.0	15.5	24.1	40.5	175.0
Borehole Diameter	6.62	11.00	8.25	10.00	8.75	10.60	9.63
Well Casing Depth	404.0	34.7	37.5	9.8	18.1	29.7	161.0
Well Casing Diameter	4.38	4.50	4.50	4.50	4.50	4.25	4.25
Well Casing Material	Steel	PVC/#40	PVC/#40	SS/#304	SS/#304	SS/#304	SS/#304
MONITORED INTERVAL							
Top - Depth	404.0	31.0	35.0	2.8	16.6	28.2	155.0
Top - Elevation	490.38	881.74	966.60	910.86	889.40	888.77	761.98
Midpoint - Depth	408.4	38.1	43.0	9.2	20.1	34.1	163.0
Midpoint - Elevation	485.98	874.64	958.60	904.51	885.90	882.92	753.98
Bottom - Depth	412.8	45.2	51.0	15.5	23.6	39.9	171.0
Bottom - Elevation	481.58	867.54	950.60	898.16	882.40	877.07	745.98
Screen Material	.	PVC/sw/.01	PVC/sw/.01	SS/sw/.01	SS/sw/.01	SS/sw/.01	SS/pp/.01
Screen Length	.	10.0	9.6	5.4	5.0	10.0	10.0
Open-Hole Length	8.8	.	.	.	.	.	.
Open-Hole Diameter	3.63	.	.	.	.	.	.

(CONTINUED)

APPENDIX C
Monitoring Well Construction Details

Well Number	GW-617	GW-618	GW-620	GW-722	GW-733	GW-735	GW-744
Location	EXP-E	EXP-E	FTF	EXP-J	EXP-J	EXP-J	GRIDK1
Program	EXP	EXP	SMP	EXP	CMP-E	EXP	SMP
GENERAL INFORMATION	.	.	.	.	.	.	.
	.	.	.	.	.	.	.
East Coordinate	54755.65	54738.12	52894.57	64925.78	65057.00	64872.00	64324.00
North Coordinate	29806.44	29798.46	29564.54	28532.41	28447.00	28867.00	30282.00
Measuring Pt. Elevation	985.11	984.94	1015.30	953.71	959.04	924.28	907.43
Surface Elevation	982.61	982.64	1012.80	951.04	955.69	921.34	905.05
Hydrostratigraphic Unit	AQF	AQF	AQF	AQF	AQF	AQT	AQT
Geologic Formation	Cmn	Cmn	Cmn	Cn	Cmn	Cn	Cpv
Aquifer Zone	WT	WT	WT	BDR	BDR	WT	BDR
Weathered Rock - Depth	.	27.0	41.0	54.0	42.5	19.0	9.6
Weathered Rock - Elevation	.	955.64	971.80	897.04	913.19	902.34	895.45
Fresh Rock - Depth	.	.	70.0	73.0	47.1	77.5	14.6
Fresh Rock - Elevation	.	.	942.80	878.04	908.59	843.84	890.45
Total Depth Drilled	18.0	37.0	75.0	644.3	256.5	83.0	69.5
	.	.	.	.	.	.	.
SURFACE/CONDUCTOR CASING	.	.	.	.	.	.	.
	.	.	.	.	.	.	.
Casing Depth	.	27.5	42.5	56.2	51.8	25.5	27.6
Casing Diameter	.	10.75	10.75	10.75	11.75	11.75	10.75
Casing Material	none	Steel/J55	Steel/J55	Steel/J55	Steel/J55	Steel/J55	Steel/J55
	.	.	.	.	.	.	.
WELL CASING	.	.	.	.	.	.	.
	.	.	.	.	.	.	.
Borehole Depth	18.0	37.0	75.0	75.0	240.1	83.0	69.5
Borehole Diameter	9.50	9.50	9.50	6.00	10.60	10.60	9.87
Well Casing Depth	7.3	26.7	64.2	75.0	240.1	67.9	57.0
Well Casing Diameter	4.50	4.50	4.50	4.50	7.00	4.50	4.50
Well Casing Material	SS/#304	SS/#304	SS/#304	Steel/J55	Steel/F25	SS/#304	SS/#304
	.	.	.	.	.	.	.
MONITORED INTERVAL	.	.	.	.	.	.	.
	.	.	.	.	.	.	.
Top - Depth	6.8	26.0	61.7	75.0	240.1	67.5	55.0
Top - Elevation	975.81	956.64	951.10	876.04	715.59	853.84	850.05
Midpoint - Depth	12.4	31.5	68.4	359.7	248.3	73.4	62.3
Midpoint - Elevation	970.21	951.14	944.45	591.39	707.39	847.99	842.80
Bottom - Depth	18.0	37.0	75.0	644.3	256.5	79.2	69.5
Bottom - Elevation	964.61	945.64	937.80	306.74	699.19	842.14	835.55
Screen Material	SS/sw/.01	SS/sw/.01	SS/sw/.01	.	.	SS/sw/.01	SS/sw/.01
Screen Length	10.3	10.3	10.8	.	.	10.2	10.0
Open-Hole Length	.	.	.	569.3	16.4	.	.
Open-Hole Diameter	.	.	.	3.50	6.25	.	.

(CONTINUED)

APPENDIX C
Monitoring Well Construction Details

Well Number	GW-745	GW-746	GW-747	GW-748	GW-749	GW-750	GW-763
Location	GRIDK1	GRIDK1	GRIDK2	GRIDK2	GRIDK2	EXP-J	GRIDJ3
Program	SMP	SMP	SMP	SMP	SMP	EXP	SMP
GENERAL INFORMATION							
East Coordinate	64309.00	64312.00	64569.57	64579.38	64585.74	64835.48	63219.76
North Coordinate	30278.00	30291.00	29729.81	29740.86	29726.40	28974.53	29117.17
Measuring Pt. Elevation	907.06	906.88	920.96	921.17	921.19	918.86	914.85
Surface Elevation	904.28	904.26	918.33	918.89	918.69	915.96	911.38
Hydrostratigraphic Unit	AQT	AQT	AQT	AQT	AQT	AQT	AQT
Geologic Formation	Cpv	Cpv	Cm	Cm	Cm	Cn	Cn
Aquifer Zone	BDR	WT	BDR	BDR	WT	BDR	WT
Weathered Rock - Depth	9.5	9.0	10.5	8.0	9.0	18.5	17.0
Weathered Rock - Elevation	894.78	895.26	907.83	910.89	909.69	897.46	894.38
Fresh Rock - Depth	12.5	11.0	12.0	11.8	11.0	24.8	.
Fresh Rock - Elevation	891.78	893.26	906.33	907.09	907.69	891.16	.
Total Depth Drilled	33.0	15.2	79.9	27.2	16.4	72.8	17.0
SURFACE/CONDUCTOR CASING							
Casing Depth	.	.	23.8	.	.	21.7	.
Casing Diameter	.	.	10.75	.	.	11.75	.
Casing Material	none	none	Steel/J55	none	none	Steel/J55	none
WELL CASING							
Borehole Depth	33.0	15.2	79.9	27.2	16.4	72.8	17.0
Borehole Diameter	9.87	9.87	9.87	9.87	9.87	10.60	8.00
Well Casing Depth	22.5	4.5	69.2	17.0	6.0	62.4	5.2
Well Casing Diameter	4.50	4.50	4.50	4.50	4.50	4.50	4.50
Well Casing Material	SS/#304	SS/#304	SS/#304	SS/#304	SS/#304	SS/#304	SS/#304
MONITORED INTERVAL							
Top - Depth	21.2	3.2	67.4	14.8	4.8	61.2	4.0
Top - Elevation	883.08	901.06	850.93	904.09	913.89	854.76	907.38
Midpoint - Depth	27.0	9.2	73.5	21.0	10.6	67.0	10.0
Midpoint - Elevation	877.28	895.06	844.83	897.89	908.09	849.01	901.38
Bottom - Depth	32.8	15.2	79.6	27.2	16.4	72.7	16.0
Bottom - Elevation	871.48	889.06	838.73	891.69	902.29	843.26	895.38
Screen Material	SS/sw/.01	SS/sw/.01	SS/sw/.01	SS/sw/.01	SS/sw/.01	SS/sw/.01	SS/sw/.01
Screen Length	10.0	10.3	9.9	10.0	10.0	10.0	10.3
Open-Hole Length	.	.	.	.	.	.	.
Open-Hole Diameter	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX C
Monitoring Well Construction Details

Well Number	GW-769	GW-770	GW-775	GW-776	GW-781	GW-782	GW-783
Location	GRIDG3	GRIDG3	GRIDH3	GRIDH3	GRIDE3	GRIDE3	GRIDE3
Program	SMP	SMP	SMP	SMP	SMP	SMP	SMP
GENERAL INFORMATION	.	.	.	.	.	.	.
East Coordinate	60230.01	60255.00	61277.82	61309.10	58117.83	58099.21	58112.53
North Coordinate	29510.42	29504.56	29272.38	29271.39	29710.78	29718.84	29734.28
Measuring Pt. Elevation	944.26	944.55	931.35	931.25	947.72	947.56	948.32
Surface Elevation	941.53	941.67	931.48	931.44	944.66	944.48	945.81
Hydrostratigraphic Unit	AQT	AQT	AQT	AQT	AQT	AQT	AQT
Geologic Formation	Cn	Cn	Cn	Cn	Cn	Cn	Cn
Aquifer Zone	BDR	WT	BDR	WT	BDR	BDR	WT
Weathered Rock - Depth	14.2	12.0	.	14.5	0.9	1.0	1.0
Weathered Rock - Elevation	927.33	929.67	.	916.94	943.76	943.48	944.81
Fresh Rock - Depth	.	16.5	16.7	19.3	14.0	7.5	8.5
Fresh Rock - Elevation	.	925.17	914.78	912.14	930.66	936.98	937.31
Total Depth Drilled	61.4	20.0	60.5	24.0	69.6	36.0	16.3
SURFACE/CONDUCTOR CASING	.	.	.	.	.	.	.
Casing Depth	14.2	.	16.7	.	23.8	.	.
Casing Diameter	16.75	.	11.75	.	10.75	.	.
Casing Material	Steel/J55	none	Steel/J55	none	Steel/J55	none	none
WELL CASING	.	.	.	.	.	.	.
Borehole Depth	61.4	20.0	60.5	24.0	69.6	36.0	16.3
Borehole Diameter	10.62	10.62	10.62	9.87	9.87	9.87	9.87
Well Casing Depth	49.4	8.5	46.3	12.3	57.8	25.0	4.2
Well Casing Diameter	4.50	4.50	4.50	4.50	4.50	4.50	4.50
Well Casing Material	SS/#304	SS/#304	SS/#304	SS/#304	SS/#304	SS/#304	SS/#304
MONITORED INTERVAL	.	.	.	.	.	.	.
Top - Depth	48.2	7.5	45.0	10.6	56.0	23.8	3.6
Top - Elevation	893.33	934.17	886.48	920.84	888.66	920.68	942.21
Midpoint - Depth	54.3	13.3	50.7	16.8	62.7	29.9	10.0
Midpoint - Elevation	887.28	928.42	880.78	914.64	882.01	914.63	935.86
Bottom - Depth	60.3	19.0	56.4	23.0	69.3	35.9	16.3
Bottom - Elevation	881.23	922.67	875.08	908.44	875.36	908.58	929.51
Screen Material	SS/sw/.01	SS/sw/.01	SS/sw/.01	SS/sw/.01	SS/sw/.01	SS/sw/.01	SS/sw/.01
Screen Length	10.0	10.0	10.0	10.0	10.3	10.0	9.8
Open-Hole Length	.	.	.	.	.	.	.
Open-Hole Diameter	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX C
Monitoring Well Construction Details

Well Number	GW-788	GW-789	GW-791	GW-792	GW-816	GW-817
Location	GRIDF3	GRIDF3	GRIDD2	GRIDD2	EXP-SR	GRIDK3
Program	SMP	SMP	SMP	SMP	EXP	SMP
GENERAL INFORMATION	.	.	.	.	.	.
	.	.	.	.	.	.
East Coordinate	59043.21	59044.56	57423.24	57442.11	64031.36	64643.00
North Coordinate	29617.94	29644.68	30482.73	30481.15	31581.50	29269.15
Measuring Pt. Elevation	937.07	937.30	991.96	992.57	898.21	918.12
Surface Elevation	933.84	934.37	988.51	989.60	894.56	914.61
Hydrostratigraphic Unit	AQT	AQT	AQT	AQT	AQT	AQT
Geologic Formation	Cn	Cn	Cm	Cm	Cr	Cn
Aquifer Zone	BDR	BDR	BDR	WT	WT	WT
Weathered Rock - Depth	5.4	.	14.7	14.5	.	11.6
Weathered Rock - Elevation	928.44	.	973.81	975.10	.	903.01
Fresh Rock - Depth	9.0	10.0	26.0	.	.	18.4
Fresh Rock - Elevation	924.84	924.37	962.51	.	.	896.21
Total Depth Drilled	67.9	23.8	70.6	29.2	16.1	23.0
SURFACE/CONDUCTOR CASING	.	.	.	.	.	.
	.	.	.	.	.	.
	.	.	.	.	.	.
Casing Depth	7.5	.	31.5	.	.	.
Casing Diameter	10.75	.	10.75	.	.	.
Casing Material	Steel/J55	none	Steel/J55	none	none	none
WELL CASING	.	.	.	.	.	.
	.	.	.	.	.	.
	.	.	.	.	.	.
Borehole Depth	67.9	23.8	70.6	29.2	15.8	23.0
Borehole Diameter	9.87	9.87	9.87	9.87	10.00	10.75
Well Casing Depth	57.1	12.2	59.0	18.5	4.2	1.0
Well Casing Diameter	4.50	4.50	4.50	4.50	4.50	4.50
Well Casing Material	SS/#304	SS/#304	SS/#304	SS/#304	SS/#304	SS/#304
MONITORED INTERVAL	.	.	.	.	.	.
	.	.	.	.	.	.
	.	.	.	.	.	.
Top - Depth	55.9	10.7	57.5	17.0	2.9	0.6
Top - Elevation	877.94	923.67	931.01	972.60	891.66	914.01
Midpoint - Depth	61.9	17.3	64.1	23.0	9.4	11.8
Midpoint - Elevation	871.99	917.12	924.46	966.60	885.21	902.81
Bottom - Depth	67.8	23.8	70.6	29.0	15.8	23.0
Bottom - Elevation	866.04	910.57	917.91	960.60	878.76	891.61
Screen Material	SS/sw/.01	SS/sw/.01	SS/sw/.01	SS/sw/.01	SS/sw/.01	SS/sw/.01
Screen Length	9.7	10.5	10.0	9.8	9.4	21.3
Open-Hole Length	.	.	.	.	.	.
Open-Hole Diameter	.	.	.	.	.	.

APPENDIX D

CY 1997 DATA FOR GROUNDWATER AND SURFACE WATER SAMPLES

EXPLANATION

SAMPLING POINT:

GW	-	Monitoring Well
LRSPW	-	Lake Reality Emergency Spillway, seep

PROGRAM:

CMP	-	RCRA Corrective Action Monitoring Background well (-B) Point-of-compliance well (-C) Plume delineation well (-E)
EXP	-	DOE Order 5400.1 Monitoring: exit pathway
SMP	-	DOE Order 5400.1 Monitoring: surveillance

LOCATION:

B4	-	Beta-4 Security Pits
EXP	-	Exit Pathway Monitoring Location: Maynardville Limestone Picket (-E, -I, -J) In the gap through Pine Ridge along Scarboro Road (-SR) Surface water sampling location (-SW)
FTF	-	Fire Training Facility
GRID	-	Comprehensive Groundwater Monitoring Plan Grid Location
NHP	-	New Hope Pond
S2	-	S-2 Site
S3	-	S-3 Site
T2331	-	Underground Storage Tank T2331-U

SAMPLE TYPE:

DUP	-	Field Duplicate Sample
DIS	-	Dissolved concentration (Filtered Sample)
TOT	-	Total concentration (Unfiltered Sample)
ACT	-	Activity
ERR	-	Counting Error (two standard deviations)
MDA	-	Minimum Detectable Activity

EXPLANATION (cont'd)

NOTES:

Bicarbonate (HCO3) and carbonate (CO3) alkalinity were reported as calcium carbonate.

All trace metal and cation analyses were performed using the inductively coupled plasma spectroscopy method unless otherwise noted.

.	-	Not analyzed
CVAA	-	Cold Vapor Atomic Absorption
PMS	-	Plasma Mass Spectroscopy
TDS	-	Total Dissolved Solids
TSS	-	Total Suspended Solids

UNITS:

ft	-	feet (elevations are above mean sea level and depths are below grade)
ug/L	-	micrograms per liter
mg/L	-	milligrams per liter
mV	-	millivolts
umho/cm	-	micromhos per centimeter
NTU	-	Nephelometric Turbidity Units
pCi/L	-	picoCuries per liter
ppm	-	parts per million

DATA QUALIFICATION:

The following laboratory qualifiers are presented with results in this appendix:

<	-	Inorganic compound not detected at the minimum attainable detection limit.
U	-	Organic compound not detected at the minimum attainable detection limit.

The following qualifiers are not reported with results in this appendix:

Miscellaneous Laboratory Analytes:

The following results for total dissolved solids were reported with an "f" qualifier based on contamination in an associated blank sample.

Sampling Location	Sampling Date	Result (mg/L)
GW-108	08/11/97	56,982
GW-605	08/11/97	345

EXPLANATION (cont'd)

Inorganic Analytes:

Trace Metals/Cations:

PMS - All samples were diluted before analysis to obtain an optimal matrix; reporting limits were set with a five-fold dilution.

ICP - The following unfiltered (U) and/or filtered (F) samples were diluted before analysis to obtain accurate results:

Sampling Location	Sampling Date	Dilution Factor
GW-108 (U,F)	03/04/97	50
GW-108 (U,F)	08/11/97	20
GW-722-06 (F)	11/24/97	2

Anions:

The following nitrate results were reported with an "L" qualifier that indicates the analysis was performed after the sample holding time.

Sampling Location	Sampling Date	Result (mg/L)
GW-722-30	12/04/97	<0.028
GW-722-32	12/04/97	0.74

Organic Analytes:

One hundred twenty-nine results were reported with a "B" qualifier, indicating that a compound also was detected in the associated laboratory blank. These results were reported for acetone (69 results), 2-butanone (39 results), methylene chloride (8 results), tetrachloroethene (two results), carbon disulfide (one result), and dimethylbenzene (one result). All false-positive results that were screened by data reported for the laboratory blanks or the associated trip blanks (not indicated by a qualifier) are summarized in Appendix F.

Results that are estimated values below the analytical reporting limit were assigned a "J" qualifier by the laboratory. The standard reporting limits for the 54 organic analytes are 5 ug/L (for 37 compounds), 10 ug/L (for 16 compounds), or 500 ug/L (for one compound). Therefore, all results for all compounds that are less than 5 ug/L are estimated values.

EXPLANATION (cont'd)

Organic Analytes: (cont'd)

Results that were estimated values greater than or equal to 5 ug/L were reported primarily for acetone (13 results) and 2-butanone (19 results). All but two of the estimated values reported for these compounds were screened as false-positive results (see Appendix F). The following results were estimated values greater than or equal to 5 ug/L that were not analytical artifacts.

Compound	Reporting Limit (ug/L)	Sampling Location	Date Sampled	Result (ug/L)
Acetone	10	GW-733	03/05/97	9
Acetone	10	GW-722-26	12/03/97	5
Acrylonitrile	10	GW-722-06	07/28/97	6
Chloroethane	10	GW-782	05/14/97	5
Tetrachloroethene	5	GW-606	07/31/97	5
Trichloroethene	50	GW-606	03/06/97	16
Vinyl Chloride	10	GW-618	11/04/97	5

Note: The sample collected from well GW-606 on 03/06/97 was diluted before analysis to obtain an optimal matrix; reporting limits were set with a ten-fold dilution.

The following results were reported with a "D" qualifier that signifies the result was determined at a secondary dilution factor.

