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FINAL SUPPLEMENTAL REMEDIAL INVESTIGATION FOR OPERABLE UNIT 10 (OU 10) SITE 35 CAMP GEIGER AREA FUEL FARM AT MCB CAMP LEJEUNE NC

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CH2M HILL

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Final

Supplemental Remedial Investigation
Site 35-Operable Unit No. 10
Camp Geiger Area Fuel Farm

Marine Corps Base Camp Lejeune
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Prepared by

CH2MHILL

Charlotte, North Carolina

NORTH CAROLINA
LICENSED
SEAL
1501
3/30/09
GEOLOGIST
TEGWYN WILLIAMS

Executive Summary

Introduction

This Supplemental Remedial Investigation (SRI) report summarizes previous investigations and presents the field activities, data, results, and conclusions of environmental investigation activities conducted by CH2M HILL in 2006 at Operable Unit (OU) No. 10, Site 35 at Marine Corps Base (MCB) Camp Lejeune, located in Onslow County, North Carolina.

The *Final Remedial Investigation at Operable Unit No. 10 (Site 35, Camp Geiger Area Fuel Farm), Marine Corps Base Camp Lejeune, North Carolina* (Baker, 1995a) detailed investigative activities conducted in 1994. The RI concluded that Brinson Creek is unaffected by chlorinated volatile organic compounds (VOCs). This conclusion was also confirmed by the results of a Natural Attenuation Evaluation and routine sampling under the LTM program.

Based on the RI and other previous investigations, it was determined that the impacted groundwater at Site 35 had not been adequately delineated. Consequently, in 2005, CH2M HILL was tasked to complete a SRI to further assess and delineate the chlorinated solvent groundwater contaminant plume at the Site.

Site 35 Use

Site 35, formerly the Camp Geiger Fuel Farm, primarily refers to five 15,000-gallon aboveground storage tanks (ASTs) and associated distribution equipment, situated just north of the intersection of Fourth Street and 'G' Street. The Fuel Farm was in operation from 1945 until 1995. The ASTs were originally used to store No. 6 fuel oil, but were subsequently converted for storage of gasoline, diesel fuel, and kerosene. In 1995, the Fuel Farm was decommissioned and dismantled to make way for construction of the U.S. Highway 17 Bypass.

Reports of a release in an underground distribution line date back to 1957-1958. It was estimated that the leak resulted in a loss of thousands of gallons of fuel, which migrated towards Brinson Creek. Interceptor trenches were excavated and the captured fuel was ignited and burned. In April 1990, an undetermined amount of fuel (believed to be gasoline or diesel fuel) was discovered by Camp Geiger personnel along the unnamed drainage channels north of the fuel farm. The source of the fuel spill was believed to be a release from a tanker truck. During subsequent phases of investigation of the petroleum contamination, chlorinated VOCs were also detected, but the source was not identified. The presence of chlorinated VOCs in groundwater appears to be the result of historic activities conducted at Site 35, as the area east of Building G533 was reportedly used for weapons cleaning and the area southeast of Building G480 was the former location of Building TC474, a vehicle maintenance garage. These findings support conclusions drawn by previous site investigations.

The primary contaminants of concern at Site 35 are the chlorinated solvent compounds trichloroethene (TCE) and its daughter products of reductive dechlorination, including cis-1,2-dichloroethene (cis-1,2-DCE) and vinyl chloride.

Historical Site Investigations

A Final Remedial Investigation (RI) Report for OU10 (Baker, 1995a) was submitted by Baker Environmental, Inc. (Baker) in May 1995 to the North Carolina Department of Environment and Natural Resources (NCDENR), the United States Environmental Protection Agency (USEPA), and Naval Facilities Engineering Command (NAVFAC). RI activities completed by Baker in 1994 included groundwater, surface water, and sediment sampling along Brinson Creek. Additional groundwater and surface water samples have been collected as part of the Natural Attenuation Evaluation (NAE) field program in 1998 and as part of the Long-term Monitoring (LTM) program from 1999 through 2004. The RI concluded that petroleum-related and chlorinated solvent impacts were present in the groundwater. In addition, the RI concluded that Brinson Creek is unaffected by the groundwater impacts. This has been confirmed by the results of the NAE sampling and routine sampling under the LTM program.

From December 2003 to July 2005, CH2M HILL conducted a pilot study to evaluate the effectiveness of chemical oxidation for remediation of chlorinated solvent (TCE)-contaminated groundwater (CH2M HILL, 2006). The target area of the pilot study was based on a "hot spot" identified in 2003, located underneath the U.S. Highway 17 Bypass (location of the former fuel farm), extending from the vicinity of Building TC470 and east to the wetland area/Brinson Creek, at a depth of 32 to 42 feet bgs. The pilot study involved the injection of approximately 25,983 gallons of modified Fenton's reagent followed by injection of approximately 19,400 gallons of potassium permanganate solution. The pilot study achieved an 80 to 98 percent reduction in TCE concentrations and a 72 to 85 percent total VOC reduction within the pilot study area.

Based on the RI Report for OU10 (Baker, 1995a) and other previous investigations, Site 35 had not been adequately characterized and the full vertical and horizontal extent of groundwater contamination at depth had not been determined (i.e., a sufficient quantity of data did not exist to support a corrective action decision). In 2006, CH2M HILL conducted a SRI, completing the assessment and delineation of the chlorinated solvent groundwater contaminant plume at the Site. Petroleum-related groundwater contamination present at the Site is being investigated by others through the Underground Storage Tank (UST) Program.

Based on the results of a direct-push technology (DPT) groundwater investigation conducted as part of the SRI, a NTCRA was planned to address the continued presence of a dissolved-phase chlorinated VOC (CVOC) groundwater plume east of Building G533. An Engineering Evaluation/Cost Analysis (EE/CA) was prepared in January 2007 (CH2M HILL, 2007a) and the Action Memorandum was submitted in May 2007 (CH2M HILL, 2007b), which served as the Decision Document to conduct the proposed remedial work. The proposed remedial approach involves ERD via injection of emulsified vegetable oil (EVO) and lactate with DPT.

In June 2007, approximately 5,930 gallons of EVO, 1,900 gallons of lactate, and 34,000 gallons of water were injected into 28 DPT borings. Groundwater samples are being collected

monthly from select Site 35 monitoring wells to monitor VOCs and natural attenuation parameters.

Supplemental Remedial Investigation Activities

The objectives of the SRI field activities were to better define the hydrogeologic characteristics of the Site, characterize the source areas, and provide data to evaluate the fate and transport of dissolved phase chlorinated VOCs. The RI field activities included:

- Groundwater sampling using direct push technology (DPT)
- Monitoring well installation and sampling
- Aquifer testing

Site 35 Physical Characteristics

The site is located in the northeast corner of Camp Geiger, which is located in the far northwest portion of MCB Camp Lejeune. Site 35 is generally covered with a mix of vegetation, asphalt roadways, concrete, and buildings, with the eastern portion of the Site adjacent to Brinson Creek, being heavily wooded. Stormwater is conveyed via manmade drainage ditches, storm drains, and catch basins, to Brinson Creek and its tributaries, and then flows southeast into the New River.

The site is underlain by marine and non-marine sediments, with the uppermost sediments of the Undifferentiated Formation (Fm.) consisting of mostly fine-to-medium grained sands with a lesser amount of silt and clay, to depths of 0 to 30 ft bgs. The Belgrade Fm., semi-confining unit of the Castle Hayne Aquifer, lies directly beneath the Undifferentiated Fm. This Fm. appears to be laterally discontinuous and only provides semi-confining conditions for the Castle Hayne aquifer at Site 35, allowing hydraulic communication and downward vertical gradient between the Surficial aquifer and the upper Castle Hayne aquifer. The River Bend Fm. underlies the Belgrade Fm. and is composed of cemented sands, silt, shell and fossil fragments, and trace amounts of clay. The River Bend Fm. overlies the Castle Hayne Fm.

In general, groundwater flow direction within the Surficial, upper Castle Hayne, and mid-Castle Hayne aquifers at Site 35 is to the northeast. Vertical hydraulic potentials were calculated between the Surficial and upper Castle Hayne aquifers, and within the Castle Hayne aquifer. Between the Surficial and upper Castle Hayne aquifers, slight downward potentials exist in the developed area of the Site (west of and including the U.S. Highway 17 Bypass), while upward potentials exist in the wetland area adjacent to Brinson Creek. Within the Castle Hayne aquifer, slight downward potentials exist in the developed area of the Site, while an upward potential exists in the wetland area adjacent to Brinson Creek.

Nature and Extent of Contamination

Free Product and Soil

Soil samples have been collected from Site 35 as part of the *Interim Remedial Action, Remedial Investigation, Operable Unit No. 10, Site 35 – Camp Geiger Fuel Farm, Marine Corps Base Camp Lejeune, North Carolina* (Baker, 1994a) and RI Report for OU10 (Baker, 1995a) field activities. Based on the analytical results from these investigations, petroleum hydrocarbons were the

only potentially site-related contaminants identified in soil. The petroleum hydrocarbon-impacted soils were subsequently excavated and disposed of as part of a soil removal action conducted between 1995 and 1996. Therefore, impacts to soil were not further evaluated in this SRI.

Free product has been persistently detected in monitoring well 35-MW67A since 1998, and was detected again during SRI field activities. The free product was previously determined to be kerosene, and the lateral and vertical extent of free phase LNAPL has been defined. The LNAPL is being investigated separately under the UST program, so free product was not further evaluated in this SRI.

Groundwater

During the 2006 SRI monitoring well groundwater sampling events, chlorinated VOCs including 1,1,2,2-tetrachloroethane (1,1,2,2-PCA) cis-1,2-DCE, tetrachloroethene (PCE), TCE, and vinyl chloride exceeded their respective North Carolina Groundwater Quality Standards (NCGWQS) in groundwater samples collected from one or more of the monitoring wells. Other chlorinated VOCs were detected, but not at concentrations above their respective standards and they are therefore not considered contaminants of concern. Benzene was also detected at concentrations above its NCGWQS; however petroleum constituents, which includes benzene, are being assessed under separate contract and are not addressed in this SRI report.

TCE, cis-1,2-DCE, and vinyl chloride were the most prevalent VOCs detected above their respective NCGWQS during the SRI groundwater sampling events, which is consistent with previous investigations. The highest concentrations of TCE, cis-1,2-DCE, and vinyl chloride were generally found within the upper Castle Hayne aquifer. The maximum concentrations of TCE (180 µg/L), cis-1,2-DCE (760 µg/L), and vinyl chloride (250 µg/L) were reported in samples collected from monitoring wells located within and immediately downgradient of the former pilot study area. However, these maximum concentrations were approximately one order of magnitude less than the reported concentrations before the pilot study was initiated. Based upon data collected during the SRI, two potential source areas exist within the Surficial and upper Castle Hayne aquifers, which appear to be associated with Building G533 and the former Fuel Farm area (east of Building G480).

Analysis of geochemical parameters (including dissolved oxygen, oxidation reduction potential, nitrate, iron, sulfate, alkalinity, methane, total organic carbon, and chloride) generally indicates that conditions for natural attenuation are favorable or that natural attenuation is currently occurring in the Surficial, upper Castle Hayne, and mid-Castle Hayne aquifers. Chlorinated solvents are capable of being depleted by natural processes in each aquifer at Site 35. However, the limited native organic carbon present suggests that the biodegradation process may be slowed and the high sulfate concentrations suggest competitive exclusion of dechlorinating bacteria may be occurring. Additionally, the persistence of cis-1,2-DCE in Site 35 groundwater indicates reductive dechlorination has not proceeded to completion.

Surface Water and Sediment

Surface water and sediment samples have been collected along Brinson Creek as part of the original RI field activities (Baker, 1995a) and the *Brinson Creek Surface Water and Sediment*

Inorganic Analytical Results Report, Marine Corps Base Camp Lejeune, North Carolina (Baker, 2002). These studies have concluded that surface water quality has not been impacted by CVOCs in groundwater at the site. These studies also concluded that sediment has been impacted by anthropogenic activity, but the source is unclear. These conclusions haves been confirmed by the results of the NAE sampling and routine sampling under the LTM program. Based on these findings, impacts to surface water and sediment were not further evaluated in the SRI.

Fate and Transport

Based on the information gathered during the SRI, the greatest contaminant concentrations are located in two primary areas:

- The area east of Building G533 and south of Building TC342
- The area extending from east of Building G480 to east of the former pilot study area

Contaminants detected in the Surficial and upper Castle Hayne aquifers (primarily TCE, cis-1,2-DCE, and vinyl chloride) appear to originate either immediately northeast of Building G533 or immediately southeast of Building G480 (former Fuel Farm area). The contamination appears to be the result of historical activities, as the area east of Building G533 was reportedly used for weapons cleaning and the area southeast of Building G480 was the former location of Building TC474, a vehicle maintenance garage. These findings support conclusions drawn by previous site investigations.

Chlorinated VOC impacted groundwater at Site 35 exists in the Surficial aquifer, but is most prevalent in the upper Castle Hayne aquifer. Generally, VOC impacted groundwater is not present within the mid-Castle Hayne aquifer. Vertical migration of the VOCs is occurring between the Surficial and upper Castle Hayne aquifers at Site 35 as evidenced by the presence of VOCs in wells screened in the upper Castle Hayne aquifer. In general, VOCs do not appear to be migrating between the intermediate and deep aquifer zones. Vinyl chloride was reported just above its NCGWQS as deep as 58 feet below ground surface (bgs) in 35-MW72DW, located in the former pilot study area. However, VOCs were not detected above their NCGWQS in samples collected from monitoring wells screened from approximately 60 to 65 feet bgs (35-MW30DW and 35-MW80DW), located upgradient of 35-MW72DW.

Modeling predicts that TCE, cis-1,2-CDE, and vinyl chloride will each attenuate below their NCGWQS within the next 20 to 40 years. In addition, the model predicts that TCE groundwater concentrations will not reach the New River at concentrations above the surface water quality standard for TCE. TCE concentrations in groundwater at Brinson Creek may exceed the surface water quality standard, but are predicted to attenuate to concentrations below the surface water quality standard within approximately 4 years. Based on these considerations, the surface water TCE concentration in Brinson Creek is not expected to exceed surface water standards. The concentrations of cis-1,2-DCE and vinyl chloride in the Surficial aquifer adjacent to Brinson Creek are not predicted to exceed their respective surface water standards of 13,000 µg/L and 525 µg/L.

Human Health Risk Assessment

A Human Health Risk Assessment (HHRA) was conducted as part of the RI for OU10 (Baker, 1995a), evaluating the projected COCs on human health and/or the environment

now and in the future. Additionally, a supplemental HHRA was completed as part of the *Supplemental Groundwater Investigation, Operable Unit No. 10 (Site 35, Camp Geiger Area Fuel Farm), Marine Corps Base Camp Lejeune, North Carolina* (Baker, 1996a) focusing on recent groundwater data. Results of the HHRA indicate that current site conditions do not present an unacceptable risk. A slightly elevated risk was identified for current adult recreational users due to potential ingestion of mercury in fish fillets; however the risk was not considered attributable to Site 35 activities. The only risks which exceeded USEPA criteria were under the future residential use scenarios, due to ingestion of groundwater. This risk was driven by the presence of CVOCs and metals in groundwater.

An addendum HHRA was conducted in this RI which incorporated surface and subsurface soil, surface water, sediment and groundwater data collected after 1996 and updated risk assessment guidelines and methods. The results of this HHRA were compared to the previous HHRA and no significant changes in potential risk were identified.

Ecological Risk Assessment

No unacceptable risks to the environment were identified in the original ERA. An addendum to the ERA was prepared to determine if there have been any changes in exposure pathways since the completion of the ERA, to compare the concentrations of site-related constituents to current legally enforceable water quality standards, and to evaluate whether the conclusions of the ERA are still valid. The results of the addendum to the ERA support the original ERA conclusions that aquatic receptors are unlikely to be at significant risk from Site 35. The evaluation also indicated that the risks identified for terrestrial receptors in the 1995 ERA have likely been reduced to acceptable levels through a reduction in exposure to contaminated soils located nearest site structures.

Conclusions and Recommendations

VOC contamination in groundwater at Site 35 has been assessed and fully delineated horizontally and vertically in the Surficial, upper Castle Hayne, and mid-Castle Hayne aquifers. Therefore, no further investigation is required. Two distinct source areas are present and appear to be associated with:

- The area east of Building G533 and south of Building TC342
- The area extending from east of Building G480 (former Fuel Farm area) to Brinson Creek

The contamination appears to be the result of historic activities conducted at Site 35, as the area east of Building G533 was reportedly used for weapons cleaning and the area southeast of Building G480 was the former location of Building TC474, a vehicle maintenance garage. VOC contamination appears to be migrating towards Brinson Creek and the New River. A Feasibility Study is recommended to evaluate appropriate remedial alternatives for Site 35.

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Acronyms and Abbreviations

ARV	aquatic reference value
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
atm-m^3/M	atmosphere-cubic meter per mole
AWQC	ambient water quality criteria
Baker	Baker Environmental, Inc.
bgs	below ground surface
BOD	biological oxygen demand
BTEX	benzene, toluene, ethylbenzene, xylene
CDI	chronic daily intake
CERCLA	Comprehensive Environmental Response, Compensation, & Liability Act
CLEAN	Comprehensive Long-term Environmental Action—Navy
COC	contaminant of concern
COD	chemical oxygen demand
COPC	contaminant of potential concern
CSA	Comprehensive Site Assessment
CSF	carcinogenic slope factor
CSM	conceptual site model
CTO	Contract Task Order
CVOC	chlorinated volatile organic compound
°F	degrees Fahrenheit
DABS	dermal absorption factor
DCE	dichloroethene
DNAPL	dense non-aqueous phase liquid
DO	dissolved oxygen
DoD	Department of Defense
DOT	Department of Transportation
DPT	direct push technology
EE/CA	Engineering Evaluation/Cost Analysis
ELCR	excess lifetime cancer risk
EMD	Environmental Management Division
EPC	exposure point concentration
ER-L	effects range-low
ER-M	effects range-medium
ERA	Ecological Risk Assessment
ERD	enhanced reductive dechlorination
ESE	Environmental Science and Engineering, Inc.
EVO	emulsified vegetable oil

Fe(II)	ferrous iron
Fe(III)	ferric iron
FFA	Federal Facilities Agreement
FFS	Focused Feasibility Study
FS	Feasibility Study
ft	feet, foot
ft/day	feet per day
ft/ft	feet per foot
ft/year	feet per year
HHRA	Human Health Risk Assessment
HI	hazard index
HSA	hollow stem auger
HQ	hazard quotient
IAS	i*n situ* air sparging
ID	inside diameter
IDW	investigation-derived waste
IR	Installation Restoration
IROD	Interim Record of Decision
kg	kilogram
Law	Law Engineering, Inc.
LNAPL	light non-aqueous phase liquid
LTM	long-term monitoring
µg/L	micrograms per liter or parts per billion in liquid
MBI	macroinvertebrate biotic index
MCAS	Marine Corps Air Station
MCB	Marine Corps Base
MCL	maximum contaminant level
MDL	method detection limit
mg/L	milligrams per liter
ml/g	milliliter per gram
msl	mean sea level
MTBE	methyl tert-butyl ether
mV	milliVolt
NAD	North American Datum
NAE	Natural Attenuation Evaluation
NAIP	natural attenuation indicator parameter
NAVD	North American Vertical Datum
NAVFAC	Naval Facilities Engineering Command
Navy	Department of Navy
NC2B	North Carolina Water Quality Standards
NCAC	North Carolina Administrative Code
NCDENR	North Carolina Department of Environment and Natural Resources
NCDOT	North Carolina Department of Transportation

NCGWQS	North Carolina Groundwater Quality Standards
NCWQS	North Carolina Water Quality Standards
NPL	National Priorities List
NRWQC	National Recommended Water Quality Criteria
NTCRA	Non-time-critical Removal Action
NTU	nephelometric turbidity unit
O&G	oil & grease
OHM	OHM Remediation Services Corporation
ONWASA	Onslow Water and Sewer Authority
ORP	oxidation reduction potential
OU	operable unit
PAH	polynuclear aromatic hydrocarbon
PCA	tetrachloroethane
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PE	polyethylene
PPE	personal protective equipment
PQL	practical quantitation limit
PVC	polyvinyl chloride
QA/QC	quality assurance/quality control
QI	quotient index
RAC	Remedial Action Contract
RCRA	Resource Conservation and Recovery Act
RfD	reference dose
RI	Remedial Investigation
ROW	right-of-way
RSL	regional screening level
SCS	Soil Conservation Service
SGI	Supplemental Groundwater Investigation
SOP	standard operating procedure
SRI	Supplemental Remedial Investigation
SSV	sediment screening value
SU	standard unit
SVOC	semivolatile organic compound
TAL	target analyte list
TCA	trichloroethane
TCE	trichloroethene
TCL	target compound list
TDS	total dissolved solids
TOC	total organic carbon
TPH	total petroleum hydrocarbon
TRV	terrestrial reference value
TSS	total suspended solids

USEPA	United States Environmental Protection Agency
USMC	United States Marine Corps
UST	underground storage tank
VOC	volatile organic compound
WAR	Water and Air Research, Inc.
WQC	water quality criteria
WQS	water quality standard
yd^3	cubic yard

SECTION 1

Introduction

This Supplemental Remedial Investigation (SRI) report presents the field activities, findings, and conclusions of environmental investigation activities conducted by CH2M HILL at Operable Unit (OU) No. 10, Site 35 at Marine Corps Base (MCB) Camp Lejeune, located in Onslow County, North Carolina. Site 35, the former Camp Geiger Fuel Farm, is located within Camp Geiger, situated in the northwest corner of MCB Camp Lejeune.

Environmental investigations at Site 35 have historically focused on the former Camp Geiger Fuel Farm, which consisted of five 15,000-gallon aboveground storage tanks (ASTs) and stored various petroleum products over the years. In 1995, the Fuel Farm was decommissioned and dismantled to make way for the U.S. Highway 17 Bypass. Reports of a release in an underground distribution line date back to 1957 or 1958. A Confirmation Study conducted by Environmental Science and Engineering, Inc. (ESE) from 1984 to 1987 identified both petroleum constituents and chlorinated solvents at the Site (ESE, 1990); however, the source of chlorinated solvent contamination was not identified. As a result, the Site was added to the Installation Restoration (IR) Program.

In October 1994, the *Draft Remedial Investigation at Operable Unit No. 10 (Site 35, Camp Geiger Area Fuel Farm), Marine Corps Base Camp Lejeune, North Carolina* (Baker, 1994c) was submitted to the North Carolina Department of Environment and Natural Resources (NCDENR), the United States Environmental Protection Agency (USEPA), and the Naval Facilities Engineering Command (NAVFAC). NCDENR, USEPA, and NAVFAC provided comments in January, February, and April 1995, respectively. These comments were addressed and incorporated into the *Final Remedial Investigation at Operable Unit No. 10 (Site 35, Camp Geiger Area Fuel Farm), Marine Corps Base Camp Lejeune, North Carolina* (Baker, 1995a). Although numerous investigations have been conducted since the original RI, Site 35 had not been adequately characterized and the full vertical and horizontal extent of groundwater contamination at depth had not been determined (i.e., available data was not adequate to support a corrective action decision).

In order to complete the investigation of Site 35, this SRI was completed in accordance with the *Final Remedial Investigation Work Plan, Site 35 – Operable Unit No. 10 (Camp Geiger Fuel Farm), Marine Corps Base Camp Lejeune, North Carolina* (CH2M HILL, 2005c). The existing petroleum contamination at Site 35 is being addressed under NCDENR's underground storage tank (UST) program and will not be addressed in this report.

This SRI report was prepared by CH2M HILL under the NAVFAC Mid-Atlantic, Comprehensive Long-term Environmental Action—Navy (CLEAN) III Contract N62470-02-D-3052, Contract Task Order (CTO) 0105. This report is for submittal to NAVFAC Mid-Atlantic, MCB Camp Lejeune Installation and Environment Department Environmental Management Division (EMD), the USEPA, and NCDENR.

1.1 Objectives and Approach

The objectives of this SRI are to:

- Present a complete history of the investigation activities
- Describe the environmental setting at the Site, including hydrogeology, geology, hydrology, topography, and anthropogenic factors that may affect the hydrology or contaminant pathways at the Site
- Characterize the source areas via the collection of analytical data, and evaluate the migration and dispersal characteristics of the releases
- Assess the nature and extent of site contaminants via the collection and analysis of groundwater samples, and evaluate their fate and transport
- Evaluate potential receptors by collecting data describing human populations and environmental systems susceptible to contaminant exposure
- Evaluate the environmental risk posed by the site contaminants
- Provide recommendations for site management

1.2 Supplemental Remedial Investigation Report Organization

This SRI is comprised of the following sections:

- Section 1, Introduction
- Section 2, Background
- Section 3, SRI Field Activities
- Section 4, Site Physical Characteristics
- Section 5, Nature and Extent of Contamination
- Section 6, Contaminant Fate and Transport
- Section 7, Human Health Risk Assessment
- Section 8, Ecological Risk Assessment
- Section 9, Conclusions
- Section 10, References

Figures and tables referenced throughout the text are provided at the end of each section.

