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FINAL RCRA FACILITY INVESTIGATION SITE INSPECTION TECHNICAL MEMORANDUM NUMBER 3 NSB KINGS BAY GA

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ABB ENVIRONMENTAL SERVICES, INC

FINAL

RCRA FACILITY INVESTIGATION/
SITE INSPECTION
TECHNICAL MEMORANDUM No. 3

NAVAL SUBMARINE BASE
KINGS BAY, GEORGIA

Prepared for:

Southern Division
Naval Facilities Engineering Command
Charleston, South Carolina 29411-0068

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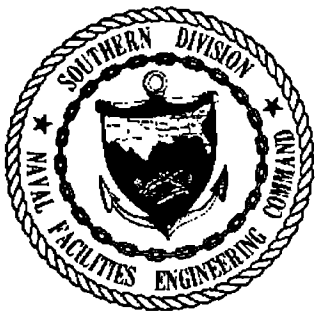

FOREWORD

In accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the 1986 Superfund Amendments and Reauthorization Act (SARA), the 1976 Resource Conservation and Recovery Act (RCRA), as augmented by the 1984 Hazardous and Solid Waste Amendments (HSWA), and as directed in Executive Order 12580 of January 1987, the Department of Defense (DOD) conducts an Installation Restoration (IR) Program for evaluating and remediating problems related to releases and disposal of toxic and hazardous materials at DOD facilities.

The Naval Assessment and Control of Installation Pollutants (NACIP) program was developed by the Navy to implement the IR Program for all Naval and Marine Corps facilities. The NACIP program was originally conducted in three phases: (1) Phase I, Initial Assessment Study, (2) Phase II, Confirmation Study (including a Verification Step and a Characterization Step), and (3) Phase III, Planning and Implementation of Remedial Measures. The three-phase IR Program was modified and updated to be congruent with CERCLA/SARA and RCRA/HSWA driven DOD IR program.

The updated nomenclature for the RCRA/SARA process is as follows:

- Preliminary Assessment and Site Inspection
- Remedial Investigation
- Feasibility Study
- Planning and Implementation of Remedial Design

Three sites at Naval Submarine Base (NSB) Kings Bay, Georgia, were identified for investigation under the IR Program. A work plan for conducting a RCRA Facility Investigation/Site Inspection (RFI/SI) at each of the three sites has been completed and implemented. This technical memorandum discusses the RFI/SI field program conducted at the activity and summarizes findings and results based on information and data collected as a result of the July 1992 field effort, which included the third of six groundwater sampling events. Certain Appendix IX parameters have been deleted from the groundwater monitoring program based on results of laboratory analysis of environmental samples collected during the RFI/SI field program and during the first two groundwater sampling events.

Southern Division Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) has the responsibility for implementation of the Navy and Marine Corps IR Program in the southeastern and midwestern United States. Questions regarding this report should be addressed to the SOUTHNAVFACENGCOM Engineer-in-Charge, Mr. Ed Lohr, at (803) 743-0355.

EXECUTIVE SUMMARY

ABB Environmental Services, Inc. (ABB-ES), under contract to Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), conducted site investigation activities at three of four former waste disposal sites at Naval Submarine Base (NSB), Kings Bay, Georgia. This technical memorandum is the third of five technical memoranda associated with the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) and Site Inspection (SI) that will continue into calendar year 1993. The RFI/SI field program and preparation of this report were completed under the Comprehensive Long-Term Environmental Action Navy (CLEAN) contract (contract number N62467-89-D-0317, Contract Task Order [CTO] Number 041) between SOUTHNAVFACENGCOM and ABB-ES.

This Technical Memorandum No. 3 summarizes findings and results based on information and data collected as a result of groundwater sampling event No. 3, which was performed on July 8 through July 13, 1992. The three sites included in the groundwater monitoring program are identified as follows:

- Site 5, Army Reserve Disposal Area, Towhee Trail
- Site 11, Old Camden County Landfill
- Site 16, Army Reserve Disposal Area, Motor Missile Magazines

Groundwater sampling event No. 3 included collection of 22 groundwater samples, including two duplicate samples. Samples were submitted to CH2M HILL Laboratories in Montgomery, Alabama, for analysis of a modified list of Appendix IX parameters. The following paragraphs summarize the analytical results for groundwater samples collected from the three sites during the third groundwater sampling event.

Site-related volatile organic compounds (VOCs) were not detected in groundwater samples collected from Sites 5 and 16. VOCs detected in groundwater samples collected from Site 11 during the second groundwater sampling event were also present in groundwater samples collected during the third sampling event. VOCs will continue to be monitored at all three sites.

At Site 11, vinyl chloride was detected in replicate groundwater samples from monitoring well KBA-11-2 at concentrations of 63 ug/l and 150 ug/l. A Plan of Action for the investigation of the vinyl chloride contaminant plume at Site 11 was developed by ABB-ES in July 1992 (ABB-ES, 1992c) and field activities were conducted on August 4 through August 13. The results of the Phase I Interim Investigation have been submitted under separate cover (ABB-ES, 1992d).

Site-related semivolatile organic compounds (SVOCs) were not detected in groundwater samples collected from Site 16. Groundwater samples collected from Sites 5 and 11 did not require analysis for SVOCs due to the confirmed absence of SVOCs at these sites during the second groundwater sampling event in May 1992.

Polychlorinated biphenyl (PCB) compounds were not detected in groundwater samples collected during the first two sampling events at Site 5 and also were not detected during the third sampling event. PCBs will continue to be monitored at Site 5 due to the confirmation of low levels of PCB Aroclor 1260 in surface soils collected during the third sampling event at Site 5.

With few exceptions, concentrations of inorganic constituents in groundwater samples collected from all three sites were similar to concentrations detected in samples collected in May 1992. Both filtered and non-filtered groundwater samples were collected during the third sampling event to determine whether aquifer solids in groundwater contribute to the total concentration of inorganic constituents in groundwater. Non-filtered samples were also analyzed for total dissolved solids (TDS) and total suspended solids (TSS) to determine what percentage of the total solids in groundwater represents suspended particulates.

Concentrations of inorganics were significantly lower for filtered groundwater samples compared to non-filtered samples at all three sites. The results for filtered samples are generally considered to be a more accurate representation of groundwater quality due to the relatively high concentrations of suspended solids in groundwater at all three sites (ranging from 79 mg/l to 2990 mg/l).

ACKNOWLEDGEMENTS

In preparing this report, the personnel at ABB Environmental Services, Inc. commend the support, assistance, and cooperation provided by the personnel at NSB Kings Bay, Georgia, and SOUTHNAVFACENGCOM. In particular, we acknowledge the outstanding effort, dedication, and professionalism provided by the following people in the preparation of this report.

Name	Title	Position	Location
Ed Lohr	Engineer	Engineer-in-Charge	SOUTHNAVFACENGCOM
James More	Engineer	Environmental Coordinator	NSB Kings Bay, GA

RCRA Facility Investigation/Site Inspection
Technical Memorandum No. 3

Naval Installation Restoration Program
Naval Submarine Base
Kings Bay, Georgia

LIST OF FIGURES

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ACRONYMS

ABB-ES	ABB Environmental Services, Inc.
ASTM	American Society for Testing and Materials
BLS	below land surface
CLEAN	Comprehensive Long-Term Environmental Action, Navy
CMS	Corrective Measures Study
CPT	Cone Penetrometer Testing
CRQL	contract required quantitation limit
CTO	Contract Task Order
DOD	Department of Defense
EL	elevation
FID	flame ionization detector
ft	Foot
GC/MS	gas chromatography/mass spectroscopy
HSWA	Hazardous and Solid Waste Amendments
IAS	Initial Assessment Study
IR	Installation Restoration
MCL	maximum contaminant level
MLW	mean low water
µg/l	micrograms per liter
µg/kg	micrograms per kilogram
µmhos/cm	micromhos per centimeter
mg/kg	milligram per kilogram
NACIP	Naval Assessment and Control of Installation Pollutants
NEESA	Naval Energy and Environmental Support Activity
NSB	Naval Submarine Base
PAH	polynuclear aromatic hydrocarbons
PCB	polychlorinated biphenyl
PID	photoionization detector
ppm	parts per million
PVC	polyvinyl chloride
QA	Quality Assurance
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation

SI	Site Inspection
s.u.	standard units
SOUTHNAV-FACENGCOM	Southern Division, Naval Facilities Engineering Command
SS	surface soil
SVOC	semivolatile organic compound
TCL	Target Compound List
TDS	total dissolved solids
TSS	total suspended solids
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound

1.0 INTRODUCTION

1.1 PURPOSE. ABB Environmental Services, Inc. (ABB-ES), under contract to Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), conducted site investigation activities at three of four former wastes disposal sites at Naval Submarine Base (NSB) Kings Bay, Georgia. This Technical Memorandum is the third of five Technical Memoranda associated with the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) and Site Inspection (SI) that will continue into calendar year 1993. The RFI/SI field program and preparation of this report were completed under the Comprehensive Long-Term Environmental Action Navy (CLEAN) contract (contract number N62467-89-D-0317, Contract Task Order [CTO] Number 041) between SOUTHNAVFACENGCOM and ABB-ES.

An Initial Assessment Study (IAS) was conducted in 1985 (C.C. Johnson and Associates, 1985) at NSB Kings Bay, Georgia. The IAS identified a total of 16 waste spill sites. None of the 16 sites required further action under the Navy Installation Restoration Program; however, four of the sites required further action under the Hazardous Waste Facility Permit. In February 1988, a RCRA and Hazardous and Solid Waste Amendments (HSWA) permit was issued to NSB Kings Bay by the Georgia Department of Natural Resources, Environmental Protection Division.

The overall purpose of the RFI/SI is to characterize three of the four previously identified sites with potential for contamination and/or contaminant migration. The three sites are identified as follows:

- Site 5 - Army Reserve Disposal Area, Towhee Trail
- Site 11 - Old Camden County Landfill
- Site 16 - Army Reserve Disposal Area, Motor Missle Magazines

The fourth site, Site 12 - Army Reserve Disposal Area, Future Dry Dock, is included in the RFI/SI but no sampling or analyses will be conducted. NSB Kings Bay Public Works Department will conduct a records search and information review to be reported in the comprehensive RFI/SI Report. The RFI/SI Report will be prepared following completion of six groundwater sampling events scheduled to extend into calendar year 1993.

The information obtained during the RFI/SI will be used to eliminate sites from further consideration within the Navy IR Program (i.e., no further action) or present the necessary information (i.e., nature and distribution of contaminants) to plan further response actions including a Corrective Measures Study (CMS) and/or RCRA permit modification.

This Technical Memorandum No. 3 presents summarized findings, results, and recommendations based on information and data collected as a result of groundwater sampling event No. 3, which was performed on July 8 through 13, 1992.

2.0 FIELD PROGRAM

2.1 GROUNDWATER SAMPLING. Groundwater sampling was performed July 8, 1992, through July 13, 1992. Groundwater samples were collected from each of the 20 wells installed during the RFI/SI. Analysis of the samples included a modified list of Appendix IX parameters. Laboratory services were provided by CH2M HILL Laboratories, Inc. in Montgomery, Alabama. Level C data quality objectives and deliverables were specified for the analytical program. Results of groundwater sample analyses are discussed in Sections 3.0 and 4.0.

Upon opening each monitoring well the headspace was screened for VOCs using a flame ionization detector (FID). Prior to sample collection each well was purged of at least three well volumes. Samples were collected within 24 hours following purging. Decontaminated teflon bailers were used to purge the monitoring wells. Decontaminated teflon bailers were also used to collect samples. For non-filtered samples groundwater was transferred from the bailer directly into labelled sample containers. For samples requiring filtration groundwater was pumped from the bailer through a 0.45 micron filter using a Masterflex™ peristaltic pump with polyethylene tubing and then collected in a labelled sample container. ABB-ES personnel placed the filled containers on ice in ice chests immediately after collection. Chain-of-custody was initiated in the field at the time of sample collection. Samples were shipped via overnight courier service to the laboratory on the date of collection.

Appropriate preservatives were added to the empty sample containers by the laboratory prior to delivery of the containers to the project. Following sample collection ABB-ES personnel checked pH values of an aliquot of all preserved samples except VOC samples. Samples for cyanide analysis were also checked for sulfide interference by testing an aliquot of the sample with lead acetate test paper.

Field parameters for groundwater samples included pH, conductivity, and temperature.

2.2 SOIL SAMPLING. Surface soil sampling was performed at Site 5 on July 13, 1992. Seven surface soil samples, plus one duplicate sample, were collected using a hand auger. Sample depths ranged from 0.5 feet below land surface (BLS) to 2.0 feet BLS. Samples were selected below intervals where changes in soil characteristics indicated the original surface of the landfill.

Sampling locations were selected based on the presence of polychlorinated biphenyl (PCB) Aroclor 1260 (53 μg/kg) in one surface soil sample, 05-SS-02, which was collected during RFI/SI field activities in February 1992. One sample was collected at the location of sample 05-SS-02 and the other six samples were collected from locations equally spaced around 05-SS-02 at a distance of 25 feet. The seven surface soil samples and associated QC samples were analyzed for PCBs. QC samples included one duplicate, a matrix spike and matrix spike duplicate, and one equipment rinseate.

3.0 ANALYTICAL PROGRAM

This section summarizes the analytical program for groundwater samples and surface soil samples collected during groundwater sampling event No. 3 at NSB Kings Bay. In addition, it presents an assessment of data quality and useability.

3.1 CHEMICAL ANALYSES. Sampling activities during the third groundwater sampling event at NSB Kings Bay included the collection of 22 groundwater samples, including two duplicate samples and eight surface soil samples, including one duplicate. All samples were collected in accordance with the procedures outlined in the Quality Assurance Project Plan, Appendix A of the NSB Kings Bay Work Plan (ABB-ES, 1991). Samples were submitted to CH2M HILL Laboratories in Montgomery, Alabama, for chemical analyses. Table 3-1 summarizes the sampling and analysis program for samples collected from Sites 5, 11, and 16 during the third sampling event. Samples were analyzed in accordance with USEPA SW-846 methods (USEPA, 1986) and NEESA Level C documentation (NEESA, 1988) for a modified list of Appendix IX volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), inorganic analytes (including total cyanide and sulfide), total dissolved solids (TDS), and total suspended solids (TSS). Table 3-2 provides the modified list of Appendix IX compounds and corresponding EPA analytical method numbers.

3.2 DATA QUALITY ASSESSMENT. All groundwater samples collected during the RFI/SI were properly preserved, placed in coolers, and packed with bagged ice immediately after their collection. All samples remained in the custody of the field operations leader until delivery to the courier service providing overnight shipment to the laboratory. All samples were shipped, complete with chain-of-custody forms, to CH2M HILL Laboratories within 24 hours for analysis. Upon arrival at CH2M HILL, the chain-of-custody and preservation of the samples was checked with the contents of each cooler by CH2M HILL personnel. After verification, the chain-of-custody form was signed by CH2M HILL personnel and the samples accepted for analysis.

Review of the field notebook and chain-of-custody forms did not indicate any non-conformance relative to field instrument calibration or sample handling. All required field quality control (QC) samples were collected in conformance with the requirements of the USEPA, NEESA, and ABB-ES Quality Assurance Plans and the June 1988 NEESA "Sampling and Chemical Analysis Quality Assurance Requirements for the Navy Installation Restoration Program" (NEESA, 1988) (Document 20.2-047B). These field QC samples include field duplicates, equipment rinseate blanks, source water blanks, and VOC trip blanks for each VOC sample shipment.

The analytical results for environmental samples collected during groundwater sampling event No. 3 were evaluated and validated according to NEESA Level C quality control criteria in order to determine data quality and useability. The data tables included in Appendix A reflect validation according to Level C criteria. These criteria are described in Section 7.3.2 of NEESA Document 20.2-047B. The following subsections discuss analytical performance and the evaluation of field and laboratory QC samples.

Table 3-1 Summary of Sampling and Analysis Program

Location and Type of Sampling	Laboratory Analysis				
	A	B	C	D	E
Site 5					
Groundwater	7	0	7	14	7
Surface Soil	0	0	7	0	0
Site 11					
Groundwater	9	0	0	18	9
Site 16					
Groundwater	4	4	0	8	4
Field Duplicates					
Groundwater	2	1	1	4	2
Surface Soil	0	0	1	0	0
Quality Control Samples					
Trip Blanks	5	0	0	0	0
Rinseate Blanks	4	1	3	4	4
Field Blanks	2	2	2	3	2

A - Volatile Organic Compounds (VOCs)
B - Semivolatile Organic Compounds (SVOCs)
C - Polychlorinated biphenyls (PCBs)
D - Inorganic constituents (including cyanide and sulfide)
E - Total Dissolved Solids (TDS) and Total Suspended Solids (TSS)

Table 3-2 Compounds and Analytical Methods for Groundwater Sampling Event No. 3

Parameter: **Volatile Organic Compounds (38 total) TCL List plus 4 additional compounds**
Method: **SW-846 Method 8240**

Chloromethane	cis-1,3-Dichloropropene
Bromomethane	Trichloroethene
Vinyl Chloride	Dibromochloromethane
Chloroethane	1,1,2-Trichloroethane
Methylene Chloride	Benzene
Acetone	trans-1,3-Dichloropropene
Carbon Disulfide	Bromoform
Trichlorofluoromethane*	2-Hexanone
1,1-Dichloroethene	4-Methyl-2-Pentanone
1,1-Dichloroethane	Tetrachloroethene
1,2-Dichloroethene (total)	1,1,2,2-Tetrachloroethane
Chloroform	Toluene
1,2-Dichloroethane	Chlorobenzene
2-Butanone	Ethylbenzene
1,1,1-Trichloroethane	Styrene
Carbon Tetrachloride	Xylene (total)
Vinyl Acetate	1,3-Dichlorobenzene*
Bromodichloromethane	1,4-Dichlorobenzene*
1,2-Dichloropropane	1,2-Dichlorobenzene*

* Non-TCL compounds

Parameter: **Polychlorinated Biphenyls (PCBs) (7 total)**
Method: **SW-846 Method 8080**

Aroclor-1016	Aroclor-1221	Aroclor-1232
Aroclor-1242	Aroclor-1248	Aroclor-1254
	Aroclor-1260	

Parameter: **Appendix IX Inorganic Analytes (19 total)**
Method: **SW-846 Methods (listed in parentheses)**

Antimony (6010)	Copper (6010)	Thallium (7841)
Arsenic (7060)	Lead (7421)	Vanadium (6010)
Barium (6010)	Mercury (7470)	Zinc (6010)
Beryllium (6010)	Nickel (6010)	Tin (6010)
Cadmium (6010)	Selenium (7740)	Cyanide (9010)
Chromium (6010)	Silver (6010)	Sulfide (9030)
	Cobalt (6010)	

Table 3-2 (continued) Compounds and Analytical Methods for Groundwater Sampling Event No. 3

Parameter: Semivolatile Organic Compounds (base/neutral fraction) TCL List (base/neutral fraction)
Method: SW-846 Method 8270 (50 total)

bis(2-Chloroethyl)Ether
1,3-Dichlorobenzene
1,4-Dichlorobenzene
Benzyl Alcohol
1,2-Dichlorobenzene
bis(2-Chloroisopropyl)Ether
N-Nitroso-Di-n-Propylamine
Hexachloroethane
Nitrobenzene
Isophorone
bis(2-Chloroethoxy)Methane
1,2,4-Trichlorobenzene
Naphthalene
4-Chloroaniline
Hexachlorobutadiene
2-Methylnaphthalene
Hexachlorocyclopentadiene
2-Chloronaphthalene
2-Nitroaniline
Dimethylphthalate
Acenaphthylene
2,6-Dinitrotoluene
3-Nitroaniline
Acenaphthene
Dibenzofuran
2,4-Dinitrotoluene
Diethylphthalate
4-Chlorophenyl-phenylether
Fluorene
4-Nitroaniline
N-Nitrosodiphenylamine
4-Bromophenyl-phenylether
Hexachlorobenzene
Phenanthrene
Anthracene
Di-n-Butylphthalate
Fluoranthene
Pyrene
Butylbenzylphthalate
3,3'-Dichlorobenzidine
Benzo(a)Anthracene
Chrysene
bis(2-Ethylhexyl)Phthalate
Di-n-Octyl Phthalate
Benzo(b)Fluoranthene
Benzo(k)Fluoranthene
Benzo(a)Pyrene
Indeno(1,2,3-cd)Pyrene
Dibenz(a,h)Anthracene
Benzo(g,h,i)Perylene

Parameter: Total Dissolved Solids (TDS)/ Total Suspended Solids (TSS)
Method: Standard Methods-- Methods 2540C and 2540D

3.2.1 Analytical Performance Review of analytical data indicated that the laboratory generally met applicable analytical QC criteria for all chemical analyses. Extraction and analysis holding times for all sample lots were met. The data review and validation were performed under a subcontract to Heartland Environmental Services, Inc., St. Peters, Missouri.

For VOC and SVOC analyses, all tuning criteria, holding times, internal standard/surrogate recoveries, precision, and accuracy criteria were met. However, several continuing calibration check standards contained compounds with percent differences exceeding QC limits. Sample results for compounds associated with the differences have been appropriately qualified as estimated and flagged with a "J". Sample quantitation limits for compounds associated with the differences have been appropriately qualified as estimated and flagged with a "UJ." All sample results qualified as estimated are considered useable data.

Analytical blanks associated with certain VOC sample analyses contained detectable concentrations of acetone and methylene chloride. Acetone and methylene chloride are common laboratory solvents and are frequently observed artifacts in laboratory method blanks. Qualifications of sample results for VOC compounds associated with blank contamination are made according to NEESA Level C quality control guidelines. Sample results for all compounds associated with acetone and methylene chloride contamination have been appropriately qualified as undetected because sample values were less than ten times the method blank concentration.

For inorganic analyses, all holding times were met. Two matrix spike results for lead and one matrix spike result for arsenic and thallium were below QC limits. One duplicate analysis for copper and zinc also exceeded QC limits. Associated sample results and quantitation limits have been appropriately qualified as estimated. Several inorganics were detected in method blanks. Table 3-3 summarizes inorganic preparation and calibration blank analytical results. Inorganic results for environmental samples, in which concentrations of metals were also found in associated blanks, are designated undetected if the concentration in the sample is below CRQL and less than five times the blank value. For sample concentrations between 5 and 10 times that found in a blank that exhibited negative bias for an inorganic analyte, the sample results are qualified as estimated. No qualification is required if the sample value is more than 5 times the blank value and there is no negative bias, or more than 10 times the blank value if there is negative basis. All sample results qualified as estimated are considered useable data.

3.2.2 Evaluation of Field QC Samples Three field blanks, five trip blanks, and five rinseate blanks were collected during the third groundwater sampling event. One field blank, BS-6-FB, represents organic-free, deionized water which was used as a final rinse during equipment decontamination procedures and one field blank, BS-8-FB, represents regular deionized water which was used as an intermediate rinse during equipment decontamination procedures. The third field blank, BS-7-FB, is a filter blank that represents organic free, deionized water that has been passed through a 0.45 micron filter. Four equipment rinseate samples were collected during decontamination procedures involving teflon bailers and one equipment rinseate sample was collected during decontamination procedures involving a hand auger.

Table 3-3 Summary of Inorganic Analysis of Preparation Blanks Associated with Samples Collected from all Sites

Sample Delivery Group No.	Blank Analysis Results: Compound	Concentration (µg/l)	CRQL[a] (µg/l)	Associated Samples		
22201	Barium	6.09 J	200	KBA-11-1F	KBA-11-3F	KBA-11-3D
22202	Copper	1.99 J	25	KBA-5-1F	KBA-5-3F	KBA-5-3D
	Chromium	-2.21 J	10	KBA-11-1	KBA-11-3	KBA-5-1
				KBA-5-3	KBA-5-2	KBA-5-2F
				KBA-11-4	KBA-11-5	KBA-11-6
				KBA-11-4F	KBA-11-5F	KBA-11-6F
				BS-18-ER		
22191	Chromium	2.45 J	10	KBA-11-2	KBA-11-2D	KBA-11-2F
22205	Cobalt	3.77 J	50	KBA-11-7	KBA-11-7F	KBA-11-8
	Copper	3.51 J	25	KBA-11-9	KBA-11-9F	KBA-16-1
	Zinc	12.9 J	20	KBA-16-1F	KBA-16-2	KBA-16-3
				KBA-16-3F	KBA-16-4	KBA-16-4F
				BS-17-ER	BS-19-ER	KBA-11-8F
				KBA-16-2F		
22208	Barium	0.67 J	200	BS-7-FB	BS-6-FB	BS-8-FB
	Beryllium	-0.46 J	5			
	Cobalt	-2.12 J	50			
22203	Barium	5.47 J	200	BS-20-ER	KBA-5-5	KBA-5-7
	Lead	2.74 J	5	KBA-5-4	KBA-5-7F	KBA-5-4F
	Antimony	-15.23 J	60	KBA-5-6	KBA-5-5D	KBA-5-6F
	Beryllium	-0.27 J	5	KBA-5-5F		
	Cobalt	-7.05 J	50			

Notes: [a]Contract required quantitation limit
J = indicates that the reported concentration is estimated because it is below the CRQL
µg/l = micrograms per liter

No VOCs, PCBs, or SVOCs were found in field blanks or rinseate blanks. Several inorganics were detected in field blanks and rinseate blanks as shown in Table 3-4. Concentrations for all but one inorganic analyte are well below the CRQL. Blanks containing inorganic analytes below the CRQL are far below any regulatory limit in water, but will be considered in the evaluation of environmental samples.

Zinc was detected in two rinseate blanks, BS-18-ER and BS-20-ER, and cannot be directly attributed to method blank or source water blank contamination. The concentration of zinc in BS-20-ER (22.8 μg/l) exceeds the CRQL of 20 μg/l. The presence of zinc in rinseate samples does not affect the interpretability of the data since concentrations in groundwater are far below any regulatory limit, but the reported concentrations of zinc in associated environmental samples may be biased high.

Review of the field duplicates showed good agreement for groundwater samples and soil soil samples. During field duplicate comparisons, where an analyte was not detected in one groundwater replicate it was present at less than three times the quantitation limit in the duplicate. Variation in groundwater replicate results is common when an analyte is present in the replicates at or near the detection limit. Groundwater replication for inorganic analytes may also vary by factors of two to five times due to the variation in the amount of suspended solids in each sample and due to the nature the inorganic constituents which are sorbed to those suspended solids.

Table 3-4 Summary of Rinseate Blanks and Field Blanks Associated with Samples Collected from all Sites

Compounds Detected	CRQL	Sample Identification				
		Rinseate Blanks			Field Blanks	
		BS-17-ER	BS-18-ER	BS-20-ER	BS-06-FB	BS-07-FB	BS-08-FB
Barium	1.0 J	6.4 U	9.5 U	1.0 U	0.57 U	1.3 U
Beryllium	0.24 U	0.20 U	0.24 UJ	0.28J	0.24 UJ	0.24 UJ
Copper	9.1 U	6.8 UJ	18.5 J	2.6 J	3.1 J	1.8 U
Lead	1.5 J	0.94 U	4.3 U	0.94 U	0.94 U	0.94 U
Zinc	12.9 U	14.9 J	22.8	7.6 U	7.6 U	7.6 U

4.0 RESULTS OF INVESTIGATIONS

The purpose of Section 4.0 is to present the results of analysis of groundwater samples collected during the third groundwater sampling event, July 1992. Technical Memorandum No. 1 (ABB-ES, 1992a) presents discussions of the RFI/SI field program, including analyses of soil samples from the sites and groundwater sampling event No. 1. Technical Memorandum No. 2 (ABB-ES, 1992b) presents results from the second groundwater sampling event. The contents of this section are arranged according to site, in the following order:

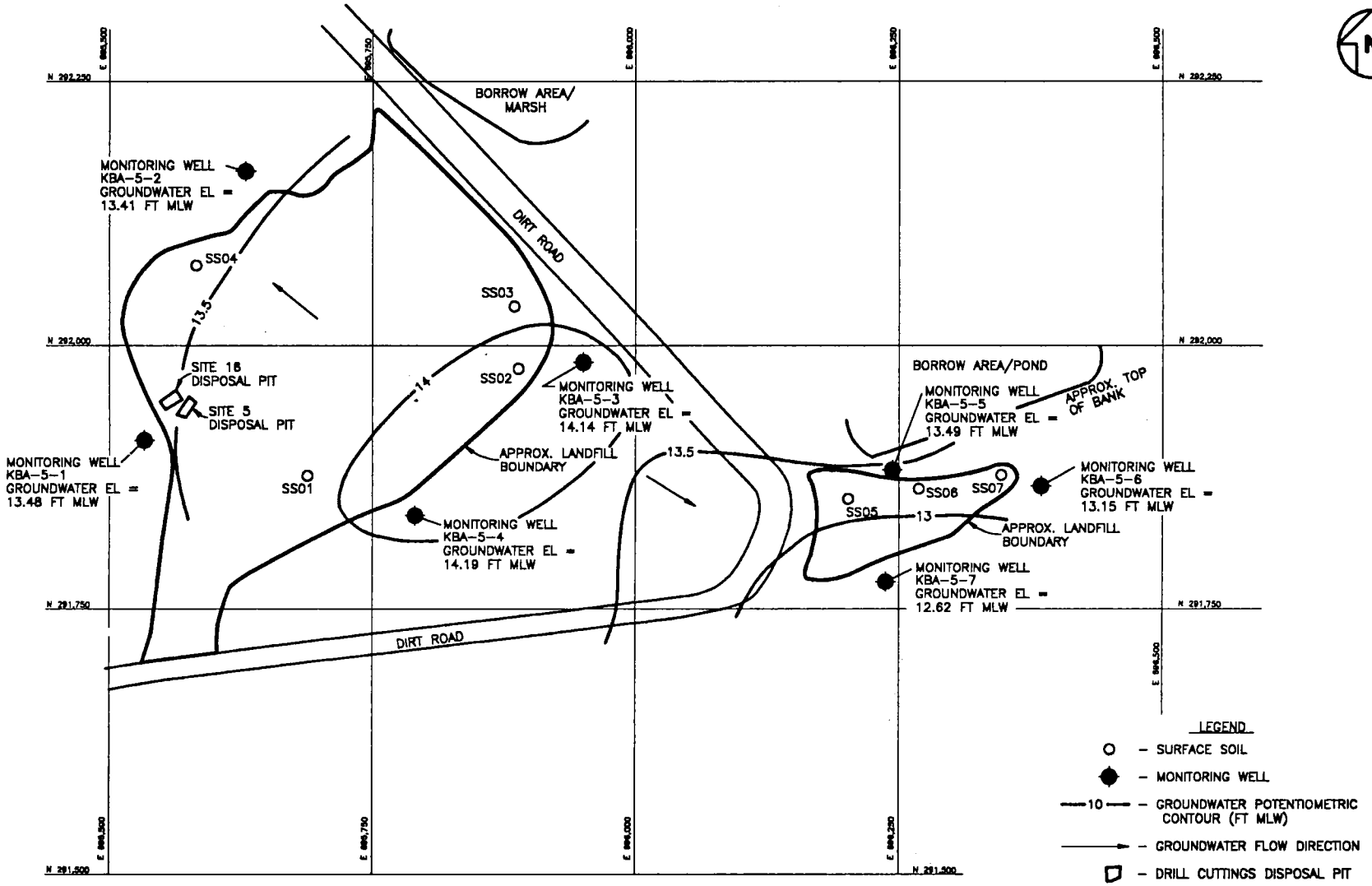
- Site 5, Army Reserve Disposal Area, Towhee Trail
- Site 11, Old Camden County Landfill
- Site 16, Army Reserve Disposal Area, Motor Missile Magazines

Tables included in this section summarize analytical data for compounds detected in samples collected during the third sampling event. The following subsections discuss comparison of these data with data associated with the first and second sampling events conducted in February and May 1992. Appendix A contains tables of validated analytical data for samples collected in July 1992. Analyses were performed by CH2M HILL Laboratories under subcontract to ABB-ES. Appendix B contains analytical data tables for compounds detected in groundwater samples collected during the first sampling event. Appendix C contains analytical data tables for compounds detected in groundwater samples collected during the second sampling event.

4.1 SITE 5, ARMY RESERVE DISPOSAL AREA, TOWHEE TRAIL On July 10, 1992, groundwater level measurements were taken from seven monitoring wells at Site 5. Figure 4-1 is a groundwater potentiometric surface map developed from these measurements. The configuration of the potentiometric surface and the groundwater flow direction are generally unchanged from May 1992, except for the addition of a northwesterly component due to groundwater mounding in the vicinity of monitoring wells KBA-5-3 and KBA-5-4.