Compound	Sampling Location	Date Sampled	Result (ug/L)
Carbon Tetrachloride	GW-220	05/22/97	450
Carbon Tetrachloride	GW-220	12/08/97	610
Tetrachloroethene	GW-251	05/07/97	600
Trichloroethene	GW-251	05/07/97	240
Tetrachloroethene	GW-383	05/22/97	350
Tetrachloroethene	GW-383	12/04/97	310
Carbon Tetrachloride	GW-722-14	07/29/97	380
Carbon Tetrachloride	GW-722-14	11/25/97	410
Carbon Tetrachloride	GW-722-17	07/30/97	620
Carbon Tetrachloride	GW-722-17	11/25/97	800
Carbon Tetrachloride	GW-722-20	12/02/97	1200
Carbon Tetrachloride	GW-722-22	07/31/97	850
Tetrachloroethene	GW-791	04/08/97	2100
Tetrachloroethene	GW-791	11/20/97	710

APPENDIX D.1

FIELD MEASUREMENTS AND MISCELLANEOUS ANALYTES

APPENDIX D.1
Field Measurements and Miscellaneous Analytes, CY 1997

Sampling Point	GW-108		GW-115		GW-148		GW-153			GW-192
Program	CMP-C		CMP-B		SMP		EXP			SMP
Location	S3		S3		NHP		NHP			B4
Date Sampled	03/04/97	08/11/97	01/22/97	08/11/97	05/20/97	12/03/97	05/21/97		12/03/97	04/07/97
Sample Type								DUP		
FIELD MEASUREMENTS										
Top-of-Casing Elev. (ft)	998.18	998.18	1054.40	1054.40	907.36	907.36	921.44	921.44	921.44	1008.60
Depth to Water (ft)	7.72	7.69	7.80	11.38	7.65	8.52	20.03	20.03	20.23	5.32
Water-Level Elev. (ft)	990.46	990.49	1046.6	1043.02	899.71	898.84	901.41	901.41	901.21	1003.28
Water Temp (degrees C)	18.1	19.9	16.2	18.3	18.1	14.3	14.6	14.5	14.5	15.9
pH (pH units)	5.8	5.4	7	6.2	6.9	6.5	7.9	7.9	8	6.9
Conductivity (umho/cm)	4650	43400	492	477	758	760	380	357	390	623
Dissolved Oxygen (ppm)	1.3	5.4	2.3	0.8	3.3	4.21	5.7	5.7	3.61	3.8
Oxidation/Reduction (mV)	240	272	-18	-78	136	424	173	174	245	43
MISCELLANEOUS ANALYTES										
pH (pH units)	5.63	5.59	7.36	7.29	6.8	7.03	7.85	7.88	8.04	6.76
Conductivity (umho/cm)	52400	51700	523	526	906	902	383	384	456	709
TDS (mg/L)	60199	56982	308	340	560	583	217	210	273	396
TSS (mg/L)	9	13	1	1	5	<1	4	4	<1	5
Turbidity (NTU)	2.24	0.42	3.97	5.77	7.13	0.54	15	14.7	0.884	9.6

(CONTINUED)

Sampling Point	GW-192	GW-193		GW-207		GW-208		GW-220		GW-251
Program	SMP	CMP-E		EXP		EXP		EXP		SMP
Location	B4	Y12		EXP-SR		EXP-SR		NHP		S2
Date Sampled	10/30/97	03/05/97	08/13/97	04/08/97	12/02/97	04/10/97	12/02/97	05/22/97	12/08/97	05/07/97
Sample Type										
FIELD MEASUREMENTS										
Top-of-Casing Elev. (ft)	1008.60	934.00	934.00	898.36	898.36	897.72	897.72	915.64	915.64	1003.60
Depth to Water (ft)	5.05	7.61	8.38	0.00	.	0.00	.	15.32	15.95	12.60
Water-Level Elev. (ft)	1003.55	926.39	925.62	898.36	.	897.72	.	900.32	899.69	991
Water Temp (degrees C)	19.7	15.7	23.2	15.1	14.4	15.3	15.4	15.2	13.4	15.9
pH (pH units)	6.6	7.8	7.4	7.6	7.47	7.4	7.57	7.5	7.4	6.5
Conductivity (umho/cm)	686	365	533	505	484	579	556	451	433	1006
Dissolved Oxygen (ppm)	2.1	1.8	1.5	0.6	0.9	0.8	0.52	2.5	0.94	1
Oxidation/Reduction (mV)	-86	-214	-305	178	82	28	80	222	211	278
MISCELLANEOUS ANALYTES										
pH (pH units)	6.92	7.87	7.56	7.43	7.44	7.5	7.58	7.47	7.6	6.4
Conductivity (umho/cm)	825	443	612	594	591	631	650	531	485	1103
TDS (mg/L)	463	290	365	348	353	430	421	287	269	739
TSS (mg/L)	12	<1	<1	<1	<1	<1	1	7	1	55
Turbidity (NTU)	129	41	131	2.86	2.38	4.25	14.1	11.4	1.97	64.1

(CONTINUED)

APPENDIX D.1
Field Measurements and Miscellaneous Analytes, CY 1997

Sampling Point	GW-251	GW-380			GW-383		GW-605			GW-606
Program	SMP	EXP			SMP		CMP-E			CMP-E
Location	S2	NHP			NHP		EXP-I			EXP-I
Date Sampled	11/05/97	05/21/97	12/02/97		05/22/97	12/04/97	03/18/97		08/11/97	03/06/97
Sample Type				DUP				DUP		
FIELD MEASUREMENTS										
Top-of-Casing Elev. (ft)	1003.60	913.55	913.55	913.55	908.50	908.50	918.88	918.88	918.88	919.39
Depth to Water (ft)	21.25	10.03	11.39	11.39	9.45	9.53	10.62	10.62	10.85	11.00
Water-Level Elev. (ft)	982.35	903.52	902.16	902.16	899.05	898.97	908.26	908.26	908.03	908.39
Water Temp (degrees C)	15.6	16.4	18	18	16.1	17.6	16.7	16.5	19.5	15
pH (pH units)	6.8	7.2	7	7	7.5	7.2	7.1	7.1	6.8	7.7
Conductivity (umho/cm)	622	619	371	373	495	465	523	521	481	780
Dissolved Oxygen (ppm)	1.99	7.3	3.24	3.22	3.2	1.4	2.2	2.2	1.4	2
Oxidation/Reduction (mV)	254	131	64	63	20	-55	68	63	206	169
MISCELLANEOUS ANALYTES										
pH (pH units)	6.68	7.12	7.11	7.12	7.47	7.34	7.29	7.27	7.12	7.4
Conductivity (umho/cm)	699	635	396	396	539	570	592	594	557	619
TDS (mg/L)	432	335	215	220	278	350	434	436	345	445
TSS (mg/L)	8	7	<1	<1	<1	<1	<1	<1	3	<1
Turbidity (NTU)	11.9	29.9	3.73	4.01	8.08	2.6	2.81	3.94	2.1	1.19

(CONTINUED)

Sampling Point	GW-606		GW-617		GW-618			GW-620		GW-722-06
Program	CMP-E		EXP		EXP			SMP		EXP
Location	EXP-I		EXP-E		EXP-E			FTF		EXP-J
Date Sampled	07/31/97		05/07/97	11/05/97	05/06/97		11/04/97	05/06/97	12/01/97	07/28/97
Sample Type		DUP				DUP				
FIELD MEASUREMENTS										
Top-of-Casing Elev. (ft)	919.39	919.39	985.11	985.11	984.94	984.94	984.94	1015.30	1015.30	.
Depth to Water (ft)	13.04	13.04	13.10	14.71	12.65	12.65	14.60	20.68	27.31	560.00
Water-Level Elev. (ft)	906.35	906.35	972.01	970.4	972.29	972.29	970.34	994.62	987.99	.
Water Temp (degrees C)	17.1	17.2	16.5	16.7	16.7	16.7	16	17.2	14	17.4
pH (pH units)	6.9	7.1	6.2	5.4	6.8	6.7	6.7	10.6	11.5	7.8
Conductivity (umho/cm)	522	533	247	151	648	696	606	295	295	900
Dissolved Oxygen (ppm)	0.9	0.9	6.1	2.85	1.7	1.7	3.3	2.7	6.54	2.1
Oxidation/Reduction (mV)	132	137	235	99	73	78	-35	95	41	-159
MISCELLANEOUS ANALYTES										
pH (pH units)	7.54	7.54	6.05	5.86	6.68	6.68	7.01	10.8	11.21	7.93
Conductivity (umho/cm)	606	605	194.9	164.4	632	631	712	191.4	207	1026
TDS (mg/L)	409	406	110	83	357	368	395	94	87	595
TSS (mg/L)	4	1	<1	8	3	4	<1	27	<1	6
Turbidity (NTU)	0.554	0.59	1.03	2.89	2.47	2.36	2.1	17.2	0.667	15.2

(CONTINUED)

APPENDIX D.1
Field Measurements and Miscellaneous Analytes, CY 1997

Sampling Point	GW-722-06	GW-722-10		GW-722-14		GW-722-17		GW-722-20		GW-722-22
Program	EXP	EXP		EXP		EXP		EXP		EXP
Location	EXP-J	EXP-J		EXP-J		EXP-J		EXP-J		EXP-J
Date Sampled	11/24/97	07/29/97	11/24/97	07/29/97	11/25/97	07/30/97	11/25/97	07/30/97	12/02/97	07/31/97
Sample Type										
FIELD MEASUREMENTS										
Top-of-Casing Elev. (ft)										
Depth to Water (ft)	44.18	503.00	44.13	425.00	44.13	385.00	44.13	328.00	44.01	315.00
Water-Level Elev. (ft)										
Water Temp (degrees C)	17.7	19.2	16.8	20.5	13	16.8	14.1	19.5	15.1	16.1
pH (pH units)	7.74	8.05	7.07	8.6	7.28	7.42	7.06	6.72	6.89	7.66
Conductivity (umho/cm)	1011	435	733	50	535	400	509	1100	579	385
Dissolved Oxygen (ppm)	7.74	13	6.32	8.5	6.51	6.4	5.96	2.8	6.82	4.8
Oxidation/Reduction (mV)	34	-71	-34	-113	-12	198	68	-37	28	196
MISCELLANEOUS ANALYTES										
pH (pH units)	8.04	7.98	7.83	8.77	7.77	7.07	7.84	7.77	7.81	7.83
Conductivity (umho/cm)	1018	625	654	43.7	531	494	517	1119	532	502
TDS (mg/L)	568	41	385	319	295	293	277	940	317	308
TSS (mg/L)	9	4	<1	27	1	10	7	500	5	22
Turbidity (NTU)	31.8	2.05	15.2	18.3	7.03	22	15.9	1103	7.59	17.7

(CONTINUED)

Sampling Point	GW-722-22	GW-722-26		GW-722-30		GW-722-32		GW-722-33		GW-733
Program	EXP	EXP		EXP		EXP		EXP		CMP-E
Location	EXP-J	EXP-J		EXP-J		EXP-J		EXP-J		EXP-J
Date Sampled	12/02/97	08/04/97	12/03/97	08/04/97	12/04/97	08/05/97	12/04/97	08/05/97		03/05/97
Sample Type									DUP	
FIELD MEASUREMENTS										
Top-of-Casing Elev. (ft)										959.04
Depth to Water (ft)	44.01	218.00	44.01	258.00	43.92	108.00	43.98	87.00		50.94
Water-Level Elev. (ft)										908.1
Water Temp (degrees C)	14.1	16.4	14.2	17.9	12.5	16.9	12.4	17.4	17.4	14.4
pH (pH units)	7.2	7.56	7.21	7.72	7.43	7.56	6.82	7.63	7.63	7.8
Conductivity (umho/cm)	422	310	373	240	327	260	407	320	320	313
Dissolved Oxygen (ppm)	6.59	4.8	6.15	4.7	2.05	6.5	2.22	6.2	6.2	2.8
Oxidation/Reduction (mV)	14	-31	-24	-17	-20	150	-7	193	193	181
MISCELLANEOUS ANALYTES										
pH (pH units)	7.06	7.66	7.67	7.91	8	7.61	7.86	7.72	7.71	7.82
Conductivity (umho/cm)	62	449	477	294	288	416	463	419	420	355
TDS (mg/L)	35	252	268	160	163	251	271	244	235	222
TSS (mg/L)	4	12	4	13	6.7	24	5.7	8	7	17
Turbidity (NTU)	10.9	22.5	25.7	12.9	9.07	54.1	14.1	10.3	9.41	41.8

(CONTINUED)

APPENDIX D.1
Field Measurements and Miscellaneous Analytes, CY 1997

Sampling Point	GW-733	GW-735			GW-744		GW-745		GW-746	
Program	CMP-E	EXP			SMP		SMP		SMP	
Location	EXP-J	EXP-J			GRIDK1		GRIDK1		GRIDK1	
Date Sampled	07/30/97	04/15/97	12/03/97		04/16/97	12/08/97	04/17/97	12/09/97	04/17/97	12/09/97
Sample Type				DUP						
FIELD MEASUREMENTS										
Top-of-Casing Elev. (ft)	959.04	924.28	924.28	924.28	907.43	907.43	907.06	907.06	906.88	906.88
Depth to Water (ft)	55.85	22.95	58.22	58.22	6.81	7.05	5.81	6.21	5.95	4.81
Water-Level Elev. (ft)	903.19	901.33	866.06	866.06	900.62	900.38	901.25	900.85	900.93	902.07
Water Temp (degrees C)	23.4	14.2	12.6	12.6	17.1	13.3	15.2	10.5	13.5	9.7
pH (pH units)	7.6	7.3	7.89	7.88	7.6	8.11	6.9	6.79	5.9	5.88
Conductivity (umho/cm)	307	561	260	260	406	398	459	471	227	203
Dissolved Oxygen (ppm)	5.7	0.9	2.34	2.34	1.4	0.66	2	1.37	4	5.49
Oxidation/Reduction (mV)	218	110	-145	-145	-54	-171	47	111	229	252
MISCELLANEOUS ANALYTES										
pH (pH units)	7.82	7.11	7.88	7.85	7.38	7.87	7.19	7.17	6.3	6.05
Conductivity (umho/cm)	279	654	355	356	483	461	504	535	264	225
TDS (mg/L)	211	362	203	206	301	274	301	313	163	134
TSS (mg/L)	25	3	1.2	1.2	<1	<1	<1	<1	2	1
Turbidity (NTU)	64.5	9.56	23.6	26.3	3.33	3.69	1.39	4.65	7.15	10

(CONTINUED)

Sampling Point	GW-747		GW-748		GW-749		GW-750		GW-763
Program	SMP		SMP		SMP		EXP		SMP
Location	GRIDK2		GRIDK2		GRIDK2		EXP-J		GRIDJ3
Date Sampled	04/17/97	12/09/97	04/17/97	12/10/97	04/17/97	12/10/97	04/14/97	12/03/97	05/20/97
Sample Type		DUP							
FIELD MEASUREMENTS									
Top-of-Casing Elev. (ft)	920.96	920.96	920.96	921.17	921.17	921.19	921.19	918.86	918.86	914.85
Depth to Water (ft)	5.99	5.99	4.65	7.35	5.35	7.02	4.00	12.62	12.77	10.12
Water-Level Elev. (ft)	914.97	914.97	916.31	913.82	915.82	914.17	917.19	906.24	906.09	904.73
Water Temp (degrees C)	15.3	15.6	9.9	14.5	13	13.4	13.9	13.6	14.4	19.8
pH (pH units)	7.7	7.7	7.8	7.6	7.4	7.2	7	7.6	7.04	7
Conductivity (umho/cm)	354	349	331	458	421	546	393	453	385	744
Dissolved Oxygen (ppm)	1.1	1	0.64	3.6	2.1	2.1	1.6	1.4	0.33	2
Oxidation/Reduction (mV)	105	97	4	176	55	100	95	28	14	-79
MISCELLANEOUS ANALYTES										
pH (pH units)	7.32	7.6	7.74	7.31	7.44	7.17	7.11	7.24	7.47	6.89
Conductivity (umho/cm)	425	426	402	555	560	640	478	504	519	711
TDS (mg/L)	253	257	242	333	324	383	297	302	331	408
TSS (mg/L)	<1	<1	<1	<1	<1	1	1	<1	1.2	40
Turbidity (NTU)	0.4	0.362	0.573	2.81	1.3	1.4	3.47	4.77	5.77	238

(CONTINUED)

APPENDIX D.1
Field Measurements and Miscellaneous Analytes, CY 1997

Sampling Point	GW-763	GW-769			GW-770		GW-775		GW-776	
Program	SMP	SMP			SMP		SMP		SMP	
Location	GRIDJ3	GRIDG3			GRIDG3		GRIDH3		GRIDH3	
Date Sampled	12/02/97	05/13/97		11/17/97	05/12/97	11/17/97	05/12/97	11/19/97	05/12/97	05/13/97
Sample Type			DUP							
FIELD MEASUREMENTS										
Top-of-Casing Elev. (ft)	914.85	944.26	944.26	944.26	944.55	944.55	931.35	931.35	931.25	931.25
Depth to Water (ft)	10.66	10.74	10.74	11.08	13.83	13.71	13.28	15.30	15.22	.
Water-Level Elev. (ft)	904.19	933.52	933.52	933.18	930.72	930.84	918.07	916.05	916.03	.
Water Temp (degrees C)	15.3	19	18.6	16.3	18	19.7	18.2	17.9	18.9	.
pH (pH units)	6.6	7.4	7.4	7.25	7.1	6.85	7.6	7.34	7.4	.
Conductivity (umho/cm)	645	438	444	485	313	317	494	461	543	.
Dissolved Oxygen (ppm)	3.24	1	1	2.34	4.6	4.54	1.7	1.29	4.5	.
Oxidation/Reduction (mV)	-60	14	17	136	220	154	178	171	210	.
MISCELLANEOUS ANALYTES										
pH (pH units)	6.76	7.36	7.37	7.71	7.36	7.26	7.36	7.48	7.21	.
Conductivity (umho/cm)	699	472	467	488	337	353	524	553	604	.
TDS (mg/L)	363	314	317	307	191	234	323	311	368	.
TSS (mg/L)	39	<1	<1	1	<1	<1	<1	<1	4	.
Turbidity (NTU)	180	1.83	1.89	0.712	4.3	0.394	0.887	0.425	15	.

(CONTINUED)

Sampling Point	GW-776	GW-781		GW-782		GW-783		GW-788		GW-789
Program	SMP	SMP		SMP		SMP		SMP		SMP
Location	GRIDH3	GRIDE3		GRIDE3		GRIDE3		GRIDF3		GRIDF3
Date Sampled	12/02/97	05/15/97	11/19/97	05/14/97	11/24/97	05/15/97	11/25/97	05/13/97	11/18/97	05/14/97
Sample Type										
FIELD MEASUREMENTS										
Top-of-Casing Elev. (ft)	931.25	947.72	947.72	947.56	947.56	948.32	948.32	937.07	937.07	937.30
Depth to Water (ft)	16.12	8.50	8.69	9.33	9.43	10.43	10.48	0.90	0.91	3.75
Water-Level Elev. (ft)	915.13	939.22	939.03	938.23	938.13	937.89	937.84	936.17	936.16	933.55
Water Temp (degrees C)	15.7	19	17	17.9	16.7	17.1	17.7	19	9.9	16.7
pH (pH units)	7.39	8.4	8.59	7.5	7.4	7.4	7.6	8.7	9.18	7.5
Conductivity (umho/cm)	511	358	364	460	487	426	358	525	465	358
Dissolved Oxygen (ppm)	2.96	3.1	3.92	1.8	1.59	5.5	4.71	2.4	3.16	2
Oxidation/Reduction (mV)	31	92	122	162	18	209	87	109	187	96
MISCELLANEOUS ANALYTES										
pH (pH units)	7.36	8.06	8.33	7.28	7.25	7.24	7.25	8.44	8.99	7.48
Conductivity (umho/cm)	610	417	429	556	553	506	493	574	619	400
TDS (mg/L)	382	291	251	363	317	332	282	416	350	268
TSS (mg/L)	1	2	<1	2	<1	7	<1	18	<1	37
Turbidity (NTU)	6.64	5.86	2.09	6.92	6.65	25.2	3.56	41.7	1.63	86.9

(CONTINUED)

APPENDIX D.1
Field Measurements and Miscellaneous Analytes, CY 1997

Sampling Point	GW-789	GW-791		GW-792		GW-816		GW-817		LRSPW
Program	SMP	SMP		SMP		EXP		SMP		EXP
Location	GRIDF3	GRIDD2		GRIDD2		EXP-SR		GRIDK3		EXP-SW
Date Sampled	11/18/97	04/08/97	11/20/97	04/08/97	11/20/97	04/16/97	12/04/97	04/17/97	12/04/97	04/22/97
Sample Type										
FIELD MEASUREMENTS										
Top-of-Casing Elev. (ft)	937.30	991.96	991.96	992.57	992.57	898.21	898.21	918.12	918.12	
Depth to Water (ft)	4.00	21.72	23.27	24.60	25.12	12.21	12.68	7.79	7.00	
Water-Level Elev. (ft)	933.3	970.24	968.69	967.97	967.45	886	885.53	910.33	911.12	
Water Temp (degrees C)	15.5	20.8	15.1	19.1	20.5	13.2	13.2	13.6	12.5	14.1
pH (pH units)	7.67	7.9	7.31	6.4	6.21	7	6.8	8.3	7.19	7.9
Conductivity (umho/cm)	335	425	391	251	296	410	319	393	363	314
Dissolved Oxygen (ppm)	2.24	3	2.98	4.6	1.75	2.3	3.97	3.9	1.11	7.8
Oxidation/Reduction (mV)	206	-53	79	28	199	-84	-52	163	76	62
MISCELLANEOUS ANALYTES										
pH (pH units)	7.77	7.37	7.48	6.36	6.3	6.86	6.75	7.96	7.37	7.73
Conductivity (umho/cm)	411	458	488	309	371	443	415	470	431	262
TDS (mg/L)	236	265	259	200	225	226	205	300	297	150
TSS (mg/L)	<1	<1	<1	1	<1	27	16	21	78.4	6
Turbidity (NTU)	1.13	1.59	0.718	3.21	1.01	231	65.2	47.5	37.7	15