SECTION 2

Background

2.1 MCB Camp Lejeune Setting and History

MCB Camp Lejeune encompasses approximately 236 square miles of land in Onslow County, North Carolina, adjacent to the southern side of the City of Jacksonville. Jacksonville is the largest city near the Base with a population of roughly 67,000, according to the 2000 U.S. Census, which is approximately half of the county's total population. Since 1990, much of the MCB Camp Lejeune complex has been part of Jacksonville. The areas adjacent to the Base are generally rural.

The Base is bisected by the New River, which flows into the Atlantic Ocean in a southeasterly direction. The Base is bordered by the Atlantic Ocean to the east, U.S. Route 17 to the west and State Route 24 to the north. **Figure 2-1** shows the location of MCB Camp Lejeune.

On November 4, 1989, MCB Camp Lejeune was placed on the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) National Priorities List (NPL). Subsequent to this listing, the USEPA Region 4, NCDENR, the Department of the Navy (Navy), and the United States Marine Corps (USMC) entered into a Federal Facilities Agreement (FFA) for MCB Camp Lejeune. The primary purpose of the FFA was to ensure that environmental impacts associated with past and present activities at the Base are thoroughly investigated and that appropriate CERCLA response and Resource Conservation and Recovery Act (RCRA) corrective action alternatives are developed and implemented, as necessary, to protect public health and welfare and the environment.

2.2 Facility-wide Demography and Land Use

MCB Camp Lejeune is home to active duty, dependent, retiree, and civilian populations of approximately 150,000 personnel. Approximately 47,000 military personnel are stationed at the Base including 39,000 Marines for resident formal school training and 8,000 Marines and Department of Defense (DoD) employees for job enhancement training. MCB Camp Lejeune provides housing, training facilities, logistical support, and administrative supplies for Fleet Marine Force units and other assigned units.

MCB Camp Lejeune is composed of training facilities that include Camp Geiger, Camp Johnson, Stone Bay, Greater Sandy Run Training Area, and Marine Corps Air Station (MCAS) New River. Military training operations at the Base include 54 live-fire ranges, 89 maneuver areas, 33 gun positions, 25 tactical landing zones, and a military operation in an urban terrain training facility. In addition, the beach frontage of the Base is capable of supporting amphibious operations.

The Base covers more than 153,000 acres that consist of approximately 26,000 acres of water and 127,000 acres of terrestrial features. The topographic elevation of the Base ranges from

sea level to approximately 70 feet (ft) above mean sea level (msl), with much of the topography traversed by swales, wetlands, streams, and creeks that drain into the New River. The perimeter of the Base is approximately 92 miles, including approximately 14 miles along the Atlantic Ocean. The ocean frontage of the Base is composed of a fragile barrier island system that is separated from the mainland by salt marshes, small bays, and an intracoastal waterway.

Past environmental investigations at MCB Camp Lejeune have identified a total of 177 sites, including 85 UST sites that contain impacted soil and/or groundwater. Assessment of the various sites has indicated that the contaminants released from past storage and disposal areas at the installation have migrated through the surface and subsurface soils to the Surficial aquifer and several surface water bodies. Contaminants identified during the site assessments at MCB Camp Lejeune have included battery acid, fuels, paints and thinners, polychlorinated biphenyls (PCBs), pesticides, herbicides, solvents, used oils, and heavy metals (NPL Site Narrative Listing, 1995).

2.3 Site 35 Setting and History

The general location of Site 35 and surrounding areas is shown on **Figure 2-2**. Site 35, formerly the Camp Geiger Area Fuel Farm, primarily refers to the former locations of five 15,000-gallon ASTs, underground fuel transmission lines, a pump house, a fuel unloading pad, an oil water separator, and a distribution island, situated north of the intersection of Fourth Street and 'G' Street. Results of previous investigations expanded the original area beyond the confines of the Fuel Farm, and Site 35 is now generally bounded by 'A' Street on the west, Second Street on the north (unmarked street north of Third Street), Brinson Creek on the east, and Eighth Street on the south, as shown on **Figure 2-3**.

The majority of the investigative area is grass-covered and exhibits little topographical relief. The U.S. Highway 17 Bypass, which runs roughly parallel to Brinson Creek, crosses through the northeast portion of the Site. Much of the area within the U.S. Highway 17 Bypass right-of-way (ROW) is also grass-covered; however the shoulders are steeply sloped. The eastern portion of the Site adjacent to Brinson Creek is low-lying, heavily wooded, and overgrown. East of Brinson Creek is privately owned property and the New River. Stormwater runoff at Site 35 is collected by a storm sewer system that discharges into Brinson Creek.

The Site currently includes roadways, buildings, former building foundations, and several large parking areas. Portions of Site 35 are currently in use by the Camp Geiger School of Infantry. An armory occupies Building G480 with additional armory operations in Buildings TC341 and TC342. Several warehouses, general storage buildings and troop barracks also occupy the area.

The Fuel Farm ASTs were installed in 1945 as part of the original Camp Geiger construction, and were originally used to store No. 6 fuel oil, but were subsequently converted for storage of gasoline, diesel fuel, and kerosene. The ASTs supplied fuel to an adjacent dispensing pump. In 1995, the Fuel Farm was decommissioned and dismantled to make way for construction of the U.S. Highway 17 Bypass. During the active life of the fuel farm, several releases of fuel are reported to have occurred. During 1957 and 1958, a release was reported

in an underground distribution line, which resulted in the loss of thousands of gallons of fuel, and apparently migrated towards Brinson Creek. The leak appeared to have occurred as a result of damage to a dispensing pump. Interceptor trenches were excavated and the captured fuel was ignited and burned. In April 1990, Camp Geiger personnel discovered fuel (believed to be gasoline or diesel fuel) within the unnamed drainage channels north of the fuel farm. The source of the fuel spill was believed to be an unauthorized discharge from a tanker truck. Clean-up required excavation and disposal of more than 20 cubic yards (yd^3) of soil. During subsequent phases of investigation of the petroleum contamination, chlorinated volatile organic compounds (CVOCs) were also detected, although a source was not identified.

2.4 History of Environmental Investigations at Site 35

Environmental investigations at Site 35 have historically focused on the former Fuel Farm area and the ASTs that used to store various grades of petroleum products. Soil and groundwater contamination resulting from the petroleum releases at the Site is being addressed by NCDENR. The following sections describe the environmental investigations conducted at Site 35. A complete discussion of the investigations completed prior to 1994 are contained in the OU10 RI Report (Baker, 1995a) and summarized below. **Table 2-1** summarizes the parameters analyzed during the previous investigations at the Site. **Figure 2-4** illustrates the approximate location and extent of previous areas of investigation and **Figure 2-5** depicts the locations of possible sources of contamination (e.g. USTs and ASTs).

2.4.1 Initial Assessment Study (Water and Air Research, Inc., 1983)

The *Initial Assessment Study of Marine Corps Base, Camp Lejeune, North Carolina* was completed in April 1983 (WAR, 1983). Its purpose was to identify and assess sites posing a potential threat to human health or the environment due to the presence of contamination from past hazardous material operations. The study entailed the following:

- Collection and evaluation of archival and activities records relating to waste generation, handling and disposal, characterization of physical conditions at the site such as geology, hydrogeology, and identification of migration pathways and potential receptors
- Interviews with current and past employees
- Ground and aerial tours of potential historical disposal sites

The results of the data evaluation efforts were used to develop recommendations concerning the need for a Confirmation Study at a given site; the goal of which was to verify the presence of contamination and determine the need for further characterization and/or remediation.

The Initial Assessment Study (WAR, 1983) examined 76 sites at MCB Camp Lejeune. Fifty-four sites were judged to present no significant risk and thus required no further evaluation. Twenty-two sites, including Site 35, warranted further investigation to assess potential long-term impacts, and were thus recommended for a Confirmation Study. This recommendation

was based largely on the finding that there had been historical releases of fuel in significant quantities, creating a potential for impacts to groundwater.

As a result of the Initial Assessment Study (WAR, 1983), MCB Camp Lejeune was placed on the NPL. Since sampling and analysis of environmental media was not conducted during the Initial Assessment Study, evaluation of actual risk was not possible.

2.4.2 Confirmation Study (ESE, 1990)

In 1984, ESE initiated a Confirmation Study (ESE, 1990) of the 22 sites identified in the Initial Assessment Study, with the intent of verifying the presence and/or absence of contamination at these sites. The Confirmation Study conducted at Site 35, included collection of groundwater and soil samples from three hand-augered borings, collection of two sediment and two surface water samples from Brinson Creek, and installation and sampling of three permanent groundwater monitoring wells. All samples collected were analyzed for lead and oil and grease (O&G). Groundwater samples were also analyzed for volatile organic compounds (VOCs), and surface water and sediment samples were also analyzed for ethylene dibromide (see Figure 35-1 and Table 35-1 in **Appendix A** for surface water and groundwater sample locations and analytical results).

Laboratory analytical results indicated that soils northeast of the Fuel Farm were potentially impacted by Site activities. Groundwater analytical results identified widespread contamination of the Surficial aquifer with fuel-related contaminants (lead, O&G, and benzene) and solvent-related contaminants, including trans-1,2-dichloroethene (trans-1,2-DCE), and trichloroethene (TCE). The source of the fuel-related compounds was thought to be the recorded historical fuel spills from the ASTs, while the source of the solvent-related compounds was thought to be an automobile maintenance shop (former Building TC474) located approximately 200 ft southeast of the fuel farm. Surface water and sediment analytical results suggested that contaminants from Site 35 were probably discharging into Brinson Creek during periods when the water table was high.

The results of the Confirmation Study sampling and analysis activities indicated that contamination was being released from Site 35, but the magnitude and distribution of this contamination could not be determined on the basis of the Confirmation Study findings alone. The results of the sampling and analysis activities were used to develop recommendations for additional investigations at Site 35.

2.4.3 Focused Feasibility Study (NUS Corporation, 1990)

In 1990, a Focused Feasibility Study (FFS) was conducted in the area north of the Fuel Farm by NUS Corporation, due to the previously described discovery of fuel in a stormwater drainage ditch. The FFS included the installation and sampling of four groundwater monitoring wells. A copy of this report is unavailable; however the results were discussed in the *Underground Fuel Investigation and Comprehensive Site Assessment, Camp Geiger Fuel Farm, Marine Corps Base Camp Lejeune, North Carolina* (Law, 1992). This study revealed that groundwater in one well and soil cuttings from two borings were contaminated with petroleum hydrocarbons. A geophysical investigation was also conducted in an attempt to determine if USTs remained at the site of the former gas station, located west of the Fuel Farm and south of the headwaters of the drainage ditch in which fuel was discovered. The

results indicated the presence of a geophysical anomaly to the north of the foundation of the former gas station, shown in **Figure 2-5**. No additional assessment activities were conducted by NUS Corporation to investigate the geophysical anomaly.

There is no available documentation that the geophysical anomaly was further investigated to confirm the presence or absence of an UST. Monitoring well cluster IR35-MW31/31IW was installed in the identified geophysical anomaly area as part of the Remedial Investigation activities. Analytical results for the monitoring well cluster installed in the geophysical anomaly area suggest contaminant constituents and concentrations detected in monitoring wells IR53-MW31/31IW are similar to the overall groundwater plume and suggest that the geophysical anomaly identified by NUS Corporation is not a source of contamination contributing to contamination at the Site.

2.4.4 Comprehensive Site Assessment, 1991 to 1992 (Law Engineering, Inc., 1992)

From 1991 to 1992, a Comprehensive Site Assessment (CSA) was conducted by Law Engineering, Inc. (Law). The purpose of the CSA was to identify the source, nature, and extent of possible free-phase petroleum and groundwater contamination at Site 35. As part of the CSA, a total of 17 soil borings were completed, sampled, and converted to nested wells. Additional soil and groundwater sampling was also conducted, including 17 soil borings and 21 groundwater samples collected by HydroPunch™. A tracer study was also performed to investigate the integrity of the ASTs and underground distribution piping. The CSA investigation area is shown in **Figure 2-4** ([HydroPunch™ locations are shown on Figure 4.4 of Appendix A of the CSA [Law, 1992]). Soil samples were analyzed for total petroleum hydrocarbons (TPH) and lead. Groundwater samples were analyzed for purgeable hydrocarbons (USEPA Method 601), purgeable aromatics and methyl tert-butyl ether (MTBE) (USEPA Method 602), polynuclear aromatic hydrocarbons (PAHs) (USEPA Method 610), and unfiltered lead.

The CSA identified separate areas of impacted soil and groundwater both beneath and apart from the Fuel Farm. The contaminants included both CVOCs (e.g., TCE, trans-1,2-DCE, and vinyl chloride) and petroleum hydrocarbons (e.g., TPH, MTBE, and benzene, toluene, ethylbenzene, and xylene [BTEX]).

In general contaminant concentrations were highest in those soil samples collected at or below the groundwater table. Law concluded that the soil contamination was due to the lateral movement of dissolved phase groundwater plume and seasonal fluctuations of the groundwater table that resulted in adsorbed hydrocarbon contamination in the capillary fringe. Two areas of impacted groundwater, generally less than 15 ft below ground surface (bgs), and containing dissolved-phase petroleum hydrocarbons were identified; these were located northeast of the UST located behind Building G480 and beneath and east of the former Fuel Farm originating near the fuel storage and transmission areas. Two areas of shallow groundwater impacted by CVOCs were also identified; however the source and extent of these plumes was not delineated. Groundwater contaminated with CVOCs was also identified at a depth of approximately 25 to 30 ft bgs, and appeared to correspond to the shallow interval contamination. Contaminant distribution maps are shown on Figure 4-9 (Surficial aquifer) and Figure 4-10 (mid-Castle Hayne aquifer) of Appendix A of the CSA (Law, 1992). The extent of impacted groundwater was generally located north of Fourth

Street and east of 'E' Street, except for a portion of the benzene and TCE plumes extending southwest of Fourth Street.

In 1992, Law completed an Addendum to the CSA in order to further characterize the southern extent of the previously identified petroleum contamination. Three monitoring wells were installed and soil samples were collected from each of the three boring locations. Results of the investigation indicated that soil and groundwater had not been impacted by petroleum-relate constituents above regulatory criteria in the newly installed wells.

2.4.5 Interim Remedial Action Remedial Investigation/Feasibility Study, (Baker, 1994a)

From 1993 to 1994, Baker conducted an Interim Remedial Action Remedial Investigation/ Feasibility Study (RI/FS) (Baker, 1994a) to obtain additional data regarding petroleum hydrocarbon contamination and support selection of an interim remedial action to address soil contamination. Remedial action was deemed necessary based on previous data and reports of 'fuel-like' odors along Brinson Creek. Interim Remedial Action RI/FS activities included installation and sampling of seven soil borings, collection of 13 shallow surface soil samples from low lying areas adjacent to Brinson Creek and drainage channels north of the Fuel Farm, and excavation of a shallow trench along Brinson Creek to allow visual examination of the shallow soils. The extent of investigative activities is shown in **Figure 2-4.** Soil samples were analyzed for Target Compound List (TCL) VOCs, TCL semivolatile organic compounds (SVOCs), target analyte list (TAL) inorganics, TPH, and O&G (see Figure 4-1, Appendix A of the Interim Remedial Action Report for OU 10 [Baker, 1994a] for results of TCL organics in soil).

Soil impacts were identified in two areas north of the Fuel Farm where past releases of fuel products were reported to have occurred. PAHs were the primary organics detected in soil samples throughout the study area.

As part of the Interim Remedial Action RI, a Human Health Risk Assessment (HHRA) was conducted to evaluate the current or future risks to human health resulting from the presence of petroleum hydrocarbon contaminants identified in the subsurface soil. An Ecological Risk Assessment (ERA) was not conducted because soil contamination was primarily at or below the water table thus limiting potential direct exposure to ecological receptors. The HHRA concluded that all risks were within the USEPA range of acceptable risk.

2.4.6 Interim Record of Decision for Contaminated Soil, (Baker, 1994b)

The Interim Remedial Action RI/FS culminated with the execution of the *Final Interim Record of Decision for Contaminated Soil at Operable Unit No. 10, Site 35 – Camp Geiger Area Fuel Farm, Marine Corps Base Camp Lejeune, North Carolina*, signed on September 15, 1994 (Baker, 1994b), for the remediation of contaminated soil at Site 35. Soil removal and disposal at an offsite recycling facility was the chosen alternative for the three areas of contaminated soil identified in the Interim Remedial Action RI/FS. Baker estimated approximately 3,600 yd^3 of contaminated soil was present in these areas.

A fourth area of soil contamination, located immediately north of Building G480 (**Figure 2-3**), was identified in the Interim Record of Decision (IROD) based on data

collected during removal of a UST in January 1994. The contaminated soil was reportedly excavated and disposed offsite; however, no documentation was available regarding how or where the soil was disposed. A soil investigation was conducted in this area as part of the RI activities to confirm that contaminated soil was not returned to the excavation.

2.4.7 Remedial Investigation (Baker, 1995a)

From 1994 to 1995, Baker conducted a comprehensive RI for OU10 (Baker, 1995a), to evaluate the nature and extent of impacted environmental media and the potential risk to human health and the environment caused by the release of hazardous substances, pollutants, and contaminants. The RI included an active soil gas survey and groundwater screening investigation, collection of approximately 40 soil samples, installation of 26 monitoring wells, collection of groundwater samples from 55 monitoring wells, and collection of sediment and surface water samples from 10 locations along Brinson Creek. **Figure 2-4** illustrates the boundaries of the OU10 RI.

Soil and groundwater samples were analyzed for TCL VOCs, SVOCs, pesticides, PCBs, and TAL metals. Groundwater samples were also analyzed for parameters including biological oxygen demand (BOD), chemical oxygen demand (COD), total organic carbon (TOC), total suspended solids (TSS), total dissolved solids (TDS), nitrogen, total phosphorus, microbial enumeration, and alkalinity. Surface water and sediment samples were analyzed for TCL organics and TAL metals. The analytical results from the RI are shown in Figures 4-1 through 4-10 of Appendix A of the OU10 RI (Baker, 1995a) and Figures 1 and 2 of Appendix A of the *Brinson Creek Surface Water and Sediment Inorganic Analytical Results Report, Marine Corps Base Camp Lejeune, North Carolina* (Baker, 2002), which includes the RI surface water and sediment results.

Groundwater analytical results identified fuel-related (primarily benzene) and chlorinated solvent (primarily TCE and cis-1,2-DCE) groundwater contamination in the surficial aquifer in the area north and east of Fifth Street. The extent of groundwater contamination was not delineated during the RI. In addition, significant levels of organic and inorganic contamination were identified in sediment samples.

As part of the RI, a HHRA and ERA were conducted to evaluate the current or future potential risks to human health and ecological receptors resulting from the presence of contaminants identified in site media (groundwater, surface water, sediment, surface soil, and subsurface soil). The HHRA concluded that the overall site risk was above the acceptable risk range for the future potential exposure to groundwater and current potential exposure to fish. The ERA concluded that metals and pesticides have the potential to affect aquatic and terrestrial receptors at Site 35.

2.4.8 Interim Feasibility Study for Surficial Groundwater for a Portion of Operable Unit No. 10 (Baker, 1995b)

In 1995, Baker completed an Interim FS to identify and evaluate remedial alternatives for contaminated groundwater in the vicinity of the Fuel Farm at Site 35 (Baker, 1995b). Although the extent of groundwater contamination was not adequately defined during the RI, an Interim FS was deemed necessary because groundwater contamination in the vicinity of the Fuel Farm was a known source of ongoing contamination to Brinson Creek. The goal

of the Interim FS was to address these impacts prior to completion of a comprehensive FS, which would consider remedial alternatives for the entire impacted area.

2.4.9 Interim Record of Decision for Surficial Groundwater for a Portion of Operable Unit No. 10 (Baker, 1995c)

The Interim FS culminated with the execution of the *Final Interim Record of Decision for Surficial Groundwater for a Portion of Operable Unit No. 10, Site 35 – Camp Geiger Area Fuel Farm, Marine Corps Base, Camp Lejeune, North Carolina*, signed on September 22, 1995 (Baker, 1995c), for the remediation of surficial groundwater for a portion of OU 10. *In situ* air sparging (IAS) was the selected alternative to remediate organic contamination in shallow groundwater in the vicinity of the former Fuel Farm area. The location of the installed IAS trench is shown in **Figure 2-4.**

2.4.10 Soil Removal Action (OHM, 1997)

From September 1995 to May 1996, OHM Remediation Services Corporation (OHM) performed excavation and offsite recycling activities of soil contaminated with petroleum hydrocarbons at the three areas identified in the IROD (OHM, 1997). The excavation was significantly extended beyond its originally defined boundaries due to the presence of TPH at concentrations above action levels; and ultimately, approximately 15,700 tons of contaminated soil was excavated for offsite disposal or recycling from the locations shown in Figure 2-4 and Figure 2-1 of Appendix A of the Final Contractor's Closeout Report (OHM, 1997) (Note: Two of the three originally identified areas of excavation were combined into a single excavation zone). OHM also performed soil sampling in the fourth area of possible soil contamination identified in the IROD for Contaminated Soil, although contaminants were not detected above remedial action levels.

2.4.11 Supplemental Groundwater Investigation, (Baker, 1996a)

From July 1995 to October 1996, Baker conducted a Supplemental Groundwater Investigation (SGI) (Baker, 1996a) to fill data gaps identified in the RI report and to collect additional soil and groundwater data in support of implementing an IAS pilot test. Field activities included completion of 63 soil borings; installation of seven permanent monitoring wells; and soil, groundwater, and sediment sampling. The extent of field activities for the SGI is shown in **Figure 2-4.**

Sediment samples were collected along Brinson Creek to assess the extent of fuel-related contamination from Fuel Farm operations. Sediment samples were analyzed for TPH, mercury, and zinc. Fuel-related constituents were detected in sediment samples collected from areas adjacent to and downstream from the former Fuel Farm, suggesting that these areas were impacted by previous operations at Site 35. Low levels of fuel related compounds were also detected in sediment samples collected from locations upstream of Site 35. The presence of impacted media upgradient of Site 35 suggests the presence of other sources including storm runoff from Highway 17 and adjacent commercial properties that are likely contributing to the reported sediment impacts.

The SGI included several rounds of groundwater sampling from temporary and permanent monitoring wells, and analysis for TCL VOCs and TAL metals. Groundwater analytical results did not identify any contamination on the Onslow County-owned property across

Brinson Creek, suggesting that contamination had not migrated offsite. Low-level fuel-related contamination was primarily identified in the upper portion of the surficial aquifer; while chlorinated solvents were primarily identified in the lower portion of the surficial aquifer. Two areas were identified with elevated levels of fuel- and chlorinated solvent-related groundwater contamination in the wetland area (west of Brinson Creek). In addition, the extent of dissolved phase solvent-impacted groundwater to the south of Fifth Street was delineated. Elevated concentrations of dissolved-phase metals were detected in groundwater samples collected from across the Site; however the concentrations were found to be generally consistent with those detected elsewhere across the Base. Furthermore, the distribution of the metals detections did not suggest a connection with previous site operations.

As part of the SGI, a HHRA was conducted to evaluate the current and future potential risks to human health based on data collected during the SGI. The supplemental HHRA concluded that the overall future site risk was above the acceptable risk range, due to ingestion of contaminated groundwater primarily due to the presence of solvent-related VOCs, iron, and arsenic.

2.4.12 *In Situ* Air Sparging Treatability Study (Baker, 1996b)

In 1996, Baker conducted an IAS Treatability Study (Baker, 1996b) to assess the applicability of IAS technology in addressing the shallow groundwater contamination at Site 35, to obtain sufficient data for full-scale development of the technology, and to assess the impact of potential air emissions from the IAS system. The IAS Treatability Study included installation of 12 monitoring wells, two air injection wells (one shallow and one deep), and six soil gas probes; collection of groundwater and soil gas samples, within the area shown on **Figure 2-4**. Groundwater samples were analyzed for TCL VOCs, while soil gas samples were screened for percent oxygen and VOCs. In addition, two soil gas samples were collected for analysis at a fixed-base laboratory for VOCs.

The results of the treatability study concluded that IAS via vertical air injection would have limited effectiveness on contaminants present in the lower portion of the surficial aquifer because subsurface site conditions were not conducive to the distribution of injected air. The treatability study also concluded that IAS, if implemented in the area between the eastern edge of the U.S. Highway 17 Bypass and Brinson Creek, would not adequately treat the petroleum hydrocarbon-impacted groundwater.

Based on the findings, the treatability study recommended: an IAS system utilizing horizontal injection of air along the top of the semi-confining layer; placement of the IAS along the western edge of the U.S. Highway 17 Bypass; and a pilot test to ensure the system's effectiveness.

2.4.13 Limited Groundwater Investigation (Baker, 1997)

In July/August 1996 and February 1997, a Limited Groundwater Investigation (Baker, 1997) was performed in an area immediately south of the U.S. Highway 17 Bypass ROW, north of Building TC470 and east of 'F' Street, to determine the optimal location of the IAS trench. Based on the results of the investigation, the IAS trench was placed northeast of the intersection of Fourth and 'F' Streets, nearly parallel to the proposed U.S. Highway 17 Bypass ROW, as shown in **Figure 2-4**.