The headspace of monitoring wells were screened for VOCs using an FID. The headspace for two monitoring wells at Site 5 contained detectable levels of VOCs, suspected of being naturally occurring methane (Table 4-1). Headspace screening concentrations were 35 ppm at monitoring well KBA-5-2 and greater than 5000 ppm at monitoring well KBA-5-6. No VOCs were detected in the headspace at these two monitoring wells during previous sampling events and groundwater analytical data for the third sampling event do not indicate a source for the VOC headspace readings at KBA-5-2 and KBA-5-6.

Field measurements of pH, specific conductance, and temperature were collected during monitoring well purging. Table 4-1 summarizes field measurements collected during purging of monitoring wells at Site 5. Purging continued until four well volumes had been removed, and field parameters had stabilized to within 10 percent (%). The final measurements of pH, specific conductance, and temperature are considered the measurements of record for the monitoring well (USEPA, 1991).



GRAPHIC SCALE (FT.)

100 0 100 200

FIGURE 4-1
SITE 5
GROUNDWATER POTENTIOMETRIC SURFACE MAP - JULY 1992

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NAVAL SUBMARINE BASE
KINGS BAY, GEORGIA

Table 4-1 Summary of Field Measurements for Monitoring Wells at Site 5

Monitoring Well No.	FID Headspace Data (ppm)	Field Data[1]	Well Volume No. 1	2	3	4	Total Purge Vol. (gal)
KBA-5-1	0	pH	4.3	3.8	3.7	3.7	4.0
		Cond.	120	100	130	140	
		Temp.	27	27	25	25	
KBA-5-2	35	pH	4.7	4.5	4.5	4.5	4.0
		Cond.	120	75	112	130	
		Temp.	29	30	29	28	
KBA-5-3	0	pH	5.3	4.5	4.3	4.3	5.6
		Cond.	175	170	160	180	
		Temp.	28	27	27	26	
KBA-5-4	0	pH	4.5	4.6	4.6	4.7	5.2
		Cond.	230	430	450	380	
		Temp.	29	28	27	27	
KBA-5-5	0	pH	5.0	4.7	4.6	4.8	5.6
		Cond.	140	130	130	120	
		Temp.	29	28	27	27	
KBA-5-6	>5000	pH	5.4	5.2	5.3	5.0	4.5
		Cond.	250	270	260	210	
		Temp.	27	26	26	25	
KBA-5-7	0	pH	6.1	6.1	6.1	6.1	4.5
		Cond.	450	400	400	400	
		Temp.	26	26	25	25	

Notes:
FID = flame ionization detector
ppm = parts per million

1) Units are standard units (s.u.) for pH, micromhos per centimeter (umhos/cm) for specific conductance, and degrees Celsius (°C) for temperature.

4.1.1 Surface Soils Eight surface soils, including one duplicate sample, were collected during sampling event No. 3. Samples were analyzed for PCBs. Figure 4-2 shows sample locations for the eight surface soil samples (05-SS-08 through 05-SS-14). Sampling locations were selected based on the presence of PCB Aroclor 1260 (53 µg/kg) in one surface soil sample, 05-SS-02, which was collected during RFI/SI field activities in February 1992. PCBs were not detected in other surface soil samples collected in February.

One soil sample 05-SS-08 was collected at the location of sample 05-SS-02 and the other six samples were collected from locations equally spaced around 05-SS-02 at a distance of 25 feet. The purpose of the additional surface soil sampling was to confirm the presence of PCBs in soil and to assess the site for higher concentrations of PCBs in soil.

Table 4-2 summarizes analytical results for compounds detected in surface soils collected from Site 5. The presence of Aroclor 1260 in surface soils was confirmed but Aroclor 1260 concentrations were lower than the concentration measured in 05-SS-02 (collected February 1992). Aroclor 1260 was detected in surface soil sample 05-SS-08, 05-SS-13, and 05-SS-14 at 8.7 µg/kg, 4.4 µg/kg, and 7.9 µg/kg, respectively. Aroclor 1260 was also detected in the duplicate sample collected from 05-SS-08 at a concentration of 14 µg/kg. Sample results are flagged J as estimated because the concentrations are well below the CRQL of 33 µg/kg. The concentrations of PCB Aroclor 1260 detected in surface soil samples collected during the first and third sampling events at Site 5 are well below the PCB spill cleanup level of 50,000 µg/kg established by the National PCB Spill Cleanup Policy (EPA, 1987).

4.1.2 Groundwater Nine groundwater samples, including two duplicate samples, were collected from seven monitoring wells at Site 5. Groundwater samples were analyzed for VOCs, PCBs, TDS, TSS, and inorganic analytes. Both filtered and non-filtered groundwater samples were collected for inorganic analysis. Table 3-2 provides a list of specific compounds analyzed in groundwater samples collected during sampling event No. 3. Table 4-3 summarizes analytical data for compounds detected in groundwater at Site 5. Section 5.1 of this document describes the analytical program for sampling events Nos. 4 through 6.

4.1.2.1 Volatile Organic Compounds in Groundwater VOCs were not detected in groundwater samples collected from Site 5. VOCs were similarly not detected in groundwater samples collected during the second sampling event in May 1992 at Site 5. VOCs will, however, continue to be monitored at Site 5.

4.1.2.2 PCBs in Groundwater PCBs were not detected in groundwater samples collected from Site 5. PCBs were similarly not detected in groundwater samples collected during the first and second sampling events at Site 5. PCBs will, however, continue to be monitored due to the confirmation of PCB Aroclor 1260 in surface soils at Site 5.

4.1.2.3 Inorganic Constituents in Groundwater With few exceptions, concentrations of inorganic constituents in groundwater samples from each monitoring well at Site 5 were similar to concentrations detected in samples collected in May 1992.

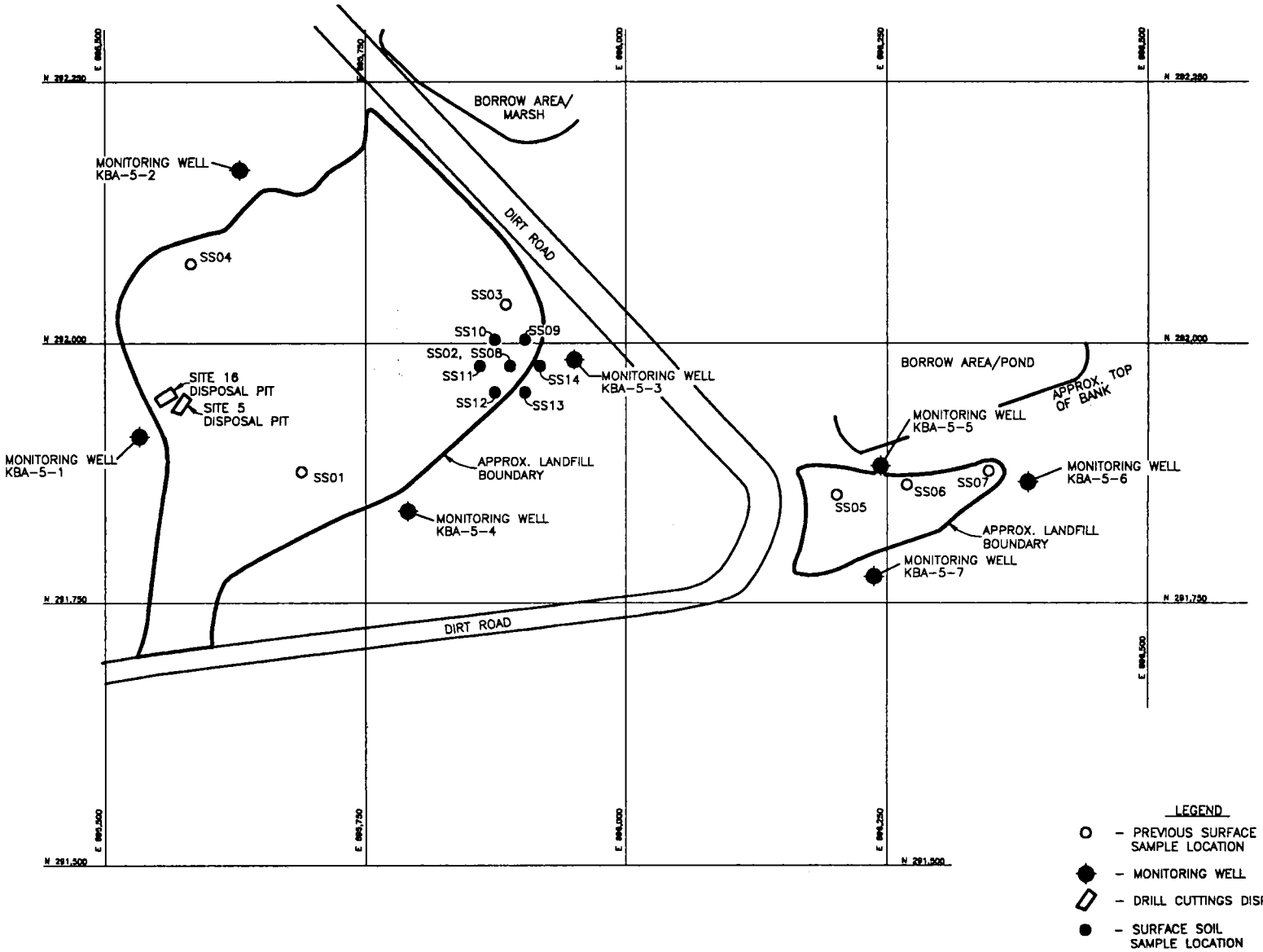

FIGURE 4-2
SITE 5
ARMY RESERVE DISPOSAL AREA
TOWHEE TRAIL
SAMPLING LOCATIONS

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Table 4-2 Summary of Laboratory Analysis of Surface Soil Samples Collected from Site 5

Compounds Detected	CRQL	Soil Boring Number 05-SS-08	05-SS-08D	05-SS-09	05-SS-10	05-SS-11	05-SS-12	05-SS-13	05-SS-14
PCB SOIL ANALYSES (µg/kg)									
Aroclor-1260	33	8.7 J	14 J	39 U	40 U	39 U	37 U	4.4 J	7.9 J

Notes:

CRQL = Contract Required Quantitation Limit
U = not detected above or below CRQL
J = sample result estimated because value is less than the CRQL

Table 4-3 Summary of Laboratory Analysis of Groundwater Samples Collected from Site 5[1]

Compounds Detected		CRQL	Monitoring Well Number KBA-5-1	KBA-5-2	KBA-5-3	KBA-5-3D	KBA-5-4	KBA-5-5	KBA-5-5D	KBA-5-6	KBA-5-7
APPENDIX IX Inorganics (µg/l)											
Arsenic[2]	non-filtered	10	5.1 J	21.4	6.7 J	5.8 J	5.9 J	37.0	---	6.3 J	135
	filtered		1.6 J	18.4	2.8 J	---	5.2 J	2.6 J	8.3 J	3.0 J	2.7 J
Barium[2]	non-filtered	200	132 J	115 J	92.8 J	82.6 J	132 J	207	---	131 J	1080
	filtered		62.2 J	15.9 U	46.1 J	---	23.2 U	51.8 J	22.9 U	30.3 J	32.0 J
Beryllium[2,3]	non-filtered	5	0.48 J	0.41 J	0.20 U	0.26 J	0.41 J	1.7 J	---	0.56 J	8.2
	filtered		0.20 U	0.20 U	0.20 U	---	0.24 UJ	0.24 UJ	0.24 UJ	0.24 UJ	0.24 UJ
Cadmium[2]	non-filtered	5	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	---	2.7 U	27.4
	filtered		3.1 J	2.7 U	2.7 U	---	2.7 U	2.7 U	2.7 U	3.0 J	2.7 U
Chromium[2,3]	non-filtered	10	13.0 J	21.2 J	13.5 J	12.9 J	18.4	46.4	---	23.0	271
	filtered		1.9 UJ	4.2 J	1.9 UJ	---	1.9 U	1.9 U	1.9 U	1.9 J	1.9 U
Cobalt[2,3]	non-filtered	50	4.8 J	4.0 J	3.3 J	1.6 U	1.6 UJ	10.8 J	---	1.6 UJ	62.6 J
	filtered		2.1 J	3.5 J	2.5 J	---	1.6 UJ	1.6 UJ	1.6 UJ	1.6 UJ	1.6 UJ
Copper[2,4]	non-filtered	25	26.2 J	37.3 J	61.8 J	89.9 J	76.5	38.2	---	19.1 J	249
	filtered		6.3 UJ	15.1 J	6.5 UJ	---	2.7 J	1.8 J	13.1 J	19.1 J	19.1 J
Lead[2,5]	non-filtered	5	9.1 J	10.0 J	6.1 J	14.7 J	7.0 U	36.9	---	10.7 U	68.9
	filtered		4.0 J	2.0 J	0.96 J	---	2.1 U	1.8 U	5.4 U	1.8 U	1.8 U
Mercury	non-filtered	0.2	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.27	---	0.16 U	0.41
	filtered		0.16 U	0.16 U	0.16 U	---	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
Nickel[2]	non-filtered	40	15.4 J	10.7 U	109	30.2 J	42.6	56.9	---	25.0 J	128
	filtered		10.7 U	10.7 U	10.7 U	---	10.7 U	10.7 U	10.7 U	10.7 U	10.7 U
Selenium[2]	non-filtered	5	1.9 U	2.4 J	1.9 U	1.9 U	1.9 U	1.9 U	---	1.9 U	1.9 U
	filtered		1.9 U	1.9 U	1.9 U	---	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Thallium[2]	non-filtered	10	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	3.0 J	---	2.1 U	3.4 J
	filtered		2.1 U	2.1 U	2.1 U	---	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U

See notes at end of table.

Table 4-3 Summary of Laboratory Analysis of Groundwater Samples Collected from Site 5[1] (continued)

Compounds Detected		CRQL	Monitoring Well Number KBA-5-1	KBA-5-2	KBA-5-3	KBA-5-3D	KBA-5-4	KBA-5-5	KBA-5-5D	KBA-5-6	KBA-5-7
APPENDIX IX Inorganics (µg/l)											
Vanadium[2]	non-filtered	50	13.6 J	20.6 J	12.7 J	9.2 J	12.1 J	42.1 J	---	18.4 J	251
	filtered		1.3 U	4.9 J	1.6 J	---	1.3 U	1.9 J	1.3 U	1.5 J	1.3 U
Zinc[4]	non-filtered	20	85.6 J	162 J	199 J	123 J	129	135	---	68.8	519
	filtered		20.5 J	132 J	26.6 J	---	20.0	30.8	23.9	27.2	40.4
Sulfide	non-filtered	100	200	200	100 U	200	300	300	---	300	300
	filtered		100 U	100 U	100 U	---	100 U	200	200	200	100 U
PHYSICAL PARAMETERS											
Total Solids (mg/l)			413	658	256	312	834	1557	---	471	3278
TSS (mg/l)			292	464	79	152	294	1450	---	355	2990
% TSS			71	71	31	49	35	93	---	75	91

Notes:
CRQL = Contract Required Quantitation Limit
TSS = total suspended solids
U = not detected above or below CRQL
--- = Analysis not required/performed
[1] Groundwater samples were analyzed for VOCs, PCBs, and inorganic analytes only. No VOCs or PCBs were detected in groundwater samples.

Data Qualifiers

[2] Values flagged J as estimated because concentrations are less than the CRQL.
[3] Values flagged J and UJ as estimated because the preparation blank exhibited negative bias for beryllium, chromium, and cobalt.
[4] Values flagged J and UJ as estimated because duplicate analysis for copper and zinc exceeded QC limits.
[5] Values flagged J as estimated because martix spike recovery for lead was outside QC limits.

Both filtered and non-filtered groundwater samples were collected for inorganic analyses from the seven monitoring wells at Site 5. The purpose of collecting and analyzing filtered and non-filtered samples is to determine what fraction of the total concentration of inorganics in groundwater samples is attributable to suspended particulates. Groundwater samples from Site 5 were also analyzed for TDS and TSS to determine what percentage of the total solids in groundwater are suspended particulates.

TDS and TSS results for groundwater samples are shown in Table 4-3. Total solids (the sum of TDS and TSS) in groundwater ranged from 256 mg/l in KBA-5-3 to 3,278 mg/l in KBA-5-7. The fraction of total solids in groundwater that represents suspended solids ranged from 31% (79 mg/l) for KBA-5-3 to 93% (1450 mg/l) for KBA-5-5. The total amount of solids and suspended solids in the upgradient monitoring wells, KBA-5-1 and KBA-5-2 were comparable to the total solids found in downgradient wells. However, the concentrations of TSS in KBA-5-5 and KBA-5-7 (1450 mg/l and 2990 mg/l, respectively) are significantly higher than the concentrations found in the upgradient wells at Site 5.

The concentrations of inorganic constituents detected in non-filtered samples from downgradient monitoring wells were compared to concentrations detected in the upgradient, non-filtered groundwater samples. For monitoring wells KBA-5-3, KBA-5-4, and KBA-5-6, two inorganic constituents, copper and nickel, were present at concentrations greater than the upgradient concentrations. Copper concentrations are considered bias high, however, due to the widespread presence of copper in method blanks and field rinseate blanks. However, copper and nickel concentrations in filtered samples collected from the three wells were considerably lower and do not exceed the concentrations found in the filtered upgradient samples. The higher concentrations in the non-filtered samples is attributed to the presence of filterable suspended solids in monitoring wells KBA-5-3 (79 mg/l), KBA-5-4 (294 mg/l), and KBA-5-6 (355 mg/l).

For monitoring wells KBA-5-5 and KBA-5-7, concentrations of several inorganic constituents significantly increased when compared to data collected in May 1992. The inorganic constituents include arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, nickel, thallium, vanadium, and zinc. Concentrations of arsenic, barium, cadmium, chromium, and lead in the non-filtered sample collected from KBA-5-7 exceeded Federal MCLs.
The presence of these inorganics at such high concentrations is generally attributable to the amount of suspended solids present in the non-filtered groundwater samples collected from KBA-5-5 and KBA-5-7. This conclusion is supported by the absence and/or decreased concentration of inorganics in the filtered samples collected from KBA-5-5 and KBA-5-7.

The presence of such high concentrations of inorganics in KBA-5-5 and KBA-5-7 is attributable to the relatively high concentrations of suspended solids present in the non-filtered groundwater samples (1450 mg/l and 2990 mg/l, respectively). This is supported by the absence and/or decreased concentration of inorganic constituents in the filtered samples collected from monitoring wells KBA-5-5 and KBA-5-7 (Table 4-3). Concentrations of inorganic constituents that were present in filtered samples from the two wells did not exceed the concentrations found in the filtered, upgradient wells. Inorganic constituents which are sorbed to aquifer solids, if not removed from a groundwater sample prior to sample preparation, will be digested during inorganic preparation and will account for a percentage of the total concentration of inorganics found in a groundwater sample.

In general, the results for filtered groundwater samples are considered to be a more accurate representation of groundwater quality at Site 5 due to relatively high percentage of suspended solids. Appendix D presents inorganic data for the first, second, and third sampling events in bar chart form for the seven inorganic constituents regulated under the Safe Drinking Water Act. As previously mentioned, MCLs for five of the seven regulated inorganic constituents were exceeded at monitoring well KBA-5-7. However, the presence of these organics at such high concentrations has been attributed to aquifer solids. Figure 4-3 summarizes concentrations of inorganics having MCLs for the filtered and non-filtered groundwater samples collected at Site 5 during the third sampling event.

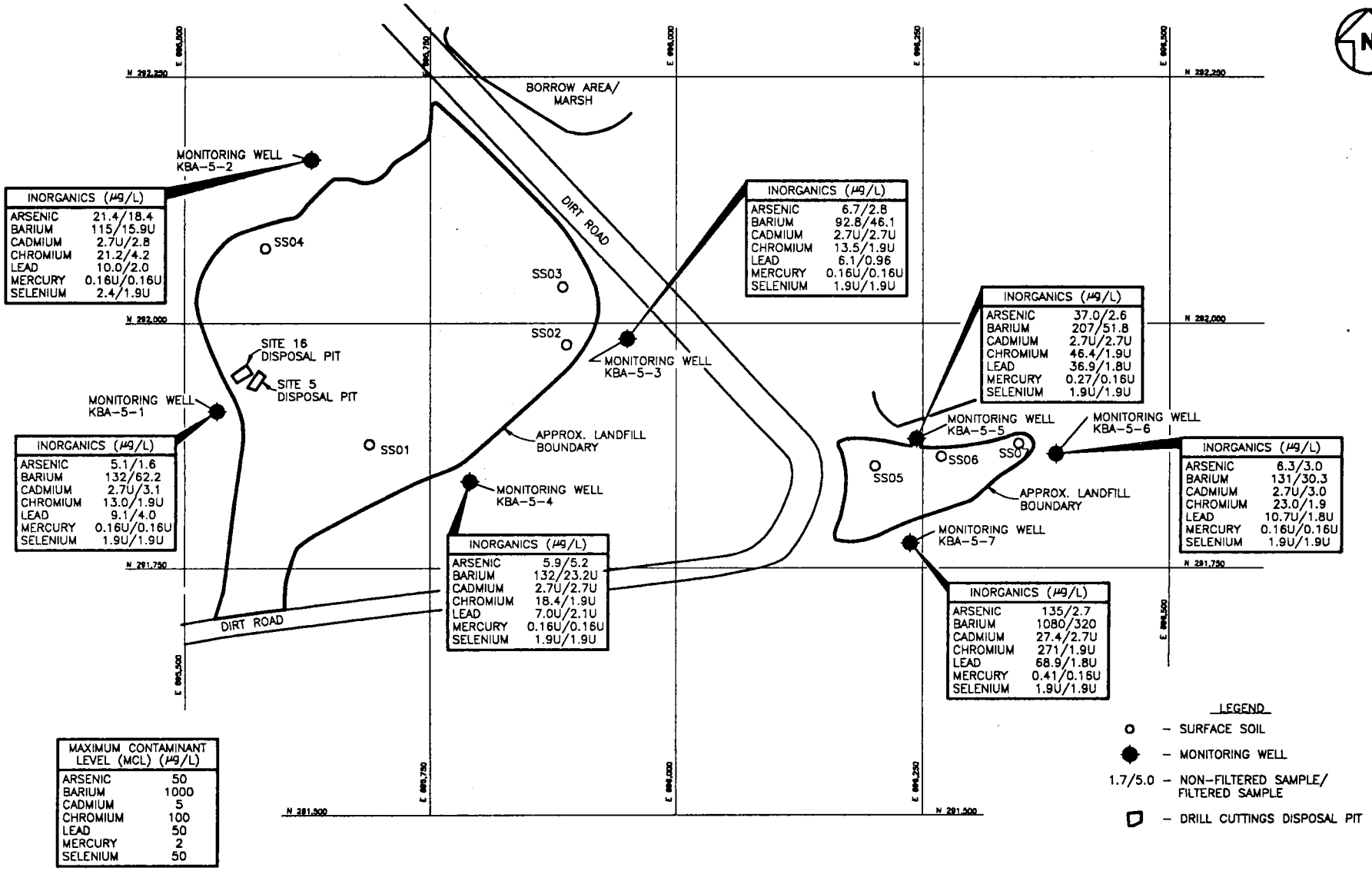
4.2 SITE 11, OLD CAMDEN COUNTY LANDFILL. On July 9, 1992, groundwater level measurements were taken from nine monitoring wells at Site 11. Figure 4-4 is a groundwater potentiometric surface map developed from these measurements. The configuration of the potentiometric surface and the groundwater flow direction are generally unchanged from February and May 1992, when sampling events No. 1 and No. 2 were conducted.

The headspace of monitoring wells were screened for VOCs using an FID. Detectable concentrations of VOCs were recorded for two monitoring wells (Table 4-4). Concentrations greater than 50 ppm VOCs were detected in the headspace of KBA-11-8 and KBA-11-9, respectively. As described in Section 4.1, these concentrations are attributed to collection of naturally occurring methane gas in the well riser.

Field measurements of pH, specific conductance, and temperature were collected during monitoring well purging. Table 4-4 summarizes field measurements collected during purging of monitoring wells at Site 11. Purging continued until four well volumes had been removed, and field parameters had stabilized to within 10 percent (%). The final measurements of pH, specific conductance, and temperature are considered the measurements of record for the monitoring well (USEPA, 1991).

Eleven groundwater samples, including two duplicate samples, were collected from nine monitoring wells at Site 11. Groundwater samples were analyzed for VOCs, TDS, TSS, and inorganic analytes. Both filtered and non-filtered groundwater samples were collected for inorganic analysis. Table 3-2 provides a list of specific compounds analyzed in groundwater samples collected during sampling event No. 3. Table 4-5 summarizes analytical data for compounds detected in groundwater samples collected from Site 11. Section 5.1 of this document describes the analytical program for sampling events Nos. 4 through 6.

4.2.1 Volatile Organic Compounds in Groundwater VOCs detected in groundwater samples collected from Site 11 during the third sampling event and their respective sample concentrations compared well with results from sampling event No. 2. Concentrations of vinyl chloride, 1,2-dichloroethene, toluene, and xylene were again present in groundwater samples from monitoring well KBA-11-2 and 1,3-dichlorobenzene and chlorobenzene were again detected in groundwater samples from monitoring well KBA-11-3 (Table 4-5). 1,4-Dichlorobenzene was detected in a groundwater samples from monitoring well KBA-11-6 during sample event No. 2 and No. 3, but the concentrations are near the instrument detection limit for this compound.



MAXIMUM CONTAMINANT LEVEL (MCL) (µg/L)	
ARSENIC	50
BARIUM	1000
CADMIUM	5
CHROMIUM	100
LEAD	50
MERCURY	2
SELENIUM	50

GRAPHIC SCALE (FT.)
100 0 100 200

FIGURE 4-3
SITE 5
INORGANICS IN GROUNDWATER RELATIVE TO PRIMARY DRINKING WATER STANDARDS

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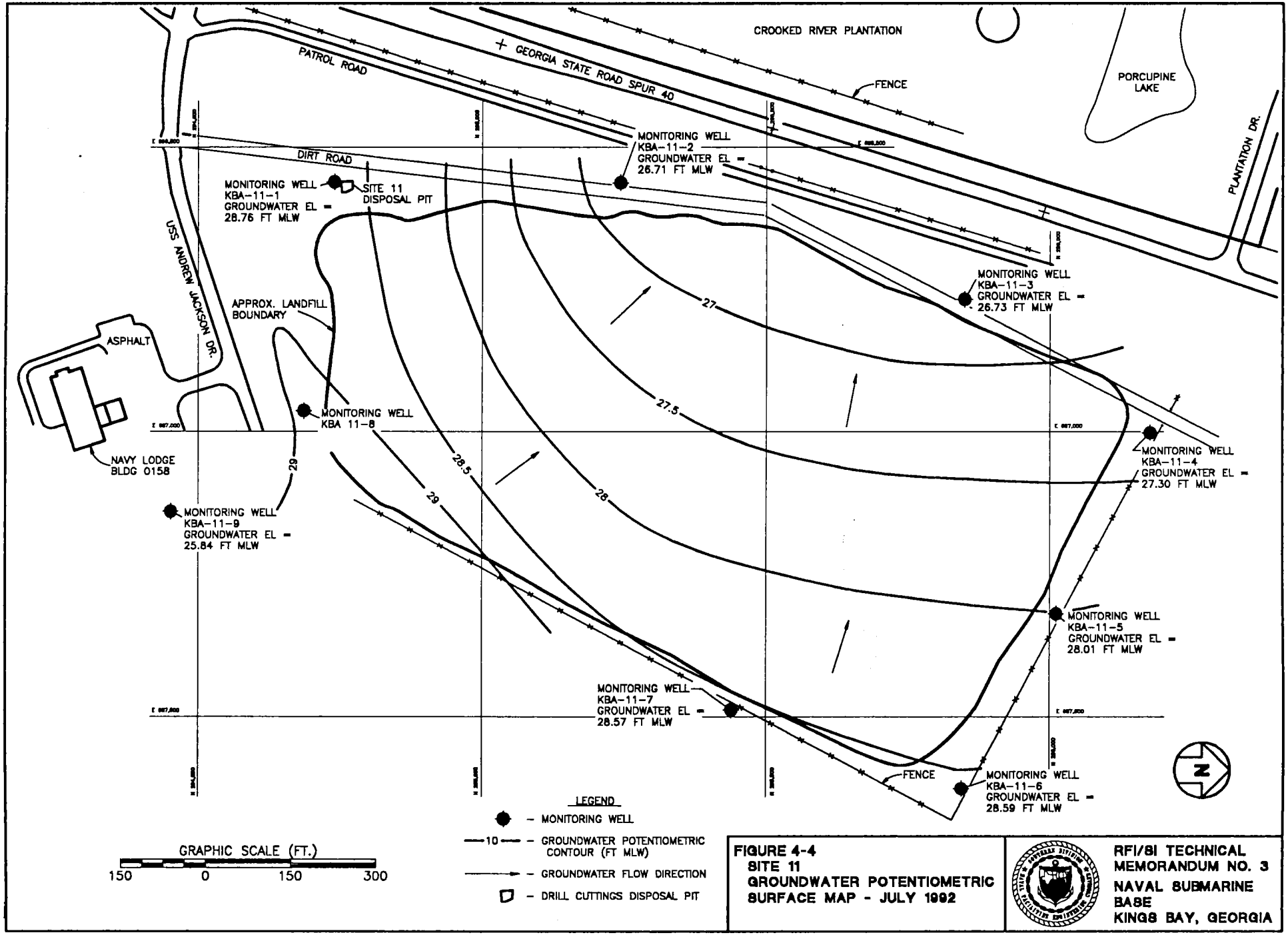

FIGURE 4-4
SITE 11
GROUNDWATER POTENTIOMETRIC SURFACE MAP - JULY 1992

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NAVAL SUBMARINE BASE
KINGS BAY, GEORGIA

Table 4-4 Summary of Field Measurements for Monitoring Wells at Site 11

Monitoring Well No.	FID Headspace Data (ppm)	Field Data[1]	Well Volume No. 1	2	3	4	Total Purge Vol. (gal)
KBA-11-1	0	pH	4.3	4.0	3.9	3.9	4.0
		Cond.	90	110	100	110	
		Temp.	26	25	25	25	
KBA-11-2	0	pH	6.1	6.2	6.5	6.5	4.5
		Cond.	340	160	260	320	
		Temp.	28	29	28	25	
KBA-11-3	0	pH	6.1	6.1	6.0	6.3	5.0
		Cond.	800	1100	1100	1100	
		Temp.	28	28	26	26	
KBA-11-4	0	pH	5.8	5.4	5.4	5.4	5.0
		Cond.	180	400	350	410	
		Temp.	28	26	25	25	
KBA-11-5	0	pH	5.3	5.4	5.6	5.6	5.0
		Cond.	90	80	80	80	
		Temp.	28	28	26	27	
KBA-11-6	0	pH	5.0	4.4	4.2	4.4	4.5
		Cond.	70	80	80	80	
		Temp.	28	26	26	25	
KBA-11-7	0	pH	5.9	5.9	5.9	5.4	4.5
		Cond.	40	40	40	40	
		Temp.	31	28	28	27	
KBA-11-8	>50	pH	6.3	6.4	6.3	6.3	4.5
		Cond.	900	450	900	850	
		Temp.	30	30	27	28	
KBA-11-9	>50	pH	5.8	5.7	5.6	5.6	4.0
		Cond.	90	100	100	90	
		Temp.	28	27	25	26	

Notes: FID = flame ionization detector ppm = parts per million

1) Units are standard units (s.u.) for pH, micromhos per centimeter (umhos/cm) for specific conductance, and degrees Celsius (°C) for temperature.