(CONTINUED)

Sampling Point	LRSPW
Program	EXP
Location	EXP-SW
Date Sampled	12/01/97
Sample Type	
FIELD MEASUREMENTS	
Top-of-Casing Elev. (ft)	
Depth to Water (ft)	
Water-Level Elev. (ft)	
Water Temp (degrees C)	13.9
pH (pH units)	7.6
Conductivity (umho/cm)	343
Dissolved Oxygen (ppm)	9.8
Oxidation/Reduction (mV)	221
MISCELLANEOUS ANALYTES	
pH (pH units)	7.92
Conductivity (umho/cm)	308
TDS (mg/L)	178
TSS (mg/L)	1
Turbidity (NTU)	1.98

APPENDIX D.2

INORGANIC ANALYTES

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-108				GW-115				GW-148	
Program	CMP-C				CMP-B				SMP	
Location	S3				S3				NHP	
Date Sampled	03/04/97		08/11/97		01/22/97		08/11/97		05/20/97	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.	.	.	.	.	.
Aluminum	<1	<1	0.98	0.73	0.027	<0.02	0.025	0.02	0.31	0.023
Antimony	<2.5	<2.5	<1	<1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	0.02	0.015	0.015	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	100	100	92	96	0.22	0.22	0.21	0.2	0.3	0.29
Beryllium	<0.015	<0.015	<0.006	<0.006	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.22	0.26	0.34	0.34	0.021	0.017	0.017	0.017	0.036	0.032
Cadmium	<0.15	<0.15	<0.06	<0.06	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.5	<0.5	<0.2	<0.2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.25	<0.25	0.16	0.14	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.2	<0.2	<0.08	<0.08	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.61	<0.25	<0.1	0.14	0.33	0.31	0.43	0.4	0.36	0.019
Lead (PMS)	0.0018	0.001	0.0017	0.0014	<0.0005	<0.0005	<0.0005	<0.0005	0.00092	0.00073
Lithium	0.4	0.39	0.34	0.35	0.016	0.016	0.018	0.018	0.0059	0.0048
Manganese	110	110	97	100	0.37	0.37	0.41	0.42	0.27	0.22
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.5	<0.5	<0.2	<0.2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.5	<0.5	0.26	0.35	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<2.5	<2.5	<1	<1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.3	<0.3	<0.12	<0.12	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	39	38	34	35	0.13	0.13	0.14	0.14	0.57	0.55
Thallium (PMS)	<0.0005	<0.0005	0.0017	0.0014	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Thorium	<10	<10	<4	<4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	0.015	0.015	0.015	0.016	<0.0005	<0.0005	<0.0005	<0.0005	0.0015	0.0015
Vanadium	<0.25	<0.25	<0.1	<0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	<0.1	<0.1	0.071	<0.04	0.0057	0.0041	0.0026	0.004	0.0078	0.011
MAJOR IONS (mg/L)	.	.	.	.	.	.	.	.	.	.
Calcium	11000	11000	12000	12000	77	76	81	80	160	160
Magnesium	1100	1100	950	980	12	12	12	12	11	10
Potassium	<30	<30	24	25	2.2	2	1.7	1.9	2.4	2
Sodium	460	450	430	450	10	10	10	10	18	17
Alkalinity-HCO3	622	.	620	.	240	.	260	.	354	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	103	.	120	.	12.4	.	14.4	.	76	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	0.1	.	<0.1	.
Nitrate-N	10500	.	19700	.	0.032	.	<0.028	.	<0.028	.
Sulfate	<100	.	<25	.	16.7	.	17.9	.	31.8	.

(CONTINUED)

Sampling Point	GW-148		GW-153						GW-192	
Program	SMP		EXP						SMP	
Location	NHP		NHP						B4	
Date Sampled	12/03/97		05/21/97				12/03/97		04/07/97	
Sample Type					DUP					
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.025	0.03	0.78	0.065	0.58	0.084	0.046	<0.02	0.036	0.022
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.29	0.28	0.05	0.05	0.048	0.044	0.046	0.047	0.17	0.17
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.039	0.037	0.023	0.021	0.024	0.022	0.015	0.018	0.015	0.015
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0095	0.0081
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.029	0.019	0.75	0.039	0.47	0.058	0.035	0.0064	3	2.9
Lead (PMS)	<0.0005	<0.0005	0.0036	<0.0005	0.0022	0.003	<0.0005	<0.0005	0.00091	0.001
Lithium	0.0069	0.0067	0.012	0.0095	0.01	0.0088	0.0081	0.0088	0.012	0.01
Manganese	0.043	0.041	0.037	0.0078	0.033	0.0013	0.0012	<0.001	2.5	2.6
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.57	0.56	0.16	0.17	0.16	0.16	0.16	0.16	0.23	0.24
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	0.00051	<0.0005	<0.0005	<0.0005	0.00052	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	0.0012	0.0011	0.0017	0.0017	0.0018	0.0016	0.0017	0.0017	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.0061	0.0069	0.0077	<0.002	0.005	0.0027	<0.002	0.0026	0.0091	0.008
MAJOR IONS (mg/L)										
Calcium	160	160	41	43	42	41	41	42	120	120
Magnesium	10	10	19	18	19	18	18	19	14	15
Potassium	2.8	2.8	2.6	2.3	2.4	2.3	3	2.9	1	0.92
Sodium	18	18	12	11	11	11	23	24	7	7
Alkalinity-HCO3	330	.	168	.	168	.	158	.	352	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	39	.	14.2	.	14.1	.	39.9	.	19.1	.
Fluoride	0.12	.	0.19	.	0.19	.	0.21	.	0.2	.
Nitrate-N	<0.056	.	0.855	.	0.824	.	1.01	.	<0.028	.
Sulfate	33.4	.	11.9	.	11.7	.	13.9	.	2.85	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-192		GW-193				GW-207			
Program	SMP		CMP-E				EXP			
Location	B4		Y12				EXP-SR			
Date Sampled	10/30/97		03/05/97		08/13/97		04/08/97		12/02/97	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	<0.02	<0.02	0.1	0.029	0.03	<0.02	<0.02	0.02	0.027	<0.02
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	0.011	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.26	0.25	0.078	0.081	0.11	0.076	0.046	0.045	0.046	0.049
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.019	0.018	0.073	0.083	0.11	0.079	0.12	0.12	0.11	0.1
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	11	10	0.17	0.037	0.024	0.0091	0.21	0.21	0.22	0.23
Lead (PMS)	<0.0005	<0.0005	0.0012	<0.0005	<0.0005	<0.0005	0.00088	0.0009	<0.0005	0.0007
Lithium	0.0069	0.0073	<0.004	<0.004	<0.004	<0.004	0.031	0.031	0.032	0.032
Manganese	2.7	2.7	0.25	0.24	0.39	0.26	0.0096	0.01	0.0093	0.01
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.34	0.34	0.38	0.39	0.49	0.36	0.54	0.54	0.54	0.54
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	0.012	0.014	0.0042	0.0043	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.0028	<0.002	0.0036	0.0023	0.0039	0.0046	<0.002	0.0036	<0.002	0.029
MAJOR IONS (mg/L)										
Calcium	150	150	64	66	89	64	58	58	58	58
Magnesium	22	22	14	14	18	13	38	38	38	38
Potassium	1.3	1.4	5.5	5.8	7.5	5.5	2.9	2.8	3	3.6
Sodium	7.5	7.6	3.9	4.1	4.7	3.3	10	10	10	10
Alkalinity-HCO3	450	.	202	.	272	.	268	.	274	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	14.7	.	5.42	.	4.43	.	1.08	.	1.03	.
Fluoride	0.32	.	0.63	.	0.6	.	0.2	.	0.22	.
Nitrate-N	<0.028	.	<0.028	.	<0.028	.	<0.028	.	<0.028	.
Sulfate	1.78	.	25.8	.	32.2	.	60.3	.	56.2	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-208				GW-220				GW-251	
Program	EXP				EXP				SMP	
Location	EXP-SR				NHP				S2	
Date Sampled	04/10/97		12/02/97		05/22/97		12/08/97		05/07/97	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.027	<0.02	<0.02	<0.02	0.42	0.073	0.098	0.026	5.6	0.08
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.041	0.041	0.041	0.043	0.11	0.11	0.1	0.1	0.13	0.11
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	0.0011	0.00057
Boron	0.22	0.22	0.22	0.23	0.046	0.047	0.055	0.057	0.033	0.028
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.17	0.16
Chromium	<0.01	<0.01	<0.01	<0.01	0.011	<0.01	<0.01	<0.01	0.015	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.036	0.029
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.57	0.42
Iron	0.73	0.62	1.1	1.4	0.63	0.073	0.053	0.0094	4.4	0.015
Lead (PMS)	0.0019	0.00082	<0.0005	<0.0005	0.0013	0.00078	<0.0005	<0.0005	0.016	0.00059
Lithium	0.03	0.031	0.032	0.034	0.0052	0.0045	0.0051	0.0044	0.0099	<0.004
Manganese	0.016	0.016	0.021	0.024	0.021	0.0068	0.0083	0.0054	5.3	4.7
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.057	0.049
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	1.5	1.5	1.5	1.6	0.44	0.44	0.43	0.43	0.24	0.23
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0034	0.0031
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	0.00057	<0.0005	<0.0005	<0.0005	0.0088	0.0066
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0078	<0.005
Zinc	1.4	1.3	1.2	1.2	0.0032	0.0055	0.0033	0.0048	0.099	0.072
MAJOR IONS (mg/L)										
Calcium	77	76	80	81	69	69	59	59	120	120
Magnesium	25	25	26	27	25	25	26	26	19	19
Potassium	2.7	2.8	2.9	3.1	2.7	2.7	2.9	3.2	4.8	3
Sodium	15	15	16	16	4.1	5.2	5	5	19	18
Alkalinity-HCO3	234	.	228	.	250	.	228	.	178	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	1.28	.	1.56	.	10.6	.	12.2	.	10.5	.
Fluoride	0.3	.	0.32	.	<0.1	.	<0.1	.	1.44	.
Nitrate-N	<0.028	.	<0.028	.	1.14	.	0.82	.	80.2	.
Sulfate	111	.	111	.	14.6	.	14.6	.	25.8	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-251		GW-380						GW-383	
Program	SMP		EXP						SMP	
Location	S2		NHP						NHP	
Date Sampled	11/05/97		05/21/97		12/02/97				05/22/97	
Sample Type							DUP			
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.22	0.02	0.13	0.025	<0.02	<0.02	<0.02	<0.02	0.046	0.029
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.065	0.063	0.032	0.032	0.023	0.022	0.023	0.022	0.55	0.55
Beryllium	0.0004	0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.012	0.011	0.025	0.022	0.034	0.029	0.031	0.033	0.13	0.12
Cadmium	0.066	0.064	0.0032	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	0.26	<0.01	0.048	<0.01	0.022	<0.01	<0.01	<0.01
Cobalt	0.0079	0.0083	0.0064	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	0.18	0.15	0.008	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.097	0.019	3.3	0.84	0.11	0.018	0.11	0.014	0.84	0.77
Lead (PMS)	0.0021	<0.0005	0.00063	0.00063	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00072
Lithium	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.017	0.017
Manganese	1.6	1.6	0.071	0.14	0.058	0.036	0.066	0.03	0.16	0.16
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	0.011	0.013	0.25	0.39	0.13	0.09	0.15	0.081	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.15	0.15	0.041	0.045	0.033	0.033	0.034	0.034	0.43	0.43
Thallium (PMS)	0.0014	0.0015	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	0.0036	0.0036	0.0012	0.00082	0.0014	0.0014	0.0014	0.0014	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.023	0.022	0.0058	0.0066	0.0068	0.0033	0.0076	0.0036	<0.002	0.0068
MAJOR IONS (mg/L)										
Calcium	86	84	36	38	30	29	30	30	79	81
Magnesium	15	14	16	16	12	12	12	12	11	11
Potassium	2.5	2.2	1	0.98	0.96	0.8	1.1	1.1	2.8	2.8
Sodium	10	9.9	70	69	37	37	38	38	18	17
Alkalinity-HCO3	174	.	180	.	138	.	138	.	234	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	5.88	.	90.3	.	45.2	.	45.8	.	29.6	.
Fluoride	1.58	.	0.16	.	0.23	.	0.23	.	0.11	.
Nitrate-N	40.9	.	0.68	.	1.5	.	1.49	.	<0.028	.
Sulfate	15.4	.	7.14	.	55.9	.	55.4	.	24.4	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-383		GW-605						GW-606	
Program	SMP		CMP-E						CMP-E	
Location	NHP		EXP-I						EXP-I	
Date Sampled	12/04/97		03/18/97				08/11/97		03/06/97	
Sample Type					DUP					
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.029	<0.02	0.04	<0.02	0.058	<0.02	0.058	<0.02	<0.02	<0.02
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.6	0.58	0.057	0.056	0.057	0.057	0.054	0.066	0.093	0.091
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.094	0.093	0.14	0.14	0.14	0.14	0.14	0.14	0.042	0.041
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.39	0.31	0.08	0.013	0.079	0.0081	0.046	<0.005	0.054	0.0067
Lead (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00058	0.00056
Lithium	0.015	0.015	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.0098	0.0096
Manganese	0.12	0.097	0.45	0.42	0.45	0.42	0.53	0.47	0.011	0.011
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.43	0.43	0.17	0.17	0.17	0.17	0.17	0.17	0.51	0.51
Thallium (PMS)	<0.0005	<0.0005	0.00076	0.00078	0.00075	0.00068	<0.0005	<0.0005	<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	0.24	0.23	0.24	0.24	0.23	0.22	0.0068	0.0065
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.0048	0.0058	0.0024	0.0024	0.0022	0.0022	0.003	0.003	0.0028	<0.002
MAJOR IONS (mg/L)										
Calcium	92	90	77	76	77	77	77	77	68	68
Magnesium	11	11	16	16	16	16	15	15	35	35
Potassium	2.9	2.9	2.8	3	2.8	2.5	2.8	2.9	3	3.1
Sodium	14	14	18	17	18	18	14	15	4.9	5
Alkalinity-HCO3	224	.	248	.	242	.	250	.	234	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	38.7	.	36.2	.	36.4	.	22.6	.	51.9	.
Fluoride	0.12	.	<0.1	.	<0.1	.	<0.1	.	0.23	.
Nitrate-N	<0.028	.	0.221	.	0.221	.	0.28	.	1.05	.
Sulfate	18	.	33.3	.	32.3	.	38.1	.	37	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-606				GW-617				GW-618	
Program	CMP-E				EXP				EXP	
Location	EXP-I				EXP-E				EXP-E	
Date Sampled	07/31/97				05/07/97		11/05/97		05/06/97	
Sample Type			DUP							
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.087	0.087	0.088	0.087	0.03	0.029	0.046	0.047	0.051	0.05
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.044	0.049	0.04	0.044	0.34	0.33	0.22	0.22	0.12	0.12
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.021	0.021
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0066	0.0075	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.019	0.0081
Iron	0.13	0.006	0.08	0.0089	0.049	0.0097	3.2	2.7	0.27	0.14
Lead (PMS)	0.0016	<0.0005	<0.0005	<0.0005	0.00056	<0.0005	<0.0005	0.0008	0.00068	0.0037
Lithium	0.0089	0.0083	0.0087	0.0085	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Manganese	0.0096	0.009	0.0095	0.0093	0.0083	0.0084	3.4	3.4	1.7	1.7
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.011	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.46	0.46	0.46	0.46	0.043	0.042	0.036	0.037	0.19	0.19
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	0.0074	0.0076	0.0075	0.0072	<0.0005	<0.0005	<0.0005	<0.0005	0.00058	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.0039	0.0027	0.0033	0.002	<0.002	<0.002	0.0032	0.0042	0.0046	0.0062
MAJOR IONS (mg/L)										
Calcium	66	67	67	67	23	23	15	15	95	94
Magnesium	33	34	34	34	5.2	5.2	4.5	4.7	8.9	8.8
Potassium	2.6	2.5	2.6	2.5	0.83	0.74	1.2	1.2	3.2	3.1
Sodium	4.9	4.8	4.9	4.8	5.2	5.1	5.2	5.4	15	15
Alkalinity-HCO3	222	.	224	.	44	.	58	.	266	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	41.5	.	39.6	.	5.14	.	6.02	.	22.5	.
Fluoride	0.2	.	0.19	.	<0.1	.	<0.1	.	0.27	.
Nitrate-N	1.14	.	1.08	.	2.14	.	0.06	.	1.39	.
Sulfate	36	.	35.8	.	30.3	.	12.8	.	21.9	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-618				GW-620				GW-722-06	
Program	EXP				SMP				EXP	
Location	EXP-E				FTF				EXP-J	
Date Sampled	05/06/97		11/04/97		05/06/97		12/01/97		07/28/97	
Sample Type	DUP									
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	<0.02	<0.02	<0.02	<0.02	0.23	0.082	0.06	0.041	0.086	<0.02
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0067
Barium	0.051	0.05	0.06	0.061	0.028	0.023	0.036	0.027	0.067	0.079
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.12	0.11	0.14	0.14	0.017	0.019	0.023	0.024	0.71	0.75
Cadmium	0.02	0.021	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	0.0067	0.0065	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.22	0.13	1.3	1.3	0.0084	0.019	<0.005	0.0067	0.38	0.13
Lead (PMS)	0.00064	0.00054	<0.0005	<0.0005	0.0027	0.0048	<0.0005	<0.0005	0.0023	0.0086
Lithium	<0.004	<0.004	<0.004	<0.004	0.011	0.0099	0.018	0.017	0.12	0.13
Manganese	1.7	1.6	1.8	1.8	<0.001	0.0015	<0.001	<0.001	0.025	0.011
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.016	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.19	0.19	0.22	0.22	0.22	0.2	0.37	0.28	4.2	4.5
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	0.00054	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.0046	0.0042	<0.002	<0.002	<0.002	0.0033	<0.002	<0.002	0.1	0.045
MAJOR IONS (mg/L)										
Calcium	94	93	110	120	62	49	18	12	22	21
Magnesium	8.8	8.7	9.7	9.8	3	2.3	0.43	0.71	14	15
Potassium	3.2	3.1	4.3	4.3	10	10	11	12	4.8	5.5
Sodium	15	14	24	22	2	2	2.2	2.3	160	180
Alkalinity-HCO3	264	.	346	.	<1	.	<1	.	262	.
Alkalinity-CO3	<1	.	<1	.	28	.	24	.	<1	.
Chloride	22	.	23.3	.	1.85	.	2.08	.	58.9	.
Fluoride	0.29	.	0.25	.	0.12	.	0.11	.	0.4	.
Nitrate-N	1.36	.	<0.028	.	1.28	.	1.44	.	<0.028	.
Sulfate	22.3	.	15.2	.	4.55	.	4.89	.	6.74	.