2.4.14 Natural Attenuation Evaluation, (CH2M HILL, CDM, & Baker, 2003)

In April 2003, CH2M HILL, CDM, and Baker completed the *Final Natural Attenuation Evaluation Report, Operable Unit 10, Site 35, Former Camp Geiger Fuel Farm, Marine Corps Base Camp Lejeune, North Carolina* (CH2M HILL/CDM/Baker 2003), compiling the results of data collected as part of the original Natural Attenuation Evaluation (NAE) conducted in September 1998, long-term monitoring (LTM) data collected from January 1999 through October 2002, and data collected from the Focused NAE conducted in January, February, and April 2002. The original NAE conducted in 1998 was hindered by the abandonment of 50 permanent monitoring wells by the North Carolina Department of Transportation (NCDOT) in the U.S. Highway 17 Bypass ROW, which restricted the ability to monitor downgradient groundwater conditions.

The original NAE included installation of 12 permanent and five temporary monitoring wells, collection of groundwater samples from 33 monitoring wells, collection of six surface water samples from Brinson Creek, and collection of four subsurface soil samples within the area shown in **Figure 2-4**. Locations of temporary wells are shown on Figure 3 of Appendix A of the *Site 35 "Hot Spot" Characterization Letter Report*, *Marine Corps Base Camp Lejeune, North Carolina* (Baker, 2003). The LTM program included 12 sampling events during which groundwater samples were collected from 16 wells screened in the surficial aquifer and from 23 wells screened in the upper portion of the Castle Hayne aquifer. Additionally, three surface water samples were collected along Brinson Creek. The Focused NAE included completion of 20 borings and the subsequent collection of multi-depth groundwater samples from each boring; installation of 29 temporary monitoring wells, collection of groundwater samples from the temporary wells, collection of three surface water and sediment samples, and installation of three permanent well clusters in the median of the U.S. Highway 17 Bypass. All groundwater samples were analyzed for TCL VOCs, dissolved gases, sulfate, chloride, TOC, nitrate, TAL metals, and hydrogen. Surface water samples were analyzed for TCL VOCs and subsurface soil samples were analyzed for TOC.

The NAE concluded that chlorinated compounds were most widespread between 32 and 42 feet bgs (upper Castle Hayne aquifer), with the highest concentration present in the vicinity of the U.S. Highway 17 Bypass ROW. The NAE report also identified a BTEX "hot spot" located just north of Building G480, and the continued presence of free-phase light non-aqueous phase liquid (LNAPL) in monitoring well 35-MW67A. The NAE did not identify any BTEX impacted groundwater in the vicinity of the former Camp Geiger Fuel Farm.

The NAE also concluded that natural attenuation processes were degrading chlorinated solvent-related contamination at Site 35; however biologically mediated attenuation appeared to be stalled at cis-1,2-DCE in some locations and the reactions may not be sustainable.

2.4.15 Brinson Creek Surface Water and Sediment Inorganic Analytical Results (Baker, 2002)

In September 2002, at the request of the Partnering Team, Baker collected surface water and sediment samples from Brinson Creek. Samples were analyzed for VOCs, SVOCs, PCBs, pesticides, and inorganics (Baker, 2002). This phase of investigation also included a

comparison to historical surface water and sediment data from the original RI sampling events (1994), LTM sampling events (2001 and 2002), and the Focused NAE (2002). These analytical results are shown in the figures in Appendix A of the Brinson Creek Surface Water and Sediment Inorganic Analytical Results Report **(Baker, 2002)**.

The study concluded that historical operations and disposal activities at Site 35 had not impacted surface water at Brinson Creek. However, it appeared that sediments of Brinson Creek had been impacted by anthropogenic activity, although the source was unclear.

2.4.16 Hot Spot Characterization (Baker, 2003)

In October 2002, Baker conducted an investigation (Baker, 2003) to identify, characterize, and delineate potential sources associated with the groundwater "hot spots" (defined as dissolved phase concentrations of TCE greater than 280 µg/L). Field activities included the completion of 30 soil borings, the collection of 15 soil samples, and the collection of 91 direct push technology (DPT) groundwater samples. All samples were analyzed by a mobile laboratory for VOCs (EPA Method 8260B).

Based on the analytical results, two "hot spots" were identified. One shallow "hot spot" was identified near Building G480 consisting of petroleum hydrocarbons and chlorinated solvents. A second, deeper (and larger) "hot spot," primarily TCE, was observed extending from the vicinity of Building TC470 underneath the U.S. Highway 17 Bypass to the wetland area (just west of Brinson Creek). Complete analytical results are shown in **Table 2** in **Appendix A-Hot Spot Characterization Report.**

2.4.17 Technical Evaluation (CH2M HILL, 2003)

In June 2003, CH2M HILL completed the *Technology Evaluation Operable Unit No. 10 (Site 35), Marine Corps Base Camp Lejeune, North Carolina.* (CH2M HILL, 2003b) to develop and evaluate a range of remedial action alternatives for the remediation of groundwater at Site 35. The document evaluated potentially feasible options for "hot spot" remediation of groundwater at Site 35. Based upon this evaluation, chemical oxidation via injection of modified Fenton's followed by injection of potassium permanganate was recommended for the TCE plume. An air sparging pilot test with vertical wells was recommended for the identified BTEX plume.

2.4.18 Long-term Monitoring (Baker, 1999 to 2004)

In order to fully assess plume stability and monitor seasonal changes, LTM began in January 1999 on a quarterly basis. From October 2000 until October 2004, LTM was conducted semi-annually. Groundwater samples were collected from 39 monitoring wells located within Site 35 and surface water samples were collected from three locations along the portion of Brinson Creek bordering Site 35 to the northeast. Groundwater samples collected under this program were analyzed for VOCs and natural attenuation indicator parameters (NAIPs).

In September 2005, CH2M HILL completed optimization of the LTM program. The *Optimization of the Long-Term-Monitoring Program, Marine Corps Base, Camp Lejeune, North Carolina* (CH2M HILL, 2005b) recommended removal of Site 35 from the LTM program, as it was a part of ongoing investigations and studies in which the LTM requirements were being fulfilled or exceeded.

2.4.19 Pilot Study (CH2M HILL, 2006)

From December 2003 to July 2005, CH2M HILL conducted a Pilot Study (CH2M HILL, 2006) to evaluate the effectiveness of *in-situ* chemical oxidation for remediation of TCE-contaminated groundwater. The target area of the pilot study was based on a "hot spot" identified in 2003, located underneath the U.S. Highway 17 Bypass (location of the former fuel farm), extending from the vicinity of Building TC470 and east to the wetland area/ Brinson Creek, at a depth of 32 to 42 ft bgs (the area of study shown in Figure 2-4 and Figure 5-1 of Appendix A of Pilot Study Report [CH2M HILL, 2006]). The pilot study involved the injection of approximately 26,000 gallons of modified Fenton's reagent followed by injection of approximately 19,400 gallons of potassium permanganate solution. The pilot study achieved 80 to 98 percent reduction in TCE concentrations and 72 to 85 percent total VOC reduction within the pilot study area.

2.4.20 Non-time-critical Removal Action (CH2M HILL, 2006-Present)

Based on the results of a DPT groundwater investigation conducted as part of this SRI, a Non-time-critical Removal Action (NTCRA) was planned to address the continued presence of a dissolved-phase CVOC groundwater plume east of Building G533. An Engineering Evaluation/Cost Analysis (EE/CA) (CH2M HILL, 2007a) was prepared in January 2007 and the Action Memorandum was submitted in May 2007, which served as the Decision Document (CH2M HILL, 2007b) for the EE/CA to conduct the proposed remedial work. The proposed remedial approach involved enhanced reductive dechlorination (ERD) via injection of emulsified vegetable oil (EVO) and lactate using DPT.

In June 2007, approximately 5,930 gallons of EVO, 1,900 gallons of lactate, and 34,000 gallons of water were injected into 28 DPT borings. Groundwater samples were collected for one year following the injections to monitor VOCs and natural attenuation parameters; and the results of the NTCRA will be discussed in a final NTCRA report.

2.5 Results of Previous Investigations at Site 35

The following sections discuss the nature and extent of impacted media at Site 35 as identified through the investigations discussed in Section 2.4. Representative analytical data from some historical reports are located in **Appendix A**.

2.5.1 Soil

Between 1984 and 2002, multiple investigations of surface and subsurface soil were conducted, the most comprehensive of which was the Interim Remedial Action RI/FS (Baker, 1994a) and the RI Report for OU10 (Baker, 1995a). Samples were analyzed for oil and grease, lead, petroleum hydrocarbons, VOCs, SVOCs, pesticides, PCBs, and metals. Based on the results of these previous investigations, it can be concluded that:

- Two areas of petroleum hydrocarbon-contaminated soil were identified during the Interim Remedial Action RI/FS, and a third area was identified during a 1994 UST removal. All three areas were located in the vicinity of Building G480. Soil from these areas that exceeded screening values was removed between 1995 and 1996 and sent to a landfill or recycled.

- Metals concentrations detected throughout Site 35 were similar to base-wide background concentrations; and were not attributed to site activities.
- Since 1998, light non-aqueous phase liquid (LNAPL) has been persistently detected in monitoring well 35-MW67. Based upon the analysis of samples collected from this well during the Hot Spot Characterization, as well as document reviews, the LNAPL was determined to be kerosene. During the Hot Spot Characterization, the extent of the LNAPL was found to be limited to an area around Building G480, and is currently being investigated separately under the State UST program.

2.5.2 Groundwater

The most comprehensive groundwater sampling event took place during the RI in 1994/1995 and the SGI (Baker, 1996a). Further characterization was completed as part of the Limited Groundwater Investigation (Baker, 1997), Hot Spot Characterization (Baker, 2003), NAE (CH2M HILL, Baker, CDM, 2003), and the Pilot Study (CH2M HILL, 2006). Over the course of these investigations, groundwater samples were analyzed for VOCs, SVOCs, pesticides, PCBs, metals, and NAIPs. Based on the results of these previous investigations, it was concluded that:

- Dissolved-phase petroleum hydrocarbon (primarily benzene) contamination is generally limited to the Surficial aquifer. A benzene "hot spot" was identified north of Building G480. The lateral extent of the fuel-related plume has not been defined; however this is being investigated by the UST program.
- Relatively low concentrations of CVOCs [less than 500 micrograms per liter (µg/L)] are present in the Surficial aquifer, limited to the area around Building G480. Analytical results from the LTM program have shown that CVOC concentrations have steadily decreased since the RI. The lateral extent of CVOCs in the Surficial aquifer was defined during the Hot Spot Characterization.
- CVOC concentrations increase with depth and contaminant distribution is most widespread in the upper Castle Hayne aquifer (between 32 and 42 ft bgs). The highest concentrations are present in a "hot spot" area identified in the vicinity of the U.S. Highway 17 Bypass ROW. Analytical results from the LTM program verified that the concentrations of CVOCs have steadily decreased since the RI. Further, sampling conducted during the pilot study indicated that concentrations of CVOCs within the "hot spot" area decreased. Despite the numerous investigations, the lateral extent of CVOC contamination in the upper Castle Hayne aquifer has not been delineated.
- During the Hot Spot Characterization, contaminants were found to have migrated vertically downward into the upper Castle Hayne aquifer and along the top of a semi-confining layer (mid-Castle Hayne aquifer); however an upward migration trend was observed in the vicinity of Brinson Creek.
- The NAE and subsequent LTM reports concluded that reduced levels of TCE, the presence of daughter products, and appropriate geochemical conditions are indicative of natural attenuation processes in the Surficial and upper Castle Hayne aquifers. However, the rate of natural attenuation was being slowed and complete degradation has not been observed.

- The vertical extent of impacted groundwater has not been delineated by historical investigations.

2.5.3 Surface Water and Sediment

Surface water and sediment samples were collected from Brinson Creek during the RI (Baker, 1995a) and Brinson Creek Surface Water and Sediment Inorganic Analytical Study (Baker, 2002). Samples were analyzed for VOCs, SVOCs, pesticides, PCBs, and metals. Based on these results, it was concluded that:

- VOCs, SVOCs, pesticides, and PCBs have not been detected above screening levels in samples collected from Brinson Creek.
- During the RI, concentrations of mercury, lead, and zinc exceeded surface water standards; and during subsequent LTM events and the 2002 Brinson Creek sampling, mercury and copper exceeded surface water standards. Mercury was not considered attributable to Site 35 activities, as the highest concentrations occur upstream of Site 35. Copper was also not considered site-related, as it was not detected above screening criteria in soil samples, and was not detected in groundwater samples collected from the wetland area adjacent to Brinson Creek. During the RI, lead and zinc were detected above surface water standards in one sample located near Site 35, and were considered potentially site-related.
- The sediment within Brinson Creek has been impacted by anthropogenic activity, but the source of the impact is unclear. During the RI, SVOCs, pesticides, and metals were detected in a number of samples; however, the presence of pesticides was considered to be attributable to historical pest control applications rather than site-related activities. SVOCs were detected in Brinson Creek sediments at locations upstream and downstream of Site 35, although the greatest concentrations were located adjacent to Site 35.
- During the SGI (Baker, 1996a), fuel-related VOC contamination was detected in Brinson Creek sediments located adjacent to or downstream of the former Fuel Farm, which may be attributable to previous Site 35 operations. However, fuel-related contamination is being investigated under the UST program.
- During the RI, lead was the only metal reported to exceed sediment screening criteria, and the exceedances occurred over much of the length of Brinson Creek (from just upstream of Site 35 to the confluence of the creek and the New River). During subsequent LTM events and the 2002 Brinson Creek sampling, a number of metals exceeded screening values, including cadmium, copper, lead, mercury, nickel, silver, and zinc. However, lead and zinc appeared to exhibit the greatest and most consistent exceedances over the length of the creek.

2.5.4 Human Health Risk Assessment

A HHRA was completed as part of the RI (Baker, 1995a) to evaluate the projected impact of contaminants of concern (COCs) on human health and/or the environment now and in the future. Additionally, a supplemental HHRA was completed as part of the SGI (Baker, 1996) focusing on recent groundwater data. Current and future receptors evaluated included: current military personnel, current child and adult recreational users of Brinson Creek,

future residents, and future construction workers. Exposure scenarios evaluated included: exposure to surface soil for current military personnel and future residents; exposure to subsurface soil for future construction workers; exposure to groundwater for future residents; exposure to surface water and sediment for current recreational users; inhalation of airborne particles for future residents, future construction workers, and current military personnel; and ingestion of fish for current adult recreational users. The results of the HHRA concluded that:

2.5.5 Ecological Risk Assessment

An ERA was conducted as part of the RI (Baker, 1995a) to evaluate whether past site operations had adversely impacted terrestrial and aquatic communities on, or adjacent to Site 35. Soil, surface water, and sediment samples collected during RI activities were compared to published values for toxicity in various aquatic and terrestrial species. In addition, fish, crabs, and benthic macroinvertebrates were collected and analyzed. Overall, the ERA concluded that:

- There were no unacceptable risks to the ecological communities surrounding Site 35 which were directly attributable to Site 35 activities.
- Aquatic receptors had not been significantly impacted by surface water and sediment quality.
- There was a potential for adverse impacts to terrestrial receptors due to the presence of cadmium in surface soil and copper in fish tissue. However, the risk due to cadmium is likely overestimated, since the high concentration was detected in one of ten samples. Additionally, copper is not considered site-related.

2.6 Data Gaps from Previous Investigations

Despite the completion of numerous investigations at Site 35, the nature and extent of contamination had not been completely delineated prior to the completion of the SRI in 2006-2007. The specific data gaps included:

- The vertical extent of groundwater impacts in the mid-Castle Hayne aquifer had not been defined.
- The lateral extent of groundwater impacts had not been defined in the northwest portion of the Surficial aquifer plume, in the southern portion of the upper Castle Hayne aquifer plume, and along the length of the mid-Castle Hayne aquifer plume.
- The source of VOCs which has impacted groundwater in the vicinity of U.S. Hwy 17 Bypass and Brinson Creek had not been identified, despite significant field investigations.

TABLE 2-1
Previous Investigations
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Investigation	Sample Date	Sample Media	Oil and Grease (SW846 9071)	Lead (SW846 6010)	TPH (SW846 8015 & 5030/3550 for GRO/DRO)	VOCs	Purgeable Hydrocarbons (EPA Method 601)	Purgeable Aromatics and MTBE (EPA Method 602)	PAHs (EPA Method 610)	Unfiltered Lead (239.2)	TCL VOCs (8260B)	TCL SVOCs (CLP Protocol)	TCL Pesticides/PCBs	TAL Metals	Mercury and Zinc	Ethylene Dibromide	TCE, 1,2-DCE, BTEX, MTBE (Method 8010A/ 8020A)	VPH & EPH (MADEP Protocol)	Ignitibility (SW846 1010)	Total Organic Carbon (9060)	Dissolved Gases (Method RSK 175)	Total Phosphorus (EPA Method 365.3)	Total Organic Nitrogen (351.1/350.1)	Total Kjeldahl Nitrogen	Nitrate/Nitrite (300.0/353.2)	Sulfate (300.0/375.4)	Sulfide (376.1)	Chloride (325.2)	Hydrogen	Ammonia (350.1)	Orthophosphate (356.2)	Ferrous Iron	Alkalinity	BOD, COD, TSS, TDS
Confirmation Study	1984 to 1987	Soil	X	X																														
		Groundwater	X	X		X																												
		Surface Water	X	X												X																		
		Sediment	X	X												X																		
Focused Feasibility Study	1990	Soil	No information available																															
		Groundwater	No information available																															
Comprehensive Site Assessment	1991	Soil		X	X														X															
		Groundwater					X	X	X	X																								
Interim Remedial Action Remedial Investigation/Feasibility Study	1993 to 1994	Soil	X		X						X	X		X																				
Remedial Investigation	1994	Soil									X	X	X	X																				
		Groundwater					X	X			X	X	X	X						X		X		X									X	X
		Surface Water									X	X	X	X																				
		Sediment									X	X	X	X						X														
Supplemental Groundwater Investigation	1996	Soil															X																	
		Groundwater									X			X			X																	X
		Sediment			X										X																			
Natural Attenuation Evaluation	1998 to 2003	Soil									X									X														
		Groundwater									X			X						X	X		X	X	X	X		X	X	X	X			
		Surface Water									X			X						X	X					X		X						
		Sediment									X									X														
Long Term Monitoring	1999 to 2005	Groundwater									X									X	X		X		X	X	X	X		X	X			
Hot Spot Characterization	2003	Soil									X	X						X		X														
		Groundwater									X																							
Pilot Study	2003 to 2004	Groundwater									X			X														X				X		

BOD - Biological Oxygen Demand
BTEX - Benzene, Toluene, Ethylbenzene, Xylenes
COD - Chemical Oxygen Demand
DCE - Dichloroethene
DRO - Diesel Range Organic
EPH - Extractable Petroleum Hydrocarbons
GRO - Gasoline Range Organic
MTBE - Methyl tert-Butyl Ether
PAH - Polynuclear Aromatic Hydrocarbon
PCB - Polychlorinated Biphenyl
MADEP- Massachusetts Department of Environmental Protection
SVOC - Semi-Volatile Organic Compound
TAL - Target Analyte List
TCE - Trichloroethene
TCL - Target Compound List
TDS - Total Dissolved Solids
TPH - Total Petroleum Hydrocarbon
TSS - Total Suspended Solids
VOC - Volatile Organic Compound
VPH - Volatile Petroleum Hydrocarbons
PCB - Polychlorinated Biphenyls

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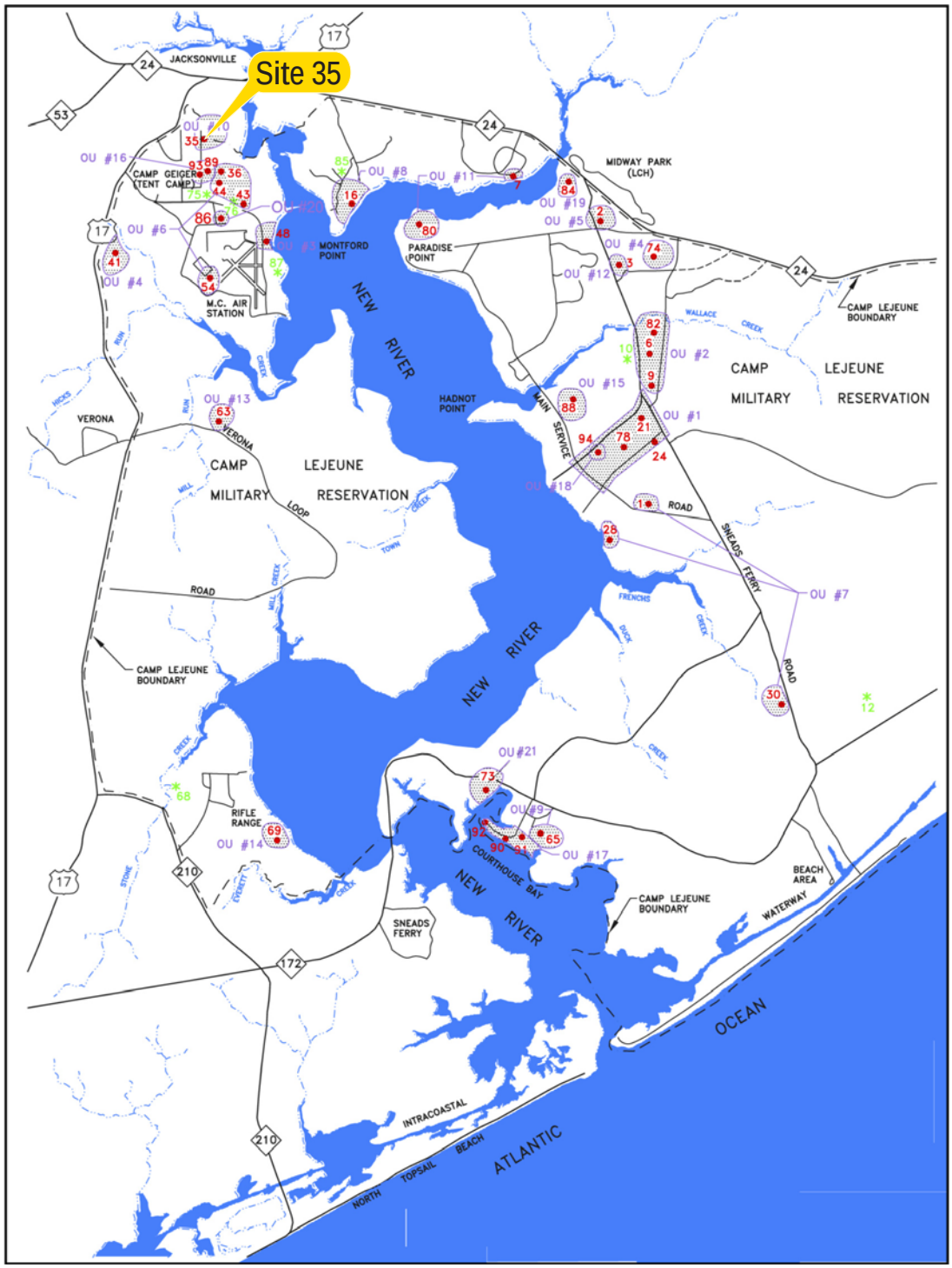
Legend
- Installation Area
- Site 35
- Limited Access Highway
- Highway
- Local Roads
- Cities

N

0 6 12 Miles

Figure 2-1
Base Location Map
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

CH2MHILL



Vicinity Map

LEGEND

35 Denotes Site 35

OU # 10 Denotes Operable Unit #10

68 Denotes Pre-RI Site*

*not to scale

N

4,500 0 4,500 Feet

Approximate Scale

Figure 2-2
Base Map with Site 35 and Adjacent IR Sites
Operable Unit No. 21 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