Table 4-5 Summary of Laboratory Analysis of Groundwater Samples Collected from Site 11[1]

Compounds Detected		Monitoring Well Number										
		CRQL	KBA-11-1	11-2	11-2D	11-3	11-3D	11-4	11-5	11-6	11-7	11-8	11-9
APPENDIX IX VOCs (µg/L)													
Vinyl Chloride		10	10 U	63	150	10 U	---	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane[2]		10	10 U	10 U	5 J	10 U	---	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene		5	5 U	5	10	5 U	---	5 U	5 U	5 U	5 U	5 U	5 U
Toluene[2]		5	5 U	5 U	2 J	5 U	---	5 U	5 U	5 U	5 U	5 U	5 U
Chlorobenzene[2]		5	5 U	5 U	5 U	4 J	---	5 U	5 U	5 U	5 U	5 U	5 U
Xylene (total)[2]		5	5 U	5 U	2 J	5 U	---	5 U	5 U	5 U	5 U	5 U	5 U
1,3-Dichlorobenzene		5	5 U	5 U	5 U	13	---	5 U	5 U	5 U	5 U	5 U	5 U
1,4-Dichlorobenzene[2]		5	5 U	5 U	5 U	5 U	---	5 U	5 U	1 J	5 U	5 U	5 U
APPENDIX IX Inorganics (µg/L)													
Arsenic[2]	non-filtered	10	1.00 U	2.4 J	2.4 J	2.7 J	2.6 J	3.3 J	6.7 J	1.1 J	1.9 J	3.7 J	3.6 J
	filtered		1.00 U	1.4 J	---	1.00 U	---	1.00 U	1.4 J	1.00 U	1.00 UJ	2.0 J	2.5 J
Barium[2]	non-filtered	200	61.4 J	30.2 J	24.0 J	49.0 J	57.6 J	27.4 J	158 J	41.5 J	65.5 J	30.8 J	44.2 J
	filtered		37.9 J	5.8 J	---	14.9 U	---	12.2 U	8.4 U	12.2 U	12.1 J	15.4 J	7.4 J
Beryllium[2]	non-filtered	5	0.32 J	0.49 J	0.26 J	0.45 J	0.73 J	0.80 J	2.4 J	0.54 J	0.75 J	0.54 J	0.91 J
	filtered		0.20 U	0.24 U	---	0.20 U	---	0.20 U	0.20 U	0.20 U	0.24 U	0.24 U	0.24 U
Cadmium[2]	non-filtered	5	3.0 J	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U
	filtered		2.7 U	2.7 U	---	2.7 U	---	2.7 U	3.1 J	2.7 U	2.7 U	2.7 U	2.7 U
Chromium[2,3]	non-filtered	10	32.9	27.2	27.9	34.3	38.7	43.6	157	38.5	77.2	29.3	44.8
	filtered		1.9 UJ	1.9 U	---	2.7 J	---	1.9 UJ	1.9 UJ	1.9 UJ	1.9 U	3.5 U	4.6 U
Cobalt[2]	non-filtered	50	1.6 J	4.6 U	5.6 U	1.6 U	1.6 J	2.8 J	6.1 J	1.6 U	5.9 U	6.7 U	6.5 U
	filtered		1.6 U	4.1 U	---	1.6 U	---	1.6 U	2.0 J	1.8 J	3.4 U	5.9 U	4.6 U
Copper[2,4]	non-filtered	25	128 J	27.8	16.1 U	27.6 J	72.6 J	72.3 J	239 J	114 J	19.6 J	81.4	69.1
	filtered		17.1 J	9.1 U	---	9.1 UJ	---	10.2 UJ	6.8 UJ	8.0 UJ	1.8 U	4.7 U	24.0 J

See notes at end of table.

Table 4-5 Summary of Laboratory Analysis of Groundwater Samples Collected from Site 11[1] (continued)

Compounds Detected		Monitoring Well Number										
		CRQL	KBA-11-1	11-2	11-2D	11-3	11-3D	11-4	11-5	11-6	11-7	11-8	11-9
APPENDIX IX VOCs (µg/L)													
Lead[2,5]	non-filtered	5	24.6 J	8.5 J	10.3 J	12.4 J	87.2 J	23.9 J	33.1 J	6.7 J	16.1 J	4.1 J	8.8 J
	filtered		0.94 U	2.5 J	---	0.94 U	---	0.94 U	1.0 J	1.2 J	0.98 J	1.6 J	1.1 J
Mercury[2]	non-filtered	0.2	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.19 J	0.46	0.16 U	0.16 U	0.16 U	0.19 J
	filtered		0.16 U	0.16 U	---	0.16 U	---	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
Nickel[2]	non-filtered	40	89.1	23.9 J	23.6 J	10.7 U	61.4	42.3	68.2	66.3	10.7 U	78.7	18.1 J
	filtered		10.7 U	10.7 U	---	10.7 U	---	10.7 U	10.7 U	10.7 U	10.7 U	10.7 U	10.7 U
Selenium[2]	non-filtered	5	2.0 J	1.9 U	2.2 J	6.4	5.5	5.2	1.9 U	3.5 J	2.9 J	4.2 J	4.3 J
	filtered		1.9 U	1.9 U	---	1.9 U	---	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Silver[2]	non-filtered	10	1.5 U	1.7 J	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
	filtered		1.5 U	1.5 U	---	1.5 U	---	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
Vanadium[2]	non-filtered	50	8.6 J	13.4 J	11.6 J	26.2 J	30.2 J	26.0 J	82.5	14.6 J	23.8 J	15.2 J	32.0 J
	filtered		1.3 U	4.1 J	---	2.9 J	---	1.8 J	2.2 J	1.3 U	1.4 J	1.8 J	4.5 J
Zinc[2,4]	non-filtered	20	208 J	48.5 U	43.2 U	37.3 J	128 J	237 J	320 J	178 J	22.0 U	101	74.0
	filtered		14.1 J	74.3	---	25.7 J	---	9.4 J	49.4 J	77.0 J	14.7 U	16.5 U	33.9 U
Cyanide[2]	non-filtered	10	2.2 U	2.2 U	2.2 U	4.4 J	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
	filtered		2.2 U	2.2 U	---	2.2 U	---	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
Sulfide	non-filtered	100	200 U	300	200	200	200	200	100 U	200	200	300	100
	filtered		100 U	200	---	100 U	---	100 U	100 U	100 U	100 U	100 U	100
PHYSICAL PARAMETERS													
Total Solids (mg/l)			325	380	563	1625	---	1116	2502	575	1542	1260	1056
TSS (mg/l)			258	198	338	693	---	713	392	505	102	653	913
% TSS			79	52	60	43	---	64	16	88	7	52	86

Notes: CRQL = Contract Required Quantitation Limit
U = not detected above or below CRQL
--- = Analysis not required/performed

[1] Groundwater samples were analyzed for VOCs and inorganic constituents only.
[2] Sample results flagged J as estimated because concentration is less than the CRQL.
[3] Sample quantitation limits flagged UJ as estimated because associated preparation blank exhibited negative bias for chromium.
[4] Sample results flagged J and UJ as estimated because duplicate analysis for copper and zinc exceeded QC limits.
[5] Sample results flagged J as estimated because matrix spike recovery for lead was outside QC limits.

The concentrations of vinyl chloride in samples from monitoring well KBA-11-2 were 63 µg/l and 150 µg/l for duplicate samples collected during the third sampling event. The Primary Drinking Water Standard MCL for vinyl chloride is 2 µg/l. Based on analytical results for samples collected from KBA-11-2 during the second sampling event (July 1992), SOUTHNAVFACENGCOM and NSB Kings Bay elected to take immediate measures to evaluate the vinyl chloride contaminant plume. A Plan of Action for this investigation was developed by ABB-ES in July 1992 (ABB-ES, 1992c) and field activities were conducted on August 4 through 16. Field activities included the collection of groundwater samples and stratigraphic characterization using cone penetrometer testing (CPT). The results of the investigation have been submitted under separate cover (ABB-ES, 1992d).

4.2.2 Inorganic Constituents in Groundwater With few exceptions, concentrations of inorganic constituents in groundwater samples from each monitoring well at Site 11 were similar to concentrations detected in samples collected in May 1992. Concentrations of copper and nickel in several monitoring wells increased from May 1992. Copper concentrations are considered bias high; however, due to the widespread presence of copper in method blanks and field rinseate blanks.

Both filtered and non-filtered groundwater samples were collected for inorganic analyses from the nine monitoring wells at Site 11. The purpose of collecting and analyzing filtered and non-filtered samples is to determine what fraction of the total concentration of inorganics in groundwater samples is attributable to suspended particulates. Groundwater samples from Site 11 were also analyzed for TDS and TSS to determine what percentage of the total solids in groundwater represent suspended particulates.

TDS and TSS results for groundwater samples are shown in Table 4-5. Total solids (the sum of TDS and TSS) in groundwater ranged from 325 mg/l KBA-11-1 to 2,502 mg/l in KBA-11-5. The fraction of total solids in groundwater that represents suspended solids ranged from 7% (102 mg/l) for KBA-11-7 to 88% (505 mg/l) for KBA-11-6. The total amount of solids and suspended solids in the upgradient monitoring wells KBA-11-1, KBA-11-7, KBA-11-8, and KBA-11-9 were comparable to the solids found in downgradient wells.

The concentrations of inorganic constituents detected in non-filtered samples collected from downgradient monitoring wells were compared to concentrations detected in upgradient, non-filtered groundwater samples. The following is a general discussion of observations regarding the constituents and concentrations detected in samples collected in July 1992.

Silver was not detected in upgradient monitoring wells at Site 11 but was detected in one non-filtered sample from downgradient well KBA-11-2 at a concentration of 1.7 J µg/l. Silver was not detected in the duplicate sample collected from this well and was not detected during sampling event No. 2. Silver was also not detected in the filtered sample collected from KBA-11-2.

Lead, selenium, and cyanide were detected at concentrations exceeding upgradient concentrations in a non-filtered sample collected from monitoring well KBA-11-3. The concentration of lead in one duplicate sample (87.2 J µg/l) collected from this well exceeded background concentrations; however, the concentration of lead in the replicate sample was well within background at 12.4 J µg/l. Selenium was detected in both replicate samples collected from KBA-11-3 (6.4 µg/l and 5.5 µg/l) but concentrations were less than two times those found in non-filtered,

upgradient samples. Cyanide was detected in one replicate sample collected from KBA-11-3 at 4.4 J μg/l but was not detected in the second replicate sample. Neither lead, selenium, or cyanide were detected in the filtered sample collected from KBA-11-3.

For monitoring well KBA-11-5, concentrations of several inorganic constituents exceeded concentrations found in upgradient monitoring wells. Constituents included arsenic, barium, beryllium, chromium, cobalt, copper, lead, mercury, vanadium, and zinc. Concentrations of these constituents in the filtered sample collected from this well were considerably lower and do not exceed the concentrations found in the filtered sample collected from upgradient wells. The concentration of chromium (157 μg/l) in the non-filtered sample exceeded the Primary Drinking Water Standard MCL of 100 μg/l. However, chromium was not detected in the filtered sample collected from KBA-11-5.

Arsenic, copper, lead, nickel, and zinc were detected in a majority of groundwater samples collected during sample event No. 3 at concentrations greater than those associated with samples collected during sample event No. 2. Increased concentrations were observed in both upgradient and downgradient groundwater samples. For this reason, the increase in concentrations of arsenic, copper, lead, nickel, and zinc may be caused by seasonal variations.

Barium, chromium, cobalt, mercury, and selenium were detected in groundwater samples collected during sampling event No. 3 at concentrations above those detected in corresponding monitoring wells during sampling event No. 2. Increased concentrations were observed in groundwater samples from both upgradient and downgradient monitoring wells. Therefore, the increase in concentrations for these constituents may be due to seasonal variations.

Cadmium and vanadium were detected in two groundwater samples, from KBA-11-1 and KBA-11-5, respectively, at concentrations above those detected in samples from these monitoring wells during sampling event No. 2. The concentration of cadmium in a sample from upgradient monitoring well KBA-11-1, 3.0 J μg/l, is near the MCL of 5 μg/l for cadmium. Cadmium was not detected in other groundwater samples collected during sampling event No. 3, and was detected in only one sample during sampling event No. 2 from an upgradient monitoring well (KBA-11-8).

In general, the results for the filtered groundwater samples are considered to be a more accurate representation of groundwater quality at Site 11 due to relatively high percentage of suspended solids.

Concentrations of inorganic constituents in non-filtered groundwater samples collected from Site 11 were compared to Federal Primary Drinking Water Standard MCLs. Appendix D presents inorganic data for the first, second, and third sampling events in bar chart form for the seven inorganic constituents regulated under the Safe Drinking Water Act. Figure 4-5 summarizes concentrations of inorganics having MCLs for the filtered and non-filtered groundwater samples collected at Site 11 during the third sampling event.

4.3 SITE 16, ARMY RESERVE DISPOSAL AREA, MOTOR MISSILE MAGAZINES. On July 11, 1992, groundwater level measurements were taken from four monitoring wells at Site 16. Figure 4-6 is a groundwater potentiometric surface map developed from these measurements. The configuration of the potentiometric surface and the groundwater flow direction are similar to those for February 1992.

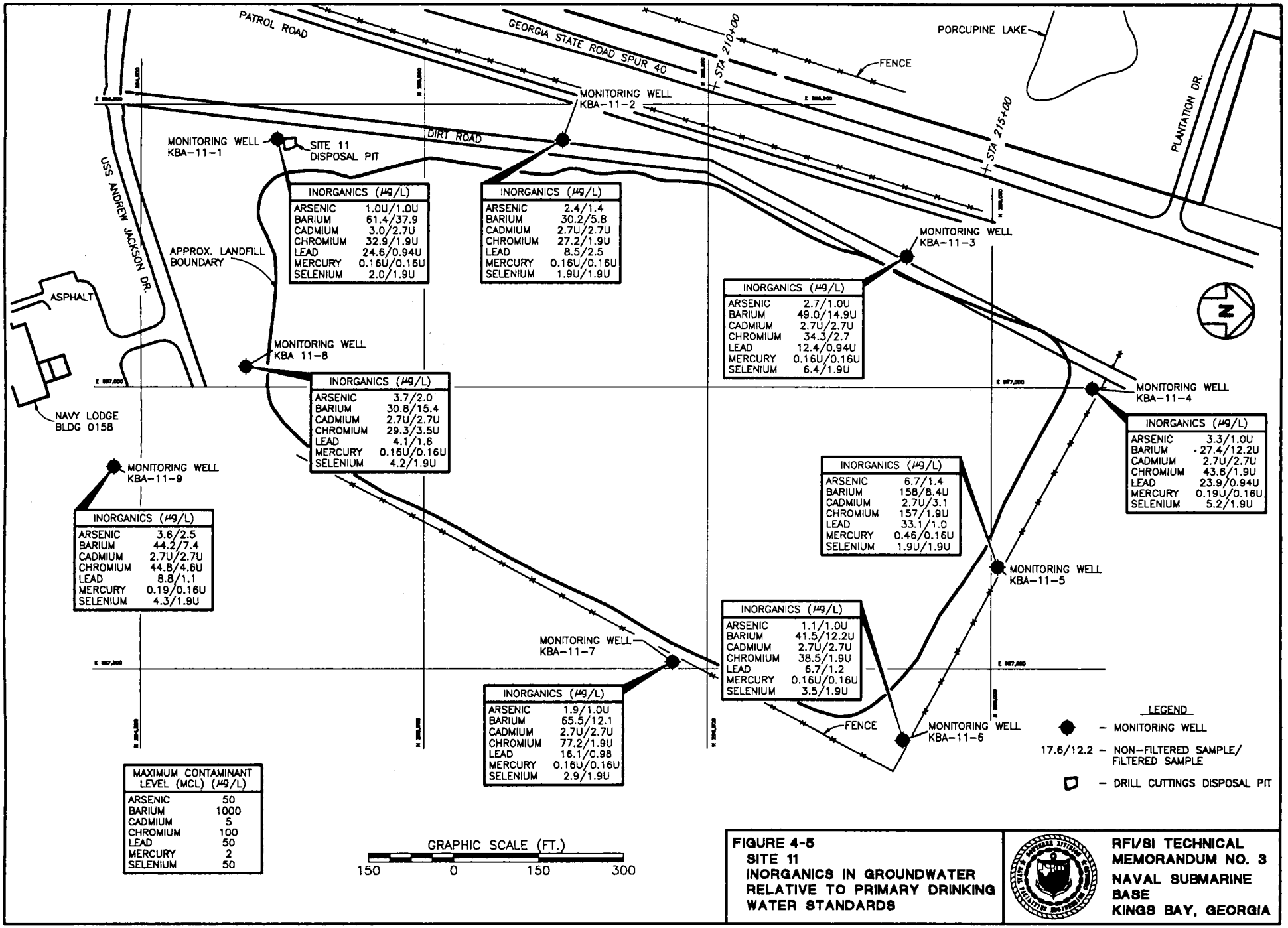

FIGURE 4-5
SITE 11
INORGANICS IN GROUNDWATER RELATIVE TO PRIMARY DRINKING WATER STANDARDS

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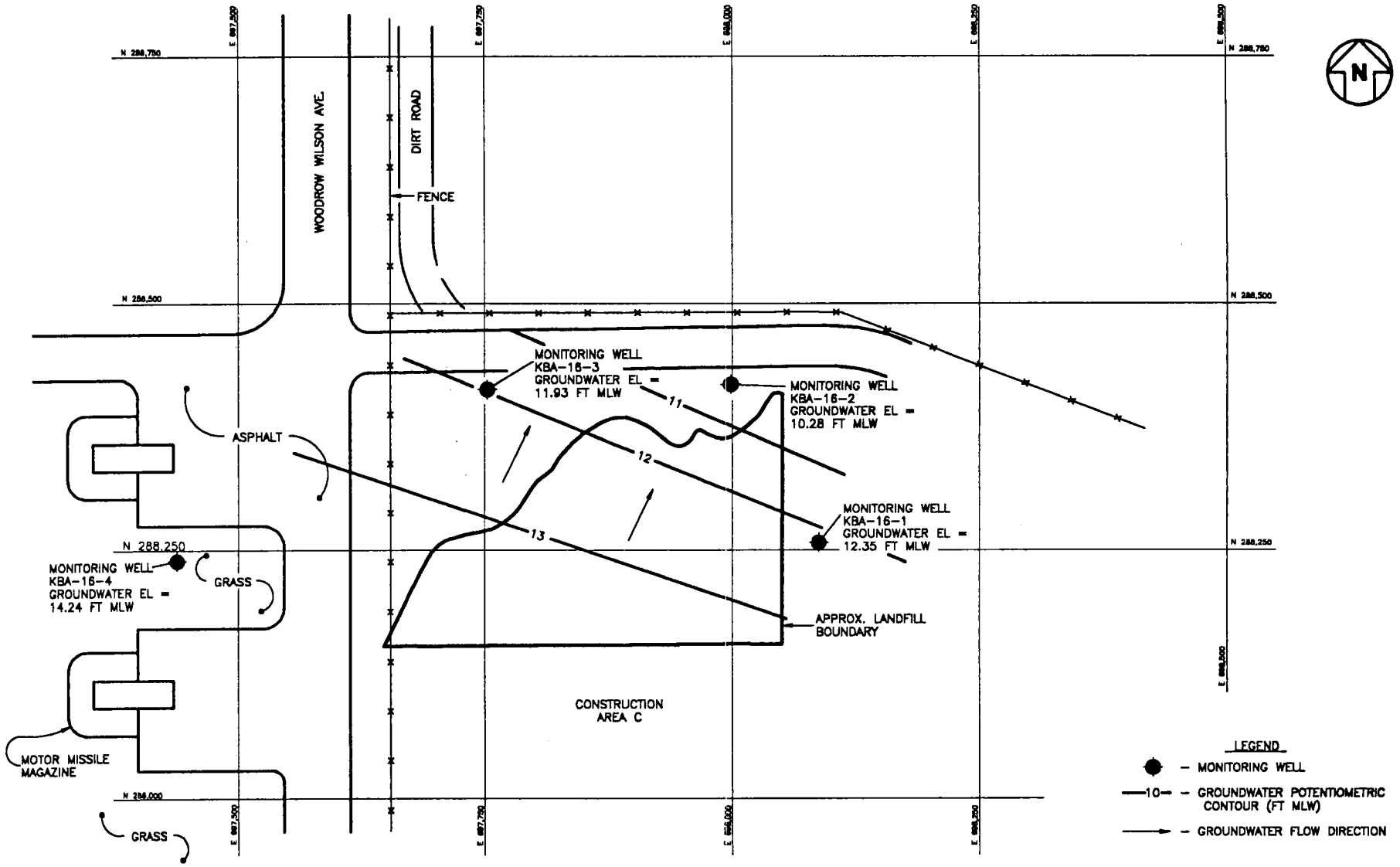

FIGURE 4-6
SITE 16
GROUNDWATER POTENTIOMETRIC SURFACE MAP - JULY 1992

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The headspace of monitoring wells were screened for VOCs using an FID. The headspace of all four monitoring wells at Site 16 contained high levels of VOCs, suspected of being naturally occurring methane (Table 4-6). Headspace screening concentrations were 1000 ppm at monitoring well KBA-16-3, and greater than 5000 ppm at the other three monitoring wells. Headspace screening concentrations were similarly high in May 1992 ranging from 2800 pm to greater than 5000 ppm. Review of groundwater sample analytical data do not indicate the presence of a source of VOCs.

Field measurements of pH, specific conductance, and temperature were collected during monitoring well purging. Table 4-6 summarizes field measurementscollected during purging of monitoring wells at Site 16. Purging continued until four well volumes had been removed, and field parameters had stabilized to within 10 percent (%). The final measurements of pH, specific conductance, and temperature are considered the measurements of record for the monitoring well (USEPA, 1991).

Five groundwater samples, including one duplicate sample, were collected from four monitoring wells at Site 16. Groundwater samples were analyzed for VOCs, SVOCs, TDS, TSS, and inorganic analytes. Both filtered and non-filtered groundwater samples were collected for inorganic analysis. Table 3-2 provides a list of specific compounds analyzed for during sampling event No. 3. Table 4-7 summarizes analytical data for compounds detected in groundwater samples collected from Site 16. Section 5.1 of this document describes the analytical program for sampling events Nos. 4 through 6.

4.3.1 Volatile Organic Compounds in Groundwater One VOC was detected in a groundwater sample collected from monitoring well KBA-16-3 during the third groundwater sampling event. The VOC toluene was detected at a concentration of 5 μg/l. No other groundwater samples collected from the site during groundwater sampling event No. 3 contained detectable levels of VOCs. No VOCs were detected in groundwater samples collected from Site 16 during the second sampling event. Xylene and ethylbenzene were detected in groundwater from KBA-16-2 in February (sampling event No. 1). Xylene, toluene, and ethylbenzene are fuel-related VOCs and the occurance of toluene in well KBA-16-3 during the third sampling event may be related to the occurance of xylene and ethylbenzene during the first sampling event. VOCs will continue to be monitored at this site. Section 5.1 of this document describes the analytical program for sampling events Nos. 4 through 6.

4.3.2 Semivolatile Organic Compounds in Groundwater One phthalate compound, bis(2-ethylhexyl)phthalate, was detected in groundwater samples associated with the third sampling event. As shown in Table 4-6, three of the four monitoring wells at this site contained bis(2-ethylhexyl)phthalate at estimated concentrations ranging from 3 J μg/l to 7 J μg/l. These values have been qualified as estimated because they are below the contract required quantitation limit of 10 μg/l. Bis(2-ethylhexyl)phthalate was also detected in KBA-16-2 and KBA-16-3 during sampling event No. 2 but was attributed to laboratory or sampling artifact because of associated method blank contamination. Phthalates can easily be introduced into sampling media through sample containers, plastic gloves, coolers, and other plastic material used in support of laboratory and sampling activities. While the concentrations of bis(2-ethylhexyl) phthalate detected in the groundwater samples collected from Site 16 during sampling event No. 3 cannot be directly attributed to blank contamination, they are also not considered to be directly attributed to waste disposal at the site.

Table 4-6 Summary of Field Measurements for Monitoring Wells at Site 16

Monitoring Well No.	FID Headspace Data (ppm)	Field Data[1]	Well Volume No. 1	2	3	4	Total Purge Vol. (gal)
KBA-16-1	>5000	pH	5.7	5.5	5.6	5.6	5.5
		Cond.	600	600	600	600	
		Temp.	32	28	28	26	
KBA-16-2	>5000	pH	6.0	6.2	6.2	6.2	6.0
		Cond.	500	500	500	500	
		Temp.	29	28	27	26	
KBA-16-3	1000	pH	6.0	6.0	6.0	6.0	5.5
		Cond.	300	250	210	210	
		Temp.	30	28	28	27	
KBA-16-4	>5000	pH	5.3	5.5	5.6	5.7	7.0
		Cond.	500	600	700	900	
		Temp.	31	28	27	26	

Notes:

FID = flame ionization detector
ppm = parts per million

1) Units are standard units (s.u.) for pH, micromhos per centimeter (umhos/cm) for specific conductance, and degrees Celsius (°C) for temperature.

Table 4-7 Summary of Laboratory Analysis of Groundwater Samples Collected from Site 16[1]

Compounds Detected		CRQL	Monitoring Well Number KBA-16-1	KBA-16-2	KBA-16-2D	KBA-16-3	KBA-16-4
APPENDIX IX VOCs (µg/l)							
Toluene		5	5 U	5 U	---	5	5 U
APPENDIX IX SVOCs (µg/l)							
bis(2-Ethylhexyl) Phthalate[2]		10	10 U	3 J	6 J	7 J	3 J
APPENDIX IX Inorganics (µg/l)							
Arsenic[2,3]	non-filtered	10	4.4 J	21.4 J	---	8.3 J	3.5 J
	filtered		1.1 J	3.2 J	---	6.2 J	1.00 UJ
Barium[2]	non-filtered	200	35.4 J	74.2 J	---	83.3 J	38.4 J
	filtered		18.2 J	17.4 J	---	19.5 J	24.9 J
Beryllium[2]	non-filtered	5	0.24 U	0.64 J	---	1.5 J	0.24 U
	filtered		0.24 U	0.24 U	---	0.24 U	0.24 U
Cadmium[2]	non-filtered	5	3.4 J	2.7 U	---	2.7 U	2.7 U
	filtered		2.7 U	2.7 U	---	2.7 U	2.7 U
Chromium	non-filtered	10	16.4	40.7	---	31.2	11.3 U
	filtered		4.1 U	4.0 U	---	4.7 U	4.0 U
Copper[2]	non-filtered	25	23.9 J	30.4	---	82.8	14.6 U
	filtered		18.6 J	24.8 J	---	15.8 U	11.8 U
Lead[2,3]	non-filtered	5	12.5 J	14.9 J	---	6.2 J	5.2 J
	filtered		1.4 J	0.94 UJ	---	0.94 UJ	1.0 J
Nickel[2]	non-filtered	40	10.7 U	24.3 J	---	274	10.9 J
	filtered		10.7 U	10.7 U	---	10.7 U	10.7 U
Selenium[2]	non-filtered	5	2.1 J	2.2 J	---	1.9 U	1.9 U
	filtered		1.9 U	1.9 U	---	1.9 U	1.9 U
Silver[2]	non-filtered	10	1.5 U	1.6 J	---	1.5 U	1.5 U
	filtered		1.5 J	1.5 J	---	1.5 U	1.5 U
Vanadium[2]	non-filtered	50	16.4 J	40.7 J	---	28.1 J	10.6 J
	filtered		2.4 J	2.9 J	---	5.3 J	5.7 J
Zinc	non-filtered	20	31.3 U	77.0	---	268	32.6 U
	filtered		55.5 U	41.7 U	---	31.6 U	35.2 U
Sulfide	non-filtered	100	200	500	---	200	400
	filtered		300	100 U	---	300	500
PHYSICAL PARAMETERS							
Total Solids (mg/l)			734	1016	---	606	830
TSS (mg/l)			304	716	---	326	171
% TSS			41	70	---	54	21

Notes:
CRQL = Contract Required Quantitation Limit
U = not detected above or below CRQL
--- = Analysis not required/performed
TSS = total suspended solids
Data Qualifiers
[1] Groundwater samples were analyzed for VOCs, SVOCs, and inorganic constituents only.
[2] Value(s) flagged J as estimated because concentrations are less than the CRQL.
[3] Values flagged J as estimated because matrix spike recovery for arsenic was below QC limits.

The base/neutral fraction of SVOCs will remain on the list of parameters to monitor at Site 16 because one subsurface soil sample from a downgradient monitoring well boring contained concentrations of polynuclear aromatic hydrocarbons (PAHs). No PAHs or other site-related SVOCs have been detected in groundwater samples collected from Site 16 to date.

4.3.3 Inorganic Constituents in Groundwater With few exceptions, concentrations of inorganic constituents in groundwater samples from each monitoring well at Site 16 were similar to concentrations detected in samples collected in May 1992. Concentrations of copper in downgradient wells KBA-16-1, KBA-16-2, and KBA-16-3 increased, however, these concentrations are considered bias high due to the wide spread presence of copper in method blanks and field and rinseate blanks.

Lead concentrations in groundwater samples collected from all four monitoring wells increased when compared to data for the second sampling event. Nickel concentrations increased in samples from all wells except KBA-16-1. Increased concentrations in samples from the upgradient monitoring well and downgradient monitoring wells may reflect seasonal variations.

Cadmium concentrations in a sample from monitoring well KBA-16-1, and chromium, silver, and zinc concentrations in samples from monitoring wells KBA-16-2 and KBA-16-3 increased when compared to data for the second sampling event. None of these inorganics were detected in the upgradient groundwater sample collected during this sampling event.

Both filtered and non-filtered groundwater samples were collected for inorganic analyses from the four monitoring wells at Site 16. The purpose of collecting and analyzing filtered and non-filtered samples is to determine what fraction of the total concentration of inorganics in groundwater samples is attributable to suspended particulates. Groundwater samples from Site 16 were also analyzed for TDS and TSS to determine what percentage of the total solids in groundwater are suspended particulates.

TDS and TSS results for groundwater samples are shown in Table 4-7. Total solids (the sum of TDS and TSS) in groundwater ranged from 606 mg/l for KBA-16-3 to 1016 mg/l for KBA-16-2. The fraction of total solids in groundwater that represents suspended solids ranged from 21% for KBA-16-1 to 70% for KBA-16-2. The total amount of solids in the upgradient monitoring well KBA-16-4 (830 mg/l) was comparable to the total solids found in downgradient wells. However, the total amount of suspended solids in monitoring well KBA-16-4 was considerably lower than for downgradient wells. The presence of suspended solids in groundwater samples at Site 16 may contribute to the total concentration of inorganic constituents in groundwater and the increase of suspended solids in downgradient wells at Site 16 may result in higher concentrations of inorganics in non-filtered samples relative to the non-filtered upgradient sample.

The concentrations of inorganic constituents detected in non-filtered samples from downgradient monitoring wells KBA-16-1, KBA-16-2, and KBA-16-3 were compared to concentrations detected in the upgradient, non-filtered groundwater sample. Twelve inorganic constituents present at concentrations greater than the upgradient concentrations include arsenic, barium, cadmium, beryllium, chromium, copper, lead, nickel, selenium, vanadium, silver, and zinc. Six of these constituents, beryllium, cadmium, chromium, nickel, selenium, and zinc, are considered to be artifacts of a silty aquifer because these constituents were

detected in non-filtered groundwater samples but were not detected in associated filtered samples collected from downgradient wells. The following is a general discussion of observations regarding the constituents and concentrations detected in samples collected in July 1992.

Arsenic concentrations in non-filtered samples from KBA-16-2 and KBA-16-3 were more than two times the concentration in the upgradient groundwater sample, being 21.4 J µg/l and 8.3 J µg/l and are well below the Federal MCL of 50 µg/l. Arsenic concentrations in filtered downgradient samples were considerably lower, ranging from 1.1 J µg/l to 6.2 J µg/l. Arsenic was not detected in the filtered, upgradient sample.

Barium and vanadium concentrations in non-filtered samples from the three downgradient wells were two times the concentration in the upgradient groundwater sample, ranging from 35.4 J µg/l to 83.3 J µg/l for barium and from 16.4 J µg/l to 40.7 J µg/l for vanadium. Barium and vanadium concentrations in filtered samples were considerably lower and do not exceed the concentrations found in the filtered sample from the upgradient well.

Copper was present in downgradient samples at concentrations ranging from 23.9 J µg/l to 82.8 µg/l for non-filtered samples and from 15.8 U µg/l to 24.8 µg/l for filtered samples. Copper was not detected in the filtered or non-filtered upgradient groundwater sample. As stated earlier, these concentrations are considered bias high due to the widespread presence of copper in method blanks and field and rinseate blanks.

Lead concentrations in non-filtered samples from KBA-16-1 and KBA-16-2 were more than two times the concentration in the upgradient groundwater sample, being 12.5 J µg/l and 14.9 J µg/l, respectively. Lead concentration in filtered samples were considerably lower and were at or below the concentration for the filtered upgradient groundwater sample.