(CONTINUED)

Sampling Point	GW-722-06		GW-722-10				GW-722-14			
Program	EXP		EXP				EXP			
Location	EXP-J		EXP-J				EXP-J			
Date Sampled	11/24/97		07/29/97		11/24/97		07/29/97		11/25/97	
Sample Type	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.11	<0.04	0.05	0.021	<0.02	<0.02	0.17	<0.02	0.094	<0.02
Antimony	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	0.0097	0.021	<0.005	<0.005	0.0072	0.0063	<0.005	<0.005	<0.005	<0.005
Barium	0.13	0.48	0.066	0.074	0.069	0.091	0.078	0.054	0.068	0.076
Beryllium	<0.0003	<0.0006	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.68	0.7	0.14	0.17	0.24	0.3	0.04	0.013	0.074	0.093
Cadmium	<0.003	<0.006	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.02	<0.01	<0.01	0.014	<0.01	0.017	<0.01	0.015	<0.01
Cobalt	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.008	0.0057	<0.004	<0.004	<0.004	0.0059	<0.004	<0.004	<0.004
Iron	0.26	0.22	0.42	0.032	0.47	0.025	0.65	0.012	0.22	0.046
Lead (PMS)	0.0008	0.0007	0.0041	0.0053	0.0009	0.0024	0.029	0.0026	0.001	<0.0005
Lithium	0.14	0.18	0.027	0.032	0.051	0.061	0.0077	<0.004	0.016	0.021
Manganese	0.028	0.068	0.025	0.0077	0.019	0.021	0.017	0.0027	0.0075	0.0066
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	0.053	0.23	0.02	<0.01	0.016	0.014	0.026	<0.01	0.013	<0.01
Selenium	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.012	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	5	7.7	1.5	1.4	3.7	3.4	0.38	0.11	0.9	1.6
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Thorium	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.043	0.036	0.43	0.03	0.025	0.0026	0.98	0.028	0.022	0.013
MAJOR IONS (mg/L)										
Calcium	27	46	26	24	43	43	28	6.9	53	49
Magnesium	16	21	16	15	29	29	12	0.76	29	28
Potassium	7	5.9	1.9	2.6	4.1	3.2	0.85	0.64	2.3	1.8
Sodium	200	340	37	44	68	89	8.2	2.6	19	23
Alkalinity-HCO3	270	.	30	.	208	.	214	.	208	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	167.349	.	59.3	.	53.163	.	14.5	.	23.653	.
Fluoride	1.04	.	0.46	.	0.61	.	0.13	.	0.39	.
Nitrate-N	<0.28	.	0.27	.	0.353	.	0.69	.	2.934	.
Sulfate	26.173	.	34.2	.	73.25	.	8.64	.	30.313	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-722-17				GW-722-20				GW-722-22	
Program	EXP				EXP				EXP	
Location	EXP-J				EXP-J				EXP-J	
Date Sampled	07/30/97		11/25/97		07/30/97		12/02/97		07/31/97	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.11	0.033	0.091	<0.02	6.2	0.046	0.17	<0.02	0.16	0.032
Antimony	<0.05	<0.05	<0.05	<0.05	<0.051	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.073	0.085	0.066	0.06	0.25	0.17	0.077	0.075	0.093	0.1
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	0.00059	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.075	0.074	0.066	0.067	0.25	0.25	0.049	0.054	0.068	0.074
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.0031	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	0.013	<0.01	0.014	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	0.012	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	<0.004	0.036	<0.004	0.0045	<0.004	<0.004	<0.004
Iron	0.28	0.06	0.19	0.033	43	17	0.59	0.03	0.79	0.068
Lead (PMS)	0.0019	0.0043	<0.0005	0.0007	0.047	0.0017	0.0017	<0.0005	0.0022	0.0031
Lithium	0.012	0.011	0.013	0.013	0.039	0.028	0.013	0.011	0.013	0.014
Manganese	0.0079	0.0053	0.0069	0.0037	0.43	0.086	0.012	0.0032	0.012	0.0045
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	0.027	<0.01	0.014	<0.01	0.012	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.051	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.0061	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	1	0.98	1.1	1.1	4.3	4	0.73	0.76	0.73	0.81
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	0.00087	<0.0005	<0.0005	<0.0005	0.00069	0.00074
Vanadium	<0.005	<0.005	<0.005	<0.005	0.0083	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.12	0.047	0.034	0.015	0.28	0.076	0.14	0.029	0.06	0.032
MAJOR IONS (mg/L)										
Calcium	53	45	53	49	560	220	55	52	66	55
Magnesium	31	29	31	31	78	62	27	28	28	28
Potassium	2.4	2.2	2.3	3.6	7	4.3	3.5	1.4	1.5	1.9
Sodium	12	11	12	13	21	22	11	12	12	13
Alkalinity-HCO3	206	.	204	.	544	.	212	.	214	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	15.8	.	16.884	.	18.9	.	18.1	.	17.6	.
Fluoride	0.28	.	0.31	.	0.58	.	0.41	.	0.29	.
Nitrate-N	3.67	.	3.137	.	0.17	.	2.73	.	3.26	.
Sulfate	24.9	.	24.558	.	92	.	24.7	.	28.9	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-722-22		GW-722-26				GW-722-30			
Program	EXP		EXP				EXP			
Location	EXP-J		EXP-J				EXP-J			
Date Sampled	12/02/97		08/04/97		12/03/97		08/04/97		12/04/97	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.064	0.031	0.066	0.02	<0.02	0.021	0.59	<0.02	0.13	0.028
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.097	0.092	0.32	0.26	0.33	0.32	0.053	0.068	0.094	0.067
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.05	0.059	0.062	0.055	0.07	0.065	0.0087	0.0084	0.021	0.015
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	0.0049	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.29	0.043	2.2	1.4	2.2	1.1	1.1	0.19	0.48	0.062
Lead (PMS)	0.0027	0.0007	0.0012	0.009	<0.0005	0.0014	0.0017	0.0017	0.001	<0.0005
Lithium	0.012	0.013	0.0092	0.0082	0.0094	0.01	0.0059	0.0055	0.0052	0.0066
Manganese	0.008	0.003	0.14	0.11	0.14	0.13	0.021	0.022	0.02	0.015
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.021	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.64	0.7	2.2	1.8	2.4	2.1	0.09	0.18	0.21	0.11
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.42	0.03	0.14	0.072	0.093	0.31	0.042	0.0095	0.061	0.0041
MAJOR IONS (mg/L)										
Calcium	52	52	59	51	58	55	39	39	37	39
Magnesium	24	27	23	20	23	22	15	15	14	15
Potassium	2	1.4	2.9	5.2	3.1	3.3	1.3	2.5	3.4	1.7
Sodium	11	12	4.3	5.4	4.1	4.4	1	1.5	1.2	0.81
Alkalinity-HCO3	206	.	246	.	244	.	160	.	148	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	18.6	.	5.2	.	5.11	.	2.47	.	1.83	.
Fluoride	0.32	.	1.25	.	1.31	.	0.24	.	0.2	.
Nitrate-N	2.85	.	<0.028	.	<0.028	.	<0.028	.	<0.028	.
Sulfate	24.9	.	<0.25	.	<0.25	.	4.89	.	7.37	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-722-32				GW-722-33				GW-733	
Program	EXP				EXP				CMP-E	
Location	EXP-J				EXP-J				EXP-J	
Date Sampled	08/05/97		12/04/97		08/05/97				03/05/97	
Sample Type							DUP			
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	2	0.021	0.67	0.042	0.063	0.025	0.1	<0.02	0.03	<0.02
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.042	0.051	0.047	0.051	0.033	0.036	0.032	0.036	0.027	0.028
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	<0.004	<0.004	0.0068	0.0062	<0.004	<0.004	<0.004	<0.004	0.021	0.015
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	0.0053	<0.004	<0.004	0.017	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	2.3	0.026	1	0.04	0.15	0.021	0.17	0.015	8.8	0.59
Lead (PMS)	0.004	0.0034	0.0011	<0.0005	0.00084	0.0016	0.00093	0.0024	0.0019	0.0093
Lithium	0.0083	<0.004	0.0068	0.0047	<0.004	<0.004	0.0041	<0.004	0.0059	0.0048
Manganese	0.042	0.0039	0.02	0.003	0.0032	0.001	0.0036	0.0011	0.066	0.024
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.071	0.091	0.082	0.087	0.068	0.072	0.066	0.073	0.12	0.11
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00066
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	0.00053	<0.0005	<0.0005	0.00052	0.00051	<0.0005	0.0005	0.0008	0.00066
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.071	0.031	0.032	0.017	0.034	0.022	0.035	0.022	0.003	0.0022
MAJOR IONS (mg/L)										
Calcium	72	61	81	79	73	74	72	73	43	41
Magnesium	11	9.6	13	13	11	11	11	11	17	17
Potassium	1.9	1.6	2.8	2.9	1.4	1.9	1.6	1.9	1.6	1.7
Sodium	3.2	3.1	3.6	3.8	3.3	3.4	3.2	3.4	3.5	3.5
Alkalinity-HCO3	210	.	236	.	212	.	216	.	180	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	4.05	.	3.89	.	4.05	.	4.94	.	8.82	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	<0.1	.	0.29	.
Nitrate-N	0.82	.	0.74	.	0.79	.	0.83	.	0.366	.
Sulfate	10.7	.	12.3	.	10.8	.	10.8	.	11	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-733		GW-735						GW-744	
Program	CMP-E		EXP						SMP	
Location	EXP-J		EXP-J						GRIDK1	
Date Sampled	07/30/97		04/15/97		12/03/97				04/16/97	
Sample Type							DUP			
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.13	0.036	0.26	0.022	0.022	0.02	0.026	<0.02	0.049	<0.02
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.031	0.026	0.33	0.34	0.025	0.025	0.024	0.025	0.19	0.19
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.021	0.021	0.025	0.025	0.011	0.012	0.013	0.013	0.053	0.053
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	0.0043	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	12	0.012	0.24	0.061	1.9	1.9	1.9	1.9	0.27	0.26
Lead (PMS)	0.0042	<0.0005	0.0011	0.00071	<0.0005	<0.0005	<0.0005	<0.0005	0.0012	0.00061
Lithium	0.0048	<0.004	<0.004	0.004	0.0057	0.0046	0.0052	0.0051	0.025	0.023
Manganese	0.066	0.02	0.28	0.28	0.16	0.16	0.17	0.16	0.16	0.17
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.12	0.12	0.28	0.28	0.1	0.1	0.099	0.1	1.1	1.1
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	0.00088	0.00087	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.022	0.003	0.0036	0.0036	0.0022	0.0045	0.006	0.0051	0.008	0.0026
MAJOR IONS (mg/L)										
Calcium	43	43	120	120	39	39	39	39	57	57
Magnesium	17	17	8.9	9.1	18	18	18	18	9.4	9.4
Potassium	1.2	1.3	2.4	2.4	3.1	3.1	3.3	3.2	2.9	2.8
Sodium	3.8	3.7	4.2	4.4	3.9	4	3.9	4	29	29
Alkalinity-HCO3	164	.	316	.	158	.	158	.	224	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	9.31	.	17.6	.	9.07	.	9.09	.	7.59	.
Fluoride	0.25	.	<0.1	.	0.26	.	0.26	.	0.12	.
Nitrate-N	0.38	.	0.142	.	<0.028	.	<0.028	.	<0.028	.
Sulfate	9.46	.	24.9	.	9.49	.	9.93	.	22.2	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-744		GW-745				GW-746			
Program	SMP		SMP				SMP			
Location	GRIDK1		GRIDK1				GRIDK1			
Date Sampled	12/08/97		04/17/97		12/09/97		04/17/97		12/09/97	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	<0.02	0.023	<0.02	<0.02	<0.02	<0.02	0.023	<0.02	0.027	<0.02
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.22	0.21	0.14	0.14	0.19	0.18	0.14	0.13	0.17	0.17
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.058	0.057	0.038	0.036	0.047	0.045	0.0095	0.0094	0.015	0.014
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.13	<0.01	0.14	0.016
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	0.0051	<0.004	<0.004	0.0054	<0.004	<0.004	<0.004
Iron	0.045	0.065	0.23	0.22	0.31	0.033	0.92	0.021	0.99	0.0086
Lead (PMS)	0.0008	0.0005	<0.0005	<0.0005	0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0005
Lithium	0.028	0.029	0.023	0.022	0.027	0.027	<0.004	<0.004	<0.004	<0.004
Manganese	0.12	0.12	0.64	0.62	1.1	1.1	0.036	0.035	0.03	0.03
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	0.066	0.058	0.34	0.34	0.65	0.64
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	1.2	1.2	0.69	0.66	0.8	0.77	0.097	0.096	0.086	0.085
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	<0.002	0.0027	0.0033	0.0088	0.0021	0.0029	0.0033	0.01	0.0078	0.0084
MAJOR IONS (mg/L)										
Calcium	55	54	64	63	75	72	23	22	19	18
Magnesium	10	10	11	11	13	12	8	7.8	7.3	7.3
Potassium	3.5	3.4	2.8	2.5	3.3	3.3	1.6	1.6	2.2	1.9
Sodium	32	31	19	18	22	21	9.7	9.4	11	11
Alkalinity-HCO3	220	.	200	.	222	.	52	.	44	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	5.76	.	24.8	.	21	.	34.4	.	25.2	.
Fluoride	<0.1	.	0.11	.	0.1	.	<0.1	.	<0.1	.
Nitrate-N	<0.028	.	<0.028	.	<0.028	.	1.26	.	0.79	.
Sulfate	16.4	.	29.3	.	29.8	.	22.1	.	18.2	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-747						GW-748			
Program	SMP						SMP			
Location	GRIDK2						GRIDK2			
Date Sampled	04/17/97				12/09/97		04/17/97		12/10/97	
Sample Type			DUP							
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	<0.02	<0.02	<0.02	<0.02	0.024	<0.02	<0.02	<0.02	0.026	0.021
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.13	0.13	0.14	0.13	0.13	0.13	0.11	0.11	0.14	0.13
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.068	0.066	0.068	0.067	0.1	0.1	0.012	0.012	0.016	0.016
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.057	0.048	0.061	0.049	0.028	0.031	0.021	<0.005	0.056	0.048
Lead (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0018	<0.0005	<0.0005	0.0007	0.0006
Lithium	0.015	0.016	0.016	0.016	0.023	0.023	0.0068	0.0079	0.0093	0.0099
Manganese	0.015	0.01	0.011	0.017	0.0085	0.0093	0.0035	0.008	0.0059	0.0015
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.52	0.51	0.52	0.51	0.43	0.44	0.23	0.23	0.25	0.26
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	<0.002	<0.002	<0.002	<0.002	0.0022	0.0049	<0.002	0.0037	0.0097	0.0079
MAJOR IONS (mg/L)										
Calcium	42	41	42	42	33	34	87	87	93	93
Magnesium	8.7	8.7	8.9	8.7	6.6	6.7	8.7	8.8	9.9	9.9
Potassium	1.8	1.8	1.8	1.7	1.8	1.7	0.79	1.1	1	1.2
Sodium	32	31	32	32	48	49	9.9	10	11	11
Alkalinity-HCO3	204	.	210	.	200	.	236	.	232	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	3.15	.	2.96	.	1.26	.	19.1	.	20.3	.
Fluoride	0.2	.	0.2	.	0.21	.	<0.1	.	<0.1	.
Nitrate-N	<0.028	.	<0.028	.	0.17	.	<0.028	.	<0.028	.
Sulfate	19.7	.	19.4	.	15.1	.	37.1	.	35.5	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-749				GW-750				GW-763	
Program	SMP				EXP				SMP	
Location	GRIDK2				EXP-J				GRIDJ3	
Date Sampled	04/17/97		12/10/97		04/14/97		12/03/97		05/20/97	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	<0.02	<0.02	0.053	<0.02	0.024	0.02	0.022	<0.02	1.1	0.066
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.12	0.12	0.12	0.11	0.7	0.7	0.8	0.79	0.098	0.093
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.0088	0.0088	0.0097	0.0091	0.084	0.081	0.1	0.1	0.034	0.028
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	0.0048	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.077	0.049	0.26	0.027	0.29	0.29	0.64	0.23	15	14
Lead (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	0.00083	0.00073	<0.0005	<0.0005	0.01	0.00074
Lithium	<0.004	<0.004	<0.004	<0.004	0.011	0.0099	0.011	0.011	<0.004	<0.004
Manganese	0.76	0.61	0.32	0.052	0.047	0.046	0.05	0.05	1.1	1.1
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.23	0.22	0.17	0.17	0.68	0.67	0.85	0.84	0.27	0.26
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00072	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	0.0017	0.0015	0.0018	0.0018	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	<0.002	<0.002	0.0075	0.0025	0.015	0.011	<0.002	0.002	0.0086	0.0083
MAJOR IONS (mg/L)										
Calcium	100	100	82	82	78	75	79	79	120	120
Magnesium	8.6	8.6	6.7	6.7	11	11	12	12	13	13
Potassium	1.1	1.1	1.9	2	4.3	4.2	5.6	5.4	1.6	1.1
Sodium	9.4	9.1	7.6	7.6	5	4.9	6.4	6.4	10	9.7
Alkalinity-HCO3	262	.	190	.	242	.	244	.	324	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	25.3	.	11.3	.	4.62	.	5.02	.	47.9	.
Fluoride	0.14	.	0.1	.	<0.1	.	<0.1	.	0.16	.
Nitrate-N	<0.028	.	0.071	.	<0.028	.	<0.028	.	<0.028	.
Sulfate	44.3	.	40.5	.	20.3	.	16.5	.	2.68	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-763		GW-769						GW-770	
Program	SMP		SMP						SMP	
Location	GRIDJ3		GRIDG3						GRIDG3	
Date Sampled	12/02/97		05/13/97				11/17/97		05/12/97	
Sample Type					DUP					
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.024	<0.02	<0.02	<0.02	<0.02	<0.02	0.023	<0.02	0.29	<0.02
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.047	0.045	0.42	0.43	0.42	0.45	0.43	0.41	0.057	0.058
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.02	0.018	0.043	0.047	0.044	0.053	0.031	0.031	0.026	0.025
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.004	<0.004	<0.004
Iron	24	21	0.15	0.14	0.14	0.28	0.068	0.039	0.28	0.011
Lead (PMS)	<0.0005	<0.0005	0.00055	0.00065	0.0017	0.01	0.00064	0.0005	0.0006	<0.0005
Lithium	<0.004	<0.004	0.016	0.017	0.016	0.017	0.017	0.017	<0.004	<0.004
Manganese	0.81	0.77	0.014	0.014	0.014	0.016	0.012	0.012	0.012	0.0011
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.2	0.19	0.44	0.44	0.44	0.45	0.43	0.42	0.08	0.084
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.001	0.0011
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	<0.002	<0.002	<0.002	0.0027	0.0022	0.0067	0.0057	0.0022	0.0025	0.0022
MAJOR IONS (mg/L)										
Calcium	100	100	75	75	75	76	79	77	57	59
Magnesium	14	14	10	10	10	11	10	9.9	4.4	4.5
Potassium	1.2	1.1	2.7	2.8	2.8	2.9	2.8	3.2	2.1	2
Sodium	14	14	6.2	6.3	6.2	6.5	6.7	6.6	4.4	4.7
Alkalinity-HCO3	272	.	202	.	204	.	210	.	142	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	66	.	20.3	.	20.2	.	27.4	.	4.58	.
Fluoride	0.29	.	<0.1	.	<0.1	.	<0.1	.	0.2	.
Nitrate-N	<0.028	.	0.04	.	0.04	.	0.279	.	0.72	.
Sulfate	2.34	.	18.8	.	18	.	23.6	.	23.6	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-770		GW-775				GW-776		
Program	SMP		SMP				SMP		
Location	GRIDG3		GRIDH3				GRIDH3		
Date Sampled	11/17/97		05/12/97		11/19/97		05/12/97	05/13/97	
Sample Type									
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	TOT	DIS
METALS (mg/L)									
Aluminum	<0.02	0.021	<0.02	<0.02	0.025	<0.02		0.6	<0.02
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005
Barium	0.069	0.068	0.18	0.18	0.19	0.19		0.09	0.078
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003		<0.0003	<0.0003
Boron	0.033	0.031	0.022	0.026	0.014	0.012		0.02	0.017
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003		<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		3.8	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		0.016	<0.005
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004		0.03	0.0058
Iron	0.0069	0.0078	0.024	0.005	0.008	0.0052		20	0.02
Lead (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		0.00075	<0.0005
Lithium	<0.004	<0.004	0.0083	0.0098	0.0097	0.0083		<0.004	<0.004
Manganese	<0.001	<0.001	0.0014	<0.001	<0.001	<0.001		0.12	0.033
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002		<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.061	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.92	0.41
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006		<0.006	<0.006
Strontium	0.093	0.089	0.24	0.23	0.24	0.23		0.17	0.17
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2	<0.2
Uranium (PMS)	0.0018	0.0014	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		0.01	<0.005
Zinc	<0.002	<0.002	<0.002	0.0021	0.0038	<0.002		0.0058	0.011
MAJOR IONS (mg/L)									
Calcium	62	60	88	88	90	89		99	98
Magnesium	5.4	5.1	7.2	7.1	7.3	7.2		5.3	5.2
Potassium	2.8	3	2.3	2.3	2.7	2.7		3.1	2.9
Sodium	4.7	5.2	4.5	4.5	4.5	4.4		13	13
Alkalinity-HCO3	156		180		184		200		
Alkalinity-CO3	<1		<1		<1		<1		
Chloride	6.2		42.9		39.36		54.4		
Fluoride	0.21		<0.1		<0.1		<0.1		
Nitrate-N	0.828		0.7		0.706		1.61		
Sulfate	32.2		34		28.3		43.3		