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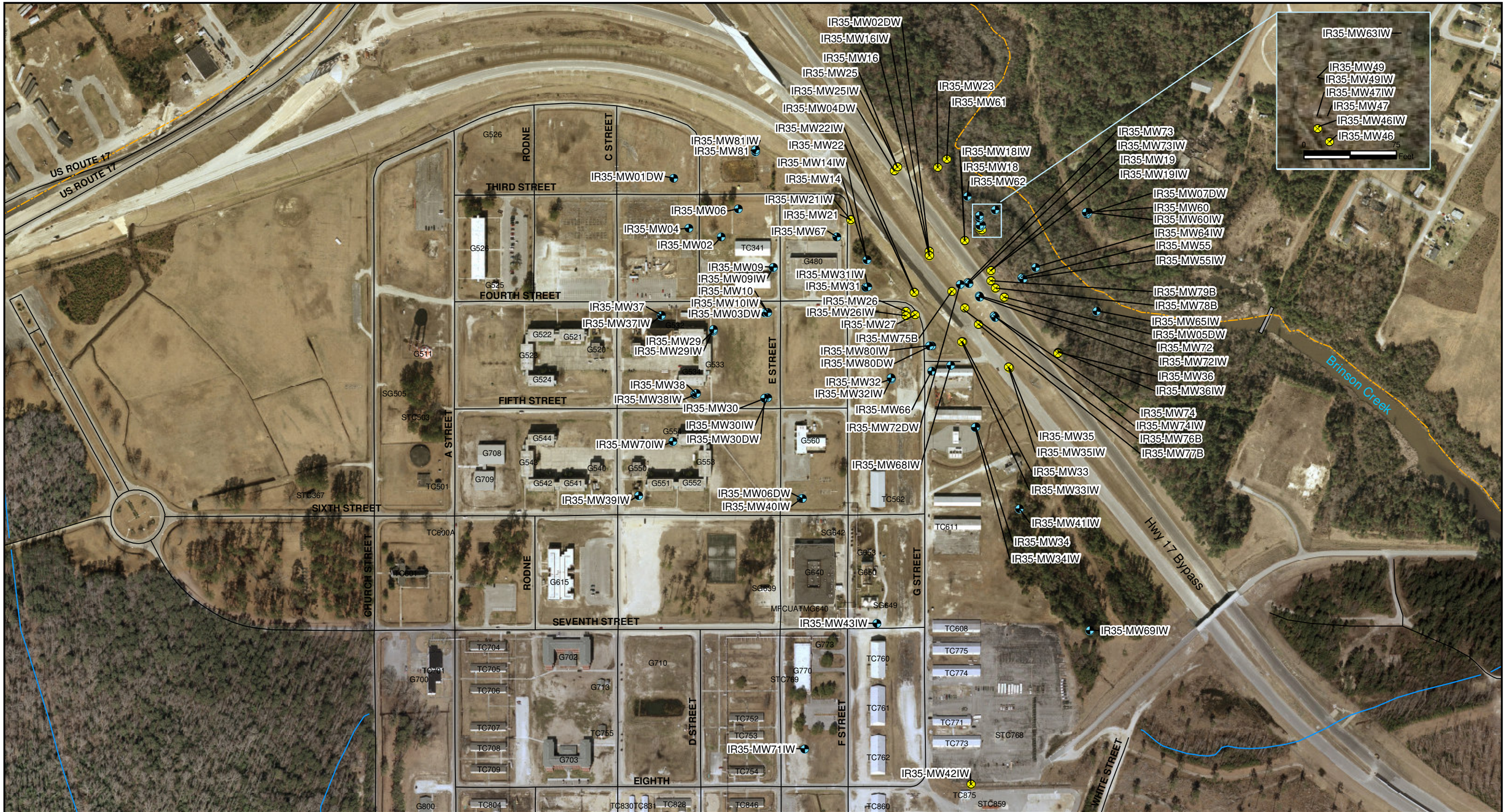

Legend

- Monitoring Wells
- Abandoned Wells
- Surface Water Course Centerline
- Base Boundary

N

0 400 800 Feet

1 inch equals 400 feet

Figure 2-3
Site 35 Map
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

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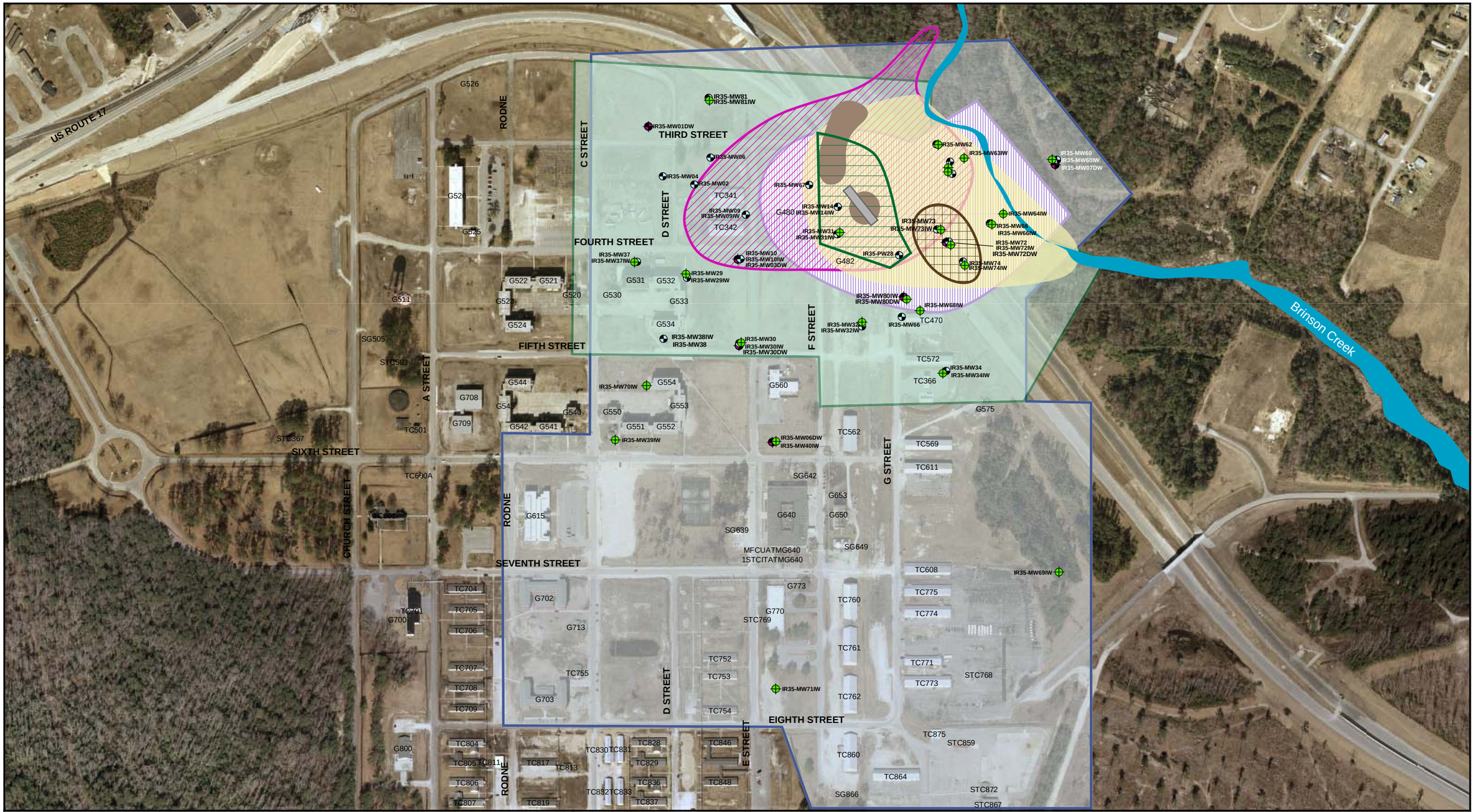

Legend

- Deep Monitoring Well
- Intermediate Monitoring Well
- Shallow Monitoring Well
- GW Groundwater
- SS Soil and Sediment
- SW Surface Water

- Comprehensive Site Assessment & Addendum - 1992 & 1994 (SS,GW)
- Interim Remedial Action RI/FS - 1994 (SS,GW)
- Remedial Investigation - 1995 (SS,SW,GW)
- Soil Removal Action - 1995 to 1996 (SS)

- Approximate Location of IAS Trench - 1996
- IAS Treatability Study - 1996 (GW)
- Supplemental Groundwater Investigation - 1996 (GW)
- Brinson Crk. Surface Water & Sediment Investigation - 2002 (SS,SW)
- Final Natural Attenuation Evaluation - 2003 (GW)
- Pilot Study - 2006 (GW)

N

0 400 800 Feet

1 inch equals 400 feet

Figure 2-4
Site 35 Previous Investigation Areas
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

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Legend

- Monitoring Wells
- Former Oil- Water Separator
- Road Centerline
- Surface Water Course Centerline
- Potential Source Area
- Base Boundary

N

0 200 400 Feet

1 inch equals 200 feet

Figure 2-5
Locations of Potential Source Areas
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

CH2MHILL

SECTION 3

SRI Field Activities

This section presents a summary of field activities conducted by CH2M HILL in 2006 for the Site 35 SRI including:

- DPT groundwater screening
- Monitoring well installation
- Groundwater sampling
- Aquifer testing
- Investigation-derived waste (IDW) management
- Surveying

Additional details of sampling events and descriptions of quality assurance/quality control (QA/QC) procedures, field screening, and available background data are provided in the appendices. All SRI field activities were conducted in accordance with the Standard Operating Procedures (SOPs) outlined in the Field Sampling Plan section of the *Master Project Plans* (CH2M HILL, 2005a) and summarized in the *Remedial Investigation Work Plan, Site 35 - Operable Unit No. 10 (Camp Geiger Fuel Farm), Marine Corps Base Camp Lejeune, North Carolina* (CH2M HILL, 2005c). The differences between these SRI SOPs and those presented in the project plans are identified here and in the appendices.

The various analytical test methods used during the investigation are identified in **Table 3-1**, which also lists the compounds analyzed, test methods, and the associated typical detection limits for these analyses. Actual detection limits varied for some samples due to dilutions and other interferences. Analytical results for the SRI at Site 35 are discussed in Section 5 of this report.

3.1 DPT Groundwater Screening

As part of the SRI field activities, CH2M HILL subcontracted Probe Technology, Inc. to advance soil borings for groundwater collection using a truck-mounted DPT rig. The purpose of the DPT sampling event was to screen COC concentrations both horizontally and vertically throughout the aquifer to complete the delineation of previously identified impacts east of Building G533 and to identify potential source areas. DPT groundwater sampling was initially conducted from October 17 to October 19, 2005. Based on the analytical results, an additional phase of DPT groundwater sampling was conducted from January 31 to February 1, 2006.

3.1.1 Borehole Advancement and Sample Collection

Following clearance of subsurface utilities, DPT borings were advanced to depths of 44 to 49 ft bgs. In October 2005, 20 DPT locations (designated 35-IS100 through 35-IS119) were identified and advanced in a grid pattern with borings spaced approximately 100 feet apart, as shown on **Figure 3-1**. The sample grid included the area between Fourth and Fifth Streets and between Building G533 and 'F' Street. In January/February 2006, 20 additional DPT

locations (designated 35-IS200 through 35-IS219) were identified and advanced in a grid pattern with borings spaced approximately 200 feet apart. The sample grid included the area between Third and Fifth Streets and between Rodne and 'E' Streets, as shown on **Figure 3-1**.

Discrete groundwater samples were collected from each of the 40 DPT borings; from the Surficial aquifer (approximately 20 to 24 feet bgs) and from the upper Castle Hayne aquifer (approximately 40 to 44 feet bgs or 45 to 49 feet bgs). During the two phases of DPT groundwater investigation, a total of 77 groundwater samples were collected. Samples were not collected from the upper Castle Hayne aquifer at 35-IS207, 35-IS208, and 35-IS214 due to DPT refusal above proposed sample collection depths.

Groundwater samples were collected using the Geoprobe® SP-15 groundwater sampling system, consisting of either a stainless steel or disposable polyvinyl chloride (PVC) screen (1.5-inch outside diameter [O.D.] screen sheath 41 inches in length), attached to DPT rods. Once the screen was advanced to the specified sampling depth, groundwater samples were collected by advancing polyethylene (PE) tubing through the inside of the DPT rods down to the screen and purging groundwater at a low-flow rate with a peristaltic pump. DPT rods were decontaminated between sampling locations and new disposable tubing was used for each sampling depth and location.

Groundwater samples were packed on ice and delivered under chain-of-custody control to CompuChem Laboratories, located in Cary, North Carolina. Groundwater samples were analyzed for VOCs (EPA Method 8260B). Analytical data from the DPT groundwater sampling was not validated. Laboratory reports and chain-of-custody forms for the DPT groundwater sampling events are included in **Appendix B**.

3.1.2 Borehole Abandonment

Once the target depth of each borehole had been reached and all samples were collected, the borehole was abandoned using a cement grout slurry consisting of Portland cement and 3 percent powdered bentonite.

3.2 Monitoring Well Installation

In accordance with the SRI Work Plan, six permanent groundwater monitoring wells were installed in April and May 2006. The additional monitoring wells were installed to further assess the horizontal and vertical distribution of impacted groundwater, to provide additional lithologic information and assist in LTM of groundwater quality and hydrology. In addition, the wells were installed in clusters in order to monitor upper- and mid-Castle Hayne aquifers, or to supplement existing monitoring well pairs. Monitoring well locations were based on the results of previous investigations at the Site.

Upper- and mid-Castle Hayne aquifer monitoring well couplets were installed along the southeastern edge of former Building TC474, a Surficial and upper Castle Hayne aquifer monitoring well couplet was installed approximately 300 feet northwest of 35-MW23IW, and two mid-Castle Hayne aquifer monitoring wells were installed for vertical delineation at the 35-MW72 and 35-MW30 monitoring well nests. The shallow monitoring well was installed to an approximate depth of 25 feet bgs. Upper Castle Hayne aquifer monitoring

wells were generally installed between the semi-confining cemented sand layers, between 40 and 50 ft bgs. Mid-Castle Hayne aquifer monitoring wells were installed to penetrate the cemented sand layer and at an approximate depth of 70 to 80 ft bgs.

The new Surficial and upper Castle Hayne aquifer monitoring wells were installed using hollow-stem auger (HSA) drilling techniques while the mid-Castle Hayne aquifer wells were installed using rotosonic drilling techniques. Drilling and well installation activities were conducted under the supervision of a CH2M HILL hydrogeologist and in accordance with North Carolina Well Construction Standards. Locations of the newly installed and existing monitoring wells at Site 35 are shown on **Figure 2-3**. **Table 3-2** summarizes the construction details of all Site 35 monitoring wells including total depth, screen interval, and top of casing elevation. **Appendix C** contains detailed soil boring logs and monitoring well construction diagrams from each monitoring well installation. A complete description of the site-specific geology and hydrogeology is provided in Section 3.3.2.

3.2.1 Type II Monitoring Wells

As previously stated, the shallow and upper Castle Hayne aquifer Type II (singled-cased) monitoring wells were installed using HSA drilling techniques. CH2M HILL subcontracted Parratt-Wolff, a North Carolina-licensed well driller from Hillsborough, North Carolina, for the drilling and well installation services.

Soil cores were collected from each boring for lithologic characterization and field screening in accordance with American Society for Testing and Materials (ASTM) Method D-1586, *Standard Method for Penetration Test and Split-Barrel Sampling of Soil*s.

The boreholes were advanced to an approximate depth of 25 ft bgs for the Surficial aquifer well and an approximate depth of 50 ft bgs for the upper Castle Hayne aquifer wells. Final construction depths for the wells were determined in the field following review of the site-specific lithology. The monitoring wells were constructed using 2-inch inside diameter (ID) Schedule 40 PVC casing and screen. The shallow well was constructed using 10 ft of 0.010-inch slotted screen, while 5 ft screens were used on the upper Castle Hayne aquifer wells. After the well casing and screen assembly were installed, the annular space of each borehole was filled with 20-30 grade silica sand extending from the bottom of the borehole to approximately 2 feet above the top of the well screen. A bentonite seal was placed above the filter pack by pouring bentonite pellets down the annulus as the augers were being withdrawn to form a seal approximately 2 feet thick. When necessary, the bentonite pellets were hydrated with potable water. Following hydration of the bentonite pellets, the remaining annular space of the borehole was grouted to within a few inches of the ground surface using a grout slurry consisting of Portland cement and 3 percent powdered bentonite. A watertight, locking, expansion cap was installed on top of the 2-inch diameter casing. All wells were completed at the ground surface using an 8-inch diameter steel casing and security cover set in a 2-ft square concrete pad. Well completion diagrams are contained in **Appendix C**.

3.2.2 Type III Equivalent Monitoring Wells

The three mid-Castle Hayne aquifer Type III equivalent (double-cased) monitoring wells were installed using rotosonic drilling techniques. These wells included 35-MW30DW and

35-MW80DW, installed on April 6 and 7, 2006 and 35-MW72DW installed on August 5 and 6, 2006. CH2M HILL subcontracted Prosonic Corporation, a North Carolina-licensed well driller from Aiken, South Carolina for the rotosonic drilling and well installation services. The rotosonic drilling method eliminated the need for permanent surface casings through the use of temporary outer casings; significantly reduced the volume of IDW generated; and allowed for a higher production rate on well installation as compared to other drilling methods. The dual-line casing method of the rotosonic technique consisted of a sampling barrel and overriding outer casing. Rotosonic drilling uses high-frequency vibration and low rotational energy to displace soil at the head of the outer casing and to simultaneously advance both the inner sampling barrel and the overriding outer casing. Continuous 3-inch diameter soil cores were collected from the inner sampling barrel as each well borehole was advanced while maintaining the borehole integrity with the overriding outer casing.

Boreholes for the mid-Castle Hayne aquifer monitoring wells were advanced to a target depth of approximately 70 ft bgs. Following review of the site-specific lithology, wells 35-MW30DW and 35-MW80DW were completed at depths of 65 ft bgs and well 35-MW72DW was completed at a depth of 58 ft bgs. The monitoring wells were constructed within each borehole using 2-inch ID Schedule 40 PVC riser and 5 ft of 0.010-inch slotted screen. A quartz sand filter pack was placed in the annular space between the well screen and borehole wall, from the bottom of the borehole to approximately 2 ft above the top of the well screen. Bentonite pellets were placed on top of the filter pack to form a seal approximately 6 ft thick. After hydration of the bentonite pellets, the remaining annular space of the borehole was grouted to within a few inches of the ground surface. A watertight, locking, expansion cap was installed on top of the 2-inch diameter casing. Monitoring wells 35-MW72DW and 35-MW80DW were completed at the ground surface using a permanent 8-inch diameter steel casing and a security cover set in a 2-foot square concrete pad. Monitoring well 35-MW30DW was completed above the ground surface using a steel, stick-up protective cover with concrete pad. Well completion diagrams are contained in **Appendix C.**

3.2.3 Monitoring Well Development

Each newly installed monitoring well was developed by surging with a surge block across the length of the well screen, and pumping with a submersible pump. Well development was generally achieved when the pump discharge was free of visible sediment, the water quality parameters (pH, specific conductance, and temperature) had stabilized, and the turbidity had either stabilized or was below 10 nephelometric turbidity units (NTUs). Stabilization generally occurred when pH measurements remained constant within 0.1 standard unit (SU), specific conductance varied no more than 10 percent, and the temperature was constant for three consecutive readings. If a well was pumped dry during development, the well was allowed to recover and then pumped again. All development water was containerized and handled as IDW.

3.3 Groundwater Sampling

In April 2006, water levels were measured and groundwater samples were collected from a total of 33 Site 35 monitoring wells. Twenty-two additional wells, located within the U.S. Highway 17 Bypass ROW or adjacent to Brinson Creek (accessed from the ROW), could not

be gauged or sampled in April 2006 due to access restrictions imposed by NCDOT. Consequently, a second mobilization was required, and the remaining 22 monitoring wells were gauged and sampled in June, 2006. A third mobilization occurred in August 2006, to gauge and sample three monitoring wells (35-MW81, 35-MW81IW, and 35-MW72DW) installed in early August 2006.

During the June 2006 monitoring activities, free-phase petroleum product was encountered in monitoring well 35-MW67, located northeast of Building G-480, which prevented sample collection from this well.

Groundwater sampling was conducted following low-flow purge and sample methods in accordance with CH2M HILL and Navy CLEAN SOPs. Prior to sampling, new, disposable polyethylene (PE) tubing was advanced down each monitoring well to the middle of the screened interval and groundwater was purged at a low flow rate (between 0.1 and 0.5 liters per minute) using a peristaltic pump. New PE tubing was used to collect each sample and was replaced after each use. During the monitoring well purging activities, water quality parameters, including pH, specific conductance, temperature, dissolved oxygen (DO), oxidation-reduction potential (ORP) and turbidity were measured. Groundwater samples were collected after field parameters had stabilized over three consecutive readings and at least one well volume had been purged from each well. Once collected in appropriately labeled containers, groundwater samples were immediately packed on ice in coolers. Samples were shipped under chain of custody control via overnight courier to Mitkem Laboratory of Warwick, Rhode Island, an NCDENR-approved laboratory, for analysis. Groundwater samples remained in the presence of a CH2M HILL project representative until delivered to the courier.

Groundwater samples collected from all Site 35 monitoring wells were submitted to the laboratory for analysis of VOCs and NAIPs, including alkalinity, chloride, nitrate, nitrite, sulfate, sulfide, TOC, ferrous iron, ferric iron and dissolved gases (methane, ethane, and ethene). **Table 3-3** presents a summary of the monitoring wells sampled and the corresponding analyses.

3.4 Aquifer Testing

Following installation of the new monitoring wells, aquifer testing was completed by CH2M HILL in accordance with Master Project Plans (CH2M HILL, 2005a). On August 6, 2006, rising head slug tests were performed on three upper Castle Hayne aquifer groundwater monitoring wells (35-MW30IW, 35-MW37IW, and 35-MW81IW) and three mid-Castle Hayne aquifer groundwater monitoring wells (35-MW01DW, 35-MW30DW, and 35-MW80DW). The SRI slug test results from the upper Castle Hayne aquifer monitoring wells were compared to data from slug tests conducted on four upper Castle Hayne aquifer aquifer wells constructed in the median of the U.S. Highway 17 Bypass in March 2004 as part of the pilot study.

The resulting data from these tests was used to calculate hydraulic conductivity following the Bouwer and Rice method. Hydraulic conductivities were generally similar within Castle Hayne aquifer; the upper Castle Hayne aquifer ranged from 1.9 to 7.1 feet per day (ft/day)

with a geometric mean of 4.3 ft/day, while the hydraulic conductivity in the mid-Castle Hayne aquifer ranged from 0.4 to 12.5 ft/day with a geometric mean of 3.2 ft/day.

Hydraulic conductivities calculated in the upper Castle Hayne aquifer during SRI activities were also generally similar to those calculated during pilot test activities. According to the March 2004 data, hydraulic conductivities in the upper Castle Hayne aquifer ranged from 1.9 to 3.4 ft/day with a geometric mean of 2.6 ft/day.

3.5 Investigation-derived Waste Management

CH2M HILL coordinated with the Shaw Group (Remedial Action Contract (RAC) Contractor), the Base subcontractor for IDW management, for the supply of all IDW containers as well as disposal of the filled containers. All solid IDW generated during the Site 35 SRI field investigation was containerized in Department of Transportation (DOT)-approved 55-gallon steel drums. Liquid IDW was placed in a storage tank, and emptied by vacuum truck, or in DOT-approved 55-gallon steel drums (depending on the work area and quantity). Personal protective equipment (PPE), soil cuttings, drilling fluids, and other liquids were containerized separately. After each field event, CH2M HILL coordinated with the Shaw Group for disposal of IDW.

During the June 2006 groundwater sampling event, CH2M HILL coordinated with the RAC Contractor on a daily basis due to NCDOT restrictions. All IDW drums were removed from the U.S. Highway 17 Bypass ROW at the end of each work day.

3.6 Site Survey

All newly-installed monitoring wells and four previously installed monitoring wells (35-MW02, 35-MW06, 35-MW38, and 35-MW38IW) were surveyed in October 2006. The locations were referenced both horizontally and vertically to permanent land monuments or a grid system. The survey controls were tied to the North American Datum (NAD) of 1983 and the North American Vertical Datum (NAVD) of 1988. Ground surface and monitoring well top of casing vertical control were surveyed to the nearest 0.01 ft, and the horizontal control was to the nearest 0.10 ft. Each monitoring well top of casing was notched or otherwise marked to identify a constant measuring point for measuring depths to groundwater to determine groundwater elevations.