Silver was detected in one non-filtered sample KBA-16-2 at 1.6 J µg/l and two filtered samples KBA-16-1 and KBA-16-2 at 1.5 J µg/l. Silver was not detected in upgradient groundwater samples and was also not detected in previous sampling events.

In general, the results for filtered groundwater samples are considered to be a more accurate representation of groundwater quality at Site 16 due to relatively high percentage of suspended solids.

Concentrations of inorganic constituents in non-filtered groundwater samples collected from Site 16 were compared to Federal Primary Drinking Water Standard MCLs. Appendix D presents inorganic data for the first, second, and third sampling events in bar chart form for seven inorganic constituents regulated under the Safe Drinking Water Act. None of the inorganic constituents detected in samples collected during the second or third sampling event were present at concentrations above their corresponding MCLs. Figure 4-7 summarizes concentrations of inorganics having MCLs for the filtered and non-filtered groundwater samples collected at Site 16 during the third sampling event.

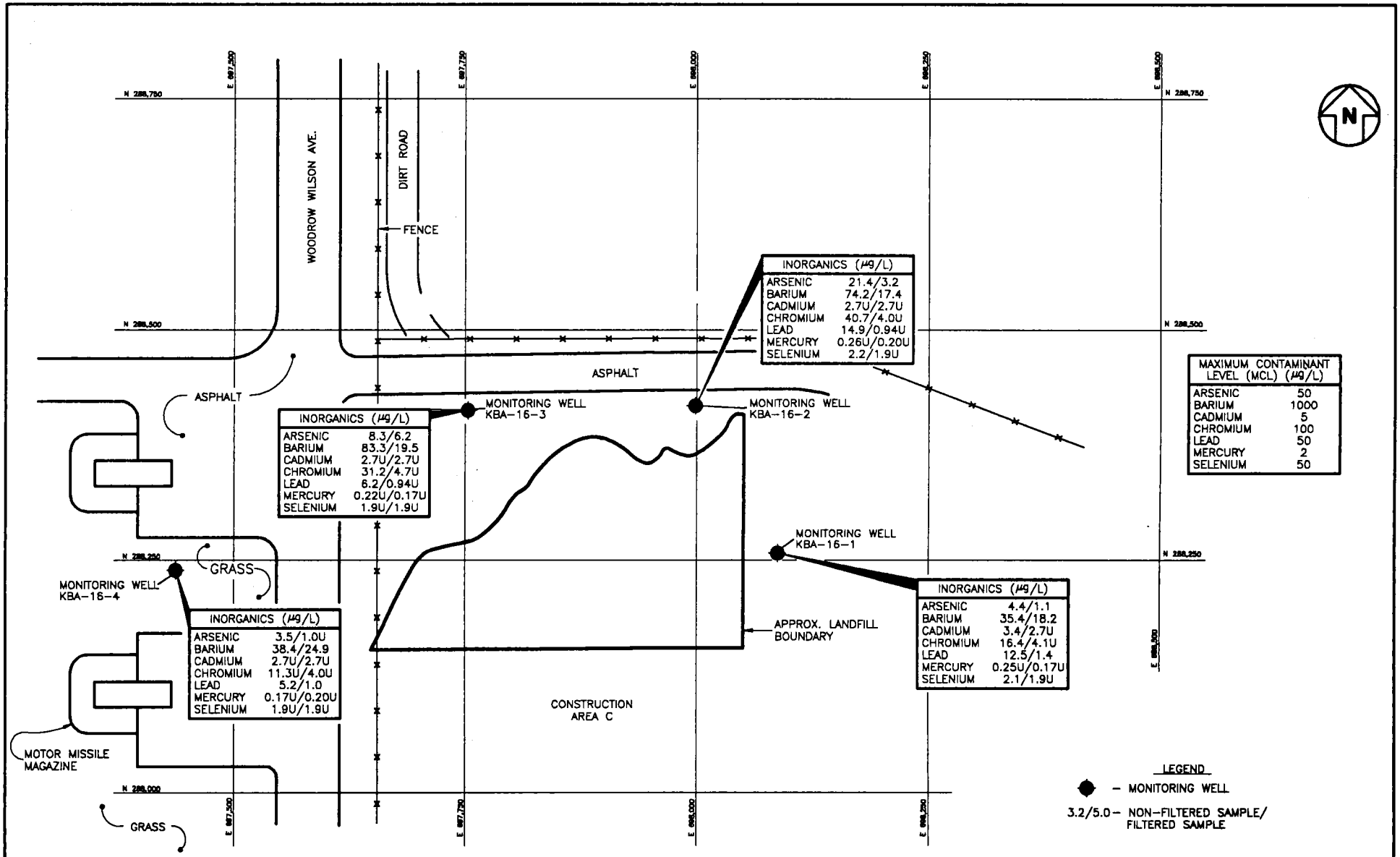

FIGURE 4-7
SITE 16
INORGANICS IN GROUNDWATER RELATIVE TO PRIMARY DRINKING WATER STANDARDS

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5.0 SUMMARY

This section summarizes results from the third groundwater sampling event and outlines the groundwater monitoring analytical program for groundwater sampling events Nos. 4 through 6. The analytical program has been developed based on information obtained from analysis of soil samples collected during the RFI/SI field program and three groundwater sampling events.

Three rounds of groundwater samples were analyzed for Appendix IX constituents. The following paragraphs summarize the analytical results for groundwater samples collected from three sites during the third groundwater sampling event at NSB, Kings Bay, Georgia. The three sites are discussed separately below and are identified as follows:

- Site 5 - Army Reserve Disposal Area, Towhee Trail
- Site 11 - Old Camden County Landfill
- Site 16 - Army Reserve Disposal Area, Motor Missile Magazines

Table 5-1 is a summary of the sampling and analysis program for groundwater sampling events No.4 through 6. Table 5-2 lists the compounds and analytical methods included in the analytical program.

5.1 Site 5, Army Reserve Disposal Area, Towhee Trail

VOCs were not detected in groundwater samples collected in May 1992 (second sampling event) and were similarly not detected in the third sampling event. VOCs will continue to be monitored at this site due to the presence of VOCs in groundwater samples collected during the first sampling event (February 1992).

PCBs were not detected in groundwater samples collected in February 1992 or May 1992 and were similarly not detected in July 1992. PCBs will continue to be monitored due to the confirmation of low levels of PCB Aroclor 1260 in surface soils at Site 5. Concentrations of Aroclor 1260 in surface soils collected during the third sampling event ranged from non-detect to 14 ug/kg.

With few exceptions, concentrations of inorganic constituents in groundwater samples from each monitoring well at Site 5 were similar to concentrations detected in samples collected in May 1992. Both filtered and non-filtered groundwater samples were collected during the third sampling event at Site 5 to determine whether aquifer solids in groundwater contribute to the total concentration of inorganic constituents in groundwater. Non-filtered samples were also analyzed for TDS and TSS to determine what percentage of the total solids in groundwater represents suspended particulates.

Concentrations of inorganics were significantly lower for filtered groundwater samples than for non-filtered samples at Site 5. For one monitoring well KBA-5-7, concentrations for arsenic, barium, beryllium, cadmium, chromium, and lead in the non-filtered sample exceeded Federal Primary Drinking Water MCLs while the concentrations for the filtered sample were well below corresponding MCLs and did not exceed concentrations found in filtered samples collected from upgradient monitoring wells. The results for filtered samples are generally considered to be a more accurate representation of groundwater quality at Site 5 due to the relatively high concentrations of suspended solids in groundwater (ranging from 79 mg/l to 2990 mg/l).

Table 5-1 Summary of Sampling and Analysis Program for Groundwater Sampling Events Nos. 4 through 6

Location and Type of Sampling	Laboratory Analysis					
	A	B	C	D	E	F
Site 5						
Groundwater	7	0	7	7	7	7
Site 11						
Groundwater	9	0	0	9	9	9
Site 16						
Groundwater	4	4	0	4	4	4
Field Duplicates						
Groundwater	2	2	2	2	2	2
Quality Control Samples						
Trip Blanks	5	0	0	0	0	0
Rinseate Blanks	5	1	2	5	5	5
Field Blanks	2	2	2	2	3	2

Notes:

A - Volatile Organic Compounds (VOCs)
B - Semivolatile Organic Compounds (SVOCs) (base/neutral fraction)
C - Polychlorinated Biphenyl Compounds (PCBs)
D - Inorganic constituents (including cyanide and sulfide) (non-filtered)
E - Inorganic constituents (including cyanide and sulfide) (filtered)
F - Total Dissolved Solids (TDS) and Total Suspended Solids (TSS)

Table 5-2 Compounds and Analytical Methods for Groundwater Sampling Events Nos. 4 through 6

Parameter:	**Volatile Organic Compounds (38 total) TCL List plus 4 additional compounds**
Method:	**SW-846 Method 8240**

Chloromethane	cis-1,3-Dichloropropene
Bromomethane	Trichloroethene
Vinyl Chloride	Dibromochloromethane
Chloroethane	1,1,2-Trichloroethane
Methylene Chloride	Benzene
Acetone	trans-1,3-Dichloropropene
Carbon Disulfide	Bromoform
Trichlorofluoromethane*	2-Hexanone
1,1-Dichloroethene	4-Methyl-2-Pentanone
1,1-Dichloroethane	Tetrachloroethene
1,2-Dichloroethene (total)	1,1,2,2-Tetrachloroethane
Chloroform	Toluene
1,2-Dichloroethane	Chlorobenzene
2-Butanone	Ethylbenzene
1,1,1-Trichloroethane	Styrene
Carbon Tetrachloride	Xylene (total)
Vinyl Acetate	1,3-Dichlorobenzene*
Bromodichloromethane	1,4-Dichlorobenzene*
1,2-Dichloropropane	1,2-Dichlorobenzene*

* Non-TCL compounds

Parameter:	**Polychlorinated Biphenyls (PCBs) (7 total)**
Method:	**SW-846 Method 8080**

Aroclor-1016	Aroclor-1221	Aroclor-1232
Aroclor-1242	Aroclor-1248	Aroclor-1254
	Aroclor-1260	

Parameter:	**Appendix IX Inorganic Analytes (19 total)**
Method:	**SW-846 Methods (listed in parentheses)**

Antimony (6010)	Copper (6010)	Thallium (7841)
Arsenic (7060)	Lead (7421)	Vanadium (6010)
Barium (6010)	Mercury (7470)	Zinc (6010)
Beryllium (6010)	Nickel (6010)	Tin (6010)
Cadmium (6010)	Selenium (7740)	Cyanide (9010)
Chromium (6010)	Silver (6010)	Sulfide (9030)
	Cobalt (6010)	

Table 5-2 (continued) Compounds and Analytical Methods for Groundwater Sampling Events Nos. 4 through 6

Parameter: Semivolatile Organic Compounds (base/neutral fraction) TCL List (base/neutral fraction)
Method: SW-846 Method 8270 (50 total)

bis(2-Chloroethyl)Ether
1,3-Dichlorobenzene
1,4-Dichlorobenzene
Benzyl Alcohol
1,2-Dichlorobenzene
bis(2-Chloroisopropyl)Ether
N-Nitroso-Di-n-Propylamine
Hexachloroethane
Nitrobenzene
Isophorone
bis(2-Chloroethoxy)Methane
1,2,4-Trichlorobenzene
Naphthalene
4-Chloroaniline
Hexachlorobutadiene
2-Methylnaphthalene
Hexachlorocyclopentadiene
2-Chloronaphthalene
2-Nitroaniline
Dimethylphthalate
Acenaphthylene
2,6-Dinitrotoluene
3-Nitroaniline
Acenaphthene
Dibenzofuran
2,4-Dinitrotoluene
Diethylphthalate
4-Chlorophenyl-phenylether
Fluorene
4-Nitroaniline
N-Nitrosodiphenylamine
4-Bromophenyl-phenylether
Hexachlorobenzene
Phenanthrene
Anthracene
Di-n-Butylphthalate
Fluoranthene
Pyrene
Butylbenzylphthalate
3,3'-Dichlorobenzidine
Benzo(a)Anthracene
Chrysene
bis(2-Ethylhexyl)Phthalate
Di-n-Octyl Phthalate
Benzo(b)Fluoranthene
Benzo(k)Fluoranthene
Benzo(a)Pyrene
Indeno(1,2,3-cd)Pyrene
Dibenz(a,h)Anthracene
Benzo(g,h,i)Perylene

Parameter: Total Dissolved Solids (TDS)/ Total Suspended Solids (TSS)
Method: Standard Methods-- Methods 2540C and 2540D

Parameter: Volatile Organic Compounds (21 total)
Method: SW-846 Method 8010 (select list)

Bromodichloromethane
Bromoform
Bromomethane
Carbon tetrachloride
Chloroethane
Chloroform
Chloromethane
Dibromochloromethane
1,1-Dichloroethane
1,2-Dichloroethane
Vinyl chloride
1,1-Dichloroethene
trans-1,2-Dichloroethene
1,2-Dichloropropane
trans-1,3-Dichloropropene
1,1,2,2-Tetrachloroethane
Tetrachloroethene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethene
Trichlorofluoromethane
Methylene chloride

Table 5-2 (continued) Compounds and Analytical Methods for Groundwater Sampling Events Nos. 4 through 6

Parameter:	**Volatile Organic Compounds (8 total)**
Method:	**SW-846 Method 8020 (select list)**
Benzene	1,2-Dichlorobenzene
Chlorobenzene	Ethyl Benzene
1,4-Dichlorobenzene	Toluene
1,3-Dichlorobenzene	Xylenes

5.2 Site 11, Old Camden County Landfill

VOCs detected in groundwater samples collected from Site 11 during the third sampling event and their respective sample concentrations compared well with results from sampling event No. 2. VOCs detected include vinyl chloride, chloroethane, 1,2-dichloroethene, toluene, chlorobenzene, xylene, 1,3-dichlorobenzene, and 1,4-dichlorobenzene. The concentrations of vinyl chloride in monitoring well KBA-11-2 again exceeded the Federal Primary Drinking Water MCL of 2 ug/l.

A Plan of Action for the investigation of the vinyl chloride contaminant plume at Site 11 was developed by ABB-ES in July 1992 (ABB-ES, 1992c) and field activities were conducted on August 4 through 16. The results of the investigation have been submitted under separate cover (ABB-ES, 1992d).

With few exceptions, concentrations of inorganic constituents in groundwater samples from each monitoring well at Site 11 were similar to concentrations detected in samples collected in May 1992. Both filtered and non-filtered groundwater samples were collected during the third sampling event at Site 11 to determine whether aquifer solids in groundwater contribute to the total concentration of inorganic constituents in groundwater. Non-filtered samples were also analyzed for TDS and TSS to determine what percentage of the total solids in groundwater represents suspended particulates.

Concentrations of inorganics were significantly lower for filtered groundwater samples than for non-filtered samples at Site 11. For one monitoring well KBA-11-5, chromium was detected in the non-filtered sample at a concentration exceeding the corresponding Federal Primary Drinking Water MCL of 100 ug/l but chromium was not detected in the filtered sample collected from this well. The results for filtered samples are generally considered to be a more accurate representation of groundwater quality at Site 11 due to the relatively high concentrations of suspended solids in groundwater (ranging from 102 mg/l to 913 mg/l).

5.3 Site 16, Army Reserve Disposal Area, Motor Missile Magazines

The VOC toluene was detected in a groundwater sample collected from monitoring well KBA-16-3 during the third sampling event. No other groundwater samples collected from the site contained detectable levels of VOCs. The presence of toluene in KBA-16-3 is not considered to be related to site conditions since this VOC has not been detected in any of the monitoring wells during previous sampling events. No site-related SVOCs were detected in groundwater samples collected from Site 16 during the third sampling event.

Concentrations of inorganic constituents in groundwater samples from each monitoring well at Site 16 were similar to concentrations detected in samples collected in May 1992. Both filtered and non-filtered groundwater samples were collected during the third sampling event at Site 16 to determine whether aquifer solids in groundwater contribute to the total concentration of inorganic constituents in groundwater. Non-filtered samples were also analyzed for TDS and TSS to determine what percentage of the total solids in groundwater represents suspended particulates.

Concentrations of inorganics were significantly lower for filtered groundwater samples than for non-filtered samples at Site 16. The results for filtered samples are generally considered to be a more accurate representation of groundwater quality at Site 11 due to the relatively high concentrations of suspended solids in groundwater (ranging from 171 mg/l to 716 mg/l).

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APPENDIX A
ANALYTICAL DATA VALIDATION SUMMARY TABLES SAMPLE EVENT NO. 3 JULY 1992

DEFINITION OF DATA QUALIFIERS

Organic Data Qualifiers

J - Indicates an estimated concentration because results are either below the concentration required detection level (CRQL) or quality control criteria were not met.

U - Indicates that compound was analyzed but not detected.

UJ - Indicates that quantitation level was estimated because QC criteria were not met.

NJ - Presumptive evidence for the presence of a compound at an estimated value.

E - Indicates that the analyte concentration exceeded the calibration range of the GC/MS and re-analysis of diluted sample within calibration range.

D - Indicates that sample concentration was obtained by dilution to bring result within calibration range.

X - Total concentration of two indistinguishable isomers (i.e., 3-Methylphenol and 4-Methylphenol).

UR - Indicates that the reported detection limit is unusuable because QA criteria were not met.

Inorganic Data Qualifiers

J - Indicates an estimated concentration because results are either below the concentration required detection level (CRQL) or quality control criteria were not met.

U - Indicates that compound was analyzed but not detected.

UJ - Indicates that quantitation level was estimated because QC criteria were not met.

E - The reported concentration is estimated because of the presence of an interference.

UR - Indicates that the reported detection limit is unusable because QC criteria were not met.

PROJECT: NSB KINGS BAY, GEORGIA		VOLATILE AQUEOUS ANALYSES (ug/l)					Validation/Summary Table	
SAMPLE LOCATION:		KBA-5-1	KBA-5-2	KBA-5-3	KBA-5-3D	KBA-5-4	KBA-5-5	KBA-5-6
LAB NUMBER:		22201009	22201010	22201011	22201016	22203006	22203005	22203004
DATE SAMPLED:		07/10/92	07/10/92	07/10/92	07/10/92	07/12/92	07/12/92	07/12/92
DATA ANALYZED:		07/13/92	07/13/92	07/13/92	07/17/92	07/20/92	07/20/92	07/20/92
DILUTION FACTOR:		1.0	1.0	1.0	1.0	1.0	1.0	1.0
VOLATILES -- METHOD 8240								
ANALYTE	CRQL							
Chloromethane	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	5	5 U	6 U	6 U	7 U	5 U	5 U	5 U
Acetone	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon Disulfide	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Trichlorofluoromethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethene (total)	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloroform	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Butanone	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon Tetrachloride	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Vinyl Acetate	10	10 UJ	10 UJ	10 UJ	10 UJ	10 U	10 U	10 U
Bromodichloromethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,3-Dichloropropene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromoform	5	5 U	5 U	5 U	5 U	5 UJ	5 UJ	5 UJ
2-Hexanone	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone	10	10 U	10 U	10 U	10 U	10 UJ	10 UJ	10 UJ
Tetrachloroethene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5	5 U	5 U	5 U	5 U	5 UJ	5 UJ	5 UJ
Toluene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chlorobenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Ethylbenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Styrene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Xylene (total)	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,3-Dichlorobenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,4-Dichlorobenzene	5	5 U	5 U	5 U	5 U	5 UJ	5 UJ	5 UJ
1,2-Dichlorobenzene	5	5 U	5 U	5 U	5 U	5 UJ	5 UJ	5 UJ

PROJECT: NSB KINGS BAY, GEORGIA		VOLATILE AQUEOUS ANALYSES (ug/l)					Validation/Summary Table	
SAMPLE LOCATION:		KBA-5-7	KBA-16-1	KBA-16-2	KBA-16-3	KBA-16-4	KBA-11-1	KBA-11-2
LAB NUMBER:		22203003	22205006	22205005	22205004	22205003	22201001	22191001
DATE SAMPLED:		07/12/92	07/11/92	07/11/92	07/11/92	07/11/92	07/10/92	07/09/92
DATE ANALYZED:		07/20/92	07/20/92	07/20/92	07/20/92	07/20/92	07/13/92	07/10/92
DILUTION FACTOR:		1.0	1.0	1.0	1.0	1.0	1.0	1.0
VOLATILES -- METHOD 8240								
ANALYTE	CRQL							
Chloromethane	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	10	10 U	10 U	10 U	10 U	10 U	10 U	63
Chloroethane	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	5	5 U	5 U	5 U	5 U	6 U	5 U	5 U
Acetone	10	10 U	12 U	10 U	10 U	12 U	10 U	10 U
Carbon Disulfide	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Trichlorofluoromethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethene (total)	5	5 U	5 U	5 U	5 U	5 U	5 U	5
Chloroform	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Butanone	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon Tetrachloride	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Vinyl Acetate	10	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U
Bromodichloromethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,3-Dichloropropene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromoform	5	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 U	5 U
2-Hexanone	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone	10	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 U	10 U
Tetrachloroethene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 U	5 U
Toluene	5	5 U	5 U	5 U	5	5 U	5 U	5 U
Chlorobenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Ethylbenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Styrene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Xylene (total)	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,3-Dichlorobenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,4-Dichlorobenzene	5	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 U	5 U
1,2-Dichlorobenzene	5	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 U	5 U

PROJECT: NSB KINGS BAY, GEORGIA		VOLATILE AQUEOUS ANALYSES (ug/l)					Validation/Summary Table	
SAMPLE LOCATION:		KBA-11-2D	KBA-11-3	KBA-11-4	KBA-11-5	KBA-11-6	KBA-11-7	KBA-11-8
LAB NUMBER:		22191002	22201004	22201006	22201007	22201008	22191004	22191007
DATE SAMPLED:		07/09/92	07/10/92	07/10/92	07/10/92	07/10/92	07/09/92	07/09/92
DATE ANALYZED:		07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92
DILUTION FACTOR:		1.0	1.0	1.0	1.0	1.0	1.0	1.0
VOLATILES -- METHOD 8240								
ANALYTE	CRQL							
Chloromethane	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	10	150	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	10	5 J	10 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon Disulfide	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Trichlorofluoromethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethene (total)	5	10	5 U	5 U	5 U	5 U	5 U	5 U
Chloroform	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Butanone	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon Tetrachloride	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Vinyl Acetate	10	10 UJ	10 U	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Bromodichloromethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,3-Dichloropropene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromoform	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Hexanone	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	5	2 J	5 U	5 U	5 U	5 U	5 U	5 U
Chlorobenzene	5	5 U	4 J	5 U	5 U	5 U	5 U	5 U
Ethylbenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Styrene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Xylene (total)	5	2 J	5 U	5 U	5 U	5 U	5 U	5 U
1,3-Dichlorobenzene	5	5 U	13	5 U	5 U	5 U	5 U	5 U
1,4-Dichlorobenzene	5	5 U	5 U	5 U	5 U	1 J	5 U	5 U
1,2-Dichlorobenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U

PROJECT: NSB KINGS BAY, GEORGIA		VOLATILE AQUEOUS ANALYSES (ug/l)					Validation/Summary Table	
SAMPLE LOCATION:		KBA-11-9						
LAB NUMBER:		22191012						
DATE SAMPLED:		07/09/92						
DATE ANALYZED:		07/17/92						
DILUTION FACTOR:		1.0						
VOLATILES -- METHOD 8240								
ANALYTE	CRQL							
Chloromethane	10	10 U						
Bromomethane	10	10 U						
Vinyl Chloride	10	10 U						
Chloroethane	10	10 U						
Methylene Chloride	5	5 U						
Acetone	10	17 U						
Carbon Disulfide	5	5 U						
Trichlorofluoromethane	5	5 U						
1,1-Dichloroethene	5	5 U						
1,1-Dichloroethane	5	5 U						
1,2-Dichloroethene (total)	5	5 U						
Chloroform	5	5 U						
1,2-Dichloroethane	5	5 U						
2-Butanone	10	10 U						
1,1,1-Trichloroethane	5	5 U						
Carbon Tetrachloride	5	5 U						
Vinyl Acetate	10	10 UJ						
Bromodichloromethane	5	5 U						
1,2-Dichloropropane	5	5 U						
cis-1,3-Dichloropropene	5	5 U						
Trichloroethene	5	5 U						
Dibromochloromethane	5	5 U						
1,1,2-Trichloroethane	5	5 U						
Benzene	5	5 U						
trans-1,3-Dichloropropene	5	5 U						
Bromoform	5	5 U						
2-Hexanone	10	10 U						
4-Methyl-2-Pentanone	10	10 U						
Tetrachloroethene	5	5 U						
1,1,2,2-Tetrachloroethane	5	5 U						
Toluene	5	5 U						
Chlorobenzene	5	5 U						
Ethylbenzene	5	5 U						
Styrene	5	5 U						
Xylene (total)	5	5 U						
1,3-Dichlorobenzene	5	5 U						
1,4-Dichlorobenzene	5	5 U						
1,2-Dichlorobenzene	5	5 U						

PROJECT: NSB KINGS BAY, GEORGIA		SEMIVOLATILE AQUEOUS ANALYSES (ug/l)					Validation/Summary Table	
SAMPLE LOCATION:		KBA-16-1	KBA-16-2	KBA-16-2D	KBA-16-3	KBA-16-4		
LAB NUMBER:		22205006	22205005	22205011	22205004	22205003		
DATE SAMPLED:		07/11/92	07/11/92	07/11/92	07/11/92	07/11/92		
DATE EXTRACTED:		07/14/92	07/14/92	07/14/92	07/14/92	07/14/92		
DATE ANALYZED:		07/17/92	07/16/92	07/17/92	07/16/92	07/16/92		
DILUTION FACTOR:		1.0	1.0	1.0	1.0	1.0		
SEMIVOLATILES -- METHOD 8270								
ANALYTE	CRQL							
bis (2-Chloroethyl) Ether	10	10 U	10 U	10 U	10 U	10 U		
1,3- Dichlorobenzene	10	10 U	10 U	10 U	10 U	10 U		
1,4- Dichlorobenzene	10	10 U	10 U	10 U	10 U	10 U		
Benzyl Alcohol	10	10 U	10 U	10 U	10 U	10 U		
1,2- Dichlorobenzene	10	10 U	10 U	10 U	10 U	10 U		
bis (2- Chloroisopropyl) Ether	10	10 U	10 U	10 U	10 U	10 U		
N-Nitroso-Di-n-Propylamine	10	10 U	10 U	10 U	10 U	10 U		
Hexachloroethane	10	10 U	10 U	10 U	10 U	10 U		
Nitrobenzene	10	10 U	10 U	10 U	10 U	10 U		
Isophorone	10	10 U	10 U	10 U	10 U	10 U		
bis (2-Chloroethoxy) Methane	10	10 U	10 U	10 U	10 U	10 U		
1,2,4-Trichlorobenzene	10	10 U	10 U	10 U	10 U	10 U		
Naphthalene	10	10 U	10 U	10 U	10 U	10 U		
4-Chloroaniline	10	10 U	10 U	10 U	10 U	10 U		
Hexachlorobutadiene	10	10 U	10 U	10 U	10 U	10 U		
2-Methylnaphthalene	10	10 U	10 U	10 U	10 U	10 U		
Hexachlorocyclopentadiene	10	10 U	10 U	10 U	10 U	10 U		
2-Chloronaphthalene	10	10 U	10 U	10 U	10 U	10 U		
2-Nitroaniline	50	50 U	50 U	50 U	50 U	50 U		
Dimethylphthalate	10	10 U	10 U	10 U	10 U	10 U		
Acenaphthylene	10	10 U	10 U	10 U	10 U	10 U		
2,6-Dinitrotoluene	10	10 U	10 U	10 U	10 U	10 U		
3-Nitroaniline	50	50 U	50 U	50 U	50 U	50 U		
Acenaphthene	10	10 U	10 U	10 U	10 U	10 U		
Dibenzofuran	10	10 U	10 U	10 U	10 U	10 U		
2,4-Dinitrotoluene	10	10 U	10 U	10 U	10 U	10 U		
Diethylphthalate	10	10 U	10 U	10 U	10 U	10 U		
4-Chlorophenyl-phenylether	10	10 U	10 U	10 U	10 U	10 U		
Fluorene	10	10 U	10 U	10 U	10 U	10 U		
4-Nitroaniline	50	50 U	50 U	50 U	50 U	50 U		
N-Nitrosodiphenylamine	10	10 U	10 U	10 U	10 U	10 U		
4-Bromophenyl-phenylether	10	10 U	10 U	10 U	10 U	10 U		
Hexachlorobenzene	10	10 U	10 U	10 U	10 U	10 U		
Phenanthrene	10	10 U	10 U	10 U	10 U	10 U		
Anthracene	10	10 U	10 U	10 U	10 U	10 U		
Di-n-Butylphthalate	10	10 U	10 U	10 U	10 U	10 U		
Fluoranthene	10	10 U	10 U	10 U	10 U	10 U		
Pyrene	10	10 U	10 U	10 U	10 U	10 U		
Butylbenzylphthalate	10	10 U	10 U	10 U	10 U	10 U		
3,3'-Dichlorobenzidine	20	20 U	20 U	20 U	20 U	20 U		
Benzo (a) Anthracene	10	10 U	10 U	10 U	10 U	10 U		
Chrysene	10	10 U	10 U	10 U	10 U	10 U		
bis (2-Ethylhexyl) Phthalate	10	10 U	3 J	6 J	7 J	3 J		
Di-n-Octyl Phthalate	10	10 U	10 U	10 U	10 U	10 U		
Benzo (b) Fluoranthene	10	10 U	10 U	10 U	10 U	10 U		
Benzo (k) Fluoranthene	10	10 U	10 U	10 U	10 U	10 U		
Benzo (a) Pyrene	10	10 U	10 U	10 U	10 U	10 U		
Indeno (1,2,3-cd) Pyrene	10	10 U	10 U	10 U	10 U	10 U		
Dibenz (a,h) Anthracene	10	10 U	10 U	10 U	10 U	10 U		
Benzo (g,h,i) Perylene	10	10 U	10 U	10 U	10 U	10 U		

PROJECT: NSB KINGS BAY, GEORGIA		PCB AQUEOUS ANALYSES (ug/l)					Validation/Summary Table	
SAMPLE LOCATION:		KBA-5-1	KBA-5-2	KBA-5-3	KBA-5-3D	KBA-5-4	KBA-5-5	KBA-5-6
LAB NUMBER:		22201009	22201010	22201013	22201012	22203006	22203005	22203004
DATE SAMPLED:		07/10/92	07/10/92	07/10/92	07/10/92	07/12/92	07/12/92	07/12/92
DATE EXTRACTED:		07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92
DATE ANALYZED:		08/04/92	08/04/92	08/04/92	08/04/92	08/07/92	08/07/92	08/07/92
DILUTION:		1.0	1.0	1.0	1.0	1.0	1.0	1.0
POLYCHLORINATED BIPHENYLS (PCBs) -- METHOD 8080								
ANALYTE	CRQL							
Aroclor-1016	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1221	2.0	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Aroclor-1232	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1242	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1248	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Aroclor-1254	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Arolcor-1260	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

PROJECT: NSB KINGS BAY, GEORGIA		PCB AQUEOUS ANALYSES (ug/l)					Validation/Summary Table	
SAMPLE LOCATION:		KBA-5-7						
LAB NUMBER:		22203003						
DATE SAMPLED:		07/12/92						
DATE EXTRACTED:		07/13/92						
DATE ANALYZED:		08/07/92						
DILUTION:		1.0						
POLYCHLORINATED BIPHENYLS (PCBs) -- METHOD 8080								
ANALYTE	CRQL							
Aroclor-1016	0.50	1.0 U						
Aroclor-1221	0.50	2.0 U						
Aroclor-1232	0.50	1.0 U						
Aroclor-1242	0.50	1.0 U						
Aroclor-1248	0.50	1.0 U						
Aroclor-1254	1.0	1.0 U						
Arolcor-1260	1.0	1.0 U						