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-776		GW-781				GW-782			
Program	SMP		SMP				SMP			
Location	GRIDH3		GRIDE3				GRIDE3			
Date Sampled	12/02/97		05/15/97		11/19/97		05/14/97		11/24/97	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	<0.02	<0.02	0.2	<0.02	0.043	<0.02	<0.02	<0.02	<0.02	<0.02
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.094	0.088	0.34	0.36	0.34	0.34	0.59	0.44	0.69	0.66
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.019	0.016	0.49	0.51	0.47	0.48	0.11	0.046	0.12	0.11
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	0.043	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	0.0045	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Iron	0.66	0.048	0.16	0.007	0.028	0.016	0.71	0.14	0.76	0.078
Lead (PMS)	0.0013	0.0007	0.00076	0.00069	0.0007	<0.0005	<0.0005	0.0054	<0.0005	<0.0005
Lithium	0.0047	<0.004	0.061	0.062	0.058	0.059	0.018	0.018	0.021	0.019
Manganese	0.034	0.022	0.01	0.0047	0.0091	0.0082	0.042	0.014	0.061	0.04
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	0.62	0.56	<0.01	<0.01	<0.01	<0.01	0.013	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.19	0.19	0.69	0.74	0.66	0.67	1	0.45	1.1	1.1
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0012	0.0013	0.002	0.0018
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.024	0.0071	0.0044	0.0027	0.0038	0.0049	<0.002	0.0025	0.0036	<0.002
MAJOR IONS (mg/L)										
Calcium	100	100	13	13	12	12	85	75	82	81
Magnesium	6.2	6	4.1	4.3	4.2	4.2	15	10	15	15
Potassium	3	2.9	4.6	4.7	5.7	5.7	4.5	2.9	4.9	4.8
Sodium	14	14	75	77	76	78	9.7	6.4	10	10
Alkalinity-HCO3	192	.	200	.	200	.	248	.	254	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	51.2	.	9.53	.	10.624	.	18.9	.	18.607	.
Fluoride	<0.1	.	<0.1	.	<0.1	.	<0.1	.	<0.1	.
Nitrate-N	1.1	.	0.05	.	0.178	.	0.231	.	0.309	.
Sulfate	48.3	.	8.82	.	8.786	.	17.7	.	17.95	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-783				GW-788				GW-789	
Program	SMP				SMP				SMP	
Location	GRIDE3				GRIDF3				GRIDF3	
Date Sampled	05/15/97		11/25/97		05/13/97		11/18/97		05/14/97	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.14	<0.02	<0.02	<0.02	2.9	0.059	0.06	0.033	1.5	0.052
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.12	0.12	0.095	0.095	0.12	0.1	0.11	0.11	0.33	0.33
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.037	0.037	0.044	0.043	1.4	1.3	1.1	1.1	0.065	0.064
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	0.44	<0.01	0.059	<0.01	0.011	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	0.027	<0.004	<0.004	<0.004	0.0078	<0.004	<0.004	<0.004	0.0063	0.0042
Iron	5.7	0.026	0.34	0.026	1.9	0.033	0.041	0.024	1.2	0.074
Lead (PMS)	0.0006	0.0019	<0.0005	<0.0005	0.0014	<0.0005	<0.0005	0.0006	0.0016	0.00073
Lithium	<0.004	<0.004	<0.004	<0.004	0.083	0.082	0.072	0.073	0.013	0.012
Manganese	0.034	0.0093	0.0054	0.0038	0.047	0.002	0.0014	<0.001	0.14	0.014
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	0.24	0.16	0.045	0.043	<0.01	<0.01	<0.01	<0.01	0.011	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.21	0.21	0.15	0.15	0.49	0.51	0.51	0.51	0.3	0.29
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	0.0014	0.0012	0.0014	0.0013	0.00095	0.00083	0.0016	0.0018	0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0052	<0.005	<0.005	<0.005
Zinc	0.0055	0.0033	<0.002	0.0034	0.0055	0.0035	0.0024	0.012	0.0039	<0.002
MAJOR IONS (mg/L)										
Calcium	85	84	78	80	11	8.5	5.9	5.9	66	62
Magnesium	6.2	6.1	4.3	4.5	3.1	2.6	3	3.1	9.7	9.9
Potassium	1.7	1.5	1.3	1.3	5.3	4.5	6	5.5	3.4	2.7
Sodium	15	14	19	18	120	120	120	120	5.8	5.8
Alkalinity-HCO3	216	.	202	.	270	.	222	.	186	.
Alkalinity-CO3	<1	.	<1	.	<1	.	36	.	<1	.
Chloride	21.1	.	20.353	.	9.65	.	12.4	.	6.39	.
Fluoride	0.1	.	0.15	.	1.68	.	1.25	.	0.11	.
Nitrate-N	0.82	.	1.315	.	0.4	.	1.256	.	0.722	.
Sulfate	20.6	.	24.622	.	22.2	.	36.8	.	19.8	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-789		GW-791				GW-792			
Program	SMP		SMP				SMP			
Location	GRIDF3		GRIDD2				GRIDD2			
Date Sampled	11/18/97		04/08/97		11/20/97		04/08/97		11/20/97	
Sample Type										
	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)										
Aluminum	0.037	<0.02	0.04	0.034	<0.02	<0.02	0.066	0.02	<0.02	0.021
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.33	0.32	0.26	0.27	0.26	0.25	0.092	0.089	0.1	0.1
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.053	0.053	0.021	0.021	0.017	0.017	0.012	0.012	<0.004	<0.004
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.0047	0.0072	<0.004	<0.004
Iron	0.028	0.005	0.28	0.12	0.058	0.064	0.25	0.016	0.063	0.018
Lead (PMS)	<0.0005	<0.0005	0.022	0.00068	0.0006	0.0011	0.00089	0.00063	<0.0005	<0.0005
Lithium	0.011	0.011	0.014	0.014	0.013	0.014	0.0092	0.0088	0.0092	0.0099
Manganese	0.0024	<0.001	0.034	0.02	0.02	0.019	0.014	0.0082	0.02	0.019
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.021	0.02	0.048	0.044
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.3	0.29	0.38	0.38	0.42	0.42	0.082	0.081	0.091	0.09
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	<0.002	0.0032	0.0036	0.0049	<0.002	0.0029	0.013	0.012	<0.002	0.0034
MAJOR IONS (mg/L)										
Calcium	62	61	66	67	67	66	43	42	46	45
Magnesium	9.8	9.7	14	14	14	14	4.2	4.2	4.7	4.7
Potassium	3.3	3.2	2	1.8	1.7	2	0.87	0.82	1.4	1.1
Sodium	6.1	6	7.2	7.2	7.3	7.2	8.3	8.5	9.6	9.6
Alkalinity-HCO3	184	.	226	.	228	.	86	.	70	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.	<1	.
Chloride	7.4	.	5.91	.	7.112	.	22.8	.	47.162	.
Fluoride	0.11	.	<0.1	.	<0.1	.	0.12	.	<0.1	.
Nitrate-N	0.853	.	<0.028	.	<0.028	.	2.78	.	4.937	.
Sulfate	24.9	.	12	.	11.16	.	25.3	.	21.504	.

(CONTINUED)

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	GW-816				GW-817			
Program	EXP				SMP			
Location	EXP-SR				GRIDK3			
Date Sampled	04/16/97		12/04/97		04/17/97		12/04/97	
Sample Type	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS
METALS (mg/L)								
Aluminum	0.036	<0.02	0.029	<0.02	1.6	0.022	2.3	0.028
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Barium	0.38	0.36	0.5	0.49	0.19	0.17	0.25	0.22
Beryllium	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Boron	0.027	0.026	0.016	0.017	0.013	0.01	0.018	0.015
Cadmium	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.0054	<0.004
Iron	22	21	19	18	0.85	0.044	0.9	0.041
Lead (PMS)	0.00062	0.00057	<0.0005	<0.0005	0.0005	<0.0005	0.0009	<0.0005
Lithium	<0.004	<0.004	<0.004	<0.004	0.0073	0.0052	0.014	0.011
Manganese	1.8	1.8	1.5	1.4	0.036	0.004	0.044	0.0063
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Strontium	0.11	0.11	0.12	0.12	0.17	0.16	0.2	0.19
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005	0.0023	0.0021	0.0014	0.0012
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.0042	0.0056	0.015	0.0083	0.0088	<0.002	0.022	0.003
MAJOR IONS (mg/L)								
Calcium	48	47	53	53	64	64	73	68
Magnesium	15	15	12	12	7.6	7.3	8	7.2
Potassium	5.5	5.3	6	6.3	2.7	2.3	3.2	3
Sodium	3.9	3.8	5	5	20	19	15	16
Alkalinity-HCO3	236	.	204	.	228	.	208	.
Alkalinity-CO3	<1	.	<1	.	<1	.	<1	.
Chloride	4.81	.	5.65	.	3.83	.	4.4	.
Fluoride	0.1	.	0.1	.	0.18	.	0.15	.
Nitrate-N	<0.028	.	<0.028	.	0.108	.	0.54	.
Sulfate	9.86	.	0.36	.	22.9	.	15.5	.

APPENDIX D.2
Inorganic Analytes, CY 1997

Sampling Point	LRSPW				
Program	EXP				
Location	EXP-SW				
Date Sampled	04/22/97	04/23/97		12/01/97	
Sample Type					
	TOT	TOT	DIS	TOT	DIS
METALS (mg/L)	.	.	.	.	.
	.	.	.	.	.
Aluminum	.	0.11	<0.02	0.097	0.031
Antimony	.	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	.	<0.005	<0.005	<0.005	<0.005
Barium	.	0.082	0.076	0.036	0.036
Beryllium	.	<0.0003	<0.0003	<0.0003	<0.0003
Boron	.	0.022	0.019	0.018	0.017
Cadmium	.	<0.003	<0.003	<0.003	<0.003
Chromium	.	<0.01	<0.01	<0.01	<0.01
Cobalt	.	<0.005	<0.005	<0.005	<0.005
Copper	.	<0.004	<0.004	<0.004	<0.004
Iron	.	0.47	0.069	0.087	0.0094
Lead (PMS)	.	0.0046	0.0017	<0.0005	<0.0005
Lithium	.	<0.004	<0.004	0.011	0.01
Manganese	.	0.13	0.11	0.033	0.013
Mercury (CVAA)	.	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	.	<0.01	<0.01	<0.01	<0.01
Nickel	.	<0.01	<0.01	<0.01	<0.01
Selenium	.	<0.05	<0.05	<0.05	<0.05
Silver	.	<0.006	<0.006	<0.006	<0.006
Strontium	.	0.21	0.1	0.093	0.094
Thallium (PMS)	.	0.00066	<0.0005	<0.0005	<0.0005
Thorium	.	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	.	0.0057	0.0059	0.0062	0.0061
Vanadium	.	<0.005	<0.005	<0.005	<0.005
Zinc	.	0.0027	<0.002	0.026	0.021
	.	.	.	.	.
MAJOR IONS (mg/L)	.	.	.	.	.
	.	.	.	.	.
Calcium	.	35	35	39	40
Magnesium	.	7.6	7.1	9.8	9.9
Potassium	.	2.5	2.2	1.7	1.5
Sodium	.	8.1	8.1	7	7.2
Alkalinity-HCO3	94	.	.	114	.
Alkalinity-CO3	<1	.	.	<1	.
Chloride	21.4	.	.	9.26	.
Fluoride	0.2	.	.	0.36	.
Nitrate-N	2.21	.	.	1.45	.
Sulfate	16.2	.	.	23.9	.

APPENDIX D.3

ORGANIC ANALYTES

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-108		GW-115		GW-148		GW-153	
Program	CMP-C		CMP-B		SMP		EXP	
Location	S3		S3		NHP		NHP	
Date Sampled	03/04/97	08/11/97	01/22/97	08/11/97	05/20/97	12/03/97	05/21/97	
								DUP
ORGANIC COMPOUNDS (ug/L)								
Acetone	18	16	10U	10U	4	10U	53	120
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
Benzene	5U	5U	5U	5U	5U	5U	5U	5U
Bromochloromethane		10U		10U	10U	10U	10U	10U
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	2	2	5U	5U	5U	5U	5U	5U
Bromomethane	1	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	5	10U	5	4
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	5U	5U	5U	5U	5U	5U	200	200
Chlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	29	22	5U	5U	5U	5U	10	10
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane		10U		10U	10U	10U	10U	10U
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene		5U		5U	5U	5U	5U	5U
1,4-Dichlorobenzene		5U		5U	5U	5U	5U	5U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethene	5U	5U	5U	5U	11	8	5U	5U
cis-1,2-Dichloroethene	5U	5U	5U	5U	11	8	5U	5U
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	3	5U	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene chloride	48	38	5U	5U	5U	5U	5U	5U
Styrene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U		10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	5U	5U	5U	5U	5U	7	7
Toluene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	2	2	5U	5U	5U	5U	2	2
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-153	GW-192		GW-193		GW-207		GW-208
Program	EXP	SMP		CMP-E		EXP		EXP
Location	NHP	B4		Y12		EXP-SR		EXP-SR
Date Sampled	12/03/97	04/07/97	10/30/97	03/05/97	08/13/97	04/08/97	12/02/97	04/10/97
ORGANIC COMPOUNDS (ug/L)								
Acetone	10U	12	2	10U	150	10U	10U	10U
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
Benzene	5U	5U	5U	180	120	5U	5U	5U
Bromochloromethane	10U	10U	10U		10U	10U	10U	10U
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	1	10U	10U	10U	10U	10U
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	5U	5U	5U	5U	5U	5U	5U	5U
Chlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U	4	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	5U	5U	5U	5U	5U	5U	5U	5U
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane	10U	10U	10U		10U	10U	10U	10U
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	5U	5U	5U		5U	5U	5U	5U
1,4-Dichlorobenzene	5U	5U	5U		5U	5U	5U	5U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	2	1	5U	5U	5U	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethene	5U	17	12	5U	5U	5U	5U	5U
cis-1,2-Dichloroethene	5U	17	12	5U	5U	5U	5U	5U
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	120	52	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	140	130	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	5U	5U	5U	5U	5U	5U	5U
Styrene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	2	3	5U	5U	5U	5U	5U
Toluene	5U	5U	5U	36	13	5U	5U	5U
1,1,1-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	3	3	5U	5U	5U	5U	5U
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-208	GW-220		GW-251		GW-380		
Program	EXP	EXP		SMP		EXP		
Location	EXP-SR	NHP		S2		NHP		
Date Sampled	12/02/97	05/22/97	12/08/97	05/07/97	11/05/97	05/21/97	12/02/97	DUP
ORGANIC COMPOUNDS (ug/L)								
Acetone	1	10U	2	25	1	3	2	10U
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
Benzene	5U	5U	5U	5U	5U	5U	5U	5U
Bromochloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	4	10U	10U	6	10U	4	3	10U
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	5U	450	610	18	2	5U	5U	5U
Chlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	5U	24	29	13	9	5U	2	2
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
1,4-Dichlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethene	5U	3	3	8	2	5U	5U	5U
cis-1,2-Dichloroethene	5U	3	3	8	2	5U	5U	5U
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	5U	5U	1	5U	5U	5U	5U
Styrene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	45	33	600	130	5U	5U	5U
Toluene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	10	6	240	50	5U	5U	5U
Trichlorofluoromethane	5U	5U	1	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-383		GW-605			GW-606		
Program	SMP		CMP-E			CMP-E		
Location	NHP		EXP-I			EXP-I		
Date Sampled	05/22/97	12/04/97	03/18/97		08/11/97	03/06/97	07/31/97	
				DUP				DUP
ORGANIC COMPOUNDS (ug/L)								
Acetone	10U	4	3	3	5	26	13	3
Acrolein	10U	10U	10U	10U	10U	100U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	100U	10U	10U
Benzene	5U	5U	5U	5U	5U	50U	5U	5U
Bromochloromethane	10U	10U			10U		10U	10U
Bromodichloromethane	5U	5U	5U	5U	5U	50U	5U	5U
Bromoform	5U	5U	5U	5U	5U	50U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	100U	10U	10U
2-Butanone	10U	1	10U	10U	10U	100U	5	10U
Carbon disulfide	5U	5U	5U	5U	5U	50U	5U	5U
Carbon tetrachloride	2	5U	100	100	170	810	67	66
Chlorobenzene	5U	5U	5U	5U	5U	50U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	100U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	100U	10U	10U
Chloroform	2	5U	11	11	16	210	66	67
Chloromethane	10U	10U	10U	10U	10U	100U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	50U	5U	5U
1,2-Dibromo-3-chloropropane	10U	10U			10U		10U	10U
1,2-Dibromoethane	5U	5U	5U	5U	5U	50U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	100U	10U	10U
1,2-Dichlorobenzene	5U	5U			5U		5U	5U
1,4-Dichlorobenzene	5U	5U			5U		5U	5U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	50U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	50U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	50U	5U	5U
1,1-Dichloroethane	5U	5U	5U	5U	5U	50U	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	50U	5U	5U
1,1-Dichloroethene	3	3	5U	5U	5U	50U	5U	5U
1,2-Dichloroethene	132	101	3	3	5	50U	5U	5U
cis-1,2-Dichloroethene	130	100	3	3	5	50U	5U	5U
trans-1,2-Dichloroethene	2	1	5U	5U	5U	50U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	50U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	50U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	50U	5U	5U
Dimethylbenzene	5U	5U	5U	5U	5U	50U	5U	5U
Ethanol	500U	500U	500U	500U	500U	5000U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	50U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	50U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	100U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	50U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	100U	10U	10U
Methylene chloride	5U	5U	5U	5U	5U	50U	1	5U
Styrene	5U	5U	5U	5U	5U	50U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	100U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	50U	5U	5U
Tetrachloroethene	350	310	3	3	7	50U	5	4
Toluene	5U	5U	5U	5U	5U	50U	5U	5U
1,1,1-Trichloroethane	5U	5U	5U	5U	5U	50U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	50U	5U	5U
Trichloroethene	180	100	1	1	2	16	5U	5U
Trichlorofluoromethane	5U	5U	5U	5U	5U	50U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	50U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	100U	10U	10U
Vinyl chloride	4	10U	10U	10U	10U	100U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-617		GW-618			GW-620		GW-722-06
Program	EXP		EXP			SMP		EXP
Location	EXP-E		EXP-E			FTF		EXP-J
Date Sampled	05/07/97	11/05/97	05/06/97		11/04/97	05/06/97	12/01/97	07/28/97
				DUP				
ORGANIC COMPOUNDS (ug/L)								
Acetone	11	7	99	68	4	28	7	6
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	6
Benzene	5U	5U	5U	5U	5U	5U	5U	5U
Bromochloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	5	10U	8	11	1	9	10U	11
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	5U	5U	5U	5U	5U	5U	5U	5U
Chlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	5U	5U	5U	2	5U	1	5U	5U
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
1,4-Dichlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethene	5U	6	30	31	29	74	94	5U
cis-1,2-Dichloroethene	5U	6	30	31	29	74	94	5U
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	5U	5U	2	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	1	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	5U	1	1	5U	5U	5U	5U
Styrene	5U	5U	5U	5U	5U	5U	5U	1
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	5U	1	3	3	110	93	5U
Toluene	5U	5U	5U	5U	5U	5U	1	5U
1,1,1-Trichloroethane	5U	5U	5U	5U	5U	5U	2	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	5U	4	4	8	29	32	5U
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	2	1	5	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-722-06	GW-722-10		GW-722-14		GW-722-17		GW-722-20
Program	EXP	EXP		EXP		EXP		EXP
Location	EXP-J	EXP-J		EXP-J		EXP-J		EXP-J
Date Sampled	11/24/97	07/29/97	11/24/97	07/29/97	11/25/97	07/30/97	11/25/97	07/30/97
ORGANIC COMPOUNDS (ug/L)								
Acetone	2	4	1	3	1	6	2	58
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	49
Benzene	5U	5U	5U	5U	5U	5U	5U	5U
Bromochloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	2	10	10U	6	10U	9	10U	21
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	1
Carbon tetrachloride	5U	82	36	380	410	620	800	120
Chlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	5U	22	22	39	35	58	67	28
Chloromethane	10U	10U	10U	10U	10U	10U	10U	2
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
1,4-Dichlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	5U	5U	1	2	2	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	5U	5U	1	4	4	5U
1,2-Dichloroethene	5U	2	2	4	4	9	10	2
cis-1,2-Dichloroethene	5U	2	2	4	4	9	10	2
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	1	5U	5U	5U	5U	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	1	5U	5U	5U	5U	5U	5
Styrene	1	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	12	7	32	30	72	66	12
Toluene	5U	5U	5U	5U	5U	1	5U	5U
1,1,1-Trichloroethane	5U	5U	5U	2	2	6	7	1
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	3	2	5	4	8	11	2
Trichlorofluoromethane	5U	5U	5U	3	5	11	15	1
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-722-20	GW-722-22		GW-722-26		GW-722-30		GW-722-32
Program	EXP	EXP		EXP		EXP		EXP
Location	EXP-J	EXP-J		EXP-J		EXP-J		EXP-J
Date Sampled	12/02/97	07/31/97	12/02/97	08/04/97	12/03/97	08/04/97	12/04/97	08/05/97
ORGANIC COMPOUNDS (ug/L)								
Acetone	2	4	5	27	29	4	2	3
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	26	20	2	10U	10U
Benzene	5U	5U	5U	1	2	5U	5U	5U
Bromochloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10	10U	7	5	11	10U	10U
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	1200	850	7	5U	1	5U	5U	5U
Chlorobenzene	5U	5U	5U	5U	4	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	57	38	5U	5U	5U	5U	5U	2
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
1,4-Dichlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	1	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	2	1	5U	5U	2	5U	5U	5U
1,2-Dichloroethene	7	5	5U	5U	5U	5U	5U	5U
cis-1,2-Dichloroethene	7	5	5U	5U	5U	5U	5U	5U
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	1	2	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	3	5U	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	5U	5U	5U	5U	5U	5U	5U
Styrene	5U	5U	5U	3	3	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	58	44	5U	5U	5U	5U	5U	5U
Toluene	5U	5U	5U	3	9	5U	5U	5U
1,1,1-Trichloroethane	6	3	5U	5U	5U	5U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	7	6	5U	5U	1	5U	5U	5U
Trichlorofluoromethane	12	6	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-722-32	GW-722-33		GW-733		GW-735		
Program	EXP	EXP		CMP-E		EXP		
Location	EXP-J	EXP-J		EXP-J		EXP-J		
Date Sampled	12/04/97	08/05/97		03/05/97	07/30/97	04/15/97	12/03/97	
			DUP					DUP
ORGANIC COMPOUNDS (ug/L)								
Acetone	10U	3	3	9	100	10U	2	10U
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
Benzene	5U	5U	5U	5U	5U	5U	5U	5U
Bromochloromethane	10U	10U	10U		10U	10U	10U	10U
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10	6	10U	11	10U	10U	10U
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	5U	5U	5U	31	26	5U	5U	5U
Chlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	2	2	2	2	2	2	3	4
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane	10U	10U	10U		10U	10U	10U	10U
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	5U	5U	5U		5U	5U	5U	5U
1,4-Dichlorobenzene	5U	5U	5U		5U	5U	5U	5U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	5U	5U	5U	5U	5U	5U	5U
Styrene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	5U	5U	1	5U	5U	5U	5U
Toluene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-744		GW-745		GW-746		GW-747	
Program	SMP		SMP		SMP		SMP	
Location	GRIDK1		GRIDK1		GRIDK1		GRIDK2	
Date Sampled	04/16/97	12/08/97	04/17/97	12/09/97	04/17/97	12/09/97	04/17/97	
								DUP
ORGANIC COMPOUNDS (ug/L)								
Acetone	10U	3	21	9	10U	7	10U	10U
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
Benzene	5U	5U	5U	5U	5U	5U	5U	5U
Bromochloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	10U	3	10U	10U
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	5U	5U	5U	5U	5U	5U	5U	5U
Chlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	5U	5U	5U	5U	5U	5U	5U	5U
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
1,4-Dichlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	5U	5U	5U	5U	5U	5U	5U
Styrene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	5U	5U	5U	5U	5U	5U	5U
Toluene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-747	GW-748		GW-749		GW-750		GW-763
Program	SMP	SMP		SMP		EXP		SMP
Location	GRIDK2	GRIDK2		GRIDK2		EXP-J		GRIDJ3
Date Sampled	12/09/97	04/17/97	12/10/97	04/17/97	12/10/97	04/14/97	12/03/97	05/20/97
ORGANIC COMPOUNDS (ug/L)								
Acetone	3	10U	3	10U	2	10U	3	8
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
Benzene	5U	5U	5U	5U	5U	5U	5U	5U
Bromochloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	10U	10U	10U	3
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	5U	5U	5U	5U	5U	5U	5U	5U
Chlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	5U	1	5U	5U	5U	5U	5U	5U
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
1,4-Dichlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	2
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	4
1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	173
cis-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	170
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	3
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	5U	5U	5U	5U	5U	5U	5U
Styrene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	5U	5U	5U	5U	5U	5U	35
Toluene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	5U	5U	5U	5U	5U	5U	8
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	10U	10U	10U	10U	10U	24