TABLE 3-1
Analytical Parameters and Reporting Limits
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Analyte	Reporting Limit		
	DPT GW Sampling October 2005 (µg/L)	DPT GW Sampling Jan/Feb 2006 (µg/L)	MW Sampling April/June/August 2006 (µg/L)
Method	**8260B**	**8260B**	**8260B**
Volatile Organic Compounds (µg/L)			
1,1,1-Trichloroethane	1	0.5	0.5
1,1,2,2-Tetrachloroethane	1	0.5	0.5
1,1,2-Trichloro-1,2,2-trifluoroethane	1	0.5	0.5
1,1,2-Trichloroethane	1	0.5	0.5
1,1-Dichloroethane	1	0.5	0.5
1,1-Dichloroethene	1	0.5	0.5
1,2,3-Trichlorobenzene	1	NA	0.5
1,2,4-Trichlorobenzene	1	0.5	0.5
1,2-Dibromo-3-chloropropane	5	0.5	0.5
1,2-Dibromoethane	1	0.5	0.5
1,2-Dichlorobenzene	1	0.5	0.5
1,2-Dichloroethane	1	0.5	0.5
1,2-Dichloropropane	1	0.5	0.5
1,3-Dichlorobenzene	1	0.5	0.5
1,4-Dichlorobenzene	1	0.5	0.5
2-Butanone	25	2.5	5
2-Hexanone	5	2.5	5
4-Methyl-2-pentanone	5	2.5	5
Acetone	5	0.5	5
Benzene	1	0.5	0.5
Bromochloromethane	NA	NA	0.5
Bromodichloromethane	1	0.5	0.5
Bromoform	1	0.5	0.5
Bromomethane	1	0.5	0.5
Carbon disulfide	1	0.5	0.5
Carbon tetrachloride	1	0.5	0.5
Chlorobenzene	1	0.5	0.5
Chloroethane	1	0.5	0.5
Chloroform	1	0.5	0.5
Chloromethane	1	0.5	0.5
cis-1,2-Dichloroethene	1	0.5	0.5
cis-1,3-Dichloropropene	1	0.5	0.5
Cumene	1	0.5	NA
Cyclohexane	1	0.5	0.5
Dibromochloromethane	1	0.5	0.5
Dichlorodifluoromethane	5	0.5	0.5
Ethane	NA	NA	26
Ethene	NA	NA	35
Ethylbenzene	1	0.5	0.5
Freon 113	1	NA	NA
Isopropylbenzene	NA	NA	0.5

TABLE 3-1
Analytical Parameters and Reporting Limits
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Analyte	Reporting Limit		
	DPT GW Sampling October 2005 (µg/L)	**DPT GW Sampling Jan/Feb 2006 (µg/L)**	**MW Sampling April/June/August 2006 (µg/L)**
Method	**8260B**	**8260B**	**8260B**
m- and p-Xylene	2	1	NA
Methane	NA	NA	14
Methyl acetate	1	0.5	0.5
Methyl tert-butyl ether	1	0.5	0.5
Methylcyclohexane	1	0.5	0.5
Methylene chloride	5	0.5	0.5
o-Xylene	1	0.5	NA
Styrene	1	0.5	0.5
Tetrachloroethene	1	0.5	0.5
Toluene	1	0.5	0.5
trans-1,2-Dichloroethene	1	0.5	0.5
trans-1,3-Dichloropropene	1	0.5	0.5
Trichloroethene	1	0.5	0.5
Trichlorofluoromethane	1	0.5	0.5
Vinyl chloride	1	0.5	0.5
Xylene (total)	NA	0.5	NA
Total Metals (µg/L)			
Method	**--**	**--**	**6010B**
Iron	NA	NA	200
Wet Chemistry (mg/L)			
Alkalinity, Total (As CaCO3)	NA	NA	20
Chloride	NA	NA	2
Ferric Iron	NA	NA	10
Ferrous Iron	NA	NA	1
Nitrogen, Nitrate (As N)	NA	NA	0.13
Nitrogen, Nitrite (As N)	NA	NA	0.13
Organic Carbon, Total	NA	NA	10
Sulfate	NA	NA	0.03
Sulfide	NA	NA	0.03

DPT- Direct Push Technology
MW - Monitoring Well
NA - Not Available
GW-Groundwater

TABLE 3-2
Summary of Permanent Monitoring Well Construction Details
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Well Identification	**Year Installed**	**Top of Casing Elevation** (feet msl)	**Ground Surface Elevation** (feet msl)	**Well Depth** (feet bgs)	**Screened Interval** (feet bgs)
IR35-MW01DW	1994	19.95	18	61	56 to 60
IR35-MW02*	1992	16.21	16.25	20	5 to 20
IR35-MW03DW	1994	19.03	16.7	65	60 to 64
IR35-MW04	1994	20.52	18.4	13	3 to 13
IR35-MW06*	1994	18.14	16.28	13	3 to 13
IR35-MW06DW	1996	17.57	17.8	69	63 to 68
IR35-MW07DW	1996	9.41	7.30	51.5	46 to 51
IR35-MW09	1991	18.88	16.9	13	3.5 to 12.5
IR35-MW09IW	1991	18.88	16.9	30	25.5 to 29.5
IR35-MW10	1991	19.01	16.6	14	4.5 to 13.5
IR35-MW10IW	1991	19.01	16.6	30	25.5 to 29.5
IR35-MW14	1991	17.73	15.3	13	3.5 to 12.5
IR35-MW14IW	1991	17.73	15.3	29	24.5 to 28.5
IR35-MW29	1994	20.62	18.6	16	6 to 15
IR35-MW29IW	1994	20.28	18.5	47	42 to 46
IR35-MW30	1994	18.38	16.3	16	6 to 15
IR35-MW30IW	1994	18.38	16.2	42	37 to 41
IR35-MW30DW*	2006	16.94	15.25	65	60 to 65
IR35-MW31	1994	18.32	16.4	13	3 to 12
IR35-MW31IW	1994	18.46	16.4	42	37.5 to 41.5
IR35-MW32	1994	18.23	16.1	14	4 to 13
IR35-MW32IW	1994	18.75	16.1	42	37 to 41
IR35-MW34	1994	16.77	14.7	14	4 to 13
IR35-MW34IW	1994	16.76	14.8	41	36 to 40
IR35-MW37	1994	20.30	18.3	15	5 to 14
IR35-MW37IW	1994	20.33	18.3	45	40 to 44
IR35-MW38*	1994	18.64	17.24	15	5 to 14
IR35-MW38IW*	1995	18.9	17.26	44	39.5 to 43.5
IR35-MW39IW	1996	18.03	19.1	47	40 to 45
IR35-MW40IW	1996	17.59	17.8	47	40 to 45
IR35-MW41IW	1996	16.43	16.7	47	40 to 45
IR35-MW42IW	1996	15.12	15.2	40	35 to 40
IR35-MW43IW	1996	15.01	15.30	42	35 to 40
IR35-MW47	1998	5.49	2.6	15	5 to 15
IR35-MW47IW	1998	5.77	2.8	34	26 to 31.5
IR35-MW49	Unknown	4.99	2.4	13	2 to 12

TABLE 3-2
Summary of Permanent Monitoring Well Construction Details
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Well Identification	**Year Installed**	**Top of Casing Elevation** (feet msl)	**Ground Surface Elevation** (feet msl)	**Well Depth** (feet bgs)	**Screened Interval** (feet bgs)
IR35-MW49IW	Unknown	4.98	2.3	36	26 to 36
IR35-MW55	1998	6.25	2.3	12	7 to 12
IR35-MW55IW	1998	6.09	2.9	27	21 to 26
IR35-MW60	1996	10.08	7.6	20	9 to 19
IR35-MW60IW	1996	9.59	7.1	36	30 to 35
IR35-MW62	1998	4.49	1.9	13	3 to 13
IR35-MW63IW	1998	5.30	2	30	25 to 30
IR35-MW64IW	1998	4.80	1.4	30	25 to 30
IR35-MW66	1998	15.66	15.88	16	6 to 16
IR35-MW67	1998	15.28	15.64	15	5 to 15
IR35-MW68IW	1998	15.86	16.32	43	38 to 43
IR35-MW69IW	1998	19.83	17.08	44	39 to 44
IR35-MW70IW	1998	19.26	19.42	46	41 to 46
IR35-MW71IW	1998	12.70	13.01	43	38 to 43
IR35-MW72	2002	17.42	17.8	19	9 to 19
IR35-MW72IW	2002	17.19	17.8	46	40 to 45
IR35-MW72DW*	2006	11	11.46	58	53 to 58
IR35-MW73	2002	17.71	18.1	21	11 to 21
IR35-MW73IW	2002	17.77	18.2	48	43 to 48
IR35-MW74	2002	17.06	17.4	18	8.5 to 18.5
IR35-MW74IW	2002	17.32	17	44	39 to 44
IR35-MW80IW*	2006	14.62	14.86	51	45 to 50
IR35-MW80DW*	2006	14.82	15.04	65	60 to 65
IR35-MW81*	2006	16.34	16.6	25	20 to 25
IR35-MW81IW*	2006	16.38	16.55	48	42.5 to 47.5
IR35-PW28	1992	14.81	NM	25.0	5.5 to 24.5

NM - Not surveyed
*Newly surveyed wells (October 2006)
msl - mean sea level
bgs - below ground surface

TABLE 3-3
Groundwater Samples and Parameters Analyzed
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

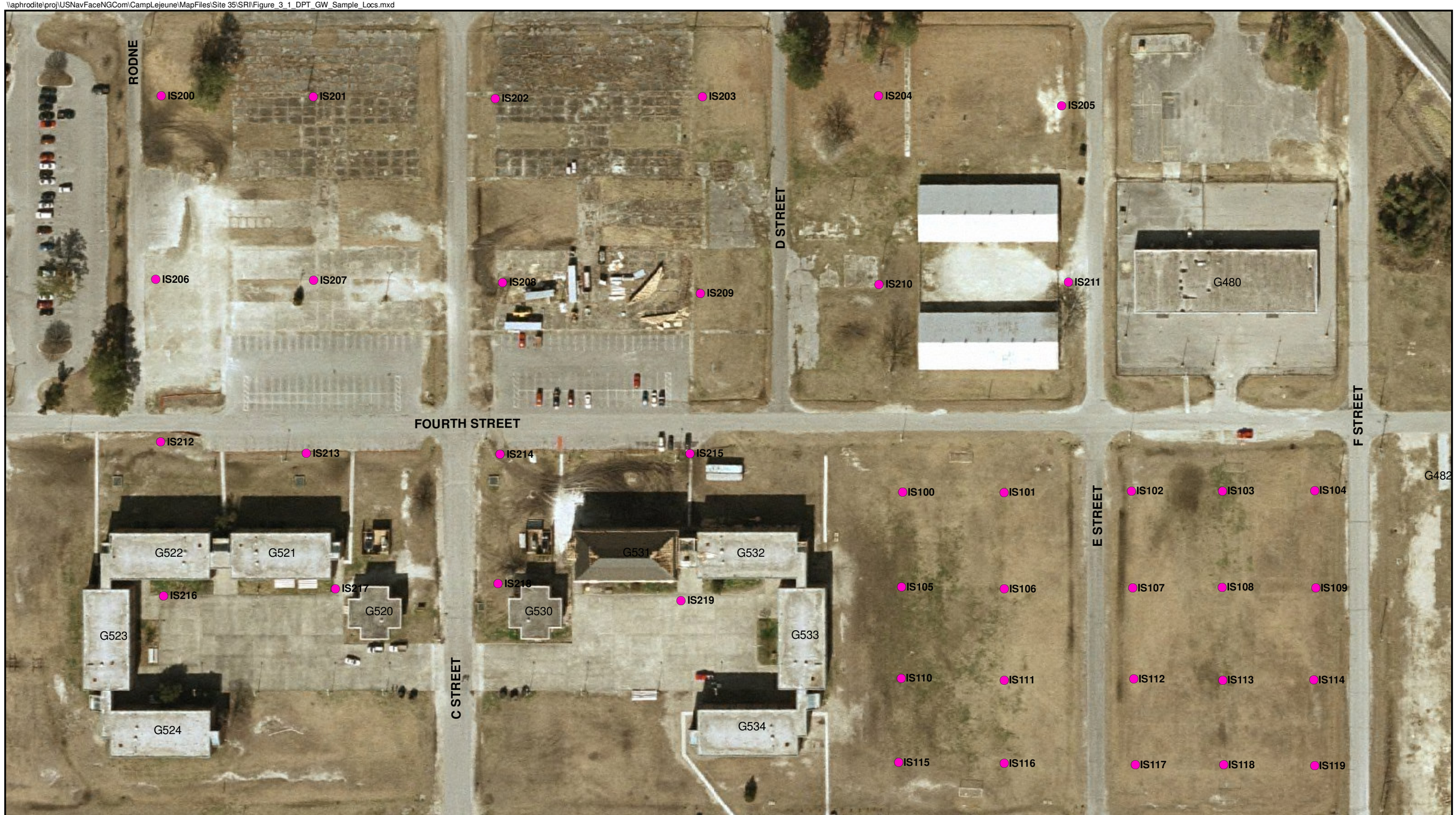
Well ID	Sample ID	TCL VOCs (EPA Method 8260B)	Alkalinity (310.1)	Chloride, Nitrate, Nitrite, and Sulfate (300.0)	Ferrous/Ferric Iron (SM 3500 Fe-D)	Methane, Ethane, and Ethene (RSK-175)	Sulfide (376.1)	Total Organic Carbon (9060)
IR35-MW01DW	IR35-GW01DW-06B	X	X	X	X	X	X	X
IR35-MW02	IR35-GW02-06B	X	X	X	X	X	X	X
IR35-MW03DW	IR35-GW03DW-06B	X	X	X	X	X	X	X
IR35-MW04	IR35-GW04-06B	X	X	X	X	X	X	X
IR35-MW06	IR35-GW06-06B	X	X	X	X	X	X	X
IR35-MW06DW	IR35-GW06DW-06B	X	X	X	X	X	X	X
IR35-MW07DW	IR35-GW07DW-06B	X	X	X	X	X	X	X
IR35-MW09	IR35-GW09-06B	X	X	X	X	X	X	X
IR35-MW09IW	IR35-GW09IW-06B	X	X	X	X	X	X	X
IR35-MW10	IR35-GW10-06B	X	X	X	X	X	X	X
IR35-MW10IW	IR35-GW10IW-06B	X	X	X	X	X	X	X
IR35-MW14	IR35-GW14-06B	X	X	X	X	X	X	X
IR35-MW14IW	IR35-GW14IW-06B	X	X	X	X	X	X	X
IR35-MW29	IR35-GW29-06B	X	X	X	X	X	X	X
IR35-MW29IW	IR35-GW29IW-06B	X	X	X	X	X	X	X
IR35-MW30	IR35-GW30-06B	X	X	X	X	X	X	X
IR35-MW30IW	IR35-GW30IW-06B	X	X	X	X	X	X	X
IR35-MW30DW	IR35-GW30DW-06B	X	X	X	X	X	X	X
IR35-MW31	IR35-GW31-06B	X	X	X	X	X	X	X
IR35-MW31IW	IR35-GW31IW-06B	X	X	X	X	X	X	X
IR35-MW32	IR35-GW32-06B	X	X	X	X	X	X	X
IR35-MW32IW	IR35-GW32IW-06B	X	X	X	X	X	X	X
IR35-MW34	IR35-GW34-06B	X	X	X	X	X	X	X
IR35-MW34IW	IR35-GW34IW-06B	X	X	X	X	X	X	X
IR35-MW37	IR35-GW37-06B	X	X	X	X	X	X	X
IR35-MW37IW	IR35-GW37IW-06B	X	X	X	X	X	X	X
IR35-MW38	IR35-GW38-06B	X	X	X	X	X	X	X
IR35-MW38IW	IR35-GW38IW-06B	X	X	X	X	X	X	X
IR35-MW39IW	IR35-GW39IW-06B	X	X	X	X	X	X	X
IR35-MW40IW	IR35-GW40IW-06B	X	X	X	X	X	X	X
IR35-MW47	IR35-GW47-06B	X	X	X	X	X	X	X
IR35-MW47IW	IR35-GW47IW-06B	X	X	X	X	X	X	X

TABLE 3-3
Groundwater Samples and Parameters Analyzed
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Well ID	Sample ID	TCL VOCs (EPA Method 8260B)	Alkalinity (310.1)	Chloride, Nitrate, Nitrite, and Sulfate (300.0)	Ferrous/Ferric Iron (SM 3500 Fe-D)	Methane, Ethane, and Ethene (RSK-175)	Sulfide (376.1)	Total Organic Carbon (9060)
IR35-MW49	IR35-GW49-06B	X	X	X	X	X	X	X
IR35-MW49IW	IR35-GW49IW-06B	X	X	X	X	X	X	X
IR35-MW55	IR35-GW55-06B	X	X	X	X	X	X	X
IR35-MW55IW	IR35-GW55IW-06B	X	X	X	X	X	X	X
IR35-MW60	IR35-GW60-06B	X	X	X	X	X	X	X
IR35-MW60IW	IR35-GW60IW-06B	X	X	X	X	X	X	X
IR35-MW62	IR35-GW62-06B	X	X	X	X	X	X	X
IR35-MW63IW	IR35-GW63IW-06B	X	X	X	X	X	X	X
IR35-MW64IW	IR35-GW64IW-06B	X	X	X	X	X	X	X
IR35-MW66	IR35-GW66-06B	X	X	X	X	X	X	X
IR35-MW68IW	IR35-GW68IW-06B	X	X	X	X	X	X	X
IR35-MW69IW	IR35-GW69IW-06B	X	X	X	X	X	X	X
IR35-MW70IW	IR35-GW70IW-06B	X	X	X	X	X	X	X
IR35-MW71IW	IR35-GW71IW-06B	X	X	X	X	X	X	X
IR35-MW72	IR35-GW72-06B	X	X	X	X	X	X	X
IR35-MW72IW	IR35-GW72IW-06B	X	X	X	X	X	X	X
IR35-MW72DW	IR35-GW72DW-06B	X	X	X	X	X	X	X
IR35-MW73	IR35-GW73-06B	X	X	X	X	X	X	X
IR35-MW73IW	IR35-GW73IW-06B	X	X	X	X	X	X	X
IR35-MW74	IR35-GW74-06B	X	X	X	X	X	X	X
IR35-MW74IW	IR35-GW74IW-06B	X	X	X	X	X	X	X
IR35-MW80IW	IR35-GW80IW-06B	X	X	X	X	X	X	X
IR35-MW80DW	IR35-GW80DW-06B	X	X	X	X	X	X	X
IR35-MW81	IR35-GW81-06B	X	X	X	X	X	X	X
IR35-MW81IW	IR35-GW81IW-06B	X	X	X	X	X	X	X

Note:
TCL VOC - Target Compound List Volatile Organic Compound
A sample was not collected from IR35-MW67 due to the presence of LNAPL.

\\aphrodite\proj\USNavFaceNGCom\CampLejeune\MapFiles\Site 35\SRI\Figure_3_1_DPT_GW_Sample_Locs.mxd



Legend

- DPT Sample Location

Note:
- IS100-IS119 were sampled in October 2005
- IS200-IS219 were sampled in February 2006

N

0 100 200 Feet

1 inch equals 100 feet

Figure 3-1
DPT Groundwater Sample Locations
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

CH2MHILL

SECTION 4

Physical Characteristics

The following sections describe the physical characteristics of the region, MCB Camp Lejeune, and Site 35 in particular. The majority of the following sections are based on prior knowledge of conditions at the Base, but have been modified to incorporate the findings from SRI field activities that are discussed in Section 3.

4.1 Regional and Facility-wide Physiography, Climate, and Surface Water Hydrology

As shown on **Figure 4-1**, the MCB Camp Lejeune facility lies within the Atlantic Coastal Plain Physiographic Province of North Carolina, which stretches from Georgia to Long Island, New York. The physiography of the area is typical of the Atlantic Coastal Plain with stepped terraces consisting of wide, gently eastward-sloping plains separated by linear, steeper, northward and eastward-facing scarps. Low elevations and relatively low relief characterize topography across MCB Camp Lejeune and the general vicinity of Site 35. Ground surface elevations range from sea level to approximately 70 ft above msl with most of MCB Camp Lejeune's elevation ranging from 20 to 40 ft above msl.

The New River and its tributaries bisect MCB Camp Lejeune. The land at MCB Camp Lejeune generally slopes toward the New River with a grade of about 0.5 percent. The relief between stream and interstream areas typically ranges from 20 to 30 ft. Site 35 is located within an interstream area and has little topographic relief except on the northeastern edge of the Site where the ground surface slopes down toward Brinson Creek. The natural slope of the land has been disrupted by the construction of the U.S. Highway 17 Bypass, which crosses through the northeast portion of the Site. Brinson Creek forms the eastern Site boundary and eventually flows into the New River. The surficial soils at Site 35 are classified as Baymeade-Urban land complex. These soils are described by the Soil Conservation Service (SCS) as having rapid drainage and slow runoff (USDA, 1992).

Mild winters and hot humid summers generally characterize climatic conditions within southeastern North Carolina and at MCB Camp Lejeune. Winters are usually short and mild with occasional short, cold periods. Summers are long, hot and humid. Average annual net precipitation is approximately 50 inches. Ambient air temperatures generally range from 33 to 53 degrees Fahrenheit (°F) in the winter months, and 71°F to 88°F during the summer months. Winds are generally south-southwesterly in the summer, and north-northwesterly in the winter (WAR, 1983).

4.2 Site 35 Topography, Drainage, and Surface Features

Site 35 is located in the northeast corner of Camp Geiger, which is located in the far northwest portion of MCB Camp Lejeune. Ground surface elevation for the developed area of Site 35 generally ranges from 14 to 18 ft above msl. Construction of the U.S. Highway 17

Bypass required raising the roadbed, so the natural topography of the Site has been disrupted. The wooded portion of the Site east of the Bypass slopes toward Brinson Creek, with a ground surface elevation generally ranging from 1 to 6 feet above msl. The hydrologic features of Site 35 are shown on **Figure 4-2**.The surface of Site 35 is covered with a mix of vegetation, asphalt roadways, concrete, and buildings. The eastern portion of the Site adjacent to Brinson Creek is heavily wooded. An armory occupies Building G480 with additional armory operations in Buildings TC341 and TC342. Several warehouses, general storage buildings and troop barracks also occupy the area.

A stormwater collection system serves Site 35 and the vicinity. Stormwater is conveyed via manmade drainage ditches, storm drains, and catch basins, discharges into Brinson Creek and its tributaries, and then flows southeast into the New River (Baker, 1995a). Relatively high runoff and low infiltration rates are expected in the vicinity of the buildings, parking lots, and roadways; however, higher rates of infiltration are expected in the grass-covered and wooded areas.

4.3 Geology and Hydrogeology

4.3.1 General Regional Geologic and Hydrogeologic Framework

Southeastern North Carolina and MCB Camp Lejeune are within the Tidewater region of the Atlantic Coastal Plain physiographic province. The Tidewater region is defined by low relief, with elevations averaging about 20 ft above msl and is generally swampy.

The MCB Camp Lejeune area is underlain by an eastward thickening wedge of marine and non-marine sediments ranging in age from early Cretaceous to Holocene. The eastward thickening wedge of sediment begins at the Fall Line (western boundary of Atlantic Coastal Plain physiographic province) and dips southeastward towards the coast. Along the coastline, several thousands of feet of interlayered, unconsolidated sediment are present consisting of gravel, sand, silt, clay deposits, calcareous clays, shell beds, with occasional beds of sandstone and limestone, that was deposited upon pre-Cretaceous crystalline basement rock. Minor amounts of detrital carbonate shells, and secondary minerals such as glauconite, siderite, and chlorite, often distinguish these sedimentary units.

Historical Coastal Plain sedimentation and deposition was controlled by fluctuations in sea level on a subsiding continental margin in marine and near-shore environments (Winner and Coble, 1989). Confining units associated with specific aquifers within the Coastal Plain region are composed of less permeable beds of clay and silt. Within the MCB Camp Lejeune area, approximately 1,500 ft of a sedimentary sequence that overlies the basement rock compose seven aquifers and their associated confining units, and include the Surficial, Castle Hayne, Beaufort, Peedee, Black Creek, and Upper and Lower Cape Fear aquifers (Cardinell, Berg, and Lloyd, 1993). Hydrostratigraphic units of the North Carolina Coastal Plain are presented in **Table 4-1.**

Recharge of aquifers within the Coastal Plain region generally occurs within interstream areas. Recharge to the aquifers has been estimated in the range of 5 to 21 inches of rainfall yearly (Heath, 1989). Natural discharge of groundwater from the Coastal Plain aquifer system is generally into streams, swamps, and lakes. Evapotranspiration from the soil zone and upward leakage through confining units into streams, estuaries, swamps, and even the

ocean also contribute to groundwater discharge. The New River estuary serves as the principal discharge area for groundwater from the Castle Hayne aquifer within the vicinity of MCB Camp Lejeune (Harned, Lloyd, and Treece., 1989).

4.3.2 Site-Specific Geologic and Hydrogeologic Framework

This section presents the geological and hydrogeological characteristics of Site 35 based on SRI field activities and the results of previous investigations. **Figure 4-3** illustrates the locations of geologic cross-section locations presented on **Figures 4-4** and **4-5**. These interpretations are based largely on field information collected by Baker and supplemented with field information collected by CH2M HILL.

Site Geology

The regional stratigraphic framework of the Lower Coastal Plain in North Carolina is shown by **Table 4-1**. According to Cardinell, Berg, and Lloyd (1993), three of the upper Tertiary Formations (Yorktown, Eastover, and Pungo River) shown on **Table 4-1** are not present in the vicinity of MCB Camp Lejeune. Cardinell, Berg, and Lloyd postulated that the New River may have eroded the Belgrade Fm. locally at MCB Camp Lejeune, although it is observed at Site 35. Its existence can be attributed to the upriver location of Site 35 where migrations of the New River had less impact on erosion. Specific geologic correlations of soils logged during monitoring well installations in addition to information from Cardinell, Berg, and Lloyd referencing well T-15, at the intersection of Second and 'C' Streets, were used to identify formations in the vicinity of Site 35.

Within the vicinity of Site 35, the uppermost Undifferentiated Fm. of Holocene and Pleistocene age sediments consist of mostly fine-to-medium grained, medium dense sands with a lesser amount of silt and clay, present at depths of 0 to 30 ft bgs. Thin, 0.1- to 0.5-ft thick, discontinuous lenses of silt and clay are found within the Undifferentiated Fm. The Belgrade Fm. Consists of sandy silt and lies directly beneath the Undifferentiated Fm., with an approximate thickness of is 7 ft.

The Oligocene age River Bend Fm. underlies the Belgrade Fm. (where present), and is composed of sands, silt, shell and fossil fragments, and trace amounts of clay. Sands tend to be cemented within this Fm. The amount of shell fragments within this Fm. decreases with depth down to approximately 55 to 65 ft bgs, where a greenish-gray to olive very fine sand to silt is present. This greenish, very fine sand-silt layer is noted by a decrease in moisture content. Below this layer the composition of the River Bend Fm. changes to a fine to medium grained sand with trace amounts of silts and shells. The River Bend Fm. overlies the Eocene age Castle Hayne Fm.

Cross-section A-A′ (**Figure 4-4**) trends from the southwest to the northeast and crosses the central portion of Site 35 including a portion of Camp Geiger, U.S. Highway 17 Bypass, and Brinson Creek, ending at an offsite well cluster. The Undifferentiated Fm. varies in thickness across cross-section A-A′. Since it exhibits little lithologic difference with respect to portions of the upper River Bend Fm., its thickness is estimated at 0 to 10 ft bgs. At the southwest side of the A-A′ cross-section the lithology of the Undifferentiated Fm. consists of mostly fine silty sand with trace amounts of clay near the surface. The Belgrade, a discontinuous, plastic, silty clay layer is present within the vicinity of Site 35 from approximately 3 to 12 ft bgs and is identified within the boring logs from nests 35-MW30, 35-MW32, and 35-MW72.