PROJECT: NSB KINGS BAY, GEORGIA		PCB SOIL ANALYSES (ug/kg)					Validation/Summary Table	
SAMPLE LOCATION:		05-SS-08	05-SS-08D	05-SS-09	05-SS-10	05-SS-11	05-SS-12	05-SS-13
LAB NUMBER:		22208006	22208007	22208008	22208009	22208010	22208011	22208012
DATE SAMPLED:		07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92
DATE EXTRACTED:		07/14/92	07/14/92	07/14/92	07/14/92	07/14/92	07/14/92	07/14/92
DATE ANALYZED:		08/08/92	08/08/92	08/08/92	08/08/92	08/08/92	08/08/92	08/08/92
DILUTION:		1.0	1.0	1.0	1.0	1.0	1.0	1.0
POLYCHLORINATED BIPHENYLS (PCBs) -- METHOD 8080								
ANALYTE	CRQL							
Aroclor-1016	33	38 U	38 U	39 U	40 U	39 U	37 U	39 U
Aroclor-1221	67	78 U	77 U	79 U	82 U	79 U	75 U	80 U
Aroclor-1232	33	38 U	38 U	39 U	40 U	39 U	37 U	39 U
Aroclor-1242	33	38 U	38 U	39 U	40 U	39 U	37 U	39 U
Aroclor-1248	33	38 U	38 U	39 U	40 U	39 U	37 U	39 U
Aroclor-1254	33	38 U	38 U	39 U	40 U	39 U	37 U	39 U
Arolcor-1260	33	8.7 J	14 J	39 U	40 U	39 U	37 U	4.4 J
PERCENT SOLIDS:		86	87	85	82	85	89	84

PROJECT: NSB KINGS BAY, GEORGIA		PCB SOIL ANALYSES (ug/kg)					Validation/Summary Table	
SAMPLE LOCATION:		05-SS-14						
LAB NUMBER:		22208013						
DATE SAMPLED:		07/13/92						
DATE EXTRACTED:		07/14/92						
DATE ANALYZED:		08/08/92						
DILUTION:		1.0						
POLYCHLORINATED BIPHENYLS (PCBs) -- METHOD 8080								
ANALYTE	CRQL							
Aroclor-1016	33	36 U						
Aroclor-1221	67	73 U						
Aroclor-1232	33	36 U						
Aroclor-1242	33	36 U						
Aroclor-1248	33	36 U						
Aroclor-1254	33	36 U						
Arolcor-1260	33	7.9 J						
PERCENT SOLIDS:		92						

PROJECT: NSB KINGS BAY, GEORGIA		INORGANIC AQUEOUS ANALYSES (ug/l)					Validation/Summary Table	
SAMPLE LOCATION:		KBA-5-1	KBA-5-1F	KBA-5-2	KBA-5-2F	KBA-5-3	KBA-5-3D	KBA-5-3F
LAB NUMBER:		22201009	22202005	22201010	22202006	22201011	22201012	22202007
DATE SAMPLED:		07/10/92	07/10/92	07/10/92	07/10/92	07/10/92	07/10/92	07/10/92
ANALYTE	CRQL							
Antimony	60	12.4 U	12.4 U	12.4 U	12.4 U	12.4 U	12.4 U	12.4 U
Arsenic	10	5.1 J	1.6 J	21.4	18.4	6.7 J	5.8 J	2.8 J
Barium	200	132 J	62.2 J	115 J	15.9 U	92.8 J	82.6 J	46.1 J
Beryllium	5	0.48 J	0.20 U	0.41 J	0.20 U	0.20 U	0.26 J	0.20 U
Cadmium	5	2.7 U	3.1 J	2.7 U	2.8 J	2.7 U	2.7 U	2.7 U
Chromium	10	13.0 J	1.9 UJ	21.2 J	4.2 J	13.5 J	12.9 J	1.9 UJ
Cobalt	50	4.8 J	2.1 J	4.0 J	3.5 J	3.3 J	1.6 U	2.5 J
Copper	25	26.2 J	6.3 UJ	37.3 J	15.1 J	61.8 J	89.9 J	6.5 UJ
Lead	5	9.1 J	4.0 J	10.0 J	2.0 J	6.1 J	14.7 J	0.96 J
Mercury	0.2	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
Nickel	40	15.4 J	10.7 U	10.7 U	10.7 U	109	30.2 J	10.7 U
Selenium	5	1.9 U	1.9 U	2.4 J	1.9 U	1.9 U	1.9 U	1.9 U
Silver	10	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
Thallium	10	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
Vanadium	50	13.6 J	1.3 U	20.6 J	4.9 J	12.7 J	9.2 J	1.6 J
Zinc	20	85.6 J	20.5 J	162 J	132 J	199 J	123 J	26.6 J
Cyanide	10	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
Tin	200	26.4 U	26.4 U	26.4 U	26.4 U	26.4 U	26.4 U	26.4 U
Sulfide	100	200	100 U	200	100 U	100 U	200	100 U
Total Dissolved Solids (mg/L)		121	---	194	---	177	160	---
Total Suspended Solids (mg/L)		292	---	464	---	79	152	---

PROJECT: NSB KINGS BAY, GEORGIA		INORGANIC AQUEOUS ANALYSES (ug/l)					Validation/Summary Table	
SAMPLE LOCATION:		KBA-5-4	KBA-5-4F	KBA-5-5	KBA-5-5D	KBA-5-5F	KBA-5-6	KBA-5-6F
LAB NUMBER:		22203006	22203011	22203005	22203007	22203010	22203004	22203009
DATE SAMPLED:		07/12/92	07/12/92	07/12/92	07/12/92	07/12/92	07/12/92	07/12/92
ANALYTE	CRQL							
Antimony	60	12.4 UJ	12.4 UJ	12.4 UJ	12.4 UJ	12.4 UJ	12.4 UJ	12.4 UJ
Arsenic	10	5.9 J	5.2 J	37.0	8.3 J	2.6 J	6.3 J	3.0 J
Barium	200	132 J	23.2 U	207	22.9 U	51.8 J	131 J	30.3 J
Beryllium	5	0.41 J	0.24 UJ	1.7 J	0.24 UJ	0.24 UJ	0.56 J	0.24 UJ
Cadmium	5	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	3.0 J
Chromium	10	18.4	1.9 U	46.4	1.9 U	1.9 U	23.0	1.9 J
Cobalt	50	1.6 UJ	1.6 UJ	10.8 J	1.6 UJ	1.6 UJ	1.6 UJ	1.6 UJ
Copper	25	76.5	2.7 J	38.2	13.1 J	1.8 J	19.1 J	19.1 J
Lead	5	7.0 U	2.1 U	36.9	5.4 U	1.8 U	10.7 U	1.8 U
Mercury	0.2	0.16 U	0.16 U	0.27	0.16 U	0.16 U	0.16 U	0.16 U
Nickel	40	42.6	10.7 U	56.9	10.7 U	10.7 U	25.0 J	10.7 U
Selenium	5	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Silver	10	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
Thallium	10	2.1 U	2.1 U	3.0 J	2.1 U	2.1 U	2.1 U	2.1 U
Tin	200	26.4 U	26.4 U	26.4 U	26.4 U	26.4 U	26.4 U	26.4 U
Vanadium	50	12.1 J	1.3 U	42.1 J	1.3 U	1.9 J	18.4 J	1.5 J
Zinc	20	129	20.0	135	23.9	30.8	68.8	27.2
Cyanide	10	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
Sulfide	100	300	100 U	300	200	200	300	200
Total Dissolved Solids (mg/L)		540	---	107	---	---	116	---
Total Suspended Solids (mg/L)		294	---	1450	---	---	355	---

PROJECT: NSB KINGS BAY, GEORGIA		INORGANIC AQUEOUS ANALYSES (ug/l)					Validation/Summary Table	
SAMPLE LOCATION:		KBA-5-7	KBA-5-7F	KBA-11-1	KBA-11-1F	KBA-11-2	KBA-11-2D	KBA-11-2F
LAB NUMBER:		22203003	22203008	22201001	22201003	22191001	22191002	22191003
DATE SAMPLED:		07/12/92	07/12/92	07/10/92	07/10/92	07/09/92	07/09/92	07/09/92
ANALYTE	CRQL							
Antimony	60	12.4 UJ	12.4 UJ	12.4 U	12.4 U	12.4 U	12.4 U	12.4 U
Arsenic	10	135	2.7 J	1.00 U	1.00 U	2.4 J	2.4 J	1.4 J
Barium	200	1080	32.0 J	61.4 J	37.9 J	30.2 J	24.0 J	5.8 J
Beryllium	5	8.2	0.24 UJ	0.32 J	0.20 U	0.49 J	0.26 J	0.24 U
Cadmium	5	27.4	2.7 U	3.0 J	2.7 U	2.7 U	2.7 U	2.7 U
Chromium	10	271	1.9 U	32.9	1.9 UJ	27.2	27.9	1.9 U
Cobalt	50	62.6 J	1.6 UJ	1.6 J	1.6 U	4.6 U	5.6 U	4.1 U
Copper	25	249	19.1 J	128 J	17.1 J	27.8	16.1 U	9.1 U
Lead	5	68.9	1.8 U	24.6 J	0.94 U	8.5 J	10.3 J	2.5 J
Mercury	0.2	0.41	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
Nickel	40	128	10.7 U	89.1	10.7 U	23.9 J	23.6 J	10.7 U
Selenium	5	1.9 U	1.9 U	2.0 J	1.9 U	1.9 U	2.2 J	1.9 U
Silver	10	1.5 U	1.5 U	1.5 U	1.5 U	1.7 J	1.5 U	1.5 U
Thallium	10	3.4 J	2.1 U	2.1 U	2.1 U	2.1 UJ	2.1 UJ	2.1 UJ
Vanadium	50	251	1.3 U	8.6 J	1.3 U	13.4 J	11.6 J	4.1 J
Zinc	20	519	40.4	208 J	14.1 J	48.5 U	43.2 U	74.3
Cyanide	10	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
Tin	200	26.4 U	26.4 U	26.4 U	26.4 U	26.4 U	26.4 U	26.4 U
Sulfide	100	300	100 U	200 U	100 U	300	200	200
Total Dissolved Solids (mg/L)		288	---	67	---	182	225	---
Total Suspended Solids (mg/L)		2990	---	258	---	198	338	---

PROJECT: NSB KINGS BAY, GEORGIA		INORGANIC AQUEOUS ANALYSES (ug/l)					Validation/Summary Table	
SAMPLE LOCATION:		KBA-11-3	KBA-11-3D	KBA-11-3F	KBA-11-4	KBA-11-4F	KBA-11-5	KBA-11-5F
LAB NUMBER:		22201004	22201015	22202001	22201006	22202002	22201007	22202003
DATE SAMPLED:		07/10/92	07/10/92	07/10/92	07/10/92	07/10/92	07/10/92	07/10/92
ANALYTE	CRQL							
Antimony	60	12.4 U	12.4 U	12.4 U	12.4 U	12.4 U	12.4 U	12.4 U
Arsenic	10	2.7 J	2.6 J	1.00 U	3.3 J	1.00 U	6.7 J	1.4 J
Barium	200	49.0 J	57.6 J	14.9 U	27.4 J	12.2 U	158 J	8.4 U
Beryllium	5	0.45 J	0.73 J	0.20 U	0.80 J	0.20 U	2.4 J	0.20 U
Cadmium	5	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	3.1 J
Chromium	10	34.3	38.7	2.7 J	43.6	1.9 UJ	157	1.9 UJ
Cobalt	50	1.6 U	1.6 J	1.6 U	2.8 J	1.6 U	6.1 J	2.0 J
Copper	25	27.6 J	72.6 J	9.1 UJ	72.3 J	10.2 UJ	239 J	6.8 UJ
Lead	5	12.4 J	87.2 J	0.94 U	23.9 J	0.94 U	33.1 J	1.0 J
Mercury	0.2	0.16 U	0.16 U	0.16 U	0.19 J	0.16 U	0.46	0.16 U
Nickel	40	10.7 U	61.4	10.7 U	42.3	10.7 U	68.2	10.7 U
Selenium	5	6.4	5.5	1.9 U	5.2	1.9 U	1.9 U	1.9 U
Silver	10	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
Thallium	10	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
Tin	200	26.4 U	26.4 U	26.4 U	26.4 U	26.4 U	26.4 U	26.4 U
Vanadium	50	26.2 J	30.2 J	2.9 J	26.0 J	1.8 J	82.5	2.2 J
Zinc	20	37.3 J	128 J	25.7 J	237 J	9.4 J	320 J	49.4 J
Cyanide	10	4.4 J	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
Sulfide	100	200	200	100 U	200	100 U	100 U	100 U
Total Dissolved Solids (mg/L)		932	---	---	403	---	2110	---
Total Suspended Solids (mg/L)		693	---	---	713	---	392	---

PROJECT: NSB KINGS BAY, GEORGIA		INORGANIC AQUEOUS ANALYSES (ug/l)					Validation/Summary Table	
SAMPLE LOCATION:		KBA-11-6	KBA-11-6F	KBA-11-7	KBA-11-7F	KBA-11-8	KBA-11-8F	KBA-11-9
LAB NUMBER:		22201008	22202004	22191004	22191005	22191007	22191008	22191012
DATE SAMPLED:		07/10/92	07/10/92	07/09/92	07/09/92	07/09/92	07/09/92	07/09/92
ANALYTE	CRQL							
Antimony	60	12.4 U	12.4 U	12.4 U	12.4 U	12.4 U	12.4 U	12.4 U
Arsenic	10	1.1 J	1.00 U	1.9 J	1.00 UJ	3.7 J	2.0 J	3.6 J
Barium	200	41.5 J	12.2 U	65.5 J	12.1 J	30.8 J	15.4 J	44.2 J
Beryllium	5	0.54 J	0.20 U	0.75 J	0.24 U	0.54 J	0.24 U	0.91 J
Cadmium	5	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U
Chromium	10	38.5	1.9 UJ	77.2	1.9 U	29.3	3.5 U	44.8
Cobalt	50	1.6 U	1.8 J	5.9 U	3.4 U	6.7 U	5.9 U	6.5 U
Copper	25	114 J	8.0 UJ	19.6 J	1.8 U	81.4	4.7 U	69.1
Lead	5	6.7 J	1.2 J	16.1 J	0.98 J	4.1 J	1.6 J	8.8 J
Mercury	0.2	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.19 J
Nickel	40	66.3	10.7 U	10.7 U	10.7 U	78.7	10.7 U	18.1 J
Selenium	5	3.5 J	1.9 U	2.9 J	1.9 U	4.2 J	1.9 U	4.3 J
Silver	10	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
Thallium	10	2.1 U	2.1 U	2.1 UJ	2.1 UJ	2.1 UJ	2.1 UJ	2.1 UJ
Tin	200	26.4 U	26.4 U	26.4 U	26.4 U	26.4 U	26.4 U	26.4 U
Vanadium	50	14.6 J	1.3 U	23.8 J	1.4 J	15.2 J	1.8 J	32.0 J
Zinc	20	178 J	77.0 J	22.0 U	14.7 U	101	16.5 U	74.0
Cyanide	10	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
Sulfide	100	200	100 U	200	100 U	300	100 U	100
Total Dissolved Solids (mg/L)		70	---	1440	---	607	---	143
Total Suspended Solids (mg/L)		505	---	102	---	653	---	913

PROJECT: NSB KINGS BAY, GEORGIA		INORGANIC AQUEOUS ANALYSES (ug/l)					Validation/Summary Table	
SAMPLE LOCATION:		KBA-11-9F	KBA-16-1	KBA-16-1F	KBA-16-2	KBA-16-2F	KBA-16-3	KBA-16-3F
LAB NUMBER:		22191013	22205006	22205007	22205005	22205010	22205004	22205009
DATE SAMPLED:		07/09/92	07/11/92	07/11/92	07/11/92	07/11/92	07/11/92	07/11/92
ANALYTE	CRQL							
Antimony	60	12.4 U	12.4 U	12.4 U	12.4 U	12.4 U	12.4 U	12.4 U
Arsenic	10	2.5 J	4.4 J	1.1 J	21.4 J	3.2 J	8.3 J	6.2 J
Barium	200	7.4 J	35.4 J	18.2 J	74.2 J	17.4 J	83.3 J	19.5 J
Beryllium	5	0.24 U	0.24 U	0.24 U	0.64 J	0.24 U	1.5 J	0.24 U
Cadmium	5	2.7 U	3.4 J	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U
Chromium	10	4.6 U	16.4	4.1 U	40.7	4.0 U	31.2	4.7 U
Cobalt	50	4.6 U	2.9 U	2.1 U	11.9 U	2.6 U	5.8 U	1.6 U
Copper	25	24.0 J	23.9 J	18.6 J	30.4	24.8 J	82.8	15.8 U
Lead	5	1.1 J	12.5 J	1.4 J	14.9 J	0.94 UJ	6.2 J	0.94 UJ
Mercury	0.2	0.16 U	0.25 U	0.17 U	0.26 U	0.20 U	0.22 U	0.17 U
Nickel	40	10.7 U	10.7 U	10.7 U	24.3 J	10.7 U	274	10.7 U
Selenium	5	1.9 U	2.1 J	1.9 U	2.2 J	1.9 U	1.9 U	1.9 U
Silver	10	1.5 U	1.5 U	1.5 J	1.6 J	1.5 J	1.5 U	1.5 U
Thallium	10	2.1 UJ	2.1 UJ	2.1 UJ	2.1 UJ	2.1 UJ	2.1 UJ	2.1 UJ
Tin	200	26.4 U	26.4 U	26.4 U	26.4 U	26.4 U	26.4 U	26.4 U
Vanadium	50	4.5 J	16.4 J	2.4 J	40.7 J	2.9 J	28.1 J	5.3 J
Zinc	20	33.9 U	31.3 U	55.5 U	77.0	41.7 U	268	31.6 U
Cyanide	10	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
Sulfide	100	100	200	300	500	100 U	200	300
Total Dissolved Solids (mg/L)		---	430	---	300	---	280	---
Total Suspended Solids (mg/L)		---	304	---	716	---	326	---

PROJECT: NSB KINGS BAY, GEORGIA		INORGANIC AQUEOUS ANALYSES (ug/l)					Validation/Summary Table	
SAMPLE LOCATION:		KBA-16-4	KBA-16-4F					
LAB NUMBER:		22205003	22205008					
DATE SAMPLED:		07/11/92	07/11/92					
ANALYTE	CRQL							
Antimony	60	12.4 U	12.4 U					
Arsenic	10	3.5 J	1.00 UJ					
Barium	200	38.4 J	24.9 J					
Beryllium	5	0.24 U	0.24 U					
Cadmium	5	2.7 U	2.7 U					
Chromium	10	11.3 U	4.0 U					
Cobalt	50	1.6 U	1.6 U					
Copper	25	14.6 U	11.8 U					
Lead	5	5.2 J	1.0 J					
Mercury	0.2	0.17 U	0.20 U					
Nickel	40	10.9 J	10.7 U					
Selenium	5	1.9 U	1.9 U					
Silver	10	1.5 U	1.5 U					
Thallium	10	2.1 UJ	2.1 UJ					
Tin	200	26.4 U	26.4 U					
Vanadium	50	10.6 J	5.7 J					
Zinc	20	32.6 U	35.2 U					
Cyanide	10	2.2 U	2.2 U					
Sulfide	100	400	500					
Total Dissolved Solids (mg/L)		659	---					
Total Suspended Solids (mg/L)		171	---					

PROJECT: NSB KINGS BAY, GEORGIA		INORGANIC AQUEOUS ANALYSES (ug/l)					Validation/Summary Table	
SAMPLE LOCATION:								
LAB NUMBER:								
DATE SAMPLED:								
ANALYTE	CRQL							
Antimony	60							
Arsenic	10							
Barium	200							
Beryllium	5							
Cadmium	5							
Chromium	10							
Cobalt	50							
Copper	25							
Lead	5							
Mercury	0.2							
Nickel	40							
Selenium	5							
Silver	10							
Thallium	10							
Tin	200							
Vanadium	50							
Zinc	20							
Cyanide	10							
Sulfide	100							
Total Dissolved Solids (mg/L)								
Total Suspended Solids (mg/L)								

TRIP BLANKS
SOURCE WATER BLANKS
SAMPLE EVENT NO. 3
JULY 1992

PROJECT: NSB KINGS BAY, GEORGIA		VOLATILE AQUEOUS ANALYSES (ug/l)					Validation/Summary Table	
SAMPLE LOCATION:		BT-17-FB	BT-18-FB	BT-19-FB	BT-20-FB	BS-17-ER	BS-18-ER	BS-19-ER
LAB NUMBER:		22191006	22201002	22205002	22203001	22191011	22201005	22205001
DATE SAMPLED:		07/09/92	07/10/92	07/11/92	07/12/92	07/09/92	07/10/92	07/11/92
DATA ANALYZED:		07/10/92	07/13/92	07/20/92	07/20/92	07/13/92	07/13/92	07/20/92
DILUTION FACTOR:		1.0	1.0	1.0	1.0	1.0	1.0	1.0
VOLATILES -- METHOD 8240								
ANALYTE	CRQL							
Chloromethane	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon Disulfide	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Trichlorofluoromethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethene (total)	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloroform	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Butanone	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon Tetrachloride	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Vinyl Acetate	10	10 U	10 UJ	10 U	10 U	10 UJ	10 UJ	10 U
Bromodichloromethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,3-Dichloropropene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromoform	5	5 U	5 U	5 UJ	5 UJ	5 U	5 U	5 UJ
2-Hexanone	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone	10	10 U	10 U	10 UJ	10 UJ	10 U	10 U	10 UJ
Tetrachloroethene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5	5 U	5 U	5 UJ	5 UJ	5 U	5 U	5 UJ
Toluene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chlorobenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Ethylbenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Styrene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Xylene (total)	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,3-Dichlorobenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,4-Dichlorobenzene	5	5 U	5 U	5 UJ	5 UJ	5 U	5 U	5 UJ
1,2-Dichlorobenzene	5	5 U	5 U	5 UJ	5 UJ	5 U	5 U	5 UJ

PROJECT: NSB KINGS BAY, GEORGIA		VOLATILE AQUEOUS ANALYSES (ug/l)					Validation/Summary Table	
SAMPLE LOCATION:		BS-20-ER	BS-06-FB	BS-08-FB	BT-21-FB			
LAB NUMBER:		22203002	22208003	22208002	22208004			
DATE SAMPLED:		07/12/92	07/13/92	07/13/92	07/13/92			
DATE ANALYZED:		07/20/92	07/21/92	07/20/92	07/21/92			
DILUTION FACTOR:		1.0	1.0	1.0	1.0			
VOLATILES -- METHOD 8240								
ANALYTE	CRQL							
Chloromethane	10	10 U	10 U	10 U	10 U			
Bromomethane	10	10 U	10 U	10 U	10 U			
Vinyl Chloride	10	10 U	10 U	10 U	10 U			
Chloroethane	10	10 U	10 U	10 U	10 U			
Methylene Chloride	5	5 U	5 U	5 U	18 U			
Acetone	10	10 U	10 U	10 U	10 U			
Carbon Disulfide	5	5 U	5 U	5 U	5 U			
Trichlorofluoromethane	5	5 U	5 U	5 U	5 U			
1,1-Dichloroethene	5	5 U	5 U	5 U	5 U			
1,1-Dichloroethane	5	5 U	5 U	5 U	5 U			
1,2-Dichloroethene (total)	5	5 U	5 U	5 U	5 U			
Chloroform	5	5 U	5 U	5 U	5 U			
1,2-Dichloroethane	5	5 U	5 U	5 U	5 U			
2-Butanone	10	10 U	10 U	10 U	10 U			
1,1,1-Trichloroethane	5	5 U	5 U	5 U	5 U			
Carbon Tetrachloride	5	5 U	5 U	5 U	5 U			
Vinyl Acetate	10	10 U	10 U	10 U	10 U			
Bromodichloromethane	5	5 U	5 U	5 U	5 U			
1,2-Dichloropropane	5	5 U	5 U	5 U	5 U			
cis-1,3-Dichloropropene	5	5 U	5 U	5 U	5 U			
Trichloroethene	5	5 U	5 U	5 U	5 U			
Dibromochloromethane	5	5 U	5 U	5 U	5 U			
1,1,2-Trichloroethane	5	5 U	5 U	5 U	5 U			
Benzene	5	5 U	5 U	5 U	5 U			
trans-1,3-Dichloropropene	5	5 U	5 U	5 U	5 U			
Bromoform	5	5 UJ	5 UJ	5 UJ	5 UJ			
2-Hexanone	10	10 U	10 U	10 U	10 U			
4-Methyl-2-Pentanone	10	10 UJ	10 UJ	10 UJ	10 UJ			
Tetrachloroethene	5	5 U	5 U	5 U	5 UJ			
1,1,2,2-Tetrachloroethane	5	5 UJ	5 UJ	5 UJ	5 U			
Toluene	5	5 U	5 U	5 U	5 U			
Chlorobenzene	5	5 U	5 U	5 U	5 U			
Ethylbenzene	5	5 U	5 U	5 U	5 U			
Styrene	5	5 U	5 U	5 U	5 U			
Xylene (total)	5	2 J	5 U	5 U	5 U			
1,3-Dichlorobenzene	5	5 U	5 U	5 U	5 UJ			
1,4-Dichlorobenzene	5	5 UJ	5 UJ	5 UJ	5 UJ			
1,2-Dichlorobenzene	5	5 UJ	5 UJ	5 UJ	5 UJ			

PROJECT: NSB KINGS BAY, GEORGIA		SEMIVOLATILE AQUEOUS ANALYSES (ug/l)					Validation/Summary Table	
SAMPLE LOCATION:		BS-19-ER	BS-06-FB	BS-08-FB				
LAB NUMBER:		22205001	22208003	22208002				
DATE SAMPLED:		07/11/92	07/13/92	07/13/92				
DATE EXTRACTED:		07/14/92	07/14/92	07/14/92				
DATE ANALYZED:		07/16/92	07/21/92	07/21/92				
DILUTION FACTOR:		1.0	1.0	1.0				
SEMIVOLATILES -- METHOD 8270								
ANALYTE	CRQL							
bis (2-Chloroethyl) Ether	10	10 U	10 U	10 U				
1,3- Dichlorobenzene	10	10 U	10 U	10 U				
1,4- Dichlorobenzene	10	10 U	10 U	10 U				
Benzyl Alcohol	10	10 U	10 U	10 U				
1,2- Dichlorobenzene	10	10 U	10 U	10 U				
bis (2- Chloroisopropyl) Ether	10	10 U	10 U	10 U				
N-Nitroso-Di-n-Propylamine	10	10 U	10 U	10 U				
Hexachloroethane	10	10 U	10 U	10 U				
Nitrobenzene	10	10 U	10 U	10 U				
Isophorone	10	10 U	10 U	10 U				
bis (2-Chloroethoxy) Methane	10	10 U	10 U	10 U				
1,2,4-Trichlorobenzene	10	10 U	10 U	10 U				
Naphthalene	10	10 U	10 U	10 U				
4-Chloroaniline	10	10 U	10 U	10 U				
Hexachlorobutadiene	10	10 U	10 U	10 U				
2-Methylnaphthalene	10	10 U	10 UJ	10 UJ				
Hexachlorocyclopentadiene	10	10 U	10 U	10 U				
2-Chloronaphthalene	10	10 U	10 U	10 U				
2-Nitroaniline	50	50 U	50 U	50 U				
Dimethylphthalate	10	10 U	10 U	10 U				
Acenaphthylene	10	10 U	10 U	10 U				
2,6-Dinitrotoluene	10	10 U	10 U	10 U				
3-Nitroaniline	50	50 U	50 U	50 U				
Acenaphthene	10	10 U	10 U	10 U				
Dibenzofuran	10	10 U	10 U	10 U				
2,4-Dinitrotoluene	10	10 U	10 U	10 U				
Diethylphthalate	10	10 U	10 U	10 U				
4-Chlorophenyl-phenylether	10	10 U	10 U	10 U				
Fluorene	10	10 U	10 U	10 U				
4-Nitroaniline	50	50 U	50 U	50 U				
N-Nitrosodiphenylamine	10	10 U	10 U	10 U				
4-Bromophenyl-phenylether	10	10 U	10 U	10 U				
Hexachlorobenzene	10	10 U	10 U	10 U				
Phenanthrene	10	10 U	10 U	10 U				
Anthracene	10	10 U	10 U	10 U				
Di-n-Butylphthalate	10	10 U	10 U	10 U				
Fluoranthene	10	10 U	10 U	10 U				
Pyrene	10	10 U	10 U	10 U				
Butylbenzylphthalate	10	10 U	10 U	10 U				
3,3'-Dichlorobenzidine	20	20 U	20 U	20 U				
Benzo (a) Anthracene	10	10 U	10 U	10 U				
Chrysene	10	10 U	10 U	10 U				
bis (2-Ethylhexyl) Phthalate	10	10 U	10 U	10 U				
Di-n-Octyl Phthalate	10	10 U	10 U	10 U				
Benzo (b) Fluoranthene	10	10 U	10 U	10 U				
Benzo (k) Fluoranthene	10	10 U	10 U	10 U				
Benzo (a) Pyrene	10	10 U	10 U	10 U				
Indeno (1,2,3-cd) Pyrene	10	10 U	10 U	10 U				
Dibenz (a,h) Anthracene	10	10 U	10 U	10 U				
Benzo (g,h,i) Perylene	10	10 U	10 U	10 U				

PROJECT: NSB KINGS BAY, GEORGIA		PCB AQUEOUS ANALYSES (ug/l)					Validation/Summary Table	
SAMPLE LOCATION:		BS-18-ER	BS-20-ER	BS-21-ER	BS-06-FB	BS-08-FB		
LAB NUMBER:		22201014	22203002	22208005	22208003	22208002		
DATE SAMPLED:		07/10/92	07/12/92	07/13/92	07/13/92	07/13/92		
DATE EXTRACTED:		07/13/92	07/13/92	07/14/92	07/14/92	07/14/92		
DATE ANALYZED:		08/04/92	08/07/92	08/07/92	08/07/92	08/07/92		
DILUTION:		1.0	1.0	1.0	1.0	1.0		
POLYCHLORINATED BIPHENYLS (PCBs) -- METHOD 8080								
ANALYTE	CRQL							
Aroclor-1016	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
Aroclor-1221	2.0	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U		
Aroclor-1232	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
Aroclor-1242	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
Aroclor-1248	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
Aroclor-1254	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
Aroicor-1260	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U		

PROJECT: NSB KINGS BAY, GEORGIA		INORGANIC AQUEOUS ANALYSES (ug/l)					Validation/Summary Table	
SAMPLE LOCATION:		BS-17-ER	BS-18-ER	BS-19-ER	BS-20-ER	BS-06-FB	BS-07-FB	BS-08-FB
LAB NUMBER:		22191011	22201005	22205001	22203002	22208003	22208001	22208002
DATE SAMPLED:		07/09/92	07/10/92	07/11/92	07/12/92	07/13/92	07/13/92	07/13/92
ANALYTE	CRQL							
Antimony	60	12.4 U	12.4 U	12.4 U	12.4 UJ	12.4 U	12.4 U	12.4 U
Arsenic	10	1.00 UJ	1.00 U	1.00 UJ	1.00 U	1.00 U	1.00 U	1.00 U
Barium	200	1.0 J	6.4 U	0.57 U	9.5 U	1.0 U	0.57 U	1.3 U
Beryllium	5	0.24 U	0.20 U	0.24 U	0.24 UJ	0.28 J	0.24 UJ	0.24 UJ
Cadmium	5	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U
Chromium	10	2.9 U	1.9 UJ	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Cobalt	50	5.4 U	1.6 U	1.6 U	1.6 UJ	1.6 UJ	1.6 UJ	1.6 UJ
Copper	25	9.1 U	6.8 UJ	5.9 U	18.5 J	2.6 J	3.1 J	1.8 U
Lead	5	1.5 J	0.94 U	0.94 UJ	4.3 U	0.94 U	0.94 U	0.94 U
Mercury	0.2	0.16 U	0.16 U	0.17 U	0.16 U	0.16 U	0.16 U	0.16 U
Nickel	40	10.7 U	10.7 U	10.7 U	10.7 U	10.7 U	10.7 U	10.7 U
Selenium	5	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
Silver	10	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
Thallium	10	2.1 UJ	2.1 U	2.1 UJ	2.1 U	2.1 U	2.1 U	2.1 U
Vanadium	50	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
Zinc	20	12.9 U	14.9 J	35.9 U	22.8	7.6 U	7.6 U	7.6 U
Cyanide	10	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
Tin	200	26.4 U	26.4 U	26.4 U	26.4 U	26.4 U	26.4 U	26.4 U
Sulfide	100	100 U	100 U	100 U	100 U	100 U	100 U	100 U
Total Dissolved Solids (mg/L)		20	10 U	10 U	10 U	10 U	---	10 U
Total Suspended Solids (mg/L)		4	4 U	4 U	4 U	4 U	---	4 U

APPENDIX B
ANALYTICAL DATA FOR GROUNDWATER
SAMPLE EVENT NOs. 1 and 2
FEBRUARY 1992
MAY 1992

Table B-1
Groundwater Sampling Event No. 1
Summary of Laboratory Analysis of Groundwater
Samples Collected from Site 5[1]

RFI/SI Technical Memorandum No. 3
NSB Kings Bay

Compounds Detected	Monitoring Well Number								
	CRQL	KBA-5-1	KBA-5-2	KBA-5-3	KBA-5-4	KBA-5-4D	KBA-5-5	KBA-5-6	KBA-5-7
APPENDIX IX VOCs (µg/L)									
Acetone	10	72	12 U	10 U	10 U	12 U	12 U	14 U	10 U
Carbon Disulfide[2]	5	2 J	1 J	2 J	5 U	5 U	1 J	5 U	5 U
Trichlorofluoromethane	5	5 U	5 U	5 U	5 U	5 U	5 U	7	5 U
4-Methyl-2-Pentanone[2]	10	10 U	3 J	10 U	10 U	10 U	3 J	10 U	10 U
Ethylbenzene[2]	5	5 U	5 U	5 U	5 U	5 U	1 J	5 U	5 U
Xylene (total)[2]	5	5 U	4 J	5 U	5 U	5 U	6	5 U	5 U
APPENDIX IX Inorganics (µg/L)									
Antimony[2]	60	10.9 U	10.9 U	10.9 U	14.0 J	10.9 U	10.9 U	11.3 J	16.8 J
Arsenic	10	36.5	27.9	22.5	15.9	18.0	33.2	14.9	76.9
Barium[2]	200	742	459	161 J	601	588	332	640	748
Beryllium[2]	5	4.2 J	2.7 J	0.92 J	3.1 J	2.9 J	3.0 J	5.1	6.1
Cadmium[2]	5	2.9 U	2.9 U	2.9 U	2.9 U	3.7 J	2.9 U	25.4	25.9
Chromium	10	134	95.7	29.5	103	101	102	152	228
Cobalt[2]	50	36.4 J	21.3 J	11.8 J	28.5 J	29.1 J	29.2 J	30.4 J	48.4 J
Copper	25	37.8	51.5	77.6	31.7	36.9	77.4	63.3	73.4

Table B-1
Groundwater Sampling Event No. 1
Summary of Laboratory Analysis of Groundwater Samples Collected from Site 5[1]

RFI/SI Technical Memorandum No. 3
NSB Kings Bay

Lead	5	30.2	23.2	7.2	22.0	25.2	23.0	32.0	43.0
Mercury	0.2	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.40	0.16 U
Nickel[3]	40	49.0	50.3	79.8	40.2 J	42.7 J	77.2	59.8	84.4
Selenium[2]	5	1.3 U	1.4 J	1.3 U	2.0 J	1.6 J	2.2 J	1.3 U	1.7 J
Thallium[2]	10	1.4 U	1.4 U	1.4 U	1.6 J	1.5 J	1.6 J	1.6 J	2.2 J
Tin	208	208 U	208 U	208 U	232	208 U	208 U	208 U	208 U
Vanadium[2]	50	117	80.6	24.4 J	84.7	82.6	81.8	138	183
Zinc[4]	20	168 J	322 J	100 J	153 J	177 J	200 J	235 J	260 J
Cyanide[2]	10	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.9 J	5.6 J
Sulfide	100	300	300	200	300	400	200	2100	300

Notes:
CRQL = Contract Required Quantitation Limit
U = not detected above or below CRQL

[1] No Appendix IX SVOCs, pesticides, PCBs, herbicides, dioxins, or furans were detected in groundwater samples.