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-763	GW-769			GW-770		GW-775	
Program	SMP	SMP			SMP		SMP	
Location	GRIDJ3	GRIDG3			GRIDG3		GRIDH3	
Date Sampled	12/02/97	05/13/97	05/13/97 DUP	11/17/97	05/12/97	11/17/97	05/12/97	11/19/97
ORGANIC COMPOUNDS (ug/L)								
Acetone	3	7	10	1	8	1	6	1
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
Benzene	5U	5U	5U	5U	5U	5U	5U	5U
Bromochloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10	11	10U	8	10U	8	10U
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	5U	3	3	11	5	4	5U	5U
Chlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	5U	1	1	2	3	4	1	5U
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
1,4-Dichlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	5U	1	5U	5U	5U	5U
1,2-Dichloroethene	5U	5U	1	2	5U	5U	5U	5U
cis-1,2-Dichloroethene	5U	5U	1	2	5U	5U	5U	5U
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	1	1	5U	5U	5U	5U	5U
Styrene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	2	2	5	5U	5U	5U	5U
Toluene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	5U	5U	1	5U	5U	5	4
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	2	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-776		GW-781		GW-782		GW-783	
Program	SMP		SMP		SMP		SMP	
Location	GRIDH3		GRIDE3		GRIDE3		GRIDE3	
Date Sampled	05/12/97	12/02/97	05/15/97	11/19/97	05/14/97	11/24/97	05/15/97	11/25/97
ORGANIC COMPOUNDS (ug/L)								
Acetone	13	1	63	1	9	11	6	23
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
Benzene	5U	5U	5U	5U	5U	2	5U	5U
Bromochloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	6	4	12	10U	10	10U	4	10U
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	5U	5U	5U	5U	4	5U	2	5U
Chlorobenzene	5U	5U	5U	5U	5U	4	5U	5U
Chloroethane	10U	10U	10U	10U	5	2	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	5U	5U	5U	5U	2	5U	5U	5U
Chloromethane	1	10U	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
1,4-Dichlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	13	5U	150	110	15	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	2	5U	44	33	4	5U
1,2-Dichloroethene	5U	5U	5U	5U	22	19	32	5
cis-1,2-Dichloroethene	5U	5U	5U	5U	15	14	20	5
trans-1,2-Dichloroethene	5U	5U	5U	5U	7	5	12	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	5U	1	5U	1	5U	5U	5U
Styrene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	2	1	4	37	190	200	36	7
Toluene	5U	5U	5U	5U	5U	4	5U	5U
1,1,1-Trichloroethane	5U	5U	2	5U	20	3	2	1
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	3	3	2	8	52	63	15	5U
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	10U	10U	3	3	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-788		GW-789		GW-791		GW-792	
Program	SMP		SMP		SMP		SMP	
Location	GRIDF3		GRIDF3		GRIDD2		GRIDD2	
Date Sampled	05/13/97	11/18/97	05/14/97	11/18/97	04/08/97	11/20/97	04/08/97	11/20/97
ORGANIC COMPOUNDS (ug/L)								
Acetone	160	3	8	2	10U	3	26	1
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
Benzene	5U	5U	5U	5U	5U	5U	5U	2
Bromochloromethane	10U	10U	10U	10U	10U	10U	10U	2
Bromodichloromethane	5U	5U	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10	10U	11	1	10U	2	10U	2
Carbon disulfide	5U	5U	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	5U	5U	5U	5U	5U	5U	5U	5U
Chlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	5U	5U	2	2	5U	5U	5U	5U
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
1,4-Dichlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	1	5U	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	5U	5U	5U	5U	5U	5U	4
Styrene	5U	5U	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	5U	5U	3	2100	710	8	9
Toluene	5U	5U	5U	5U	5U	5U	5U	3
1,1,1-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	5U	1	3	7	5U	5U	5U
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	10U	10U	10U	10U	10U	10U

(CONTINUED)

APPENDIX D.3
Organic Analytes, CY 1997

Sampling Point	GW-816		GW-817		LRSPW	
Program	EXP		SMP		EXP	
Location	EXP-SR		GRIDK3		EXP-SW	
Date Sampled	04/16/97	12/04/97	04/17/97	12/04/97	04/22/97	12/01/97
ORGANIC COMPOUNDS (ug/L)						
Acetone	10U	2	10U	4	9	10U
Acrolein	10U	10U	10U	10U	10U	10U
Acrylonitrile	10U	10U	10U	10U	10U	10U
Benzene	5U	5U	5U	5U	5U	5U
Bromochloromethane	10U	10U	10U	10U	10U	10U
Bromodichloromethane	5U	5U	5U	5U	5U	5U
Bromoform	5U	5U	5U	5U	5U	5U
Bromomethane	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	9	10U
Carbon disulfide	5U	5U	5U	5U	5U	5U
Carbon tetrachloride	5U	5U	5U	5U	5U	5U
Chlorobenzene	5U	5U	5U	5U	5U	5U
Chloroethane	10U	10U	10U	10U	10U	10U
2-Chloroethyl vinyl ether	10U	10U	10U	10U	10U	10U
Chloroform	5U	5U	5U	5U	1	3
Chloromethane	10U	10U	10U	10U	10U	10U
Dibromochloromethane	5U	5U	5U	5U	5U	5U
1,2-Dibromo-3-chloropropane	10U	10U	10U	10U	10U	10U
1,2-Dibromoethane	5U	5U	5U	5U	5U	5U
Dibromomethane	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	5U	5U	5U	5U	5U	5U
1,4-Dichlorobenzene	5U	5U	5U	5U	5U	5U
1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U
trans-1,4-Dichloro-2-butene	5U	5U	5U	5U	5U	5U
Dichlorodifluoromethane	5U	5U	5U	5U	5U	5U
1,1-Dichloroethane	5U	5U	5U	5U	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U
1,1-Dichloroethene	5U	5U	5U	5U	5U	5U
1,2-Dichloroethene	5U	5U	5U	2	5U	5U
cis-1,2-Dichloroethene	5U	5U	5U	2	5U	5U
trans-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U
1,2-Dichloropropane	5U	5U	5U	5U	5U	5U
cis-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U
trans-1,3-Dichloropropene	5U	5U	5U	5U	5U	5U
Dimethylbenzene	5U	5U	5U	5U	5U	5U
Ethanol	500U	500U	500U	500U	500U	500U
Ethylbenzene	5U	5U	5U	5U	5U	5U
Ethyl methacrylate	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	10U
Iodomethane	5U	5U	5U	5U	5U	5U
4-Methyl-2-pentanone	10U	10U	10U	10U	10U	10U
Methylene chloride	5U	5U	5U	5U	1	5U
Styrene	5U	5U	5U	5U	5U	5U
1,1,1,2-Tetrachloroethane	10U	10U	10U	10U	10U	10U
1,1,2,2-Tetrachloroethane	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	5U	5U	6	5U	1
Toluene	5U	5U	5U	5U	5U	5U
1,1,1-Trichloroethane	5U	5U	5U	5U	5U	5U
1,1,2-Trichloroethane	5U	5U	5U	5U	5U	5U
Trichloroethene	5U	5U	5U	5U	5U	5U
Trichlorofluoromethane	5U	5U	5U	5U	5U	5U
1,2,3-Trichloropropane	5U	5U	5U	5U	5U	5U
Vinyl acetate	10U	10U	10U	10U	10U	10U
Vinyl chloride	10U	10U	10U	10U	10U	10U

APPENDIX D.4

RADIOLOGICAL ANALYTES

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-108						GW-115		
Program	CMP-C						CMP-B		
Location	S3						S3		
Date Sampled	03/04/97			08/11/97			01/22/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	70	100	190	79	180	420	-2.1	2.8	7.6
Gross Beta	8000	600	760	13000	1100	1700	-13	8.6	15
Technetium 99	18000	1800	13	14000	1400	12	8	9	13

(CONTINUED)

Sampling Point	GW-115			GW-148					
Program	CMP-B			SMP					
Location	S3			NHP					
Date Sampled	08/11/97			05/20/97			12/03/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	-0.08	0.82	3.1	2.5	2.3	3.4	0	1.7	5.2
Gross Beta	0.2	3.3	16	4.2	3.9	13	1.1	3.8	15
Technetium 99	-2	8.8	13	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-153								
Program	EXP								
Location	NHP								
Date Sampled	05/21/97						12/03/97		
Sample Type				DUP					
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	2.6	2.2	3.3	2.6	1.9	1	2.6	2.2	3
Gross Beta	3.2	3.6	12	0.87	3.3	12	6.3	3.7	13
Technetium 99	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-192						GW-193		
Program	SMP						CMP-E		
Location	B4						Y12		
Date Sampled	04/07/97			10/30/97			03/05/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	0	1.5	4.4	0.9	1.7	3.7	7.6	3.8	4.8
Gross Beta	3.9	4.2	14	3.8	3.7	14	3	3.4	12
Technetium 99	.	.	.	.	.	.	-1	4.8	13

(CONTINUED)

Sampling Point	GW-193			GW-207					
Program	CMP-E			EXP					
Location	Y12			EXP-SR					
Date Sampled	08/13/97			04/08/97			12/02/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	4.4	2.8	3.5	2	2.9	5.5	-1.6	1.5	6
Gross Beta	9.9	4.4	14	3.7	6.3	24	2.7	3.6	16
Technetium 99	2	4.8	12	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-208						GW-220		
Program	EXP						EXP		
Location	EXP-SR						NHP		
Date Sampled	04/10/97			12/02/97			05/22/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	1.5	2.8	6	2	2.1	3.3	2.4	2.2	3.4
Gross Beta	1.6	6.1	25	5.2	3.9	16	5.9	3.6	14
Technetium 99	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-220			GW-251					
Program	EXP			SMP					
Location	NHP			S2					
Date Sampled	12/08/97			05/07/97			11/05/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	0	2.3	6.1	13	4.7	1.1	8	3.7	4.1
Gross Beta	-0.8	3.2	17	14	4.6	11	5.4	4	15
Technetium 99	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-380								
Program	EXP								
Location	NHP								
Date Sampled	05/21/97			12/02/97					
Sample Type							DUP		
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	-0.1	1	4.2	1.1	1.3	1	2.3	2.4	4.2
Gross Beta	-2.8	3.1	15	0.64	3.6	16	5.6	3.9	16
Technetium 99	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-383						GW-605		
Program	SMP						CMP-E		
Location	NHP						EXP-I		
Date Sampled	05/22/97			12/04/97			03/18/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	0.1	1.8	5.1	0.5	1.4	3.5	170	22	9
Gross Beta	0.4	3.5	15	4.3	4	12	80	13	22
Technetium 99	.	.	.	.	.	.	4	10	13

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-605						GW-606		
Program	CMP-E						CMP-E		
Location	EXP-I						EXP-I		
Date Sampled	03/18/97			08/11/97			03/06/97		
Sample Type	DUP								
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	150	22	7	120	39	9	8.5	3.6	1
Gross Beta	74	13	25	64	39	150	7.5	4	14
Technetium 99	-3	12	13	2	5.5	12	-3	9.8	13

(CONTINUED)

Sampling Point	GW-606						GW-617		
Program	CMP-E						EXP		
Location	EXP-I						EXP-E		
Date Sampled	07/31/97						05/07/97		
Sample Type				DUP					
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	5.5	3.1	3.5	7.4	3.4	2.9	0.76	1.4	3.1
Gross Beta	-0.8	3	14	2.9	3.3	13	5.6	3.4	9.3
Technetium 99	-5	10	13	-5	11	13			

(CONTINUED)

Sampling Point	GW-617			GW-618					
Program	EXP			EXP					
Location	EXP-E			EXP-E					
Date Sampled	11/05/97			05/06/97					
Sample Type							DUP		
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	0.3	1.4	3.6	3.4	2.6	3.7	0.41	0.83	1.1
Gross Beta	-0.3	2.9	14	2.6	3.4	12	0.9	3.4	13
Technetium 99									

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-618			GW-620					
Program	EXP			SMP					
Location	EXP-E			FTF					
Date Sampled	11/04/97			05/06/97			12/01/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	4.5	3.1	4.4	2.6	1.9	1	1.8	1.8	3
Gross Beta	5.7	3.8	14	8.3	4.1	14	6.3	4.4	17
Technetium 99									

(CONTINUED)

Sampling Point	GW-722-06						GW-722-10		
Program	EXP						EXP		
Location	EXP-J						EXP-J		
Date Sampled	07/28/97			11/24/97			07/29/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	2.5	2.2	1.4	-0.54	1.4	6.1	1.1	1.6	3
Gross Beta	3.9	3.5	13	1.9	3.8	14	1	3.5	14
Technetium 99									

(CONTINUED)

Sampling Point	GW-722-10			GW-722-14					
Program	EXP			EXP					
Location	EXP-J			EXP-J					
Date Sampled	11/24/97			07/29/97			11/25/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	0.32	1.3	3.5	1.4	1.4	0.97	-0.78	1.6	5.5
Gross Beta	3.8	3.8	15	6	3.6	12	4.7	4	16
Technetium 99									

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-722-17						GW-722-20		
Program	EXP						EXP		
Location	EXP-J						EXP-J		
Date Sampled	07/30/97			11/25/97			07/30/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	1.1	2.1	4.7	1.6	1.9	3.4	0	12	37
Gross Beta	4	3.8	13	3.7	3.8	13	18	35	140
Technetium 99									

(CONTINUED)

Sampling Point	GW-722-20			GW-722-22					
Program	EXP			EXP					
Location	EXP-J			EXP-J					
Date Sampled	12/02/97			07/31/97			12/02/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	1.2	1.8	3.5	-1.2	1.6	5.8	0.69	1.4	3
Gross Beta	6.4	4	14	2.5	3.2	12	4.9	3.7	14
Technetium 99									

(CONTINUED)

Sampling Point	GW-722-26						GW-722-30		
Program	EXP						EXP		
Location	EXP-J						EXP-J		
Date Sampled	08/04/97			12/03/97			08/04/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	4.2	2.8	3.4	0.71	2	4.8	-0.1	1.4	4.2
Gross Beta	3.8	4.2	17	3.5	3.4	14	-1.4	3.2	16
Technetium 99									

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-722-30			GW-722-32					
Program	EXP			EXP					
Location	EXP-J			EXP-J					
Date Sampled	12/04/97			08/05/97			12/04/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	1	1.7	3.7	1.5	2	4	2.7	2.3	3.3
Gross Beta	4.1	3.3	13	5.1	3.4	13	1.6	3.3	13
Technetium 99									

(CONTINUED)

Sampling Point	GW-722-33						GW-733		
Program	EXP						CMP-E		
Location	EXP-J						EXP-J		
Date Sampled	08/05/97						03/05/97		
Sample Type				DUP					
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	1.8	2	3.8	1.4	1.6	2.8	2.4	1.8	0.95
Gross Beta	1.9	3.3	15	2.4	3.5	15	0.78	3.2	13
Technetium 99							1	8.5	13

(CONTINUED)

Sampling Point	GW-733			GW-735					
Program	CMP-E			EXP					
Location	EXP-J			EXP-J					
Date Sampled	07/30/97			04/15/97			12/03/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	2.3	2.1	3.4	2.9	2.9	2	2.4	2	2.8
Gross Beta	1.8	3.2	12	3.1	7.3	26	3.2	3.7	14
Technetium 99	0	0	13						

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-735			GW-744					
Program	EXP			SMP					
Location	EXP-J			GRIDK1					
Date Sampled	12/03/97			04/16/97			12/08/97		
Sample Type	DUP								
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	2.1	1.9	2.8	-0.7	2.1	7.6	4.2	2.6	1.1
Gross Beta	4.7	3.8	13	-7.6	5.7	28	7.5	4	15
Technetium 99	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-745						GW-746		
Program	SMP						SMP		
Location	GRIDK1						GRIDK1		
Date Sampled	04/17/97			12/09/97			04/17/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	2.7	3.2	5.5	2.1	1.9	1.1	2	2.3	1.8
Gross Beta	8.1	6.7	23	2.2	3	11	-4.6	6.8	26
Technetium 99	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-746			GW-747					
Program	SMP			SMP					
Location	GRIDK1			GRIDK2					
Date Sampled	12/09/97			04/17/97					
Sample Type							DUP		
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	2	1.8	2.7	0.55	3.2	8.4	2.1	2.4	1.9
Gross Beta	-1.5	3	12	-1.6	6.6	25	-0.48	5.8	24
Technetium 99	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-747			GW-748					
Program	SMP			SMP					
Location	GRIDK2			GRIDK2					
Date Sampled	12/09/97			04/17/97			12/10/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	0.74	1.4	3.2	-0.83	2.5	8.5	0.33	1.2	3.2
Gross Beta	0.78	3.2	12	-12	5.6	27	-2	3	14
Technetium 99									