The partially cemented sands and fossil shell hash in the upper portion of the River Bend Fm., observed between 15 to 55 ft bgs, were continuous across the A-A′ cross-section. The fossil layer is an identifying characteristic of the River Bend Fm. (Cardinell, Berg, and Lloyd, 1993). A light greenish-gray, fine silty sand layer, with a lower moisture content than the cemented sand layers above and below it, was continuous at 40 to 55 ft bgs throughout the A-A′ section. An olive green-gray silty-sand layer was observed below 65 ft bgs.

Cross-section B-B′ (**Figure 4-5**) trends from the north-northwest to the south-southeast from a point north of Third Street, passes to the west of the armory (Building G480) and continues across the open field area east of Building G533 and to the southeast to the monitoring well cluster including IR35-MW06DW. The Undifferentiated Fm. consisted of silty sands near the surface. The Belgrade Fm., was identified as a discontinuous plastic, silty clay layer observed in the borings for monitoring wells 35-MW09IW to 35-MW06DW. The partially cemented sands and fossil shell hash in the upper portion of the River Bend Fm., observed between 15 to 60 feet bgs, were continuous across the B-B′ cross section. A generally continuous olive to greenish gray, silty sand layer is present at a depth of approximately 68 to 70 ft bgs and below along the B-B′ section.

Site Hydrogeology

Table 4-1 provides the hydrostratigraphic framework for the North Carolina Coastal Plain. The Surficial aquifer (Undifferentiated Fm.), Castle Hayne confining unit (Belgrade Fm.), and the Castle Hayne aquifer (River Bend and Castle Hayne Fm.) have all been described at MCB Camp Lejeune (Cardinell, Berg, and Lloyd, 1993).

The Castle Hayne confining unit, represented by the lower Belgrade Fm., appears to be laterally discontinuous and only provides semi-confining conditions to the Castle Hayne aquifer at Site 35. The lateral discontinuity of the Belgrade Fm. within the study area enables hydraulic communication and a downward vertical gradient between the Surficial aquifer and the Castle Hayne aquifer. The lower extent of the Castle Hayne aquifer is bounded by the Beaufort confining unit at a depth of approximately 180 to 200 feet bgs.

Depth to water measurements collected during the June 2006 gauging event were converted to water level elevations using top-of-casing elevation survey data (**Table 4-2).** The water level elevations within the unconfined Surficial aquifer during the June 2006 gauging event ranged from approximately sea level (35-MW62) to 13.21 ft above msl (35-MW38). In general, the groundwater flow direction within the Surficial aquifer is to the northeast towards Brinson Creek. A potentiometric surface map of the Surficial aquifer is shown on **Figure 4-6**. The horizontal hydraulic gradient in June 2006 within the Surficial aquifer ranged from approximately 0.003 feet per foot (ft/ft) between wells 35-MW37 and 35-MW09, located in the northwest portion of the Site, to approximately 0.018 ft/ft closer to Brinson Creek between wells 35-MW72 and 35-MW55.

During the June 2006 gauging event, static water level elevations measured within the upper Castle Hayne aquifer monitoring wells (screened interval of 26 to 46 ft msl) installed within the Castle Hayne aquifer ranged from 2.04 feet msl at 35-MW60IW to 13.98 feet msl at 35-MW39IW, as shown on **Table 4-2**. **Figure 4-7** shows that the groundwater flow direction within the upper portion of the Castle Hayne aquifer was to the northeast. The horizontal hydraulic gradient within the upper portion of the Castle Hayne aquifer was

approximately 0.008 ft/ft, as calculated between wells 35-MW10IW and 35-MW14IW and between wells 35-MW68IW and 35-MW64IW.

Static water level elevations within the deep wells (screened interval of 46 to 80 ft msl) installed within the Castle Hayne aquifer ranged from 2.85 ft msl at 35-MW07DW to 11.65 ft msl at 35-MW01DW. **Figure 4-8** illustrates that the groundwater flow direction within the Castle Hayne aquifer is to the northeast. The horizontal hydraulic gradient was calculated to be approximately 0.005 ft/ft between 35-MW30DW and 35-MW80DW.

Vertical hydraulic potentials were calculated between the Surficial and upper Castle Hayne aquifer and within the Castle Hayne aquifer using the June 2006 water level data. The vertical hydraulic potential is calculated using paired wells, and by dividing the difference in water level elevations by the vertical distance between the center points of the screened intervals. In the developed area of the Site (west of and including the U.S. Highway 17 Bypass), slight downward potentials were calculated to exist between the Surficial and upper Castle Hayne aquifers. While upward potentials were estimated to exist in the wetland area adjacent to Brinson Creek. Within the Castle Hayne aquifer, slight downward potentials exist in the developed area of the Site, while an upward potential exists in the wetland area adjacent to Brinson Creek.

Hydrogeologic properties of the Surficial aquifer were previously evaluated by Baker during the RI (Baker, 1995a). CH2M HILL also conducted *in-situ* aquifer tests (slug tests) within the Castle Hayne aquifer; on March 31, 2004 during the pilot study (CH2M HILL, 2006), and on January 26, 2006 during SRI field activities. Details of the aquifer testing conducted by CH2M HILL are discussed further in Section 3.4. According to Baker, the hydraulic conductivity for the Surficial aquifer is approximately 0.63 feet per day (ft/day) (Baker, 1995a). Slug test data indicated hydraulic conductivity values for the upper Castle Hayne aquifer ranged from 1.9 ft/day to 7.1 ft/day, with an average hydraulic conductivity of 4.2 ft/day. Slug test data indicated hydraulic conductivity values for the mid-Castle Hayne aquifer ranged from 0.4 ft/day to 12.5 ft/day, with an average hydraulic conductivity of 6.5 ft/day. The shelly cemented sands within the Castle Hayne aquifer appear to provide a more conductive zone for groundwater movement as compared to the undifferentiated silty sands of the Surficial aquifer. Using effective porosity values for silts and sands in the range of 25 to 35percent (Freeze and Cherry, 1979), the seepage velocity within the Surficial aquifer was calculated to be in the range of 0.005 ft/day to 0.008 ft/day (1.8 to 2.9 feet per year [ft/year]), and a seepage velocity within the more conductive Castle Hayne aquifer was calculated to be in the range of 0.09 ft/day to 0.13 ft/day (32.9 to 47.5 ft/year).

4.3.3 Regional Water Usage

In southeastern North Carolina, the Castle Hayne aquifer may be utilized as a potable source for domestic water supply, watering lawns, or filling swimming pools. Potable water for use at MCB Camp Lejeune and the surrounding residential area is provided by public water supply wells that pump groundwater from the Castle Hayne aquifer. Although fresh water is present within the surficial, Castle Hayne, Beaufort, and Peedee aquifers, all of which are located below MCB Camp Lejeune, only the Castle Hayne aquifer is used by MCB Camp Lejeune as a water supply source (Cardinell, Berg, and Lloyd, 1993).

Based on information provided in the *Wellhead Protection Plan-2002 Update, Marine Corps Base Camp Lejeune* (AHEC, 2002), one public supply well (PSWTC-600) is located within 1,500 feet of Site 35. This well, located approximately 1,300 feet west of the Site is screened from 48 to 70 feet bgs, and was recommended for abandonment.

Immediately east of Site 35 and Brinson Creek is privately owned property which is primarily residential and farm land. According to the Onslow Water and Sewer Authority (ONWASA), properties located along Georgetown Road have been provided with municipal water service by the City of Jacksonville since the mid 1960s. In 1993, the City replaced the existing water line and extended it to the remaining streets and residences in the area.

According to ONWASA, permits are not required for the installation of domestic wells. Thus, information regarding domestic wells was not available for review. According to ONWASA, domestic supply wells were historically screened at approximately 100 feet bgs, within the Castle Hayne aquifer. According to the Environmental Health Department of the Onslow County Health Department, permits are not required for the construction of supply wells. Thus, domestic well records were not available for review.

TABLE 4-1
Hydrostratigraphic Units of the North Carolina Coastal Plain
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Geologic Units			**Hydrogeologic Units**
System	**Series**	**Formation**	**Aquifer and Confining Unit**
Quaternary	Holocene/Pleistocene	Undifferentiated	Surficial Aquifer
Tertiary	Pliocene	Pinehurst[1] Waccamaw[1]	Yorktown confining unit[1] Yorktown Aquifer[1]
	Miocene	Yorktown[1]	Yorktown Aquifer[1] Pungo River confining unit[1]
		Pungo River[1] Belgrade[2]	Pungo River Aquifer[1] Castle Hayne confining unit[3]
	Oligocene	Belgrade[2] River Bend	Castle Hayne confining unit[3] Castle Hayne Aquifer
	Eocene	Castle Hayne	Castle Hayne Aquifer

Notes:

[1] Geologic and hydrogeologic units not present beneath MCB Camp Lejeune.

[2] Constitutes part of the surficial aquifer confining unit in the study area.

[3] Intermittent lenticular pattern provides semi-confining conditions at Site 35.

Source: Modified from Harned et al., 1989.

TABLE 4-2
Groundwater Elevations from June 2006
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Well Identification	**Date** (mm/dd/yyyy)	**Depth to Water** (feet BTOC)	**TOC Elevation** (ft msl)	**Well Depth** (ft)	**Water Elevation** (ft msl)	**Well Type** (S/I/D)	**Aquifer** (S/UC/MC)
IR35-MW01DW	6/19/2006	8.30	19.95	61	11.65	Deep	Mid-Castle Hayne
IR35-MW02*	6/19/2006	5.07	16.21	20	11.14	Shallow	Surficial
IR35-MW03DW	6/19/2006	8.65	19.03	65	10.38	Deep	Mid-Castle Hayne
IR35-MW04	6/19/2006	7.58	20.52	14	12.94	Shallow	Surficial
IR35-MW06*	6/19/2006	6.56	18.14	13	11.58	Shallow	Surficial
IR35-MW06DW	6/19/2006	5.99	17.57	69	11.58	Deep	Mid-Castle Hayne
IR35-MW07DW	6/21/2006	6.56	9.41	62	2.85	Deep	Mid-Castle Hayne
IR35-MW09	6/19/2006	8.10	18.92	13	10.82	Shallow	Surficial
IR35-MW09IW	6/19/2006	8.13	18.88	30	10.75	Intermediate	Upper Castle Hayne
IR35-MW10	6/19/2006	7.70	18.99	14	11.29	Shallow	Surficial
IR35-MW10IW	6/19/2006	7.76	19.01	30	11.25	Intermediate	Upper Castle Hayne
IR35-MW14	6/19/2006	10.70	17.78	13	7.08	Shallow	Surficial
IR35-MW14IW	6/19/2006	10.70	17.73	29	7.03	Intermediate	Upper Castle Hayne
IR35-MW29	6/19/2006	8.35	20.62	16	12.27	Shallow	Surficial
IR35-MW29IW	6/19/2006	7.69	20.28	47	12.59	Intermediate	Upper Castle Hayne
IR35-MW30	6/19/2006	6.30	18.38	16	12.08	Shallow	Surficial
IR35-MW30IW	6/19/2006	6.20	18.38	42	12.18	Intermediate	Upper Castle Hayne
IR35-MW30DW*	6/19/2006	6.25	16.94	65	10.69	Deep	Mid-Castle Hayne
IR35-MW31	6/19/2006	10.18	18.32	13	8.14	Shallow	Surficial
IR35-MW31IW	6/19/2006	10.36	18.46	24	8.10	Intermediate	Upper Castle Hayne
IR35-MW32	6/19/2006	8.11	18.23	14	10.12	Shallow	Surficial
IR35-MW32IW	6/19/2006	8.90	18.75	42	9.85	Intermediate	Upper Castle Hayne
IR35-MW34	6/19/2006	6.56	16.77	14	10.21	Shallow	Surficial
IR35-MW34IW	6/19/2006	7.82	16.76	41	8.94	Intermediate	Upper Castle Hayne
IR35-MW37	6/19/2006	7.13	20.30	15	13.17	Shallow	Surficial
IR35-MW37IW	6/19/2006	7.34	20.33	45	12.99	Intermediate	Upper Castle Hayne
IR35-MW38	6/19/2006	6.53	19.74	15	13.21	Shallow	Surficial
IR35-MW38IW*	6/19/2006	6.74	18.90	44	12.16	Intermediate	Upper Castle Hayne
IR35-MW39IW	6/19/2006	4.85	18.83	47	13.98	Intermediate	Upper Castle Hayne
IR35-MW40IW	6/19/2006	5.80	17.59	47	11.79	Intermediate	Upper Castle Hayne
IR35-MW47	6/19/2006	2.80	5.49	13	2.69	Shallow	Surficial
IR35-MW47IW	6/19/2006	2.30	5.77	32	3.47	Intermediate	Upper Castle Hayne
IR35-MW49	6/19/2006	3.20	4.99	13	1.79	Shallow	Surficial
IR35-MW49IW	6/19/2006	1.60	4.98	32	3.38	Intermediate	Upper Castle Hayne
IR35-MW55	6/19/2006	2.29	6.25	12	3.96	Shallow	Surficial

TABLE 4-2
Groundwater Elevations from June 2006
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Well Identification	**Date** (mm/dd/yyyy)	**Depth to Water** (feet BTOC)	**TOC Elevation** (ft msl)	**Well Depth** (ft)	**Water Elevation** (ft msl)	**Well Type** (S/I/D)	**Aquifer** (S/UC/MC)
IR35-MW55IW	6/19/2006	3.28	6.09	32	2.81	Intermediate	Upper Castle Hayne
IR35-MW60	6/21/2006	8.06	10.08	20	2.02	Shallow	Surficial
IR35-MW60IW	6/21/2006	7.55	9.59	36	2.04	Intermediate	Upper Castle Hayne
IR35-MW62	6/19/2006	4.51	4.49	13	-0.02	Shallow	Surficial
IR35-MW63IW	6/19/2006	2.30	5.39	30	3.09	Intermediate	Upper Castle Hayne
IR35-MW64IW	6/19/2006	2.55	4.77	30	2.22	Intermediate	Upper Castle Hayne
IR35-MW66	6/19/2006	6.89	15.66	16	8.77	Shallow	Surficial
IR35-MW67	6/19/2006	-- [1]	15.28	15	-- [1]	Shallow	Surficial
IR35-MW68IW	6/19/2006	13.59	15.86	43	2.27	Intermediate	Upper Castle Hayne
IR35-MW69IW	6/19/2006	10.25	19.83	43	9.58	Intermediate	Upper Castle Hayne
IR35-MW70IW	6/19/2006	5.72	19.26	46	13.54	Intermediate	Upper Castle Hayne
IR35-MW71IW	6/19/2006	1.76	12.70	43	10.94	Intermediate	Upper Castle Hayne
IR35-MW72	6/19/2006	9.80	17.42	19	7.62	Shallow	Surficial
IR35-MW72IW	6/19/2006	10.64	17.19	46	6.55	Intermediate	Upper Castle Hayne
IR35-MW73	6/19/2006	11.65	17.71	21	6.06	Shallow	Surficial
IR35-MW73IW	6/19/2006	11.68	17.77	48	6.09	Intermediate	Upper Castle Hayne
IR35-MW74	6/19/2006	9.95	17.06	21	7.11	Shallow	Surficial
IR35-MW74IW	6/19/2006	10.22	17.32	48	7.10	Intermediate	Upper Castle Hayne
IR35-MW80IW*	6/19/2006	7.60	14.62	50	7.02	Intermediate	Upper Castle Hayne
IR35-MW80DW*	6/19/2006	8.05	14.82	77	6.77	Deep	Mid-Castle Hayne

Note:

1. Water level not collected due to the presence of LNAPL

Wells IR35-MW72DW, IR35-MW81 and IR35-MW81IW not installed at the time water levels were collected.

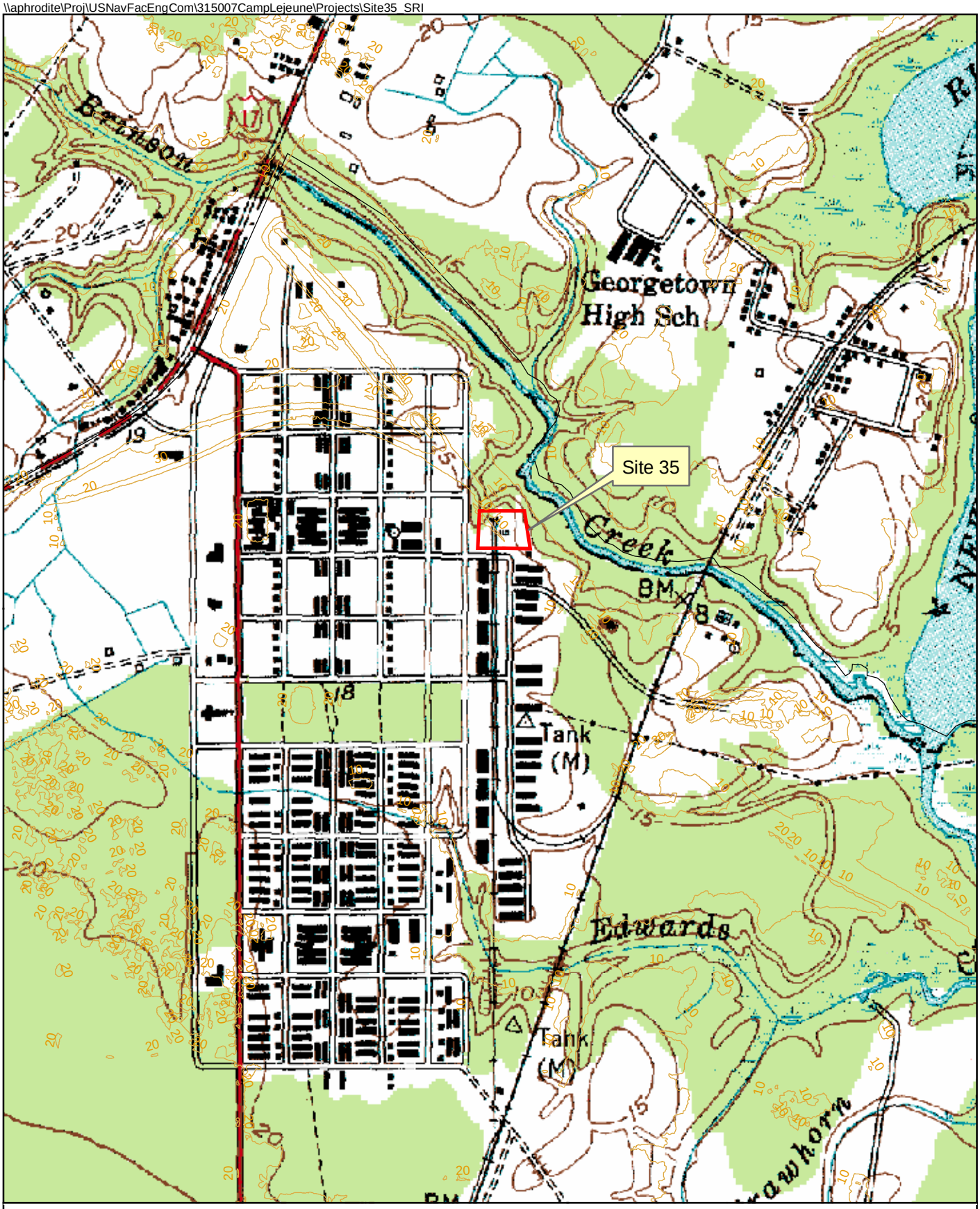
* New TOC elevation from survey conducted in October 2006

BTOC - below top of casing

ft msl - feet mean sea level

Source: USGS Report by Cardinell, A.P., S.A. Berg, and O.B. Lloyd, Jr. (1993)

Figure 4-1
Physiographic Provinces of Eastern North Carolina
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina



Legend

Site 35

Topographic Contour

USGS in Universal Trans Mercator (UTM),
North American Datum '27 (NAD 27)
Quad sheet 034077F4

N

0 1,000 2,000 Feet

1 inch equals 1,000 feet

Figure 4-2
Site 35 Hydrologic Features
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

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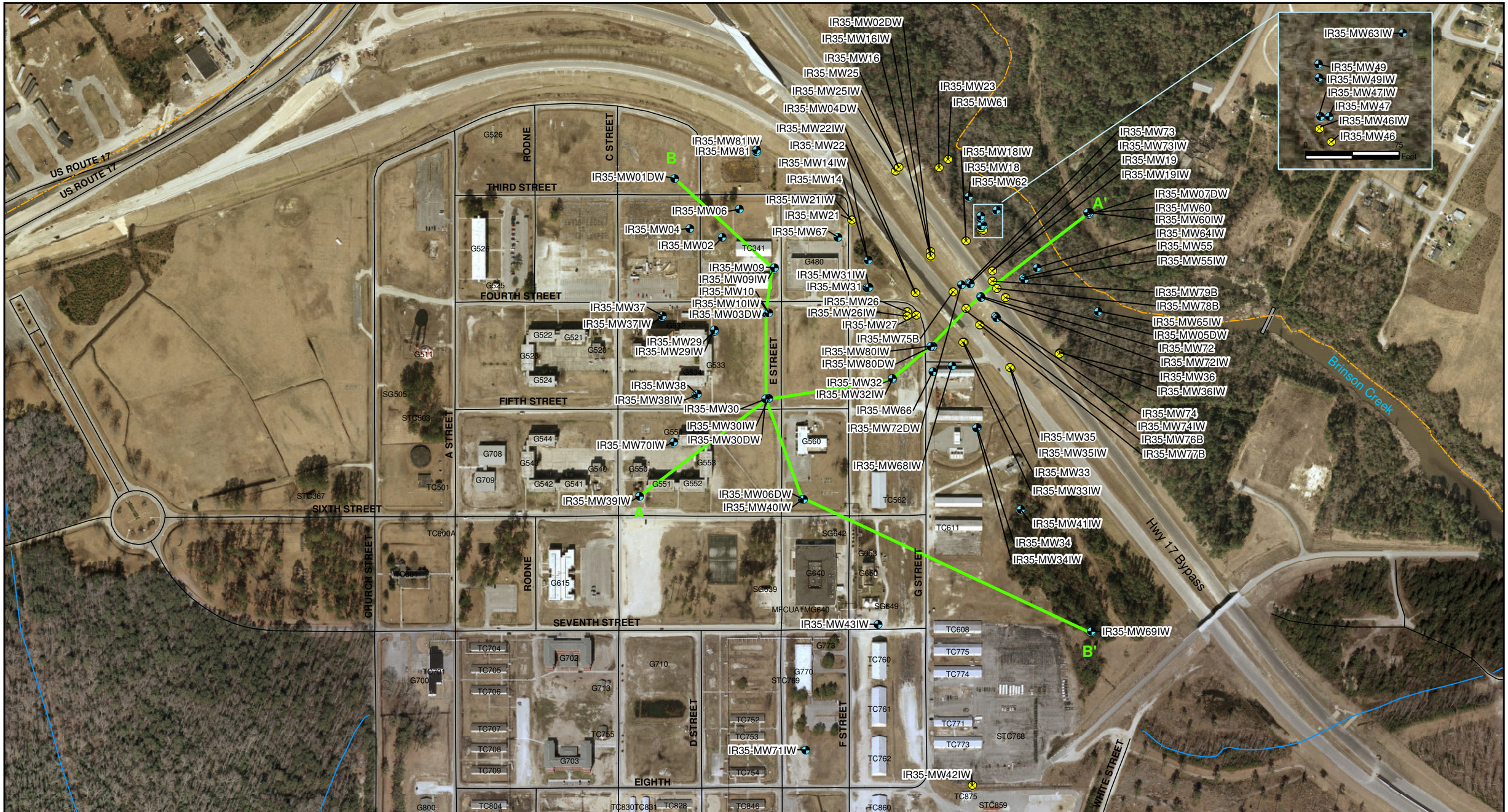
\\Ariadne\groups\GIS\USNavFaceNGCom\315007CampLejeune\Projects\Site35_SRI\Figure_4_3_Site35_CrossSectionMap_revised.mxd



Legend

- Monitoring Wells
- Abandoned Wells
- Cross Section Alignment
- Surface Water Course Centerline
- Base Boundary