Data Qualifiers

[2] Values flagged J as estimated because concentrations are less than the CRQL.
[3] Values flagged J as estimated because preparation blank exhibited negative bias for nickel.
[4] Values flagged J as estimated because the duplicate analysis for zinc was outside QC limits.

Table B-2
Groundwater Sampling Event No. 1
Summary of Laboratory Analysis of Groundwater Samples
Collected from Site 11[1]

RFI/SI Technical Memorandum No. 3
NSB Kings Bay

Compounds Detected / KBA-	CRQL	11-1	11-2	11-3	11-3D	11-4	11-5	11-6	11-7	11-8	11-9
	Monitoring Well Number										
APPENDIX IX VOCs (µg/L)											
Vinyl Chloride[2]	10	10 U	18	10 U	10 U	10 U	10 U	10 U	10 U	2 J	10 U
1,2-Dichloroethene	5	5 U	7	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-Pentanone	10	10 U	10 U	10 U	10 U	10 U	10 U	3 J	10 U	10 U	10 U
Chlorobenzene	5	5 U	5 U	6	7	5 U	5 U	5 U	5 U	5 U	5 U
Ethylbenzene[2]	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	1 J	5 U
Xylene (total)[2]	5	5 U	5 U	5 U	5 U	5 U	2 J	2 J	5 U	5	3 J
1,4-Dichlorobenzene[2]	5	5 U	5 U	13	15	5 U	5 U	1 J	5 U	5 U	5 U
APPENDIX IX SVOCs (µg/L)											
1,4-Dichlorobenzene[2,3]	10	10 U	10 U	4 J	7 J	10 U	10 U	10 U	10 U	10 U	10 U
Diethylphthalate[2,3]	10	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	9 J	10 U
bis(2-Ethylhexyl)-Phthalate[3]	10	10 U	10 U	31 UJ	10 U	10 U	10 U	10 U	94	10 U	10 U
APPENDIX IX Inorganics (µg/L)											
Antimony[2,4]	60	10.9 U	10.9 UJ	11.1 J	10.9 UJ	11.4 J	10.9 U	10.9 U	10.9 U	10.9 U	10.9 U
Arsenic[2]	10	1.9 J	3.5 J	2.3 U	0.69 U	0.69 U	89.0	7.3 J	16.9	7.7 J	3.5 J
Barium[2]	200	61.6 J	228	155 J	280	192 J	617	262	285	102 J	135 J

Table B-2
Groundwater Sampling Event No. 1
Summary of Laboratory Analysis of Groundwater Samples
Collected from Site 11[1]

RFI/SI Technical Memorandum No. 3
NSB Kings Bay

Beryllium[2]	5	0.72 J	4.3 J	2.0 J	2.9 J	5.8	10.2	4.8 J	4.1 J	2.5 J	3.0 J
Cadmium[2]	5	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	3.5 J	2.9 U	2.9 U	2.9 U	2.9 U
Chromium[5]	10	44.4 J	247	113	177	297 J	620 J	261 J	354 J	139 J	121 J
Cobalt[2]	50	3.6 U	5.6 J	3.9 J	5.1 J	7.4 J	16.8 J	6.5 J	5.9 J	3.6 U	3.6 U
Copper	25	26.8 U	53.5 U	41.0 U	86.5 U	68.8	384	49.0	121	62.2	43.2
1Lead[5]	5	12.6 J	18.1 J	18.8 J	14.8 J	24.7 J	53.5 J	16.3 J	20.4 J	16.8 J	17.6 J
Mercury	0.2	0.16 U	0.60	0.60	0.67	1.4	2.9	1.0	1.9	0.58	0.28
Nickel[2]	40	12.8 J	32.2 J	19.6 U	42.2	41.6	107	31.2 J	44.7	18.6 J	17.0 J
Selenium	5	6.9	25.6	24.5	26.0	14.6	9.4	13.8	10.4	11.4	6.4 U
Vanadium[2]	50	24.8 J	94.6	87.4	138	209	314	108	143	67.8	80.2
Zinc	20	20.1 U	53.3 U	54.8 U	102	86.1	269	211	82.1	93.6	38.1
Cyanide[2]	10	1.8 U	1.8 U	3.0 J	1.8 U	2.3 J	1.8 U	1.8 U	1.8 U	3.8 J	1.8 U
Sulfide	100	100 U	500	600	1000	1300	700	400	3400	300	200

Notes:
CRQL = Contract Required Quantitation Limit
U = not detected above or below CRQL
[1] No Appendix IX pesticides, PCBs, herbicides, or dioxins/furans were detected in groundwater samples.

Data Qualifiers
[2] Samples results flagged J as estimated because concentrations are less than the CRQL.
[3] Samples results for KBA-11-3 flagged J/UJ as estimated because surrogate recoveries were below QC limits.
[4] Technical Memorandum No. 1ed quantitation limits flagged UJ as estimated because matrix spike recoveries were below QC limits.
[5] Sample results flagged J as estimated because duplicate analysis was outside QC limits.

Table B-3
Groundwater Sampling Event No. 1
Summary of Laboratory Analysis of Groundwater
Samples Collected from Site 16[1]

RFI/SI Technical Memorandum No. 2
NSB Kings Bay

Compounds Detected	Monitoring Well Number				
	CRQL	KBA-16-1	KBA-16-2	KBA-16-3	KBA-16-4
APPENDIX IX VOCs (µg/L)					
4-Methyl-2-Pentanone[2]	10	10 U	3 J	10 U	10 U
Ethylbenzene[2]	5	5 U	2 J	5 U	5 U
Xylene (total)[2]	5	5 U	3 J	5 U	5 U
APPENDIX IX Inorganics (µg/L)					
Antimony[2]	60	18.5 J	13.3 J	11.4 J	10.9 U
Arsenic[2]	10	29.9	19.3	25.8	4.9 J
Barium[2]	200	171 J	478	519	386
Beryllium[2]	5	2.5 J	6.2	13.1	2.4 J
Chromium	10	84.6	256	194	34.0
Cobalt[2]	50	11.6 J	74.4	29.1 J	3.6 U
Lead	5	14.8 J	36.3 J	19.9 J	12.0 J
Mercury	0.2	0.16 U	0.60	0.82	0.16 U
Nickel	40	27.0 J	132	54.7	10.5 U
Selenium	5	3.2 J	8.0	1.3 U	2.3 J
Thallium	10	17.3 J	1.9 J	1.7 UJ	1.7 U
Vanadium	50	119	257	175	29.8 J
Zinc	20	50.0 U	297	182	43.6 U
Cyanide	10	3.4 J	2.6 J	1.9 J	1.8 U
Sulfide	100	400	1800	200	300

Notes:
CRQL = Contract Required Quantitation Limit

U = not detected above or below CRQL

[1] No Appendix IX semivolatile compounds, pesticides, PCBs, herbicides, or dioxins/furans were detected in groundwater samples.

Data Qualifiers
[2] Value(s) flagged J as estimated because concentrations are less than the CRQL.
[3] Values flagged J as estimated because matrix spike recovery for lead was below QC limits.

Table B-4 Summary of Laboratory Analysis of Groundwater Samples Collected from Site 5[1]

Compounds Detected	CRQL	Monitoring Well Number KBA-5-1	KBA-5-2	KBA-5-3	KBA-5-4	KBA-5-5	KBA-5-5D	KBA-5-6	KBA-5-7
APPENDIX IX SVOCs (μg/L)									
bis(2-Ethylhexyl)-Phthalate[2]	10	10 U	2 J	10 U	10 U	18	10 U	10 U	10 U
APPENDIX IX Inorganics (μg/l)									
Arsenic[3]	10	10.5 J	20.0 J	28.5	12.5	22.5 J	24.0 J	3.2 J	14.0 J
Barium[2]	200	417	181 J	366	274	187 J	187 J	208	203
Beryllium[2]	5	3.4 J	1.4 J	2.9 J	2.3 J	2.6 J	2.3 J	2.0 J	2.0 J
Cadmium[2,4]	5	1.3 J	1.0 UJ	2.2 J	1.8 J	1.3 J	3.1 J	7.5 J	5.5 J
Chromium	10	56.8	24.7	59.5	31.4	30.8	30.2	34.7	35.2
Cobalt[2]	50	16.8 J	7.8 U	14.1 J	7.8 U	14.7 J	13.0 J	7.8 U	7.8 U
Copper[2]	25	14.6 J	10.9 J	22.2 J	10.3 J	9.6 J	9.8 J	10.7 J	14.8 J
Lead	5	13.1	10.0	18.0	14.0	17.8	16.9	11.3	12.7
Nickel[2,4]	40	24.3 J	7.8 U	21.3 J	8.2 J	24.3 J	24.7 J	9.4 J	19.7 J
Selenium[2,3]	5	3.2 J	2.3 J	6.3	2.9 J	3.3 J	2.5 J	2.7 J	2.9 J
Thallium[2]	10	1.0 J	0.80 U	1.1 J	1.1 J	1.1 J	1.3 J	0.80 U	0.80 U
Vanadium[2,4]	50	63.5	21.4 J	52.3	31.5 J	42.1 J	37.6 J	34.6 J	34.3 J
Zinc	20	62.0	130	76.1	41.0	62.9	62.2	44.0	45.3

See notes at end of table.

Table B-4 Summary of Laboratory Analysis of Groundwater Samples Collected from Site 5[1]

Compounds Detected	Monitoring Well Number								
	CRQL	KBA-5-1	KBA-5-2	KBA-5-3	KBA-5-4	KBA-5-5	KBA-5-5D	KBA-5-6	KBA-5-7
Cyanide[2]	10	1.8 U	1.8 U	1.8 U	7.8 J	1.8 U	1.8 U	10.3	5.7 J
Sulfide	100	1800	100 U	400	500	1200	3100	500	400

Notes:
CRQL = Contract Required Quantitation Limit
U = not detected above or below CRQL

[1] No Appendix IX VOCs, pesticides, PCBs, herbicides, dioxins, or furans were detected in groundwater samples.

Data Qualifiers

[2] Values flagged J as estimated because concentrations are less than the CRQL.
[3] Quantitation limits flagged UJ as estimated and values flagged J as estimated due to low matrix spike recovery for arsenic and selenium.
[4] Values flagged J as estimated because the preparation blank exhibited negative bias for cadmium, nickel, and vanadium.

Table B-5 Summary of Laboratory Analysis of Groundwater Samples Collected from Site 11[1]

Compounds Detected	Monitoring Well Number										
	CRQL	KBA-11-1	11-2	11-2D	11-3	11-4	11-5	11-6	11-7	11-8	11-9
APPENDIX IX VOCs (μg/L)											
Vinyl Chloride	10	10 U	64	100	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane[2]	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	2 J	10 U
1,2-Dichloroethene	5	5 U	16	22	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene[2]	5	5 U	5 U	1 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene[2]	5	5 U	1 J	1 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Toluene[2]	5	5 U	5 U	1 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chlorobenzene	5	5 U	5 U	5 U	6	5 U	5 U	5 U	5 U	5 U	5 U
Xylene (total)[2]	5	5 U	2 J	4 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,3-Dichlorobenzene	5	5 U	5 U	5 U	15	5 U	5 U	5 U	5 U	5 U	5 U
1,4-Dichlorobenzene[2]	5	5 U	5 U	5 U	5 U	5 U	5 U	1 J	5 U	5 U	5 U
APPENDIX IX SVOCs (μg/L)											
1,4-Dichlorobenzene	10	10 U	10 U	10 U	13	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl-Phthalate[2]	10	10 U	10 U	10 U	31	10 U	4 J	5 J			

See notes at end of table.

Table B-5 Summary of Laboratory Analysis of Groundwater Samples Collected from Site 11[1]

Compounds Detected	Monitoring Well Number									
	CRQL	KBA-11-1	11-2	11-2D	11-3	11-4	11-5	11-6	11-7	11-8	11-9
APPENDIX IX Inorganics (μg/L)											
Arsenic[3]	10	0.70UJ	0.70UJ	3.5 UJ	0.70 U	0.70 U	0.70 U	3.5 U	0.70UJ	1.7 J	0.70UJ
Barium[2]	200	95.7 J	26.2 J	25.9 J	54.2 J	30.2 J	71.7 J	34.6 J	26.2 J	43.4 J	43.8 J
Beryllium[2]	5	2.3 J	1.7 J	1.7 J	1.1 J	2.2 J	4.0 J	2.3 J	1.7 J	1.7 J	2.3 J
Cadmium[4]	5	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.3 J	1.0 UJ
Chromium	10	92.8	38.1	37.2	20.8	29.0	27.1	40.5	54.6	23.8	49.1
Copper[2]	25	21.7 J	6.4 J	6.2 J	4.4 J	3.1 J	6.2 J	7.9 J	10.3 J	13.7 J	14.2 J
Lead[2]	5	23.3	4.5	5.6 J	3.9 J	3.9 J	2.9 J	4.3 J	3.8 J	4.0 J	12.2
Mercury[2]	0.2	0.11 J	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Selenium[2]	5	5.6	2.7 J	2.9 J	3.8 J	2.4 J	0.55 J	2.5 J	3.4 J	1.7 J	5.4
Thallium[2]	10	0.80 U	0.80 U	0.80 U	1.6 J	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U
Vanadium[2,4]	50	29.9 J	20.2 J	24.5 J	44.3 J	59.4	64.5	25.7 J	25.0 J	33.2 J	42.8 J
Zinc	20	7.6 U	7.5 U	10.3 U	19.5 U	10.9 U	555	9.3 U	6.5 U	23.4 U	8.7 U
Cyanide[3]	10	1.8 UJ	6.1 J	6.1 J	1.8 UJ	10.8 J	1.8 UJ	1.8 UJ	1.8 UJ	26.2 J	1.8 UJ
Sulfide	100	500	2600	1000	200	300	1500	100 U	200	2900	300

Notes:
CRQL = Contract Required Quantitation Limit
U = not detected above or below CRQL
[1] No Appendix IX pesticides, PCBs, herbicides, or dioxins/furans were detected in groundwater samples.
Data Qualifiers
[2] Samples results flagged J as estimated because concentrations are less than the CRQL.
[3] Samples quantitation limits flagged UJ as estimated and sample results flagged J as estimated because matrix spike recoveries were below QC limits.
[4] Samples quantitation limits flagged UJ as estimated and sample results flagged J as estimated because the corresponding preparation blank exhibited negative bias for cadmium and vanadium.

Table B-6
Summary of Laboratory Analysis of Groundwater
Samples Collected from Site 16[1]

RFI/SI Technical Memorandum No. 3
NSB Kings Bay

Compounds Detected	Monitoring Well Number				
	CRQL	KBA-16-1	KBA-16-2	KBA-16-3	KBA-16-4
APPENDIX IX SVOCs (µg/L)					
Di-n-Butylphthalate[2]	10	10 U	10 U	2 J	10 U
bis(2-Ethylhexyl) Phthalate	10	10 U	28	75	10 U
APPENDIX IX Inorganics (µg/L)					
Antimony[2]	60	11.0 U	11.0 U	11.0 U	11.3 J
Arsenic[2,3]	10	8.5 J	19.5	10.2 J	1.5 J
Barium[2]	200	70.8 J	82.2 J	119 J	37.1 J
Beryllium[2]	5	1.1 J	1.7 J	4.7 J	0.80 U
Cadmium[2,4]	5	1.5 J	1.6 J	1.0 UJ	1.0 UJ
Chromium	10	32.0	28.1	20.7	3.3 U
Cobalt[2]	50	7.8 U	9.1 J	7.8 U	7.8 U
Copper[2]	25	9.2 J	3.8 J	5.5 J	4.2 J
Lead[2]	5	7.6	11.5	4.3 J	2.5 U
Nickel[4,5]	40	7.8 UJ	19.4 J	7.8 U	7.8 U
Selenium[2]	5	10.6	1.6 J	1.1 J	0.88 J
Silver[2]	10	1.4 J	1.4 U	1.4 U	1.4 U
Thallium[2]	10	0.90 J	0.80 U	0.80 U	0.80 U
Vanadium[2]	50	44.4 J	48.0 J	33.6 J	12.0 J
Zinc	20	15.1 U	65.7	56.2	10.8 U
Cyanide[2]	10	8.4 J	8.5 J	1.8 U	18.5
Sulfide	100	100 U	2400	1400	200

Notes:
CRQL = Contract Required Quantitation Limit

U = not detected above or below CRQL

[1] No Appendix IX VOCs, pesticides, PCBs, herbicides, or dioxins/furans were detected in groundwater samples.

Data Qualifiers

[2] Value(s) flagged J as estimated because concentrations are less than the CRQL.

[3] Values flagged J as estimated because matrix spike recovery for arsenic was below QC limits.

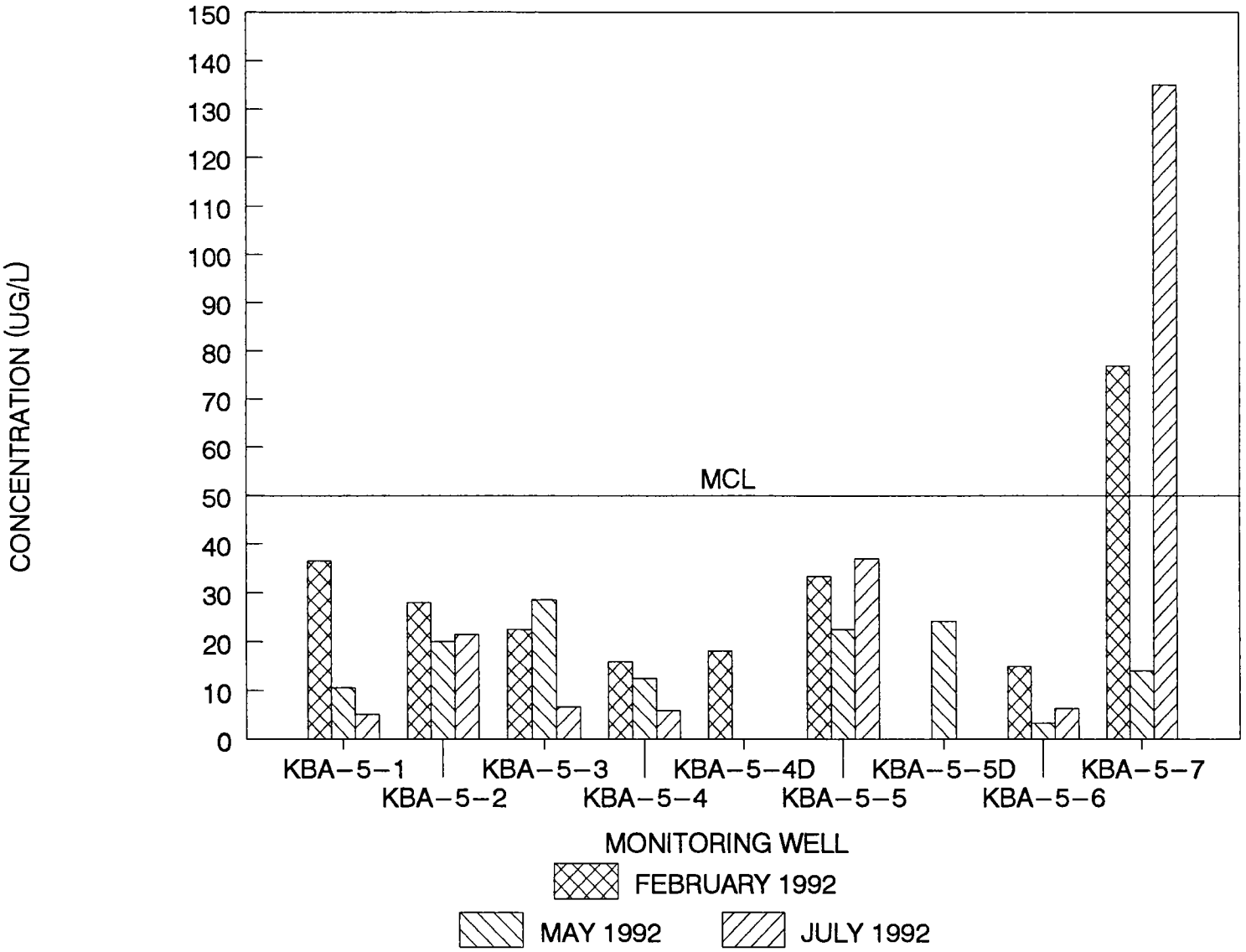
[4] Quantitation limits flagged UJ as estimated because the preparation blank exhibited negative bias for cadmium and nickel.

[5] Values flagged J as estimated because the preparation blank exhibited negative bias for and nickel