(CONTINUED)

Sampling Point	GW-749						GW-750		
Program	SMP						EXP		
Location	GRIDK2						EXP-J		
Date Sampled	04/17/97			12/10/97			04/14/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	2.2	3.2	6.2	0.83	1.2	1.1	0.1	2.5	7.6
Gross Beta	-2.6	5.1	22	3.4	3.4	11	-0.4	6.4	26
Technetium 99									

(CONTINUED)

Sampling Point	GW-750			GW-763					
Program	EXP			SMP					
Location	EXP-J			GRIDJ3					
Date Sampled	12/03/97			05/20/97			12/02/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	1.2	2.5	5.7	0.82	3.4	8.8	-1.1	1.2	5
Gross Beta	3.6	3.9	14	-0.25	3.1	12	2.8	3.5	15
Technetium 99									

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-769								
Program	SMP								
Location	GRIDG3								
Date Sampled	05/13/97						11/17/97		
Sample Type				DUP					
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	-0.4	1.2	4.3	0.8	1.6	3.5	1.5	2.2	4.7
Gross Beta	-1.2	3.3	19	2	4.2	20	6.5	3.6	11
Technetium 99	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-770						GW-775		
Program	SMP						SMP		
Location	GRIDG3						GRIDH3		
Date Sampled	05/12/97			11/17/97			05/12/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	3.3	2.2	1	0.3	1.7	4.4	1.5	1.7	3
Gross Beta	4.5	3.6	16	2.7	3.3	13	3.4	3.7	16
Technetium 99	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-775			GW-776					
Program	SMP			SMP					
Location	GRIDH3			GRIDH3					
Date Sampled	11/19/97			05/12/97			12/02/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	-0.76	1.6	5.4	0.8	1.5	3.3	1.5	1.8	3.2
Gross Beta	4.2	3.5	13	-0.6	2.9	16	5.4	3.8	13
Technetium 99	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-781						GW-782		
Program	SMP						SMP		
Location	GRIDE3						GRIDE3		
Date Sampled	05/15/97			11/19/97			05/14/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	0.5	1.9	4.9	-0.4	1.2	4.3	44	8	1.1
Gross Beta	7.6	3.8	14	2.2	3.9	15	8.2	4.1	16
Technetium 99	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-782			GW-783					
Program	SMP			SMP					
Location	GRIDE3			GRIDE3					
Date Sampled	11/24/97			05/15/97			11/25/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	56	9.4	4.7	2.3	2.1	3	0.12	0.09	0.11
Gross Beta	18	5.2	15	2.9	3.5	17	0.16	0.14	0.44
Technetium 99	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-788						GW-789		
Program	SMP						SMP		
Location	GRIDF3						GRIDF3		
Date Sampled	05/13/97			11/18/97			05/14/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	0	2	6.1	-0.1	1.9	5.5	1.2	1.7	3.3
Gross Beta	7.1	4	16	2	3.6	14	1.6	3.3	16
Technetium 99	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	GW-789			GW-791					
Program	SMP			SMP					
Location	GRIDF3			GRIDD2					
Date Sampled	11/18/97			04/08/97			11/20/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	1.5	1.8	3.3	-0.1	3	8.9	2.2	2.3	4
Gross Beta	1.2	3.5	15	0.6	6.5	26	4.4	3.8	15
Technetium 99	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-792						GW-816		
Program	SMP						EXP		
Location	GRIDD2						EXP-SR		
Date Sampled	04/08/97			11/20/97			04/16/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	-4	1.9	26	-2.6	0.93	5.9	0.14	2.1	6.4
Gross Beta	6	30	120	-2.3	3.1	14	12	7.2	23
Technetium 99	.	.	.	.	.	.	.	.	.

(CONTINUED)

Sampling Point	GW-816			GW-817					
Program	EXP			SMP					
Location	EXP-SR			GRIDK3					
Date Sampled	12/04/97			04/17/97			12/04/97		
Sample Type									
	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)	.	.	.	.	.	.	.	.	.
Gross Alpha	-0.8	1.1	4.6	4.2	3.4	1.9	2.4	2.7	5.1
Gross Beta	3.2	3.5	12	5.6	7.1	25	-1.7	3.4	13
Technetium 99	.	.	.	.	.	.	.	.	.

(CONTINUED)

APPENDIX D.4
Radiological Analytes, CY 1997

Sampling Point	LRSPW					
Program	EXP					
Location	EXP-SW					
Date Sampled	04/22/97			12/01/97		
Sample Type						
	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)						
Gross Alpha	0.81	3.4	8.7	0.8	1.5	3.3
Gross Beta	3.4	6.3	22	4.5	3.8	15
Technetium 99	-	-	-	-	-	-

APPENDIX E

CY 1997 DATA FOR QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

EXPLANATION

SAMPLING POINT:

GW	-	Monitoring Well
LRSPW	-	Lake Reality Emergency Spillway, seep
D	-	Field Duplicate Sample

LOCATION:

B4	-	Beta-4 Security Pits
EXP	-	Exit Pathway Monitoring Location: Maynardville Limestone Picket (-E, -I, -J) In the gap through Pine Ridge along Scarboro Road (-SR) Surface water sampling location (-SW)
FTF	-	Fire Training Facility
GRID	-	Comprehensive Groundwater Monitoring Plan Grid Location
NHP	-	New Hope Pond
S2	-	S-2 Site
S3	-	S-3 Site
T2331	-	Underground Storage Tank T2331-U

UNITS:

ug/L	-	micrograms per liter (all samples)
umhos/cm	-	micromhos per centimeter (equipment rinsates)
mg/L	-	milligrams per liter (equipment rinsates)
NTU	-	nephelometric turbidity unit (equipment rinsates)
pCi/L	-	picoCuries per liter (equipment rinsates)

SAMPLE TYPE (radiological results for equipment rinsates):

ACT	-	Activity
ERR	-	Counting Error (two standard deviations)
MDA	-	Minimum Detectable Activity

NOTES:

All trace metal and cation analyses were performed using inductively coupled plasma spectroscopy unless otherwise noted.

.	-	Not analyzed
<	-	Inorganic compound not detected at the reporting limit.
U	-	Organic compound not detected at the reporting limit.
CVAA	-	Cold Vapor Atomic Absorption
PMS	-	Plasma Mass Spectroscopy
TDS	-	Total Dissolved Solids
TSS	-	Total Suspended Solids

Organic Compounds Detected in QA/QC Samples, CY 1997

Trip Blank Samples	Quarter of CY 1997				Annual
	First	Second	Third	Fourth	Total
Total Number of Samples	5	19	11	23	58
Samples With VOCs	4	14	11	21	50
Percent Contaminated	80	74	100	91	86
Acetone	3	9	10	21	43
Acrolein	0	0	0	1	1
Acrylonitrile	0	0	1	0	1
2-Butanone	1	9	8	5	23
Carbon tetrachloride	0	0	1	0	1
Chloroform	2	8	2	6	18
Chloromethane	0	1	0	1	2
1,2-Dichloroethane	0	1	1	5	7
1,2-Dichloroethene	0	0	0	1	1
Cis-1,2-Dichloroethene	0	0	0	1	1
Dimethylbenzene	1	0	0	0	1
Ethylbenzene	0	0	0	1	1
4-Methyl-2-pentanone	1	0	0	0	1
Methylene chloride	0	4	0	0	4
Tetrachloroethene	0	0	0	1	1
Toluene	2	1	0	1	4
Trichloroethene	2	0	0	0	2

Laboratory Blank Samples	Quarter of CY 1997				Annual
	First	Second	Third	Fourth	Total
Total Number of Samples	5	15	8	16	44
Samples With VOCs	3	8	8	13	32
Percent Contaminated	60	53	100	81	73
Acetone	2	8	8	12	30
Acrylonitrile	0	0	0	1	1
2-Butanone	0	8	5	5	18
Carbon disulfide	0	0	2	0	2
1,2-Dichlorobenzene	0	0	0	1	1
Dimethylbenzene	0	0	1	0	1
Ethylbenzene	0	0	2	0	2
2-Hexanone	3	0	2	1	6
4-Methyl-2-pentanone	2	0	0	0	2
Methylene chloride	0	5	0	0	5
Tetrachloroethene	0	0	0	1	1

Equipment Rinsate Samples	Quarter of CY 1997				Annual
	First	Second	Third	Fourth	Total
Total Number of Samples	1	3	2	0	6
Samples With VOCs	1	3	2	0	6
Percent Contaminated	100	100	100	.	100
Acetone	1	3	2	0	6
2-Butanone	0	2	2	0	4
Chloroform	1	3	1	0	5
Dimethylbenzene	1	0	0	0	1
2-Hexanone	0	2	0	0	2
Methylene chloride	0	2	0	0	2
Toluene	1	0	0	0	1
Trichloroethene	1	0	0	0	1

Field Blank Samples	Quarter of CY 1997				Annual
	First	Second	Third	Fourth	Total
Total Number of Samples	0	1	1	1	3
Samples With VOCs	0	1	1	1	3
Percent Contaminated	.	100	100	100	100
Acetone	0	1	1	1	3
2-Butanone	0	1	1	0	2
Chloroform	0	1	0	0	1
2-Hexanone	0	1	0	0	1
Methylene chloride	0	1	0	0	1

APPENDIX E.1

CORRELATION WITH GROUNDWATER AND SURFACE WATER SAMPLES

APPENDIX E.1
Correlation of Samples to Associated Blanks
First Quarter 1997

Sampling Point	Location	Date Sampled	Sample No.	Trip Blank No.	Lab Blank No.
GW-108	S3	03/04/97	A970640012	A970640011	Q970660028
GW-115	S3	01/22/97	A970220039	A970220041	Q970350014
GW-193	Y12	03/05/97	A970650002	A970650000	Q970710009
GW-605	EXP-I	03/18/97	A970780005	A970780004	Q970800000
GW-605 D	EXP-I	03/18/97	A970780006	A970780004	Q970800000
GW-606	EXP-I	03/06/97	A970650035	A970650034	Q970700007
GW-733	EXP-J	03/05/97	A970650001	A970650000	Q970710009

APPENDIX E.1
Correlation of Samples to Associated Blanks
Second Quarter 1997

Sampling Point	Location	Date Sampled	Sample No.	Trip Blank No.	Lab Blank No.
GW-148	NHP	05/20/97	A971400096	A971400094	Q971430034
GW-153	NHP	05/21/97	A971410090	A971410089	Q971430034
GW-153 D	NHP	05/21/97	A971410091	A971410089	Q971430034
GW-192	B4	04/07/97	A970980004	A970980003	Q971010050
GW-207	EXP-SR	04/08/97	A970980041	A970980040	Q971010050
GW-208	EXP-SR	04/10/97	A971010002	A971010000	Q971070029
GW-220	NHP	05/22/97	A971420017	A971420016	Q971540024
GW-251	S2	05/07/97	A971280006	A971280004	Q971350006
GW-380	NHP	05/21/97	A971410092	A971410089	Q971430034
GW-383	NHP	05/22/97	A971420018	A971420016	Q971540024
GW-617	EXP-E	05/07/97	A971280005	A971280004	Q971350006
GW-618	EXP-E	05/06/97	A971270012	A971270011	Q971280035
GW-618 D	EXP-E	05/06/97	A971270013	A971270011	Q971350006
GW-620	FTF	05/06/97	A971270014	A971270011	Q971280035
GW-735	EXP-J	04/15/97	A971050048	A971050044	Q971110050
GW-744	GRIDK1	04/16/97	A971060097	A971060095	Q971110053
GW-745	GRIDK1	04/17/97	A971070040	A971070039	Q971140033
GW-746	GRIDK1	04/17/97	A971070041	A971070039	Q971140033
GW-747	GRIDK2	04/17/97	A971070042	A971070039	Q971140033
GW-747 D	GRIDK2	04/17/97	A971070043	A971070039	Q971140033
GW-748	GRIDK2	04/17/97	A971080003	A971080002	Q971140033
GW-749	GRIDK2	04/17/97	A971070044	A971070039	Q971140033
GW-750	EXP-J	04/14/97	A971050001	A971050000	Q971110047
GW-763	GRIDJ3	05/20/97	A971400095	A971400094	Q971430034
GW-769	GRIDG3	05/13/97	A971340001	A971340000	Q971360013
GW-769 D	GRIDG3	05/13/97	A971340002	A971340000	Q971360013
GW-770	GRIDG3	05/12/97	A971320048	A971320045	Q971400000
GW-775	GRIDH3	05/12/97	A971320046	A971320045	Q971400000
GW-776	GRIDH3	05/12/97	A971320047	A971320045	Q971400000
GW-781	GRIDE3	05/15/97	A971350053	A971350050	Q971400006
GW-782	GRIDE3	05/14/97	A971340081	A971340079	Q971400006
GW-783	GRIDE3	05/15/97	A971350052	A971350050	Q971470038
GW-788	GRIDF3	05/13/97	A971340003	A971340000	Q971360013
GW-789	GRIDF3	05/14/97	A971340080	A971340079	Q971400006
GW-791	GRIDD2	04/08/97	A970990005	A970990001	Q971010050
GW-792	GRIDD2	04/08/97	A970990006	A970990001	Q971010050
GW-816	EXP-SR	04/16/97	A971060096	A971060095	Q971110053
GW-817	GRIDK3	04/17/97	A971080004	A971080002	Q971140033
LRSPW	EXP-SW	04/22/97	A971120048	A971120047	Q971150063

APPENDIX E.1
Correlation of Samples to Associated Blanks
Third Quarter 1997

Sampling Point	Location	Date Sampled	Sample No.	Trip Blank No.	Lab Blank No.
GW-108	S3	08/11/97	A972240003	A972240001	Q972300076
GW-115	S3	08/11/97	A972230134	A972230131	Q972260135
GW-193	Y12	08/13/97	A972250080	A972250079	Q972330049
GW-605	EXP-I	08/11/97	A972240002	A972240001	Q972300076
GW-606	EXP-I	07/31/97	A972120262	A972120261	Q972200091
GW-606 D	EXP-I	07/31/97	A972120263	A972120261	Q972200091
GW-722-06	EXP-J	07/28/97	A972100001	A972100000	Q972160033
GW-722-10	EXP-J	07/29/97	A972110005	A972110004	Q972160033
GW-722-14	EXP-J	07/29/97	A972110006	A972110004	Q972160033
GW-722-17	EXP-J	07/30/97	A972120069	A972120067	Q972170097
GW-722-20	EXP-J	07/30/97	A972120068	A972120067	Q972170097
GW-722-22	EXP-J	07/31/97	A972120258	A972120257	Q972200091
GW-722-26	EXP-J	08/04/97	A972170165	A972170163	Q972230049
GW-722-30	EXP-J	08/04/97	A972170164	A972170163	Q972230049
GW-722-32	EXP-J	08/05/97	A972170168	A972170185	Q972240073
GW-722-33	EXP-J	08/05/97	A972170166	A972170185	Q972240073
GW-722-33 D	EXP-J	08/05/97	A972170167	A972170185	Q972240073
GW-733	EXP-J	07/30/97	A972110090	A972110089	Q972160033

APPENDIX E.1
Correlation of Samples to Associated Blanks
Fourth Quarter 1997

Sampling Point	Location	Date Sampled	Sample No.	Trip Blank No.	Lab Blank No.
GW-148	NHP	12/03/97	A973370145	A973370144	Q973440011
GW-153	NHP	12/03/97	A973370146	A973370144	Q973440011
GW-192	B4	10/30/97	A973030098	A973030097	Q973390054
GW-207	EXP-SR	12/02/97	A973360080	A973360079	Q973430012
GW-208	EXP-SR	12/02/97	A973360081	A973360079	Q973440011
GW-220	NHP	12/08/97	A973420262	A973420261	Q973490015
GW-251	S2	11/05/97	A973100002	A973100000	Q973390067
GW-380	NHP	12/02/97	A973370001	A973370000	Q973440011
GW-380 D	NHP	12/02/97	A973370002	A973370000	Q973440011
GW-383	NHP	12/04/97	A973380151		Q973460009
GW-617	EXP-E	11/05/97	A973100001	A973100000	Q973390062
GW-618	EXP-E	11/04/97	A973080133	A973080132	Q973390054
GW-620	FTF	12/01/97	A973350199	A973350198	Q973380042
GW-722-06	EXP-J	11/24/97	A973290101	A973290100	Q973430002
GW-722-10	EXP-J	11/24/97	A973290102	A973290100	Q973430002
GW-722-14	EXP-J	11/25/97	A973290106	A973290105	Q973430002
GW-722-17	EXP-J	11/25/97	A973290107	A973290105	Q973360000
GW-722-20	EXP-J	12/02/97	A973370086	A973370052	Q973430012
GW-722-22	EXP-J	12/02/97	A973370053	A973370052	Q973430012
GW-722-26	EXP-J	12/03/97	A973370054	A973370052	Q973440011
GW-722-30	EXP-J	12/04/97	A973380132	A973380128	Q973460009
GW-722-32	EXP-J	12/04/97	A973380133	A973380128	Q973490015
GW-735	EXP-J	12/03/97	A973380002	A973380000	Q973460009
GW-735 D	EXP-J	12/03/97	A973380003	A973380000	Q973460009
GW-744	GRIDK1	12/08/97	A973420263	A973420261	Q973490018
GW-745	GRIDK1	12/09/97	A973430139	A973430143	Q973490018
GW-746	GRIDK1	12/09/97	A973430140	A973430143	Q973490018
GW-747	GRIDK2	12/09/97	A973430144	A973430146	Q973490018
GW-748	GRIDK2	12/10/97	A973440098	A973440102	Q973500068
GW-749	GRIDK2	12/10/97	A973440099	A973440102	Q973500068
GW-750	EXP-J	12/03/97	A973380001	A973380000	Q973460009
GW-763	GRIDJ3	12/02/97	A973370003	A973370000	Q973440011
GW-769	GRIDG3	11/17/97	A973210451	A973210449	Q973380114
GW-770	GRIDG3	11/17/97	A973210450	A973210449	Q973380114
GW-775	GRIDH3	11/19/97	A973230131	A973230130	Q973380108
GW-776	GRIDH3	12/02/97	A973360082	A973360079	Q973440011
GW-781	GRIDE3	11/19/97	A973230132	A973230130	Q973380108
GW-782	GRIDE3	11/24/97	A973280134	A973280136	Q973370171
GW-783	GRIDE3	11/25/97	A973290110	A973290112	Q973360000
GW-788	GRIDF3	11/18/97	A973220104	A973220103	Q973380114
GW-789	GRIDF3	11/18/97	A973220105	A973220103	Q973380114
GW-791	GRIDD2	11/20/97	A973240272	A973240275	Q973370168
GW-792	GRIDD2	11/20/97	A973240271	A973240275	Q973370168
GW-816	EXP-SR	12/04/97	A973380162	A973380160	Q973490015
GW-817	GRIDK3	12/04/97	A973380161	A973380160	Q973490015
LRSPW	EXP-SW	12/01/97	A973350200	A973350198	Q973380042

APPENDIX E.2

TRIP BLANK DATA SUMMARY

APPENDIX E.2
Organic Analytes Detected in Trip Blank Samples, First Quarter 1997

Sample Number	A970220041	A970640011	A970650000	A970650034	A970780004
ORGANICS (ug/L)					
Acetone	10U	14	10U	5	7
2-Butanone	10U	10U	10U	3	10U
Chloroform	16	5U	5U	5U	9
Dimethylbenzene	5U	5U	5U	1	5U
4-Methyl-2-pentanone	10U	10U	10U	1	10U
Toluene	5U	1	5U	2	5U
Trichloroethene	5U	2	5U	3	5U

APPENDIX E.2
Organic Analytes Detected in Trip Blank Samples, Second Quarter 1997

Sample Number	A970980003	A970980040	A970990001	A971010000	A971050000	A971050044	A971060095	A971070039
ORGANICS (ug/L)								
Acetone	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	10U	10U	10U	10U
Chloroform	5U	3	7	5U	5U	5U	5	5U
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Methylene chloride	5U	5U	5U	5U	5U	5U	5U	5U
Toluene	5U	5U	5U	5U	5U	5U	1	5U

(CONTINUED)

Sample Number	A971080002	A971120047	A971270011	A971280004	A971320045	A971340000	A971340079	A971350050
ORGANICS (ug/L)								
Acetone	10U	11	7	8	9	8	8	11
2-Butanone	10U	11	9	7	5	8	13	10
Chloroform	1	5U	5U	5U	5U	2	5U	7
Chloromethane	10U	10U	10U	10U	3	10U	10U	10U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
Methylene chloride	5U	1	1	1	5U	5U	5U	1
Toluene	5U	5U	5U	5U	5U	5U	5U	5U