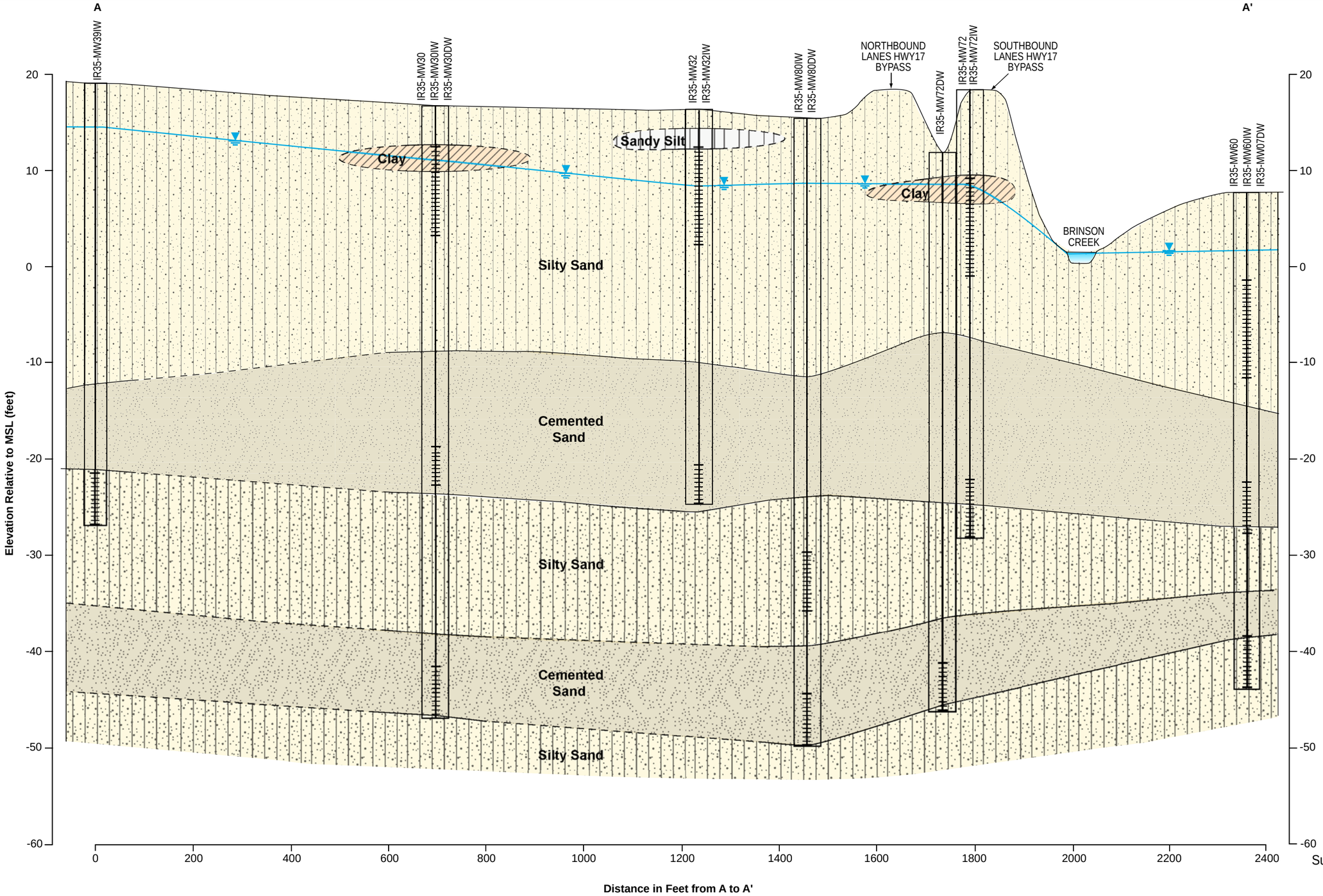
N

0 400 800 Feet

1 inch equals 400 feet

Figure 4-3
Geologic Cross-Section Location Map
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

CH2MHILL



Horizontal : 1" = 200'
Vertical: 1" = 10'
V.E. = 20x

LEGEND

- Clay
- Silty Sand
- Cemented Sand
- Sandy Silt
- Screened Interval
- Inferred geologic contact
- Water table elevation

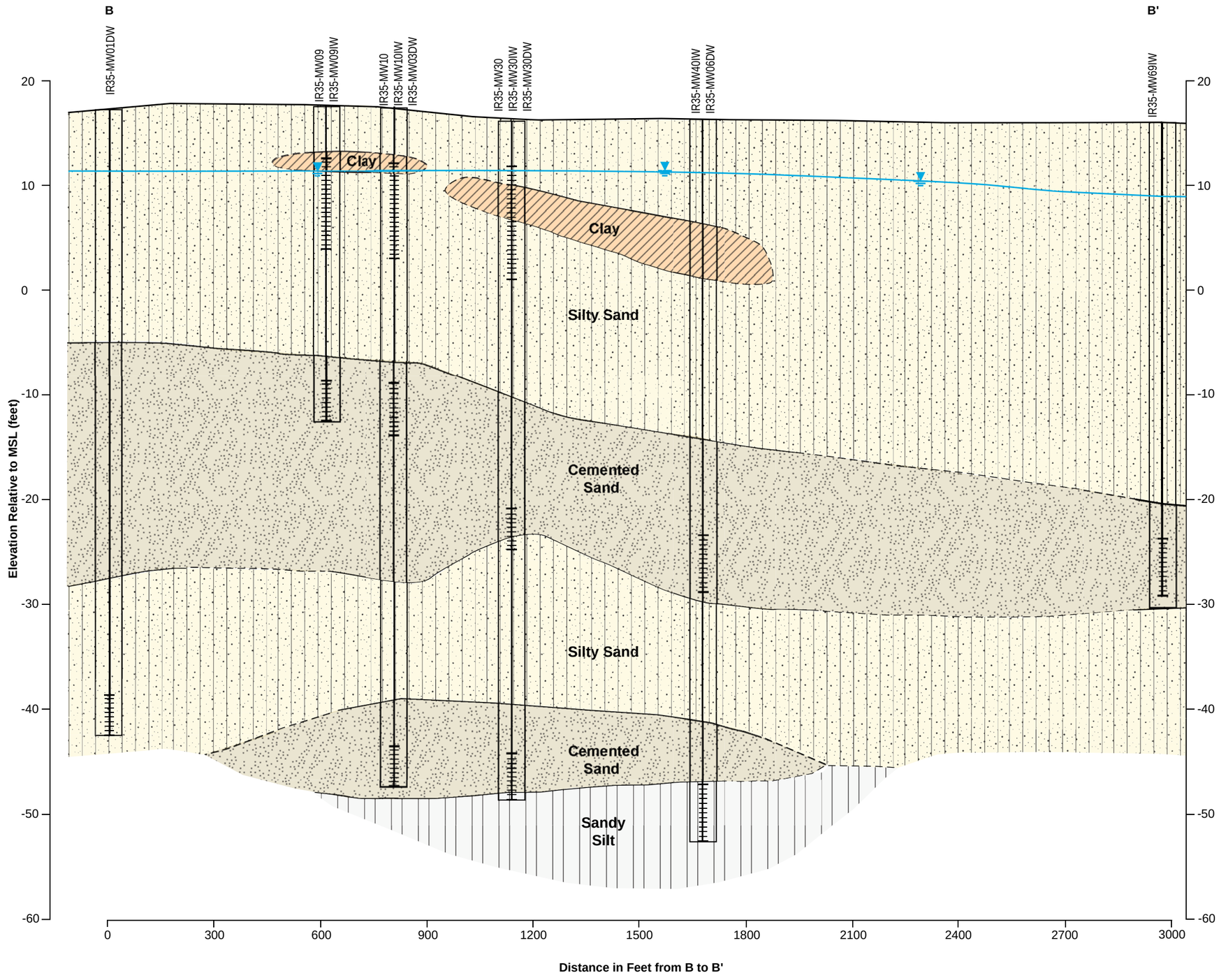
NOTE

1) The depth and thickness of the subsurface strata indicated on this section (profile) were generalized from and interpolated between test locations. Information on actual subsurface conditions apply only to the specific locations indicated. Subsurface conditions and water levels at other locations may differ from conditions occurring at the indicated locations.
2) All water levels were measured during sampling event in June 2006.

Figure 4-4
Geologic Cross Section A-A'
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

CH2MHILL

ES032009015MKE Figure_4-4_A-A_v8.ai 03.18.08 sls



Horizontal : 1" = 300'
Vertical: 1" = 10'
V.E. = 30x

LEGEND

- Clay
- Silty Sand
- Cemented sand
- Sandy Silt
- Screened Interval
- Inferred geologic contact
- Water table elevation

NOTE

1) The depth and thickness of the subsurface strata indicated on this section (profile) were generalized from and interpolated between test locations. Information on actual subsurface conditions apply only to the specific locations indicated. Subsurface conditions and water levels at other locations may differ from conditions occurring at the indicated locations.
2) All water levels were measured during sampling event in June 2006.

Figure 4-5
Geologic Cross Section B-B'
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

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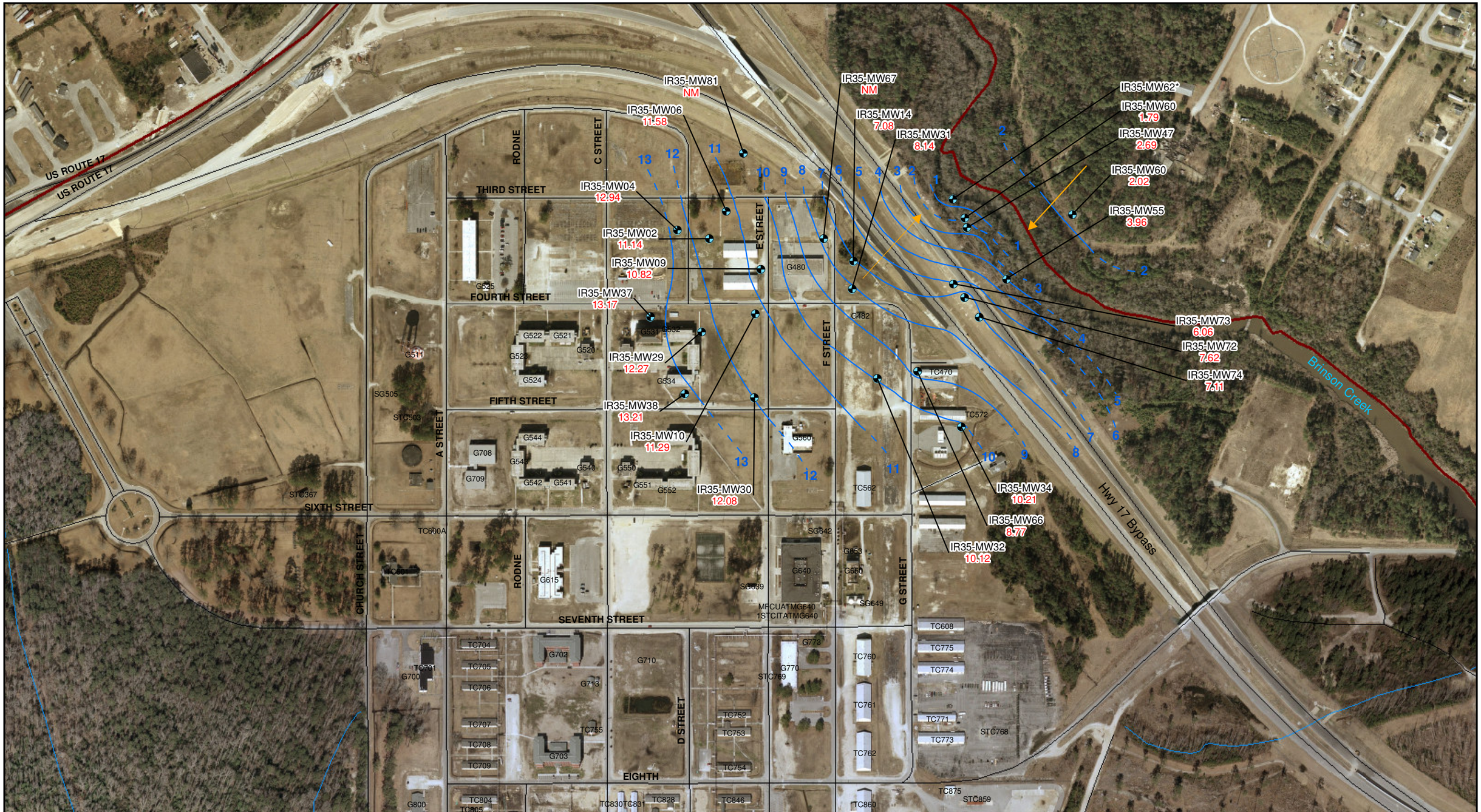

Legend

- Shallow Monitoring Well
- Base Boundary
- Road Centerline
- Potentiometric Surface Line (dashed where inferred)
- 12 Groundwater Elevation (feet mean sea level) on 06/19/2006
- Groundwater flow direction
- NM Water level not collected
- Surface Water Course Centerline

Note:
- Potentiometric surface lines have been interpolated between monitoring well locations. Actual conditions may differ from those shown in this figure.
- *Monitoring well IR35-MW62 not used for contouring purposes.

N

0 400 800 Feet

1 inch equals 400 feet

Figure 4-6
Potentiometric Surface Map of the Surficial Aquifer (June 2006)
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

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Legend

- Intermediate Monitoring Well
- Base Boundary
- Road Centerline
- Potentiometric Surface Line (dashed where inferred)
- 12.99 Groundwater Elevation (feet mean sea level) on 06/19/2006
- Groundwater flow direction
- NM Water level not collected
- Surface Water Course Centerline

Note:
- Potentiometric surface lines have been interpolated between monitoring well locations. Actual conditions may differ from those shown in this figure.
- * Monitoring well IR35-MW68IW not used for contouring purposes.

N

0 400 800 Feet

1 inch equals 400 feet

Figure 4-7
Potentiometric Surface of the Upper Castle Hayne Aquifer (June 2006)
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

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Legend

- Deep Monitoring Well
- Base Boundary
- Road Centerline
- Potentiometric Surface Line (dashed where inferred)
- 10.38 Groundwater Elevation (feet mean sea level) on 06/19/2006
- Approximate Groundwater flow direction
- NM Water level not collected
- Surface Water Course Centerline

Note:
- Potentiometric surface lines have been interpolated between monitoring well locations. Actual conditions may differ from those shown on this figure.

N

0 400 800 Feet

1 inch equals 400 feet

Figure 4-8
Potentiometric Surface Map of the Mid-Castle Hayne Aquifer (June 2006)
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

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SECTION 5

Nature and Extent of Contamination

This section discusses the nature and extent of contamination at Site 35. The discussion is organized into two parts. Section 5.1 discusses how the data are presented and evaluated, defines the various criteria used to compare the concentration of compounds and analytes found in site media. The results of SRI sampling activities are described in Section 5.2.

5.1 Data Presentation and Evaluation

5.1.1 Data Presentation

Laboratory analytical detections for each target analyte are listed in tables at the end of this section. These tables summarize the maximum concentrations along with the detection frequency for each group of samples. The tables also identify those results that exceed selected regulatory and human-health based criteria. This comparison is not a means of screening out potential contaminants from further consideration; that step is performed in the HHRA in Section 7. The purpose of this comparison is to help focus the subsequent discussions concerning nature and extent on those compounds that are likely to be most significant.

Figures are also presented, where appropriate, to show analyte detections in groundwater exceeding relevant comparison criteria. Additionally, contaminant isoconcentration maps are presented in plan and cross-sectional views to show the distribution of the primary groundwater contaminants across the Site.

Complete analytical results from fixed base laboratories for the DPT sampling events are provided in **Appendix B.** Groundwater sample data sheets, complete analytical results from fixed base laboratories, and chain of custody forms and data validation reports for the SRI monitoring well sampling events are provided in **Appendices D, E,** and **F**, respectively**.**

5.1.2 Regulatory and Health-Based Comparison Criteria

Analytical results for groundwater samples collected during SRI activities were compared against regulatory and human-health based standards or criteria. As discussed in Section 5.1.1, this comparison was performed to evaluate the nature and extent of contamination and not to eliminate compounds from further consideration.

Groundwater results were compared to both North Carolina Groundwater Quality Standards (NCGWQS) and Federal Maximum Contaminant Levels (MCLs), as these are the enforceable regulatory standards. **Table 5-1** lists the chemical-specific regulatory criteria used to evaluate results for groundwater. Brief explanations of the general classes of criteria are provided below.

- **NCGWQS**—The State of North Carolina, through rules of Subchapter 2L of the North Carolina Administrative Code (NCAC) Title 15A, establishes a series of classifications

and water quality standards that are appropriate for the purpose of classifying groundwater in the state. NCGWQS are enforceable standards intended to provide a guidance level in preventing groundwater pollution above naturally occurring levels of specified chemical constituents and are based upon what is considered naturally occurring. The goal is to preserve and protect present and anticipated uses of groundwater.

- **MCLs for Groundwater**—MCLs are enforceable standards promulgated under the Safe Drinking Water Act for public water supplies consumed by a minimum of 25 persons. The MCLs are designed for the protection of human health, based on laboratory or epidemiological studies. They are designed to prevent adverse human health effects associated with a 70-year lifetime exposure for an average adult (70 kilograms [kg]) consuming 2 liters of water per day. Contaminants exceeding MCLs must be treated/removed from the public water supply prior to its potable use.

5.2 Site 35 SRI Sampling Results

5.2.1 Soil

As discussed in Section 2.5.1, Interim Remedial Action RI (Baker, 1994a) and RI (Baker, 1995a) field activities included site-wide soil sampling. Based on the analytical results from these investigations, petroleum hydrocarbons were the only potentially site-related contaminants identified in soil. The petroleum hydrocarbon-impacted soils were subsequently excavated and disposed of as part of a soil removal action conducted between 1995 and 1996. Therefore, impacts to soil were not further evaluated by this SRI.

5.2.2 Groundwater

During the 2006 SRI, groundwater samples were collected using DPT equipment for screening purposes and from permanent monitoring wells, as described in Section 3. DPT groundwater sampling, was conducted in October 2005 and January/February 2006 at 40 locations, and consisted of the collection of 77 samples at depths of 25 and 44 to 49 ft bgs. Monitoring well sampling was conducted in April, June, and August 2006, and consisted of the collection of groundwater samples from 57 wells. DPT groundwater samples were analyzed for VOCs, and groundwater samples collected from permanent monitoring wells were analyzed for VOCs and NAIPs. The target parameters are listed in **Table 5-1.**

DPT Sampling

During the October 2005 and January/February 2006 DPT groundwater sampling events, a total of 77 groundwater samples were collected from 40 locations, at depths of approximately 20 to 24 ft bgs and 40 to 44 ft bgs (**Figure 3-1**). The laboratory analytical results for the October 2005 and January/February 2006 events are presented in **Tables 5-2A** and **5-2B,** respectively.

A total of 25 VOCs were detected during the DPT groundwater sampling events, and included seven VOCs at concentrations exceeding their respective NCGWQS or MCLs(i.e., benzene, bromodichloromethane, dibromochloromethane, TCE, cis-1,2-DCE, trans-1,2-DCE,

and vinyl chloride). The detected concentrations for the other target analytes exceeding NCGWQS during the DPT investigations are shown on **Figure 5-1.**

TCE and cis-1,2-DCE were the most prevalent VOCs detected during the SRI DPT groundwater sampling events, with reported detections in greater than 50% of the samples collected. The greatest concentrations of TCE and cis-1,2-DCE were generally detected in samples collected from the upper Castle Hayne aquifer(approximately 40 to 44 ft bgs), south of Fourth Street and east of Building G533. Elevated TCE and cis-1,2-DCE concentrations were also reported in the upper Castle Hayne aquifer (20 to 24 ft bgs), but were generally limited to the immediate area around Building G533.

TCE was reported above the method detection limit (MDL) at 11 DPT sampling locations within the upper Castle Hayne aquifer at Site 35 and exceeded the NCGWQS (2.8 μg/L) in five of those 11 sampling locations. The maximum TCE concentration reported within the upper Castle Hayne aquifer was reported at location 35-IS105 (294 μg/L); however elevated concentrations of TCE were also reported at locations 35-IS100 (129 μg/L) and 35-IS101 (183 μg/L). Within the upper Castle Hayne aquifer (approximately 40 to 44 ft bgs), TCE was reported above the MDL at 22 sampling locations and exceeded the NCGWQS in 16 of those locations. The maximum concentration of TCE reported within the upper Castle Hayne aquifer was reported at location 35-IS100 (291 μg/L); however elevated TCE concentrations were also reported in the majority of DPT locations east of Building G533.

The TCE degradation product, cis-1,2-DCE was reported above the MDL at 18 DPT sampling locations within the Surficial aquifer and exceeded the NCGWQS (70 μg/L) in four of those 18 locations. The maximum cis-1,2-DCE concentration reported within the Surficial aquifer was reported at 35-IS101 (1,150 μg/L); however elevated cis-1,2-DCE concentrations were also reported at locations 35-IS100 (805 μg/L), 35-IS105 (876 μg/L), and 35-IS219 (820 μg/L). Within the upper Castle Hayne aquifer, cis-1,2-DCE was reported above the MDL at 25 sampling locations and exceeded the NCGWQS in 10 of those locations. The maximum concentration of cis-1,2-DCE in the upper Castle Hayne aquifer was reported at location 35-IS118 (291 μg/L); however elevated concentrations of cis-1,2-DCE were also reported in the upper Castle Hayne aquifer at the majority of DPT locations east of Building G533.

Trans-1,2-DCE was reported above the MDL at 11 DPT sampling locations within the Surficial aquifer at Site 35 and exceeded the NCGWQS (100 μg/L) in four of those 11 locations. The maximum concentration of trans-1,2-DCE detcted within the Surficial aquifer was reported at 35-IS101 (335 μg/L). Within the upper Castle Hayne aquifer, trans-1,2-DCE was reported above the MDL at 17 sampling locations, but did not exceed the NCGWQS at any location.

Vinyl chloride was reported above the MDL at four DPT sampling locations within the Surficial aquifer at Site 35 and exceeded the NCGWQS (0.015 μg/L) at all four locations. The maximum vinyl chloride concentration reported within the Surficial aquifer was reported at 35-IS101 (20 to 24 ft bgs) at 15.9 μg/L. Within the upper Castle Hayne aquifer, vinyl chloride was reported above the MDL at 12 locations and exceeded the NCGWQS at all of these locations. The maximum concentration of vinyl chloride reported within the upper Castle Hayne aquifer was reported at 35-IS100 (3.55 μg/L).

Acetone was detected in 16 of the 44 groundwater samples collected during the October 2005 DPT groundwater sampling event at concentrations below the NCGWQS of 700 µg/L with a maximum concentration detected in the groundwater sample collected from IR35-IS101 (20.9 µg/L).Acetone was not detected in any of the groundwater samples collected during the January/February 2006 DPT groundwater sampling event.

Monitoring Well Groundwater Sampling

As part of the SRI field activities, groundwater samples were collected from 57 monitoring wells. Groundwater quality parameters recorded during well purging activities are summarized in **Table 5-3**. VOCs and NAIPs detected in groundwater from the Surficial aquifer (screened from 2.5 to 25 ft bgs), upper Castle Hayne aquifer (screened from 24 to 46 ft bgs) and deeper Castle Hayne aquifer (screened from 46 to 68 feet bgs) are summarized in **Tables 5-4, 5-5, and 5-6**, respectively. Isoconcentration maps depicting the distribution of TCE, cis-1,2-DCE and vinyl chloride concentrations in groundwater in the Surficial and upper Castle Hayne aquifers, as well as cross sectional views of TCE, cis-1,2-DCE, and vinyl chloride plumes are shown on **Figures 5-2** through **5-13**. Groundwater analytical data derived from the October 2005 and January/February 2006 DPT sampling events were also used in the preparation of these figures.

During the SRI groundwater sampling events, VOCs were detected in groundwater samples collected from all three sampling depths: Surficial aquifer (screened from 2.5 to 25 feet bgs), upper Castle Hayne aquifer (screened from 24 to 46 feet bgs) and mid-Castle Castle Hayne aquifer (screened from 46 to 68 ft bgs). VOCs detected included: 1,1,2,2-tetrachloroethane (1,1,2,2-PCA), 1,1,2-trichloroethane (1,1,2-TCA), 1,1-DCE, benzene, bromoform, chloroform, cis-1,2-DCE, ethylbenzene, isopropylbenzene, methylene chloride, tetrachloroethene (PCE), toluene, trans-1,2-DCE, TCE, vinyl chloride, and total xylenes. Of the 16 VOC constituents reported, only benzene, 1,1,2,2-PCA, cis-1,2-DCE, PCE, TCE, and vinyl chloride were detected at concentrations exceeding their respective NCGWQS.

TCE, cis-1,2-DCE, and vinyl chloride were the most prevalent VOCs detected above their respective NCGWQS. TCE was reported above its NCGWQS in 24 of the 57 monitoring well locations in the Surficial and upper Castle Hayne aquifers, cis-1,2-DCE was reported above its NCGWQS in 17 of the 57 monitoring well locations in the Surficial and upper Castle Hayne aquifers, and vinyl chloride was reported above its NCGWQS in 26 of the 57 monitoring well locations at all three sampling depths. The highest concentrations of TCE, cis-1,2-DCE, and vinyl chloride were generally within the upper Castle Hayne aquifer, in two distinct areas: the area east of Building G533 and south of Building TC342 or immediately east of Building G480 (former Fuel Farm area).

TCE was reported in 11 shallow monitoring wells (screened from 2.5 to 25 feet bgs), and exceeded its NCGWQS (2.8 µg/L) in nine of the 11 shallow wells. The maximum concentration of TCE reported within the Surficial aquifer (35 µg/L) was reported at 35-MW55, located east of the U.S. Highway 17 Bypass and downgradient of the former pilot study area. TCE contamination is present within the Surficial aquifer in the vicinity of Building G533, east of Building G480 near the U.S. Highway 17 Bypass, and in the vicinity of Building TC470, as shown on **Figure 5-2**.