APPENDIX C
BAR-CHART GRAPHICS OF GROUNDWATER INORGANIC DATA

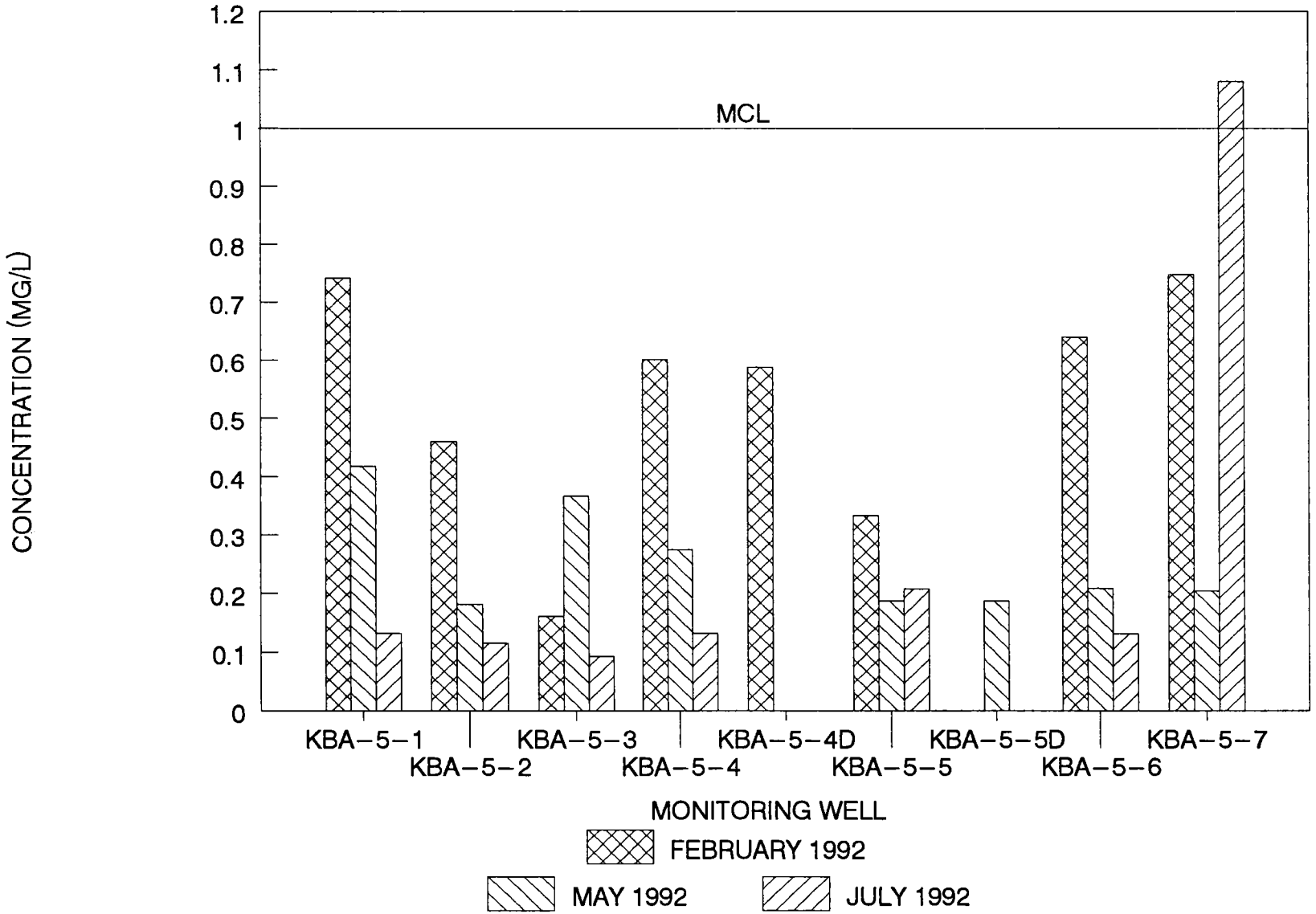
NSB KINGS BAY, GEORGIA

SITE 5 – ARSENIC IN GROUNDWATER



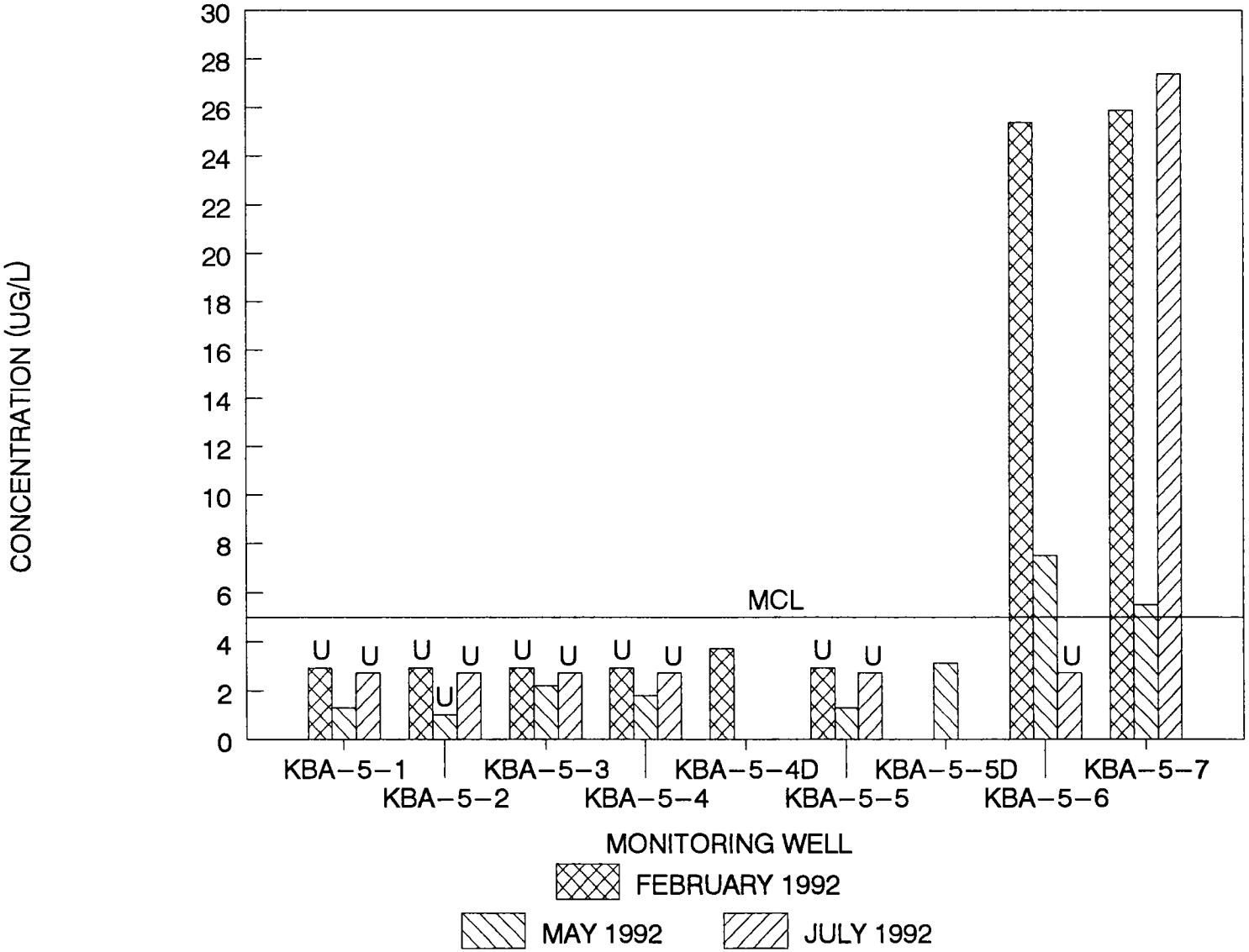
NSB KINGS BAY, GEORGIA

SITE 5 – BARIUM IN GROUNDWATER



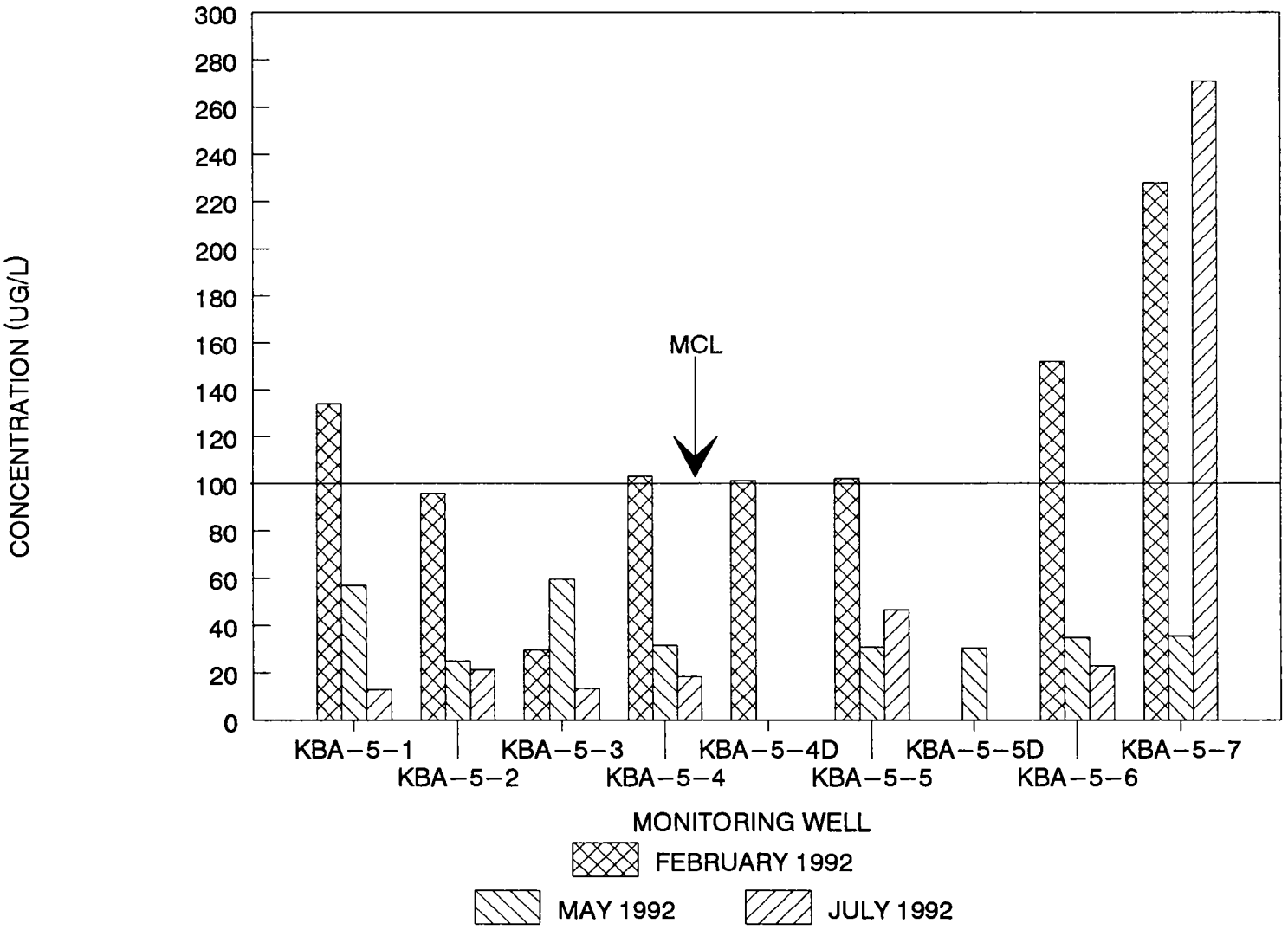
NSB KINGS BAY, GEORGIA

SITE 5 – CADMIUM IN GROUNDWATER



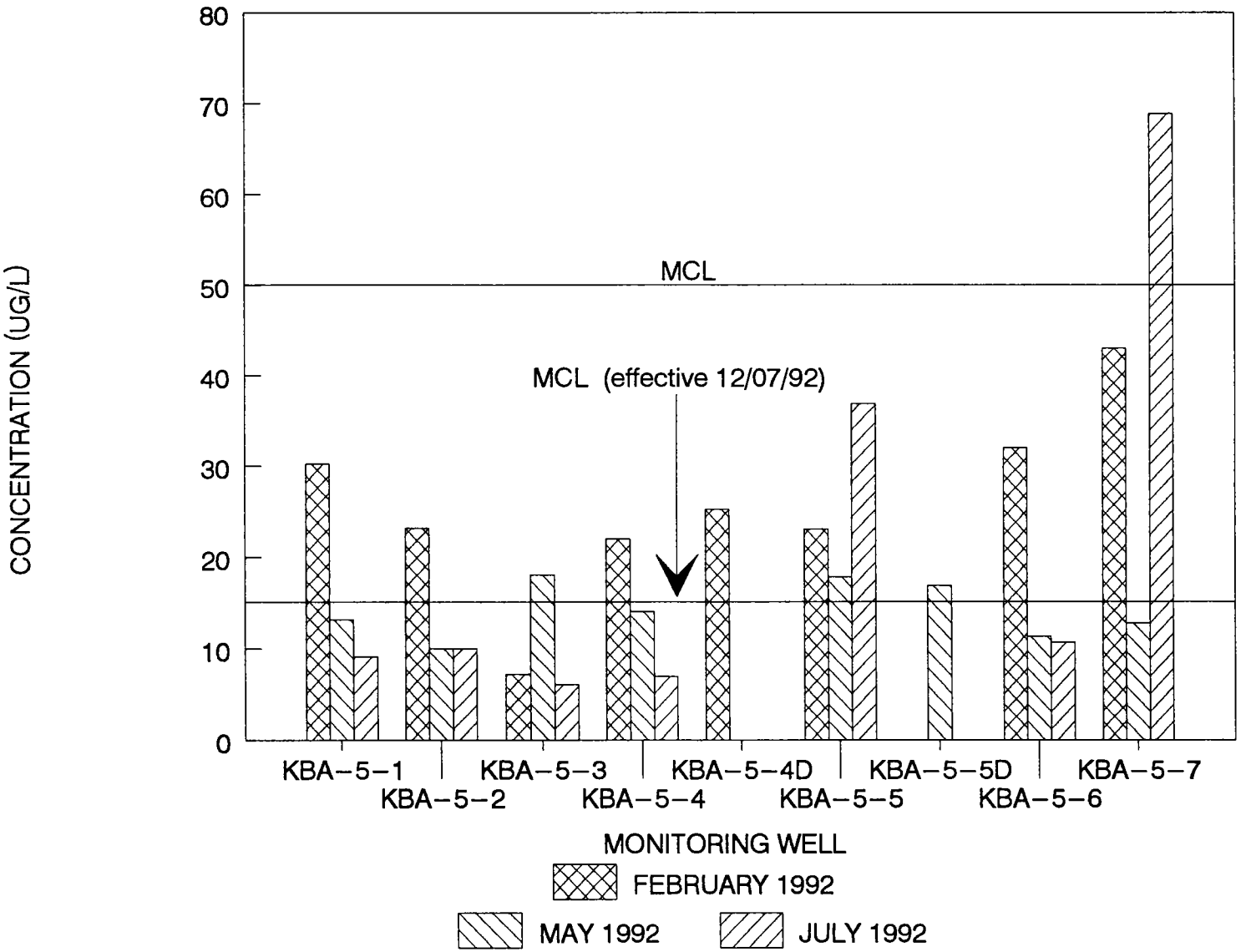
NSB KINGS BAY, GEORGIA

SITE 5 – CHROMIUM IN GROUNDWATER



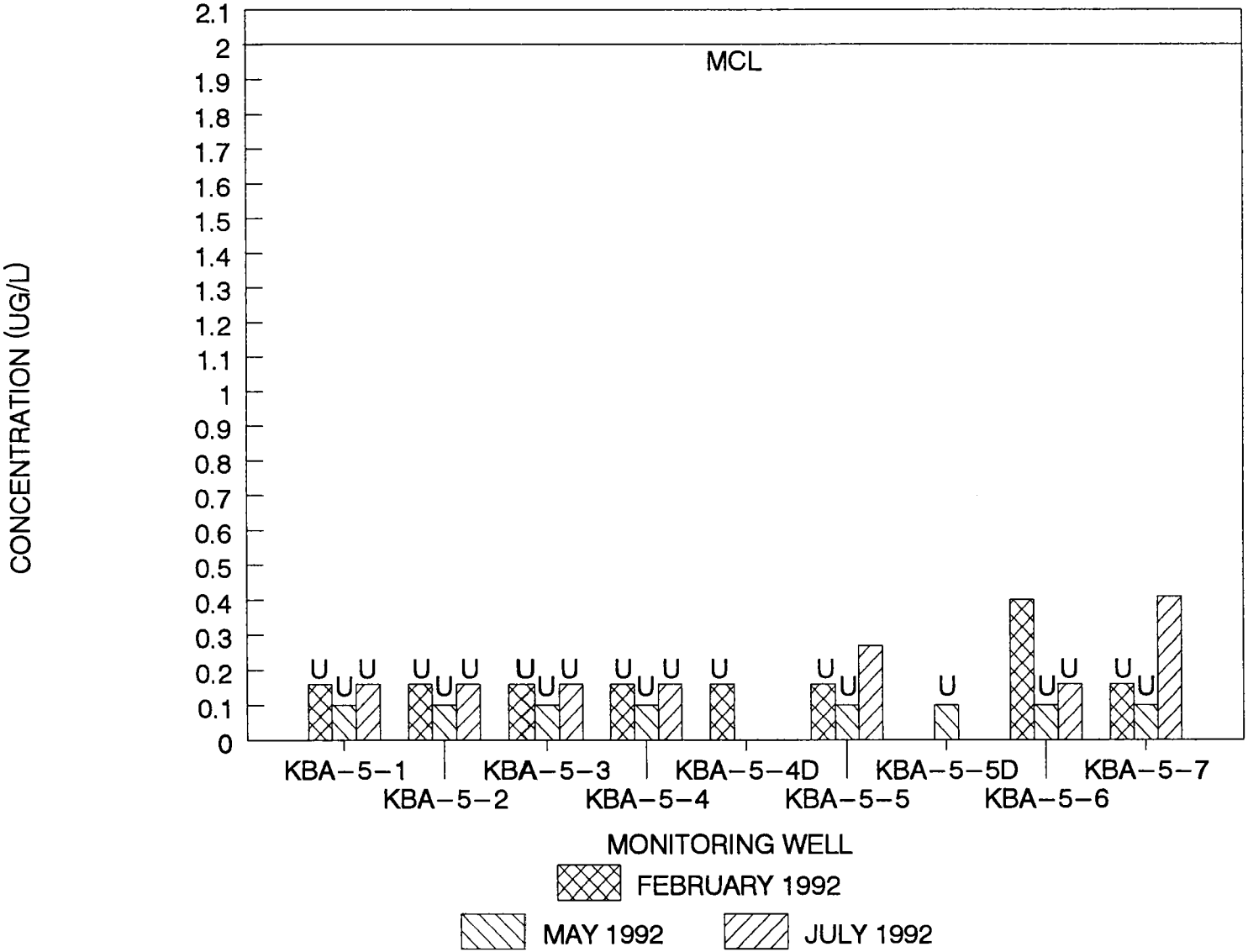
NSB KINGS BAY, GEORGIA

SITE 5 – LEAD IN GROUNDWATER



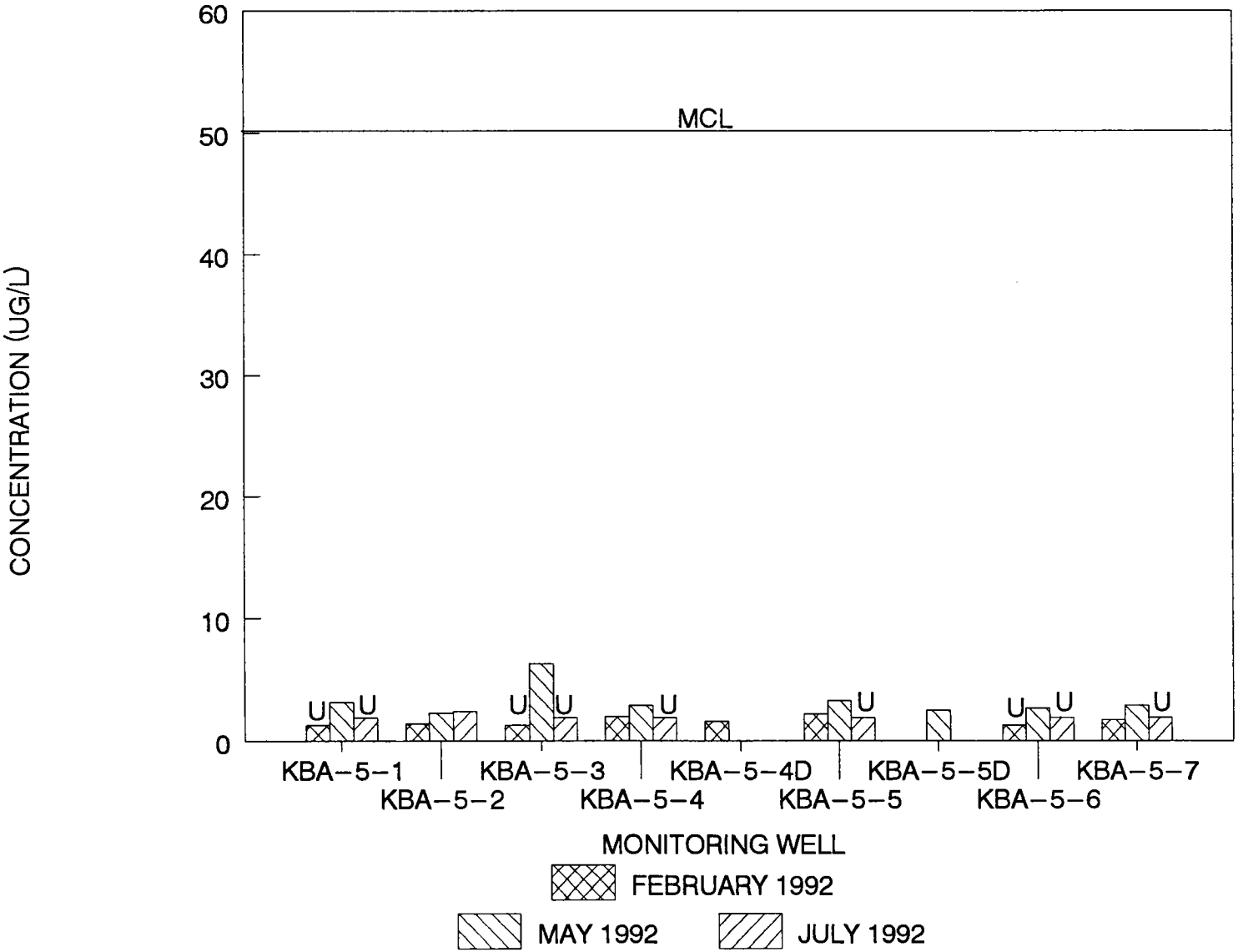
NSB KINGS BAY, GEORGIA

SITE 5 – MERCURY IN GROUNDWATER



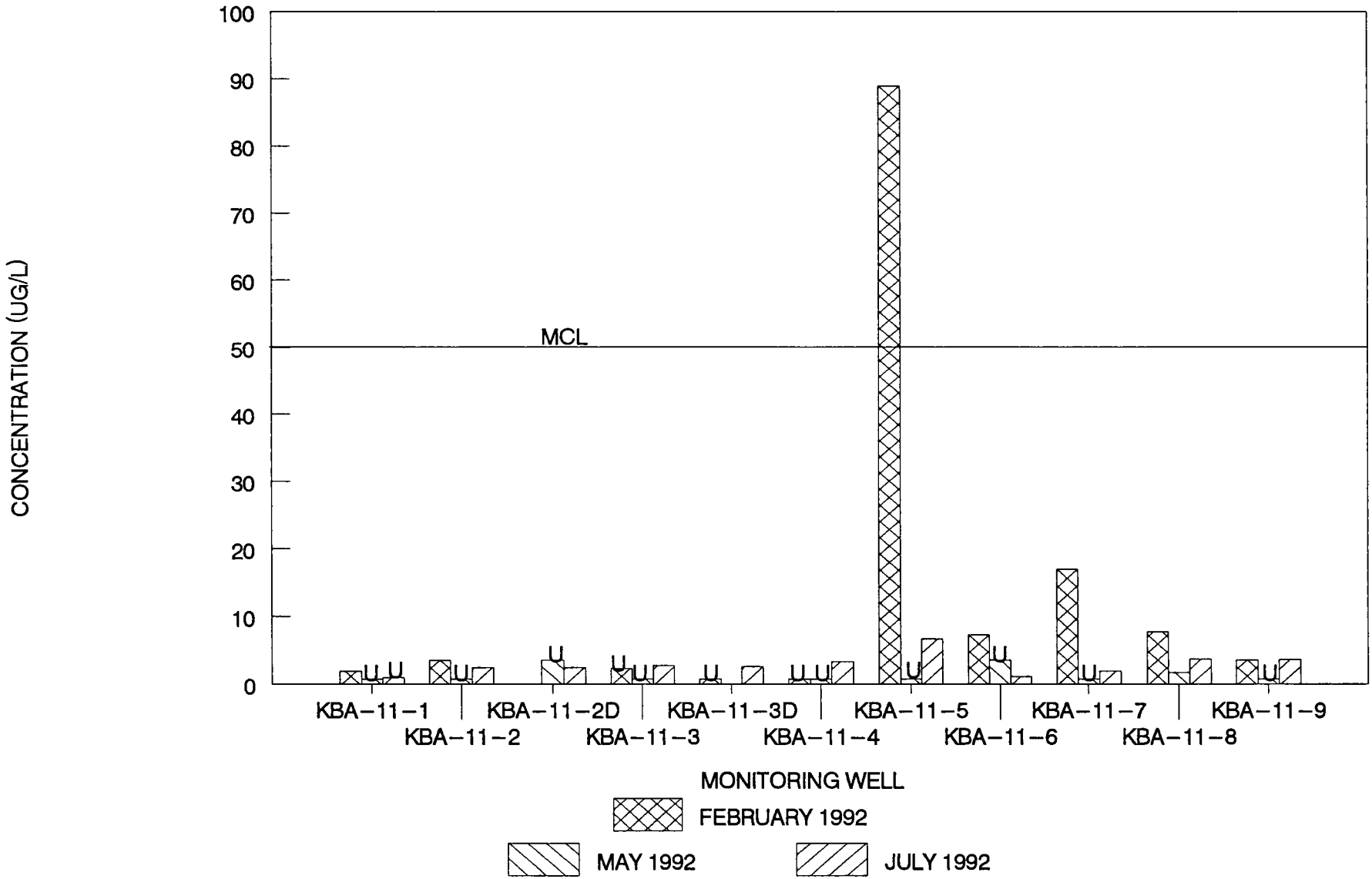
NSB KINGS BAY, GEORGIA

SITE 5 – SELENIUM IN GROUNDWATER



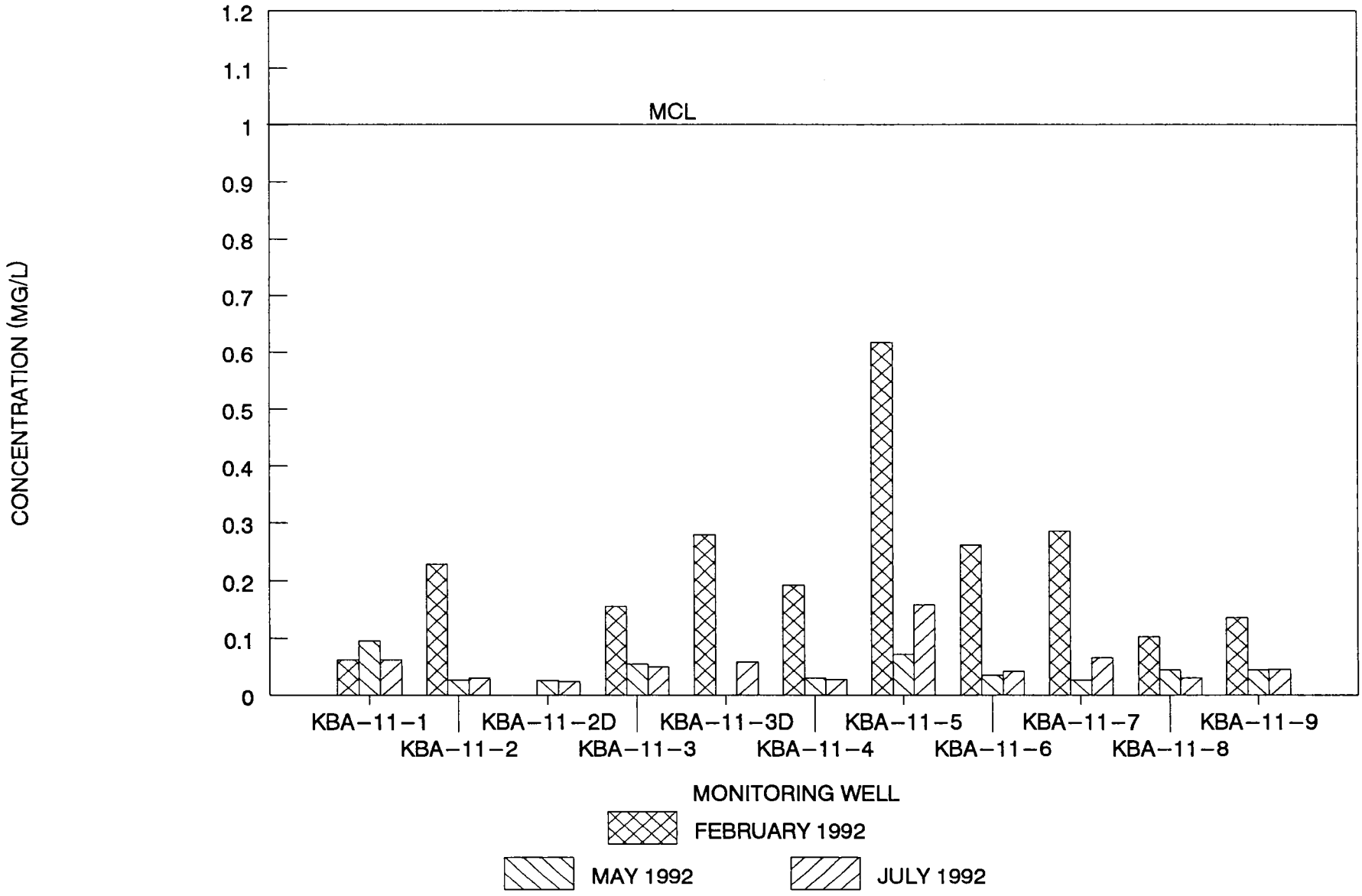
NSB KINGS BAY, GEORGIA

SITE 11 – ARSENIC IN GROUNDWATER



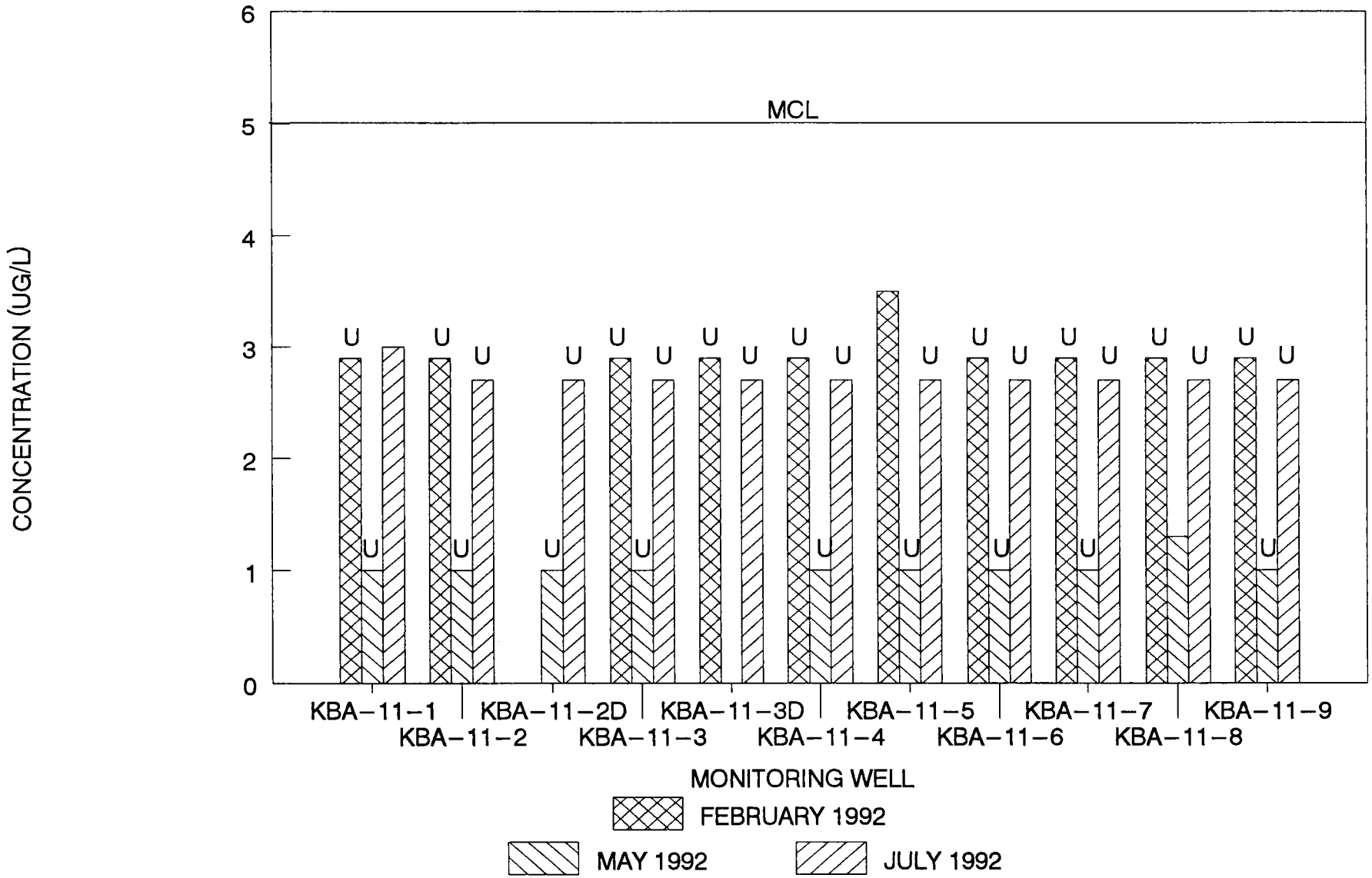
NSB KINGS BAY, GEORGIA

SITE 11 – BARIUM IN GROUNDWATER



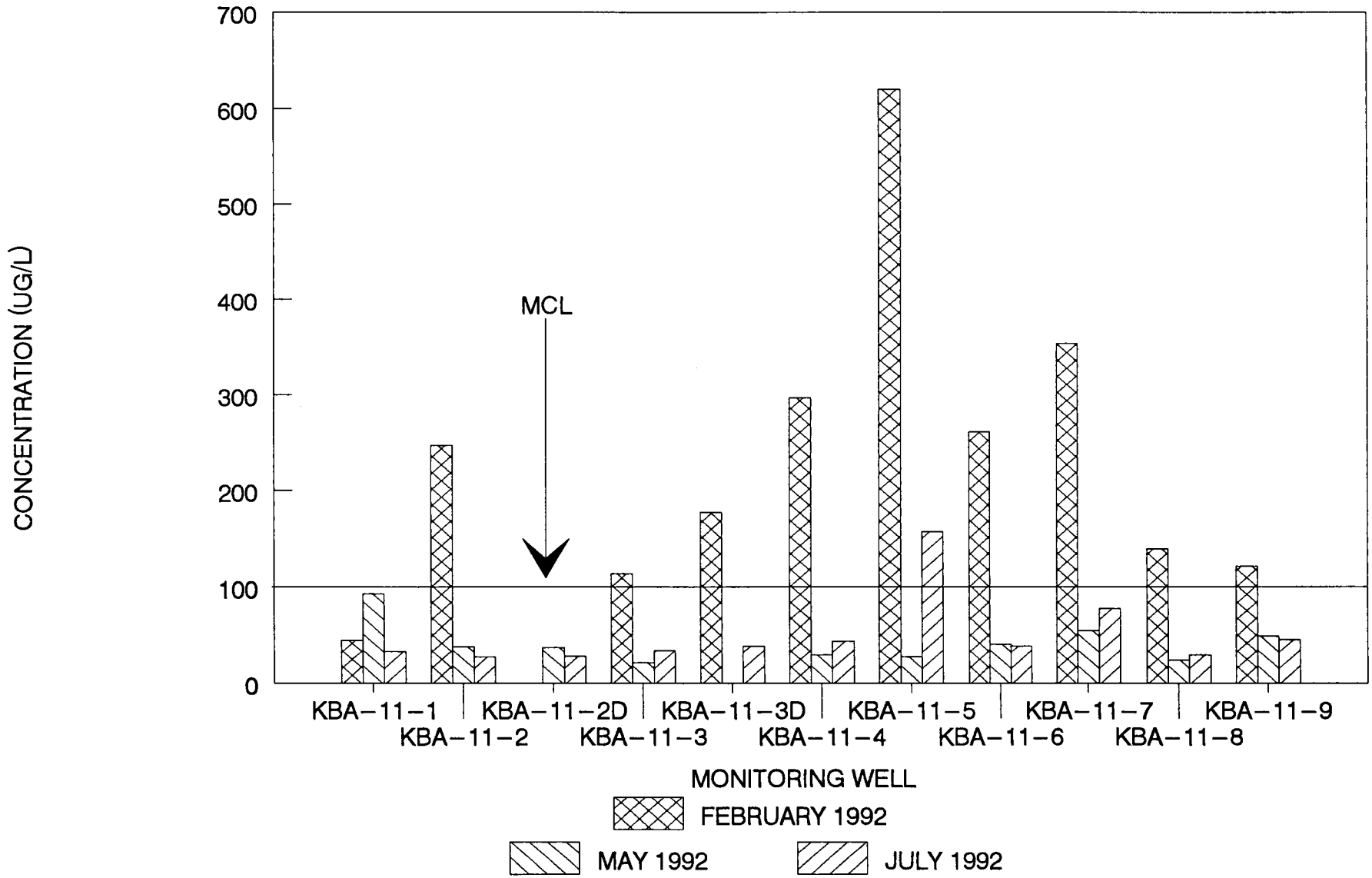
NSB KINGS BAY, GEORGIA

SITE 11 – CADMIUM IN GROUNDWATER