(CONTINUED)

Sample Number	A971400094	A971410089	A971420016
ORGANICS (ug/L)			
Acetone	7	8	10U
2-Butanone	3	5	10U
Chloroform	5U	2	1
Chloromethane	10U	10U	10U
1,2-Dichloroethane	5U	2	5U
Methylene chloride	5U	5U	5U
Toluene	5U	5U	5U

APPENDIX E.2
Organic Analytes Detected in Trip Blank Samples, Third Quarter 1997

Sample Number	A972100000	A972110004	A972110089	A972120067	A972120257	A972120261	A972170163	A972170185
ORGANICS (ug/L)								
Acetone	3	3	3	5	5	3	4	7
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	2
2-Butanone	5	6	5	11	11	6	9	5
Carbon tetrachloride	5U	5U	5U	5U	5U	5U	2	5U
Chloroform	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U

(CONTINUED)

Sample Number	A972230131	A972240001	A972250079
ORGANICS (ug/L)			
Acetone	3	10U	2
Acrylonitrile	10U	10U	10U
2-Butanone	10U	10U	10U
Carbon tetrachloride	5U	5U	5U
Chloroform	19	2	5U
1,2-Dichloroethane	5U	5	5U

APPENDIX E.2
Organic Analytes Detected in Trip Blank Samples, Fourth Quarter 1997

Sample Number	A973030097	A973080132	A973100000	A973210449	A973220103	A973230130	A973240275	A973280136
ORGANICS (ug/L)								
Acetone	4	2	3	2	2	4	2	2
Acrolein	1	10U	10U	10U	10U	10U	10U	10U
2-Butanone	1	10U	10U	10U	10U	10U	2	10U
Chloroform	14	1	1	5U	5U	5U	5U	5
Chloromethane	10U	10U	10U	10U	10U	10U	10U	3
1,2-Dichloroethane	1	4	1	5U	3	5U	5U	5U
1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
Cis-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
Ethylbenzene	1	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	5U	5U	5U	5U	5U	5U	5U
Toluene	5U	5U	5U	5U	5U	5U	5U	5U

(CONTINUED)

Sample Number	A973290100	A973290105	A973290112	A973350198	A973360079	A973370000	A973370052	A973370144
ORGANICS (ug/L)								
Acetone	3	10U	10U	3	5	3	4	4
Acrolein	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	2	10U	10U	10U	10U	3	10U	10U
Chloroform	5U	5U	5U	5U	5U	5U	5U	5U
Chloromethane	10U	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	5U	5U
1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
Cis-1,2-Dichloroethene	5U	5U	5U	5U	5U	5U	5U	5U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	5U	5U	5U	5U	5U	5U	5U
Toluene	5U	5U	5U	5U	1	5U	5U	5U

(CONTINUED)

Sample Number	A973380000	A973380128	A973380160	A973420261	A973430143	A973430146	A973440102
ORGANICS (ug/L)							
Acetone	4	4	5	2	13	33	6
Acrolein	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	10U	10U	10U	10U	5	10U
Chloroform	2	5U	5U	2	5U	5U	5U
Chloromethane	10U	10U	10U	10U	10U	10U	10U
1,2-Dichloroethane	5U	5U	5U	5U	5U	5U	1
1,2-Dichloroethene	5U	5U	1	5U	5U	5U	5U
Cis-1,2-Dichloroethene	5U	5U	1	5U	5U	5U	5U
Ethylbenzene	5U	5U	5U	5U	5U	5U	5U
Tetrachloroethene	5U	5U	3	5U	5U	5U	5U
Toluene	5U	5U	5U	5U	5U	5U	5U

APPENDIX E.3

LABORATORY BLANK DATA SUMMARY

APPENDIX E.3
Organic Analytes Detected in Laboratory Blank Samples, First Quarter 1997

Sample Number	Q970350014	Q970660028	Q970700007	Q970710009	Q970800000
ORGANICS (ug/L)					
Acetone	10U	2	2	10U	1
2-Hexanone	10U	4	6	10U	2
4-Methyl-2-pentanone	10U	2	4	10U	10U

APPENDIX E.3
Organic Analytes Detected in Laboratory Blank Samples, Second Quarter 1997

Sample Number	Q971010050	Q971070029	Q971110047	Q971110050	Q971110053	Q971140033	Q971150063	Q971280035
ORGANICS (ug/L)								
Acetone	10U	10U	10U	10U	10U	10U	8	5
2-Butanone	10U	10U	10U	10U	10U	10U	12	10
Methylene chloride	5U	5U	5U	5U	5U	5U	1	1

(CONTINUED)

Sample Number	Q971350006	Q971360013	Q971400000	Q971400006	Q971430034	Q971470038	Q971540024
ORGANICS (ug/L)							
Acetone	6	7	5	9	4	4	10U
2-Butanone	9	10	7	11	4	3	10U
Methylene chloride	1	1	5U	1	5U	5U	5U

APPENDIX E.3
Organic Analytes Detected in Laboratory Blank Samples, Third Quarter 1997

Sample Number	Q972160033	Q972170097	Q972200091	Q972230049	Q972240073	Q972260135	Q972300076	Q972330049
ORGANICS (ug/L)	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.
Acetone	13	20	6	5	4	7	7	14
2-Butanone	7	8	6	4	8	10U	10U	10U
Carbon disulfide	5U	1	5U	5U	5U	5U	5U	2
Dimethylbenzene	5U	5U	5U	5U	5U	5U	5U	1
Ethylbenzene	5U	5U	5U	5U	5U	1	1	5U
2-Hexanone	10U	10U	10U	10U	10U	1	1	10U

APPENDIX E.3
Organic Analytes Detected in Laboratory Blank Samples, Fourth Quarter 1997

Sample Number	Q973360000	Q973370168	Q973370171	Q973380042	Q973380108	Q973380114	Q973390054	Q973390062
ORGANICS (ug/L)								
Acetone	2	2	3	3	1	1	3	1
Acrylonitrile	10U	10U	10U	10U	10U	10U	10U	10U
2-Butanone	10U	2	3	10U	10U	4	1	10U
1,2-Dichlorobenzene	5U	5U	5U	5U	5U	5U	1	5U
2-Hexanone	10U	10U	10U	10U	10U	10U	10U	10U
Tetrachloroethene	5U	5U	5U	5U	5U	1	5U	5U

(CONTINUED)

Sample Number	Q973390067	Q973430002	Q973430012	Q973440011	Q973460009	Q973490015	Q973490018	Q973500068
ORGANICS (ug/L)								
Acetone	1	10U	10U	2	4	2	10U	10U
Acrylonitrile	10U	10U	10U	10U	1	10U	10U	10U
2-Butanone	10U	1	10U	10U	10U	10U	10U	10U
1,2-Dichlorobenzene	5U	5U	5U	5U	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	10U	10U	1	10U	10U
Tetrachloroethene	5U	5U	5U	5U	5U	5U	5U	5U

APPENDIX E.4

EQUIPMENT RINSATE DATA SUMMARY

APPENDIX E.4
Organic Analytes Detected in Equipment Rinsate Samples, CY 1997

Associated Well	GW-383	GW-606		GW-620	GW-722-33	GW-781
Date Sampled	05/22/97	03/06/97	07/31/97	05/06/97	08/05/97	05/15/97
Pump Number	6	2	2	6		6
ORGANICS (ug/L)						
Acetone	21	4	3	88	5	130
2-Butanone	10U	10U	4	29	8	39
Chloroform	3	13	1	7	5U	7
Dimethylbenzene	5U	1	5U	5U	5U	5U
2-Hexanone	10U	10U	10U	4	10U	5
Methylene chloride	5U	5U	5U	1	5U	1
Toluene	5U	1	5U	5U	5U	5U
Trichloroethene	5U	2	5U	5U	5U	5U

APPENDIX E.4
Inorganic Analytes in Equipment Rinsate Samples, CY 1997

Associated Well	GW-383	GW-606		GW-722-33
Date Sampled	05/22/97	03/06/97	07/31/97	08/05/97
Pump Number	6	2	2	
METALS (mg/L)				
Aluminum	<0.02	<0.02	<0.02	<0.02
Antimony	<0.05	<0.05	<0.05	<0.05
Arsenic (PMS)	<0.005	<0.005	<0.005	<0.005
Barium	0.0012	0.0088	0.0098	<0.001
Beryllium	<0.0003	0.00045	<0.0003	<0.0003
Boron	<0.004	<0.004	<0.004	0.0055
Cadmium	<0.003	<0.003	<0.003	<0.003
Chromium	<0.01	<0.01	<0.01	<0.01
Cobalt	<0.005	<0.005	<0.005	<0.005
Copper	<0.004	<0.004	<0.004	<0.004
Iron	<0.005	2.1	0.18	<0.005
Lead (PMS)	0.0006	<0.0005	<0.0005	<0.0005
Lithium	<0.004	<0.004	<0.004	<0.004
Manganese	<0.001	0.009	0.0014	<0.001
Mercury (CVAA)	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01
Selenium	<0.05	<0.05	<0.05	<0.05
Silver	<0.006	<0.006	<0.006	<0.006
Strontium	<0.0004	0.023	0.011	<0.0004
Thallium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005
Thorium	<0.2	<0.2	<0.2	<0.2
Uranium (PMS)	<0.0005	<0.0005	<0.0005	<0.0005
Vanadium	<0.005	<0.005	<0.005	<0.005
Zinc	<0.002	0.011	0.0029	0.0025
MAJOR IONS (mg/L)				
Calcium	0.051	2.9	0.99	0.024
Magnesium	0.0087	0.31	0.059	0.0049
Potassium	<0.6	<0.6	<0.6	<0.6
Sodium	0.036	0.047	0.027	<0.02
Alkalinity-HCO3	.	6	4	2
Alkalinity-CO3	.	<1	<1	<1
Chloride	.	0.174	<0.05	<0.05
Fluoride	.	<0.1	<0.1	<0.1
Nitrate-N	.	<0.028	<0.028	<0.028
Sulfate	.	<0.25	<0.25	<0.25
MISC. ANALYTES				
Conductivity (umho/cm)	.	1.9	6.4	0.6
pH (pH units)	.	6.43	7.08	6.19
TDS (mg/L)	.	33	<1	<1
TSS (mg/L)	.	<1	5	2
Turbidity (NTU)	.	1.04	6.67	0.054

APPENDIX E.4
Radiological Analytes in Equipment Rinsate Samples, 1997

Associated Well	GW-606						GW-722-33		
Date Sampled	03/06/97			07/31/97			08/05/97		
Pump Number	2			2					
Sample Type	ACT	ERR	MDA	ACT	ERR	MDA	ACT	ERR	MDA
ACTIVITY (pCi/L)									
Gross Alpha	-0.59	0.23	2.9	0.06	0.94	2.9	0.7	1.3	2.9
Gross Beta	1.5	3	13	-0.5	2.9	13	0	3.2	16
Technetium 99	4	8.9	13	2	5.5	13	.	.	.

APPENDIX E.5

FIELD BLANK DATA SUMMARY

APPENDIX E.5
Organic Analytes Detected in Field Blank Samples, CY 1997

Associated Well	GW-617	GW-620	GW-722-33
Date Sampled	11/05/97	05/06/97	08/05/97
ORGANICS (ug/L)			
Acetone	2	88	4
2-Butanone	10U	28	9
Chloroform	5U	9	5U
2-Hexanone	10U	4	10U
Methylene chloride	5U	1	5U

APPENDIX F
DATA SCREENING PROCESS AND DQO CRITERIA

CONTENTS

List of Tables

List of Acronyms and Abbreviations

BQR	blank qualification result
CY	calendar year
DQO	data quality objective
East Fork Regime	Upper East Fork Poplar Creek Hydrogeologic Regime
MDA	minimum detectable activity
µg/L	micrograms per liter
mg/L	milligrams per liter
pCi/L	picoCuries per liter
RCRA	Resource Conservation and Recovery Act
RPD	relative percent difference
TCE	Trichloroethene
VOC	volatile organic compound

F.1 INTRODUCTION

The following sections describe the process used to identify groundwater and surface water quality data that do not meet data quality objectives (DQOs) of the Resource Conservation and Recovery Act (RCRA) monitoring program in the Upper East Fork Poplar Creek Hydrogeologic Regime (East Fork Regime), as defined in the *Y-12 Plant Groundwater Protection Program - Groundwater Monitoring Program Data Management Plan* (Martin Marietta Energy Systems, Inc. 1993). The DQOs apply to the groundwater and surface water quality data obtained during calendar year (CY) 1997 for the purposes of RCRA post-closure corrective action monitoring and DOE Order 5400.1 surveillance monitoring and exit pathway/perimeter monitoring. Table F-1 shows the DQO criteria applicable to analytical results for principal ions, trace metals, volatile organic compounds (VOCs), radiological analytes (gross alpha, gross beta, and radionuclides), and miscellaneous laboratory analytes (total suspended solids, total dissolved solids, and turbidity); see Table 4 in Appendix B for the complete list of analytes.

Table F-1. DQO Criteria for Groundwater and Surface Water Quality Data

DQO Criteria	Principal Ions		Trace Metals	VOCs	Radioanalytes	Misc. Analytes
	Anions	Cations				
Duplicate Sample Results	●	●	●	●	●	●
Filtered/Unfiltered Sample Results	.	●	●	.	.	.
Ion Charge Balance Errors	●	●	.	.	.	.
False-Positive Results	.	.	.	●	.	.
MDAs/Counting Errors	.	.	.	.	●	.

Analytical results for the specified groups of analytes that do not meet the specified DQO criteria are replaced with a designated surrogate value (i.e., screened) for data evaluation purposes. Details regarding the data screening process, and summary tables of the CY 1997 groundwater and surface water quality data that do not meet applicable DQOs, are provided in the following sections.

F.2 SCREENED RESULTS FOR DUPLICATE SAMPLES

Duplicate groundwater samples were collected from nine monitoring wells during CY 1997, including two wells (GW-605 and GW-606) used for RCRA post-closure corrective action monitoring. Duplicate samples were analyzed for the suite of laboratory analytes required by the applicable monitoring program. Corresponding results for duplicate samples that differ by an order of magnitude or more were replaced with a missing value (i.e., no analytical result). Dissolved lead concentrations reported for the duplicate (filtered) groundwater samples collected from well GW-769 in May 1997 show such a difference: 0.00065 milligrams per liter (mg/L) and 0.01 mg/L.

F.3 SCREENED RESULTS FOR FILTERED/UNFILTERED SAMPLES

Filtered and unfiltered groundwater and surface water samples were analyzed for the principal cations and trace metals. Results were replaced with missing values if the dissolved (filtered) concentration exceeded the corresponding total (unfiltered) concentration by an order of magnitude or more. Such differences occur between the dissolved (0.0054 mg/L) and total (<0.0005 mg/L) lead concentrations reported for the samples collected from well GW-782 in May 1997, and the dissolved (0.029 mg/L) and total (<0.002 mg/L) zinc concentratations reported for the samples collected from well GW-207 in December 1997.

F.4 SCREENED RESULTS FOR PRINCIPAL IONS

Analytical results for the principal anions (bicarbonate alkalinity, carbonate alkalinity, chloride, fluoride, nitrate, and sulfate) and cations (calcium, magnesium, potassium, and sodium) were screened based on the calculated ion charge balance. If the relative percent difference (RPD) between respective summed milliequivalent concentrations (i.e., molecular weight of the ion divided by the net ionic charge) of the dissolved (filtered sample) cations (which exclude digested cations) and the total (unfiltered sample) anions is equal to or greater than 20%, results for all the principal ions were considered qualitative (i.e., excluded from quantitative evaluation). Charge balance RPDs determined for the groundwater samples collected from the following wells exceed 20%: GW-108 in August 1997 (-34%), GW-620 in May 1997 (+26%) and December 1997 (-38%), GW-722-06 in November 1997 (28%), and GW-722-14 in July 1997 (-80%).

F.5 SCREENED RESULTS FOR VOLATILE ORGANIC COMPOUNDS

Results for the laboratory blank and trip blank samples associated with each groundwater and surface water sample were used to calculate blank qualification results (BQRs) and identify false-positive results (i.e., sampling and/or analytical artifacts) for VOCs; these results were replaced with zero as a surrogate value. A false-positive result is defined as a VOC concentration, reported in micrograms per liter (µg/L), that is less than the BQR for the respective compound. The BQRs for acetone, methylene chloride, toluene, and 2-butanone (common laboratory reagents) represent the highest concentration in either associated blank sample multiplied by a factor of 10; BQRs for all other VOCs are similarly calculated using a factor of 5 (U.S. Environmental Protection Agency 1988).

As shown in Table F-2, a total of 141 false-positive VOCs results were reported for the groundwater and surface water samples collected in the East Fork Regime during CY 1997, most of which (87%) are for acetone, 2-butanone, and methylene chloride (i.e., common laboratory reagents).

Table F-2. False-Positive VOC Results in the East Fork Regime

Compound	Number of Detected Results	Number of False Positives
Acetone	85	75
2-Butanone	45	40
Chloroform	49	10
Methylene chloride	14	8
Tetrachloroethene	49	3
Carbon disulfide	1	1
Chloromethane	2	1
1,2-Dichloroethene	22	1
cis-1,2-Dichloroethene	36	1
Trichloroethene	45	1

The preponderance of false-positive results for laboratory reagents suggest contamination during laboratory analysis. Most of the false-positive results for acetone, 2-butanone, and methylene chloride reflect contamination of the trip blank samples and the laboratory blank samples, which suggests contamination from the laboratory environment where the samples are stored before analysis. However, all of the false-positive results for chloroform and chloromethane reflect contamination only in the trip blanks, which suggests systemic contamination of the source of deionized water used to prepare many of the trip blank samples during CY 1997.

Fourteen of the false-positive results were reported for groundwater samples collected from wells sampled for RCRA post-closure corrective action monitoring purposes. These false positives were for acetone (nine results), 2-butanone (two results), chloroform (two results), and trichloroethene (TCE) (one result). However, only chloroform and TCE are RCRA Groundwater Protection Standard constituents. The chloroform results reported for the duplicate groundwater samples collected from RCRA plume boundary well GW-605 (both 11 µg/L) in March 1997 are false positives because of chloroform contamination in the associated trip blank sample. The TCE result (2 µg/L) reported for the sample collected from RCRA point-of-compliance well GW-108 in March 1997 is also a false positive because of contamination in the associated trip blank sample. None of these false-positive results impacted the required evaluations of the RCRA post-closure corrective action monitoring data.

F.6 SCREENED RESULTS FOR RADIOANALYTES

Results for radioanalytes (gross alpha, gross beta, and radioisotopes) were screened based on the counting error reported with each result. The counting error, reported in picoCuries per liter (pCi/L), expresses the degree of analytical uncertainty, and is defined as twice the sample standard deviation. Results were replaced with missing values if the reported activity for a radioanalyte exceeds the specified minimum detectable activity, but is less than the reported counting error. Four of the CY 1997 radioanalyte results do not meet this DQO criteria: the uranium-238 activity reported for the sample collected in January 1997 from RCRA background well GW-115 (0.21 ± 0.24 pCi/L); and the gross alpha activities reported for wells GW-380 in December 1997 (1.1 ± 1.3 pCi/L), GW-746 in April 1997 (2 ± 2.3 pCi/L), and GW-747 in April 1997 (2.1 ± 2.4 pCi/L).

F.7 REFERENCES

Martin Marietta Energy Systems, Inc. 1993. *Y-12 Plant Groundwater Protection Program-Groundwater Monitoring Program Data Management Plan.* (Y/SUB/93-TK532C/1).

U.S. Environmental Protection Agency. 1988. *Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses.* U.S. EPA, Office of Solid Waste.

DISTRIBUTION

DEPARTMENT OF ENERGY

J.P. Donnelly
M.S. Ferre

ENVIRONMENTAL COMPLIANCE ORGANIZATION

S.B. Jones
E.B. Rundle
L.O. Vaughan
GWPP-File-RC (4)

ENVIRONMENTAL MANAGEMENT AND ENRICHMENT FACILITIES

H.L. King
File-EMEFDMC-RC

UNIVERSITY OF TENNESSEE

B.W. McMaster

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DOE OVERSIGHT DIVISION

D. Gilmore (3)

ORNL - LIFE SCIENCES DIVISION

B.D. Nourse

ANALYTICAL SERVICES ORGANIZATION

P. Buckley

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

W.P. Kegley / P.D. Moss
W.K. Jago

CDM FEDERAL PROGRAMS

C. Lutz

Y-12 Central Files

Y-12 Plant Records Services (2) 9711-5, MS-8169 [2 copies for OSTI]