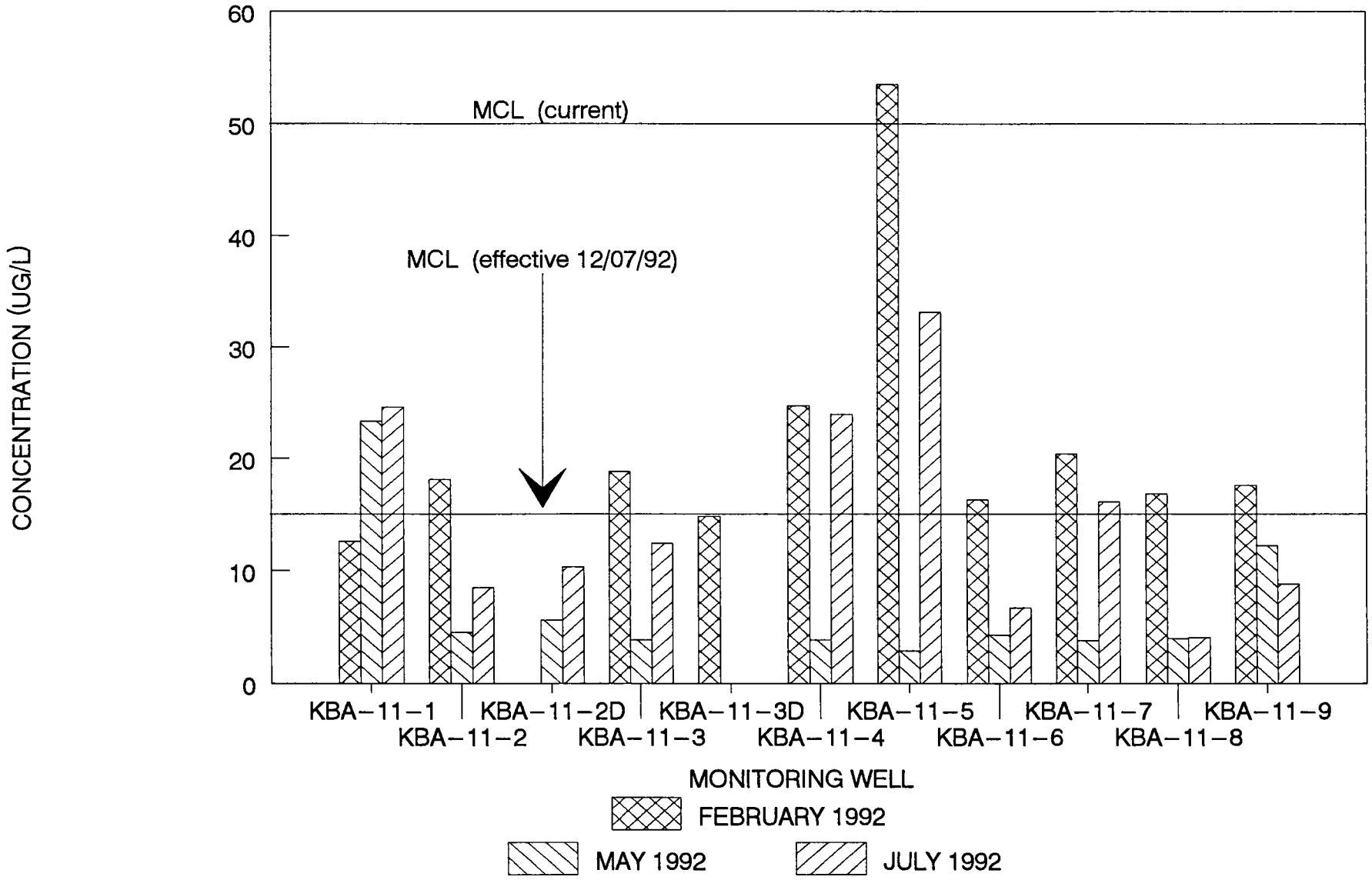
NSB KINGS BAY, GEORGIA

SITE 11 – CHROMIUM IN GROUNDWATER



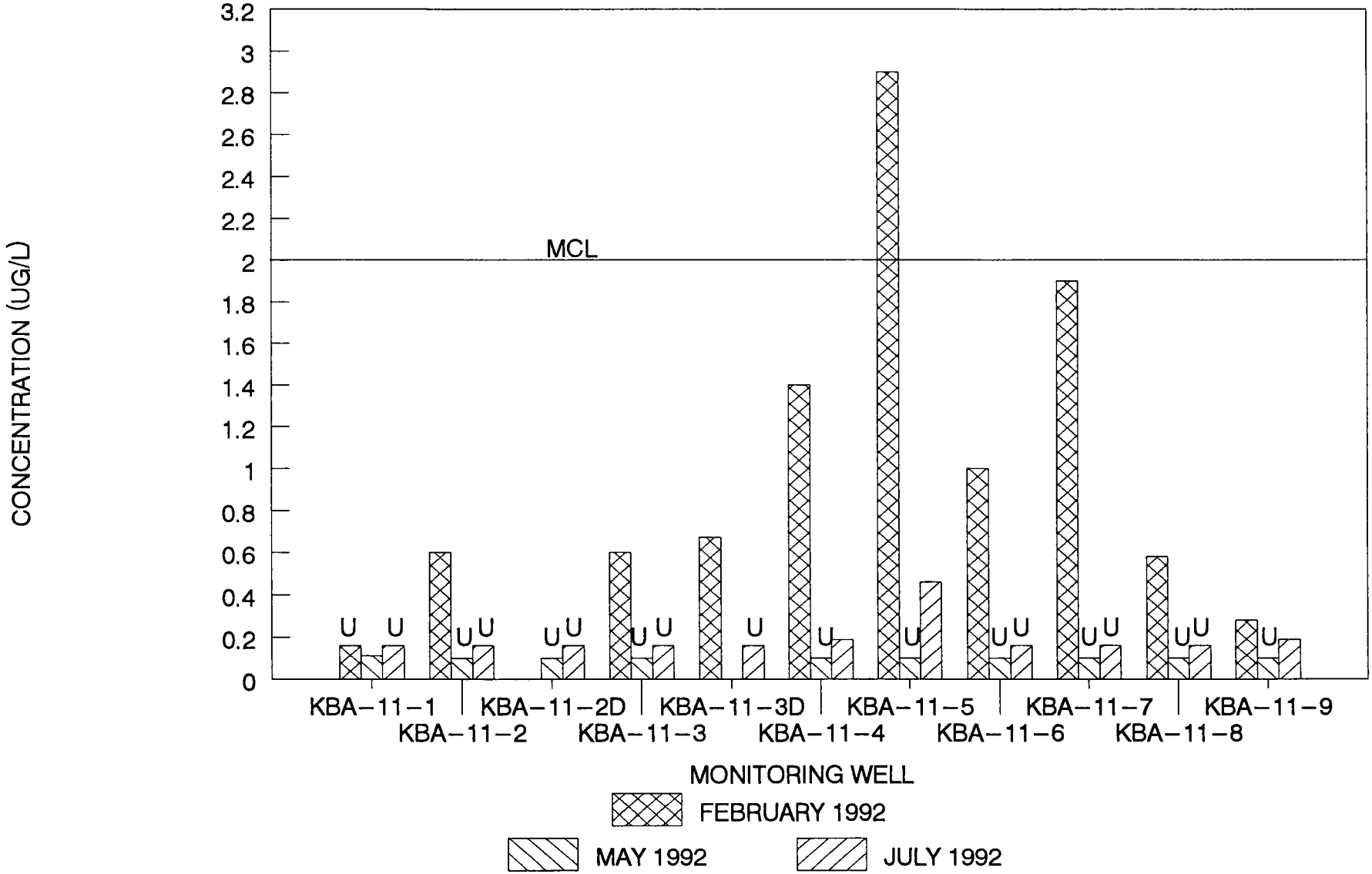
NSB KINGS BAY, GEORGIA

SITE 11 – LEAD IN GROUNDWATER



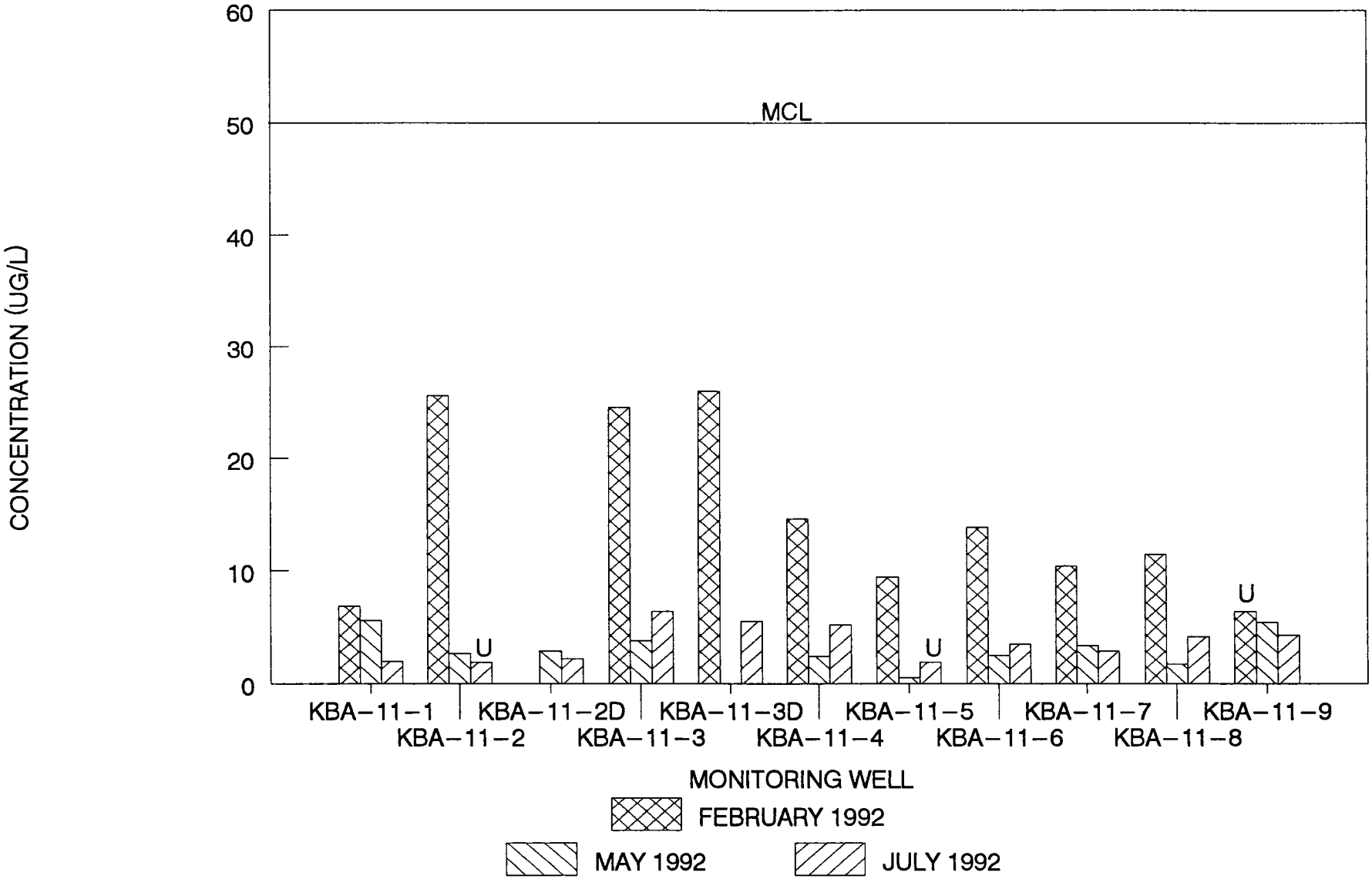
NSB KINGS BAY, GEORGIA

SITE 11 – MERCURY IN GROUNDWATER



NSB KINGS BAY, GEORGIA

SITE 11 – SELENIUM IN GROUNDWATER



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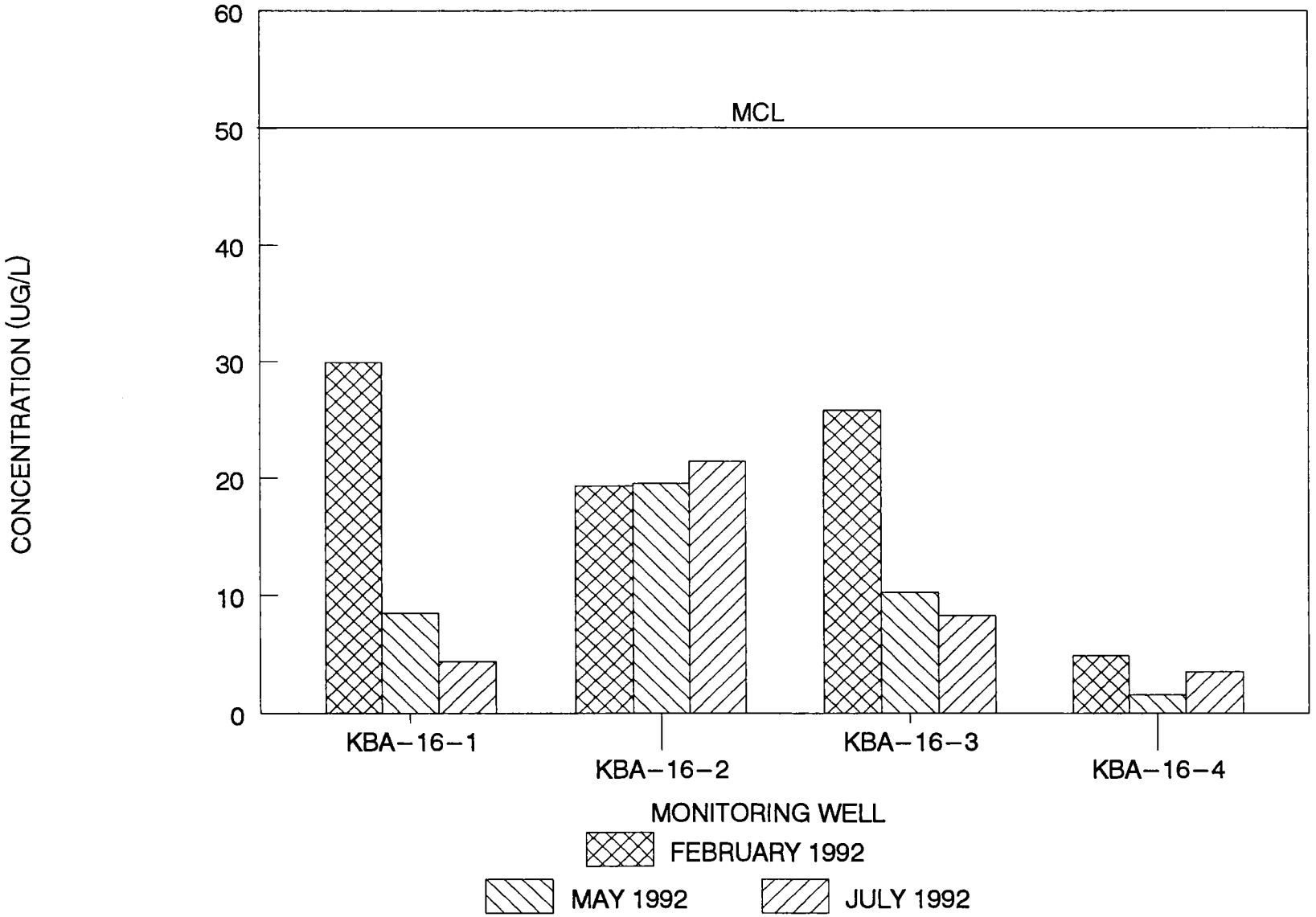
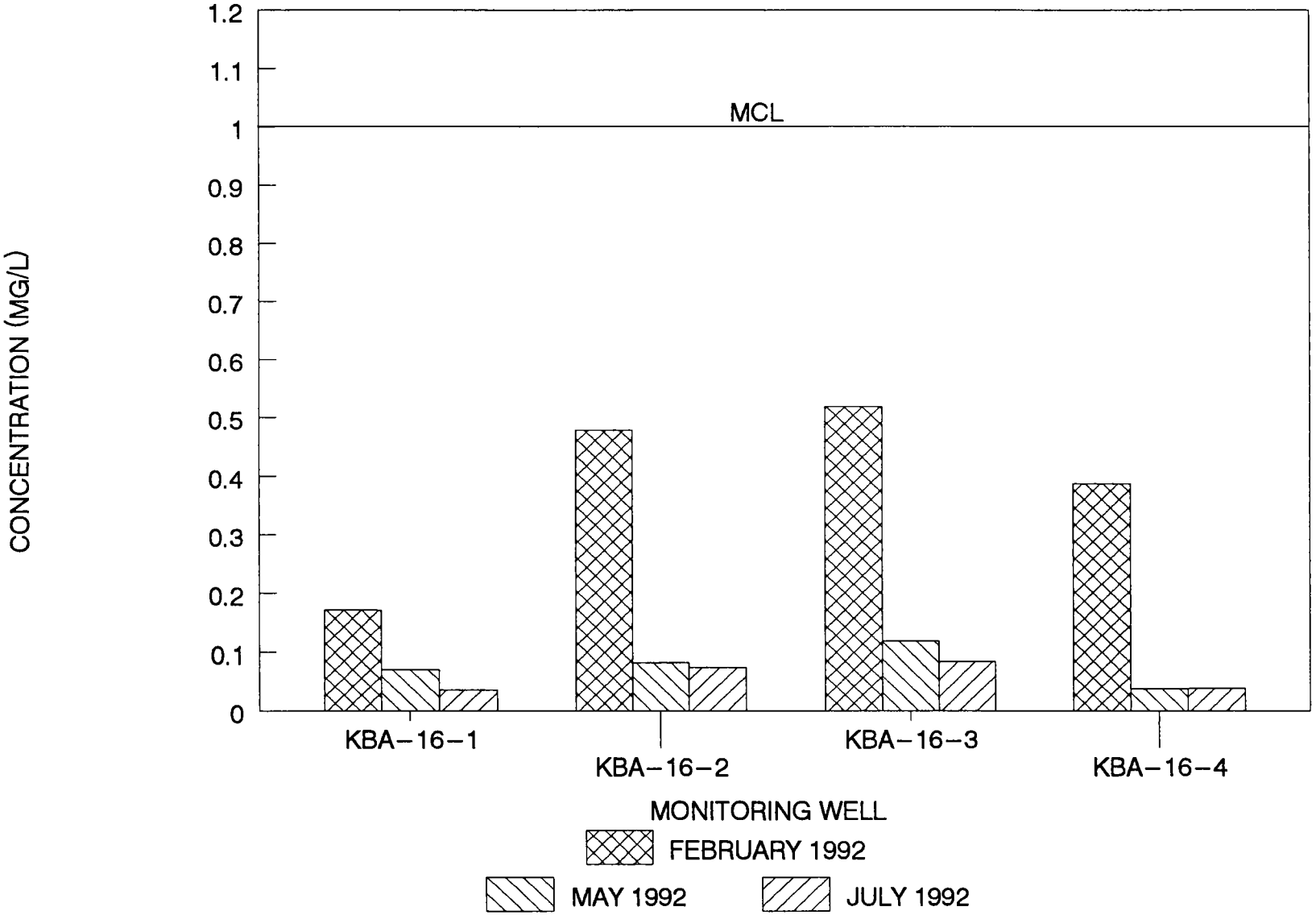
SITE 16 – ARSENIC IN GROUNDWATER



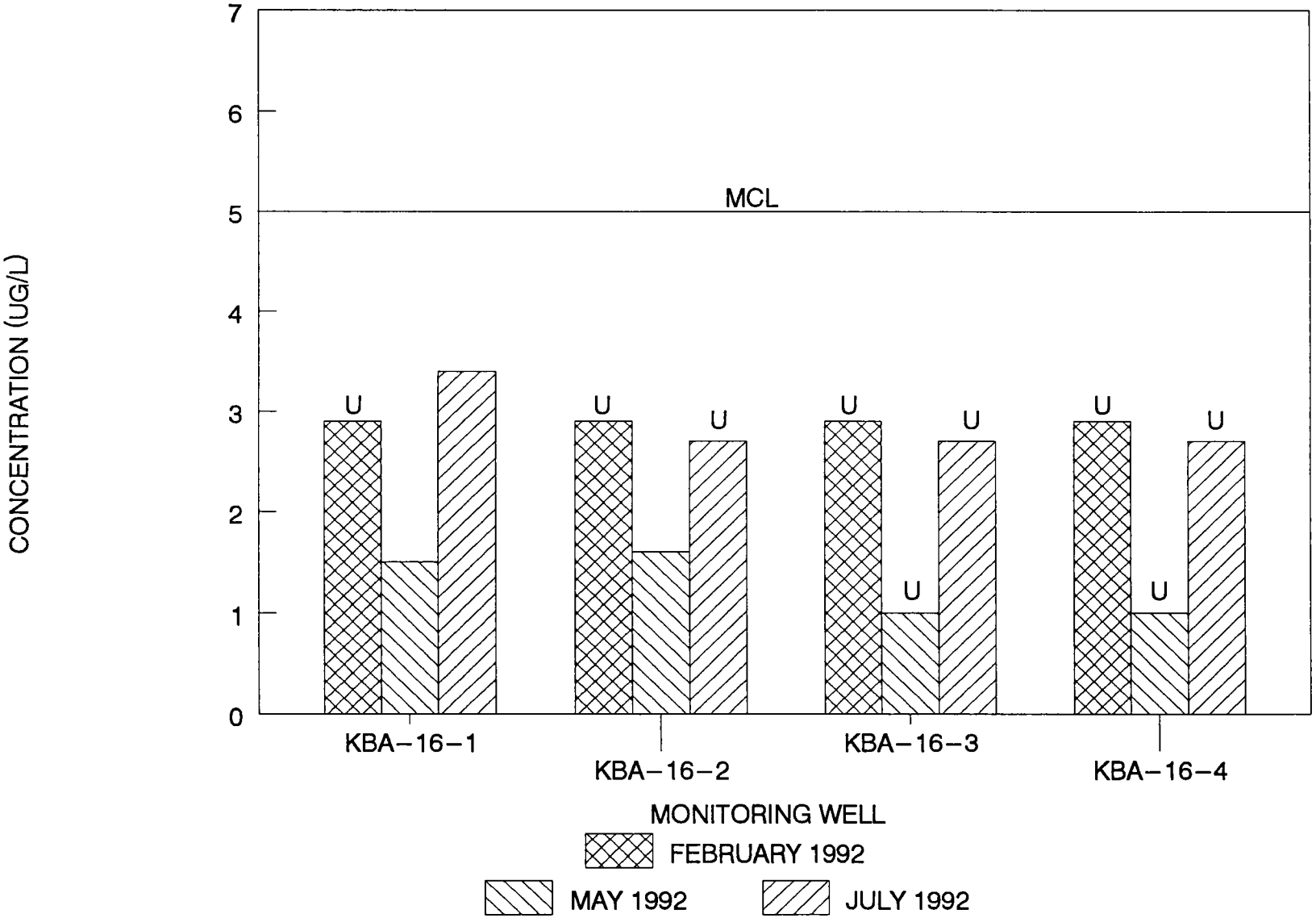
NSB KINGS BAY, GEORGIA

SITE 16 – BARIUM IN GROUNDWATER



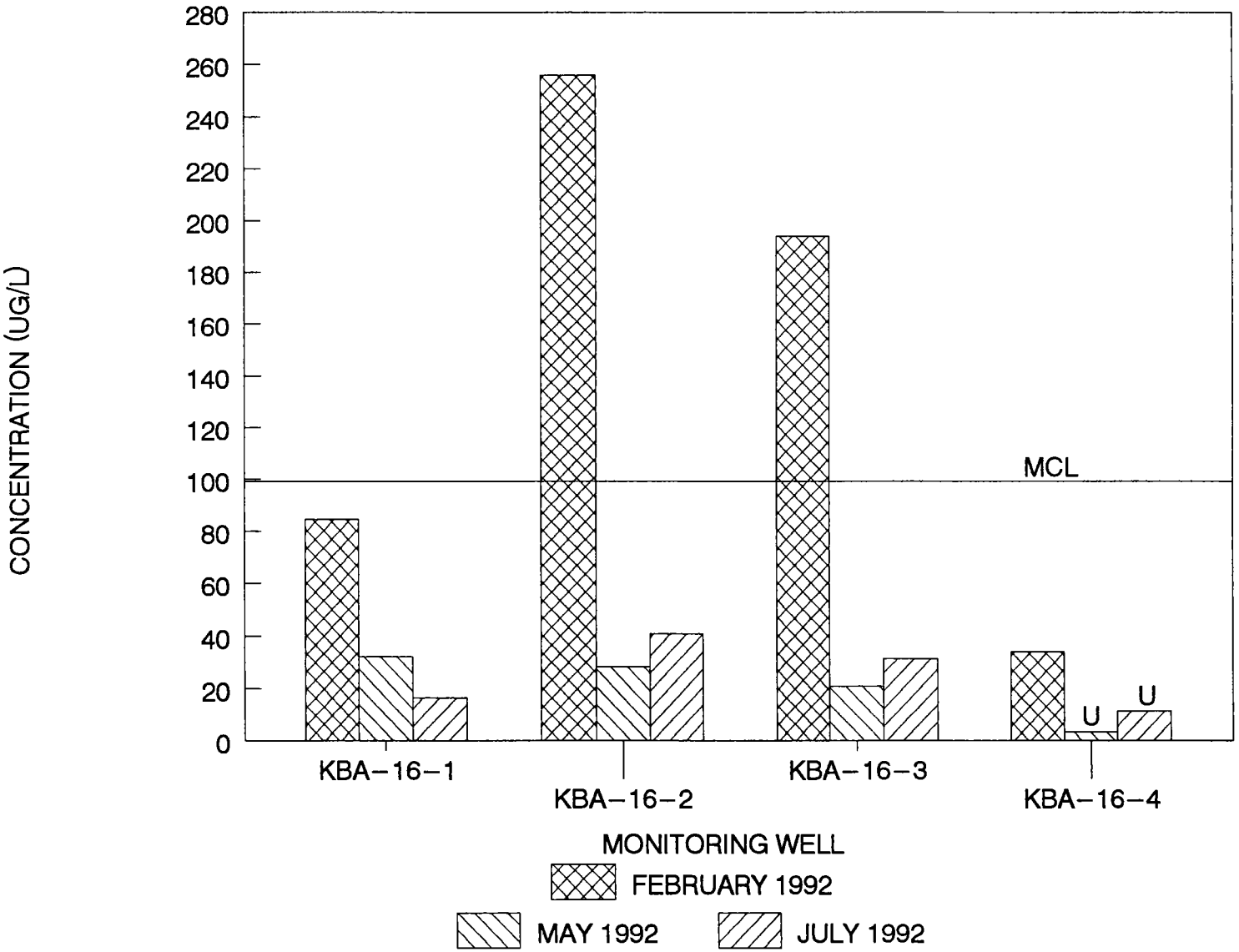
NSB KINGS BAY, GEORGIA

SITE 16 – CADMIUM IN GROUNDWATER



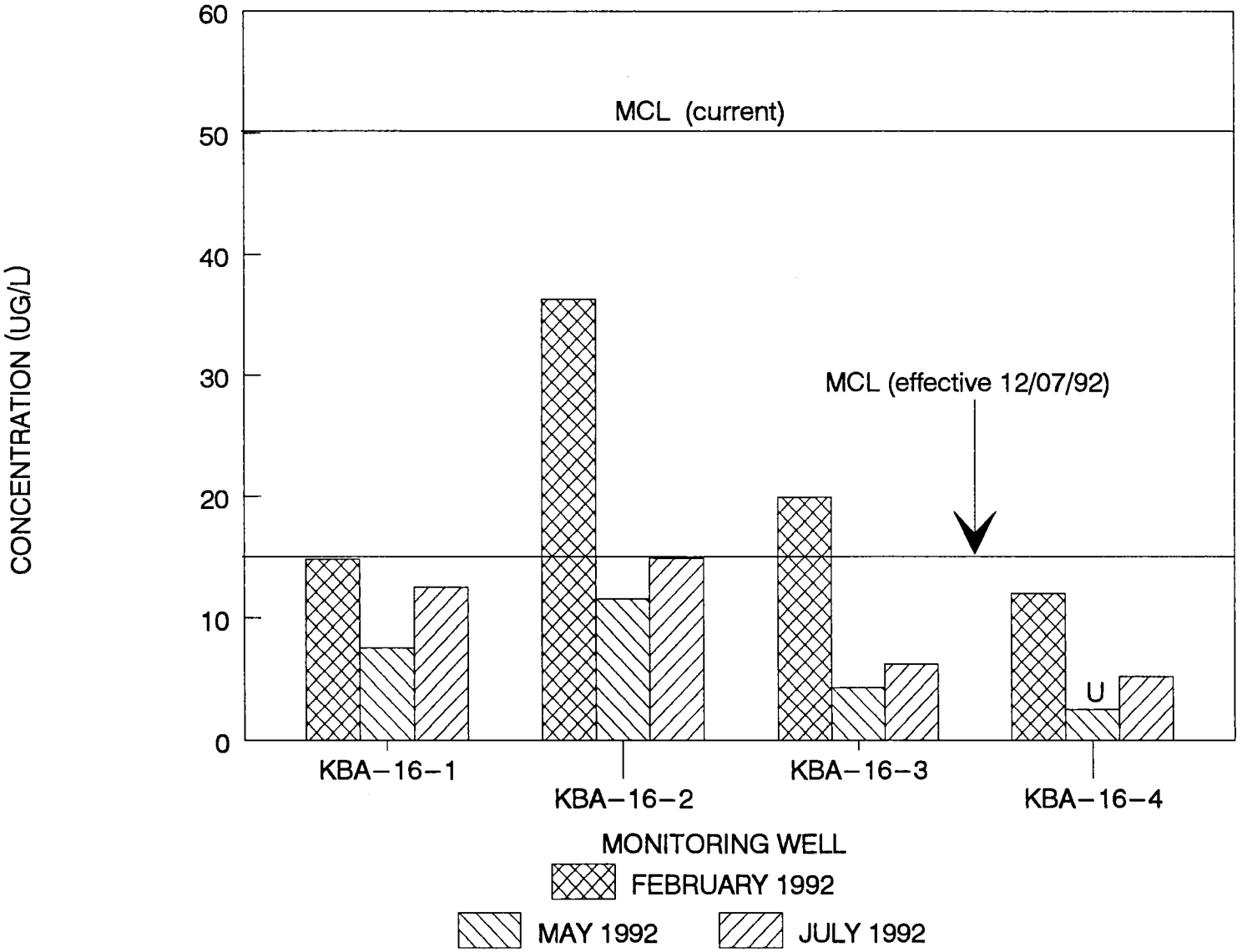
NSB KINGS BAY, GEORGIA

SITE 16 – CHROMIUM IN GROUNDWATER



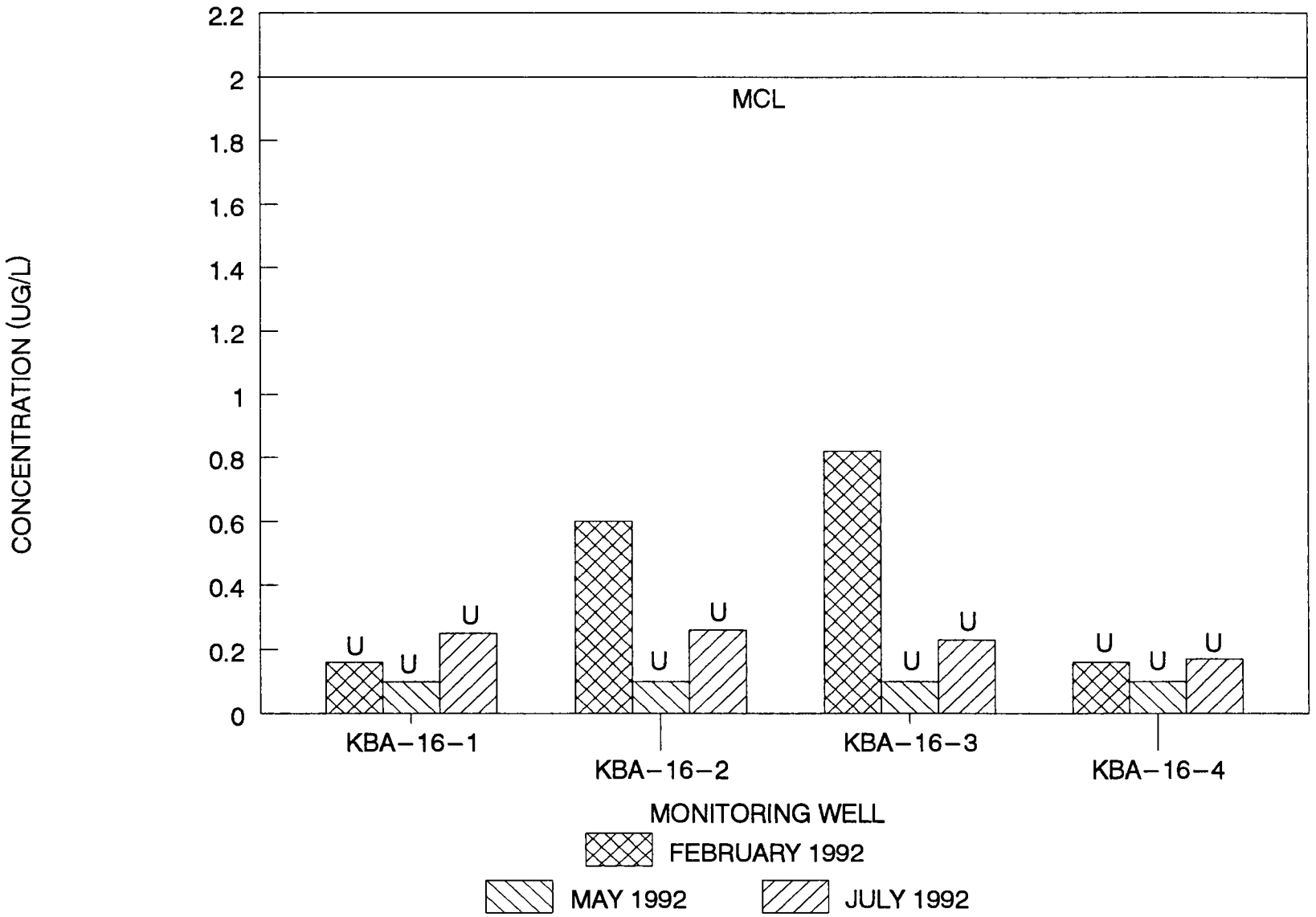
NSB KINGS BAY, GEORGIA

SITE 16 – LEAD IN GROUNDWATER



NSB KINGS BAY, GEORGIA

SITE 16 – MERCURY IN GROUNDWATER



NSB KINGS BAY, GEORGIA

SITE 16 – SELENIUM IN GROUNDWATER