Similar to the Surficial aquifer, the maximum concentration of TCE reported within the upper Castle Hayne aquifer (180 µg/L) was reported at 35-MW55IW, also located east of the U.S. Highway 17 Bypass and downgradient of the former pilot study area. The extent of TCE within the upper Castle Hayne aquifer is shown on **Figure 5-3.** TCE was reported in one mid-Castle Hayne aquifer monitoring well at Site 35; however the reported concentration was below the NCGWQS of 2.8 µg/L.

Cross sectional views of the TCE plume are shown on geologic cross sections A-A′ and B-B′ in **Figures 5-4, and 5-5**, respectively. The plume cross sections depict the extent of the plume as determined by the groundwater data.

Cis-1,2-DCE was reported in 12 shallow monitoring wells, and exceeded its NCGWQS (70 µg/L) in 5 of the 12 shallow wells. The maximum concentration of cis-1,2-DCE reported within the Surficial aquifer (120 µg/L) was reported at 35-MW14, located east of Building G480 (in the vicinity of the former Fuel Farm)**.** Within the Surficial aquifer, cis-1,2-DCE contamination exists in the area east of Building G533 and south of Building TC342 and east of Building G480 near the U.S. Highway 17 Bypass, as shown on **Figure 5-6**. The size and shape of these plumes in the Surficial aquifer is similar those of the TCE plumes in the Surficial aquifer.

Cis-1,2-DCE was detected in the groundwater samples collected from 24 upper Castle Hayne aquifer monitoring wells, and exceeded its NCGWQS in 12 of the 24 upper Castle Hayne aquifer wells. The maximum concentration of cis-1,2-DCE detected within the upper Castle Hayne aquifer (760 µg/L) was reported at 35-MW72IW, located within the median of the U.S. Highway 17 Bypass in the former pilot study area. The areal extent of the cis-1,2-DCE plumes is shown on **Figure 5-7.** Cis-1,2-DCE was detected in the samples collected from two mid-Castle Hayne aquifer monitoring wells at Site 35; however the reported concentrations were below the NCGWQS.

Cross sectional views of the cis-1,2-DCE plume are shown on geologic cross sections A-A′ and B-B′ in **Figures 5-8, and 5-9**, respectively.

The NCGWQS for vinyl chloride (0.015 µg/L) is below the practical quantitation limit (PQL) (0.5 µg/L), so in accordance with 15A NCAC 02L.0202, any detection of vinyl chloride above the PQL is considered an exceedance of the standard. Vinyl chloride was reported at concentrations greater than 0.5 µg/L in eight Surficial aquifer monitoring wells. The maximum concentration of vinyl chloride reported within the Surficial aquifer (19 µg/L) was reported at 35-MW31, located east of Building G480 (in the vicinity of the former Camp Geiger Fuel Farm). The extent of vinyl chloride contamination within the Surficial aquifer is shown on **Figure 5-10** (note the isoconcentration lines are based on the PQL of 0.5 µg/L)**.**

Vinyl chloride was detected in groundwater samples collected from 17 upper Castle Hayne aquifer monitoring wells, with a maximum concentration of 250 µg/L reported from 35-MW73IW, located within the median of the U.S. Highway 17 Bypass in the former pilot study area. The distribution of vinyl chloride within the upper Castle Hayne aquifer is shown on **Figure 5-11** (note the isoconcentration lines are based on the PQL of 0.5 µg/L**.** In general, the vinyl chloride plume in the upper Castle Hayne aquifer appears similar to that of the TCE and cis-1,2-DCE plumes.

Vinyl chloride was detected at a concentration of 1.8 µg/L in one mid-Castle Hayne aquifer monitoring well, 35-MW72DW (screened from 53 to 58 feet bgs), and exceeded the NCGWQS of 0.015 µg/L.

Cross sectional views of the vinyl chloride plume are shown on geologic cross sections A-A' and B-B' in **Figures 5-12, and 5-13**, respectively.

PCE was reported to have exceeded its NCGWQS (0.7 µg/L) in one Surficial and two upper Castle Hayne aquifer monitoring wells. The maximum concentration of PCE (1.5 µg/L) was reported in upper Castle Hayne aquifer monitoring well 35-MW29IW, located north of Building G533.

1,1,2,2-PCA exceeded its NCGWQS (0.17 µg/L) in two shallow monitoring wells. The maximum concentration of 1,1,2,2-PCA (100 µg/L) was reported in 35-MW32, located west of Building TC470.

Contaminants detected in the Surficial aquifer appear to originate in one of two areas, either the area east of Building G533 or in the vicinity of the former Camp Geiger Fuel Farm. The maximum concentrations of VOCs are located within the upper Castle Hayne aquifer within or immediately downgradient of the pilot study area. Analytical results from groundwater collected from monitoring wells screened in the mid-Castle Hayne aquifer generally indicate that the vertical extent of contamination has been delineated.

Although acetone was detected during the October 2005 DPT groundwater sampling event, it was not detected during the 2006 monitoring well sampling event.

VOC Contaminant Trends

Data collected during the LTM program by Baker and current groundwater analytical data from monitoring wells 35-MW14, 35-MW10IW, 35-MW55IW, and 35-MW72IW are plotted on **Figures 5-14**, **5-15**, **5-16**, and **5-17,** respectively. These wells have historically exhibited relatively high chlorinated VOC concentrations over previous investigations. Each figure shows a considerable decrease in TCE and cis-1,2-DCE over time and relatively stable concentrations of vinyl chloride.

The widespread presence of TCE daughter products (cis-1,2-DCE and vinyl chloride) in groundwater is an indicator that reductive dechlorination is occurring in the surficial and upper Castle Hayne aquifers.

Natural Attenuation Indicator Parameters and Other Geochemical Parameters

Biodegradation of chlorinated solvents occurs when naturally occurring microorganisms break down chlorinated solvents into less toxic or non-toxic substances through an electron transfer process. Biodegradation of chlorinated solvents most often occurs under anaerobic conditions through the process of reductive dechlorination. In general, reductive dechlorination occurs by sequential dechlorination of the chlorinated hydrocarbon (i.e. PCE→TCE→DCE→Vinyl chloride→Ethene). In reductive dechlorination, the chlorinated hydrocarbon is used as the electron acceptor and organic carbon (either native or man-made) acts as an electron donor. In the presence of additional electron donors such as BTEX compounds found at Site 35, the rate of biodegradation may increase.

Under anaerobic conditions, anaerobic bacteria utilize additional electron acceptors in the following order of preference: nitrate ("nitrate reduction"), ferric iron ("iron reduction"), sulfate ("sulfate reduction"), and carbon dioxide ("methanogenesis"). Reductive dechlorination has been demonstrated under nitrate-reducing and sulfate-reducing conditions, but is most likely to occur in methanogenic conditions. Because reductive dechlorination occurs under similar conditions to the processes mentioned above, the concentrations of constituents (such as nitrate, ferric iron, etc.) can provide an indication of the potential for reductive dechlorination to occur. Biodegradation of some chlorinated organics can also occur in aerobic conditions, such as aerobic oxidation of vinyl chloride, and possibly cis-1,2-DCE.

During the SRI monitoring well sampling events, field measurements and groundwater samples were collected from 57 monitoring wells in order to evaluate the geochemical characteristics of the Surficial, upper Castle Hayne, and mid-Castle Hayne aquifers. Field measurements collected during the purging of the wells included DO and ORP, as shown in **Table 5-3**. Additionally, groundwater samples were collected and submitted for laboratory analysis of geochemical parameters that included alkalinity, chloride, nitrate, nitrite, sulfate, sulfide, TOC, ferrous iron, ferric iron, methane, ethane, and ethene, provided in **Tables 5-4, 5-5,** and **5-6**. Concentration trends in the geochemical parameters can be used to evaluate whether biodegradation of VOCs is occurring at the Site.

A summary of NAIPs from the SRI monitoring well sampling events (April to August 2006) is provided in **Table 5-7.** Data collected from monitoring wells 35-MW38 (upgradient), 35-MW29 (source area), 35-MW31 (source area), and 35-MW55 (downgradient) were used to assess Surficial aquifer trends. Data collected from monitoring wells 35-MW39IW (upgradient), 35-MW30IW (source area), 35-MW31IW (source area), and 35-MW55IW (downgradient) were used to assess upper Castle Hayne aquifer trends. Data collected from monitoring wells 35-MW30DW (upgradient), 35-MW72DW (source area), and 35-MW07DW (downgradient) were used to assess mid-Castle Hayne aquifer trends. Trends for specific groundwater geochemical parameters, including alkalinity, chloride, ferrous iron, methane, nitrate, sulfate, and TOC for the Surficial, upper Castle Hayne, and mid-Castle Hayne aquifers are plotted on **Figures 5-18**, **5-19**, and **5-20**, respectively. Sample results at or less than the detection limit were graphed at values of half the detection limit. A more detailed discussion of each of the natural attenuation parameters is presented below.

Dissolved Oxygen. Dissolved oxygen is the most thermodynamically favored electron acceptor used by microbes for the biodegradation of organic carbon. Generally, DO concentrations below 0.5 milligrams per liter (mg/L) are required for anaerobic bacteria necessary for reductive dechlorination to exist. As the DO is diminished within the aquifer, other electron acceptors (that is, nitrate, ferrous iron, or sulfate) may be used by microorganisms to facilitate reductive dechlorination reactions.

The DO concentrations recorded during the Site 35 SRI monitoring well sampling events indicate that anaerobic conditions exist in the Surficial, upper Castle Hayne, and mid-Castle Hayne aquifers. Within the Surficial aquifer, DO concentrations ranged from 0.00 mg/L to 10.13 mg/L at 35-MW49, with concentrations less than 0.5 mg/L in 12 of 23 monitoring wells. Within the upper Castle Hayne aquifer, DO concentrations ranged from 0.00 mg/L to 12.14 mg/L at 35-MW49IW, with concentrations less than 0.5 mg/L in 15 of 27 monitoring wells. Within the mid-Castle Hayne aquifer, DO concentrations ranged from 0.00 mg/L to

1.70 mg/L at 35-MW07DW, with concentrations less than 0.5 mg/L in 5 of 7 monitoring wells.

Aerobic conditions are generally not located within the extent of the plumes; rather they are limited to the periphery of the Site. The exception to this is within the former pilot study area in the upper Castle Hayne aquifer, in which aerobic conditions exist. Degradation daughter products present within the Surficial and upper Castle Hayne aquifers during the SRI monitoring well sampling events, suggest anaerobic conditions may be conducive to reductive dechlorination of the VOC plume within these aquifers. However, the lingering concentrations of daughter products make it difficult to predict if degradation will go to completion.

Nitrate/Nitrite. When DO has been depleted, nitrate can be used as an electron acceptor in anaerobic degradation via denitrification. In denitrification, nitrate is reduced to produce nitrite. Therefore, decreased nitrate concentrations and increased nitrite concentrations relative to background indicate nitrate reduction is occurring. However, at concentrations greater than 1 mg/L, nitrate can compete with chlorinated hydrocarbons as an electron acceptor.

Within the Surficial aquifer, nitrate concentrations ranged from less than 0.13 mg/L to 13 mg/L at 35-MW32, with nitrate concentrations less than 1.0 mg/L in 19 of 23 monitoring wells. Groundwater samples exhibiting nitrate concentrations greater than 1.0 mg/L were generally collected from wells located outside of the extent of the Surficial aquifer VOC plume. Nitrite was not detected at concentrations greater than the corresponding nitrate concentration in any of the shallow monitoring wells. Although nitrate concentrations in the Surficial aquifer indicate reducing conditions are present, the absence of nitrite suggests that denitrification is not a degradation pathway in the Surficial aquifer.

Within the upper Castle Hayne aquifer, nitrate concentrations ranged from less than 0.13 mg/L to 1.6 mg/L at 35-MW31IW, with nitrate concentrations less than 1.0 mg/L in 26 of 27 monitoring wells. Nitrite was not detected at concentrations greater than the corresponding nitrate concentration in any of the upper Castle Hayne aquifer monitoring wells. Similar to the Surficial aquifer, although nitrate concentrations in the upper Castle Hayne aquifer indicate reducing conditions are present, the absence of nitrite suggests that denitrification is not a major degradation pathway in the upper Castle Hayne aquifer.

Within the mid-Castle Hayne aquifer, nitrate concentrations ranged from less than 0.13 mg/L to 0.23 mg/L at 35-MW01DW. Nitrite was not detected at concentrations greater than the corresponding nitrate concentration in any of the mid-Castle Hayne monitoring wells. Similar to the Surficial aquifer and upper Castle Hayne aquifers, although nitrate concentrations in the mid-Castle Hayne aquifer indicate reducing conditions are present, the absence of nitrite suggests that denitrification is not a degradation pathway in the mid-Castle Hayne aquifer.

Ferric Iron/Ferrous Iron. In some cases, ferric iron [Fe(III)] is used as an electron acceptor during anaerobic degradation. During this process (termed “iron reduction”), ferric iron is reduced to ferrous iron [Fe(II)]. Reduced ferric iron concentrations relative to background and ferrous iron concentrations greater than 1 mg/L are considered indicators of iron reduction. Ferrous iron concentrations can be estimated by subtracting detected ferric iron

concentrations from total iron concentrations. During the Site 35 SRI groundwater sampling, low levels of Fe(II) were detected in 5 of 23 wells in the Surficial aquifer, and Fe(II) was not detected in any monitoring wells in the Castle Hayne aquifer. These results indicate that iron reduction is not a favorable degradation pathway in the Surficial, upper Castle Hayne, or mid-Castle Hayne aquifers.

Sulfate/Sulfide. After DO and nitrate have been depleted, sulfate may be used as the electron acceptor in anaerobic degradation. This process is termed "sulfate reduction" and results in the production of sulfide. However, sulfide will preferentially precipitate with available dissolved metals (for example, ferrous iron) before remaining dissolved in groundwater. Sulfate concentrations less than background are indicative of anaerobic degradation by sulfate reduction. However, at concentrations greater than 20 mg/L, sulfate may compete with reductive dechlorination.

The sulfate and sulfide concentrations recorded during the SRI monitoring well sampling events indicate that sulfate-reduction is not a major degradation pathway within the Surficial or upper Castle Hayne aquifers, and that competitive exclusion of dechlorinating bacteria may be occurring. Within the Surficial aquifer, sulfate concentrations ranged from 10 mg/L to 160 mg/L and were less than 20 mg/L in only two of the 23 wells sampled. Within the upper Castle Hayne aquifer, sulfate concentrations were less than 20 mg/L in 11 of 27 wells sampled, with concentrations ranging from 5.5 mg/L to 130 mg/L. In the upper Castle Hayne aquifer, several of the samples in which the sulfate concentration exceeded 20 mg/L were collected from monitoring wells associated with the highest contaminant concentrations. Sulfide was not detected in any monitoring wells with the Surficial or upper Castle Hayne aquifers, but this could be due to the abiotic processes stated above. The presence of sulfate at concentrations close to, or greater than 20 mg/L, combined with the absence of sulfide suggests possible competitive exclusion of dechlorinating bacteria, as sulfate would act as the preferred electron acceptor over chlorinated solvents.

Within the mid-Castle Hayne aquifer, sulfate concentrations were less than 20 mg/L in four of seven wells sampled, with concentrations ranging from 5.2 mg/L to 78 mg/L. These results generally suggest that conditions may be favorable for reductive dechlorination in the mid-Castle Hayne aquifers.

Methane. After the other electron acceptors have been utilized, carbon dioxide can be used as the electron acceptor in anaerobic degradation. In this process, termed "methanogensis," carbon dioxide is reduced to produce methane. The presence of methane in the aquifer is indicative of strongly reducing conditions. In general, methane concentrations greater than background indicate methanogenesis is occurring. Reductive dechlorination is most efficient under methanogenic conditions.

The average background concentrations of methane were 0.12 mg/L in the Surficial aquifer and 0.07 mg/L in the upper Castle Hayne aquifer (CH2M HILL, Baker, CDM, 2003). During the SRI, methane levels ranged from less than 0.014 mg/L to 2.0 mg/L in the Surficial aquifer, from less than 0.0005 mg/L to 1.8 mg/L in the upper Castle Hayne aquifer, and from less than 0.014 mg/L to 19.0 mg/L in the mid-Castle Hayne aquifer. As shown on **Figures 5-18**, **5-19**, and **5-20**, monitoring wells within the plume areas contain the highest concentrations of methane. Monitoring wells yielding groundwater with measurable

concentrations of daughter products typically also yielded elevated concentrations of methane, providing evidence that methanogenesis is occurring in both aquifers.

Total Organic Carbon. Organic carbon is utilized as an electron donor (or may produce hydrogen which can serve as the electron donor) in the reductive dechlorination process and therefore is needed to drive the process. Organic carbon can be naturally occurring or anthropogenic. The presence of TOC at concentrations greater than 20 mg/L indicates ideal conditions for reductive dechlorination to occur (USEPA, 1998; Wiedemeier et al, 1996).

Within the Surficial aquifer, naturally occurring TOC concentrations ranged from less than 10 mg/L to 230 mg/L, with two of 23 results exceeding 20 mg/L. Within the Castle Hayne aquifer, naturally occurring TOC concentrations were not detected above 10 mg/L. Further, anthropogenic sources of TOC (e.g., petroleum hydrocarbons) were generally not detected in either the Surficial, upper Castle Hayne, or mid-Castle Hayne aquifers. Based on these results, there does not appear to be sufficient substrate to support the dechlorination process in the Surficial, upper Castle Hayne, or mid-Castle Hayne aquifers. However, the presence of TCE daughter products in Site 35 groundwater indicates the TOC present is adequate to drive reductive dechlorination to some extent.

Oxidation Reduction Potential. The ORP of groundwater is a measure of electron activity and is an indicator of the relative tendency of a solution to accept or transfer electrons. The ORP of a groundwater system depends upon and influences rates of biodegradation. Reductive dechlorination is most efficient in the ORP range corresponding to sulfate reduction and methanogenesis [less than -100 milliVolts (mV)]; however, dechlorination of PCE and other chlorinated ethenes also occurs in the ORP range associated with nitrate, manganese, and ferric iron reduction (-50 to 740 mV).

ORP measurements are, in general, negative across the Site. Within the Surficial aquifer, ORP measurements ranged from -162 mV to +341 mV, with 15 of 23 measurements less than +50 mV and 6 of 23 measurements less than -100 mV. Within the upper Castle Hayne aquifer, ORP measurements ranged from -215 mV to +219 mV, with 25 of 27 measurements less than +50 mV and 19 of 27 measurements less than -100 mV. Within the mid-Castle Hayne aquifer, ORP measurements ranged from -151 mV to -31 mV, with 5 of 7 measurements less than -100 mV. In general, groundwater samples with ORP measurements greater than 50 mV were collected from monitoring wells located around the perimeter of the Site and not within the extent of the plumes. These results suggest that conditions are favorable for reductive dechlorination in the Surficial, upper Castle Hayne, or mid-Castle Hayne aquifers within the areas of highest contamination.

Chloride. Like the geochemical indicators presented above, chloride concentrations greater than background concentrations are indicative that reduction of chlorinated solvent-related contamination is occurring (USEPA, 1998; Wiedemeier et al, 1996). The average chloride concentration detected in background wells was 14 mg/L in the Surficial aquifer, 16 mg/L in the upper Castle Hayne aquifer, and 24 mg/L in the mid-Castle Hayne aquifer.

During the Site 35 SRI monitoring well sampling event, chloride concentrations ranged from 5.6 mg/L to 45 mg/L in the Surficial aquifer, with 11 of the 23 wells sampled exhibiting chloride concentrations greater than background. Within the upper Castle Hayne aquifer, chloride concentrations ranged from 7.2 mg/L to 340 mg/L, with 14 of the 27 wells sampled

exhibiting chloride concentrations greater than background. Within the mid-Castle Hayne aquifer, chloride concentrations ranged from 16 mg/L to 49 mg/L, with five of the seven wells sampled exhibiting chloride concentrations greater than background. Within the Surficial and upper Castle Hayne aquifers, the locations of elevated chloride concentration generally correspond to locations of elevated VOC concentration, suggesting reductive dechlorination may be naturally occurring at the Site.

Summary. Analysis of the geochemical parameters generally indicates that conditions for natural attenuation are favorable or that natural attenuation is currently occurring in the Surficial, upper Castle Hayne, or mid-Castle Hayne aquifers. Further, the data indicates that reductive dechlorination is the primary natural attenuation process in the higher concentration areas of the groundwater plumes, while biodegradation via the aerobic pathway is likely the dominant fate process at the plume peripheries. Chlorinated solvents are capable of being depleted by natural processes in each aquifer. However, the limited native organic carbon present suggests that the natural attenuation process may be slowed and the high sulfate concentrations suggest competitive exclusion of dechlorinating bacteria may be occurring. These conclusions are generally consistent with the Natural Attenuation Evaluation Report (CH2M HILL, Baker, CDM, 2003).

5.2.3 Surface Water and Sediment

As discussed in Section 2.5.3, surface water and sediment samples were collected from Brinson Creek as part of RI field activities (Baker, 1995) and Brinson Creek Surface Water and Sediment study (Baker, 2002). The original RI and Brinson Creek study concluded that:

- Groundwater had not impacted the surface water quality of the creek.
- Creek sediments had been impacted by anthropogenic activity, although the source was unclear.

Historically, mercury, zinc, and lead have been detected in surface water above state and federal criteria. Zinc and lead are potentially site related; however, neither contaminant has been shown to pose a human health or ecological risk.

Fuel-related VOCs, SVOCs, pesticides, and metals have historically been detected in sediment samples above screening values. Fuel-related VOC contamination is being investigated under the UST program; and SVOCs and pesticides are not considered to be attributable to Site 35 activities. Of the metals detected above screening levels, only lead and zinc are considered to be potentially site-related; however, neither contaminant has been shown to pose a human health or ecological risk.

Based on these findings, impacts to surface water and sediment were not further evaluated in the SRI.

TABLE 5-1
Analytical Parameters and Water Quality Standards
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Chemical Name	CAS Number	MCL-Groundwater	NCGWQS
Volatile Organic Compounds (μg/L)			
1,1,1-Trichloroethane	71-55-6	200	200
1,1,2,2-Tetrachloroethane	79-34-5	--	0.17
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	76-13-1	--	210,000
1,1,2-Trichloroethane	79-00-5	5	--
1,1-Dichloroethane	75-34-3	--	70
1,1-Dichloroethene	75-35-4	7	7
1,2,3-Trichlorobenzene	87-61-6	--	--
1,2,4-Trichlorobenzene	120-82-1	70	70
1,2-Dibromo-3-chloropropane	96-12-8	0.2	0.025
1,2-Dibromoethane	106-93-4	0.05	0.0004
1,2-Dichlorobenzene	95-50-1	600	24
1,2-Dichloroethane	107-06-2	5	0.38
1,2-Dichloropropane	78-87-5	5	0.51
1,3-Dichlorobenzene	541-73-1	--	170
1,4-Dichlorobenzene	106-46-7	75	1.4
2-Butanone	78-93-3	--	4,200
2-Hexanone	591-78-6	--	280
4-Methyl-2-pentanone	108-10-1	--	--
Acetone	67-64-1	--	700
Benzene	71-43-2	5	1
Bromochloromethane	74-97-5	--	--
Bromodichloromethane	75-27-4	80	0.56
Bromoform	75-25-2	80	4.43
Bromomethane	74-83-9	--	--
Carbon disulfide	75-15-0	--	700
Carbon tetrachloride	56-23-5	5	0.269
Chlorobenzene	108-90-7	100	50
Chloroethane	75-00-3	--	2,800
Chloroform	67-66-3	80	70
Chloromethane	74-87-3	--	2.6
Cyclohexane	110-82-7	--	--
Dibromochloromethane	124-48-1	80	0.41
Dichlorodifluoromethane (Freon-12)	75-71-8	--	1,400
Ethylbenzene	100-41-4	700	550
Methyl acetate	79-20-9	--	--
Methyl-tert-butyl ether (MTBE)	1634-04-4	--	200

TABLE 5-1
Analytical Parameters and Water Quality Standards
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Chemical Name	CAS Number	MCL-Groundwater	NCGWQS
Methylcyclohexane	108-87-2	--	--
Methylene chloride	75-09-2	5	4.6
Styrene	100-42-5	100	100
Tetrachloroethene	127-18-4	5	0.7
Toluene	108-88-3	1,000	1,000
Trichloroethene	79-01-6	5	2.8
Trichlorofluoromethane(Freon-11)	75-69-4	--	2,100
Vinyl chloride	75-01-4	2	0.015
Xylene, total	1330-20-7	10,000	530
cis-1,2-Dichloroethene	156-59-2	70	70
cis-1,3-Dichloropropene	10061-01-5	--	0.19
isopropylbenzene	98-82-8	--	70
m- and p-Xylene	m&pXYLENE	--	350
o-Xylene	95-47-6	--	350
trans-1,2-Dichloroethene	156-60-5	100	100
trans-1,3-Dichloropropene	10061-02-6	--	0.19
Total Metals (µg/L)			
Iron	7439-89-6	300	--
Natural Attenuation Indicator Parameters (mg/L)			
Alkalinity	471-34-1	--	--
Chloride	16887-00-6	250	--
Ethane	74-84-0	--	--
Ethene	74-85-1	--	--
Ferric iron	FERRIC	--	--
Ferrous iron	FERROUS	--	--
Methane	74-82-8	--	--
Nitrate	14797-55-8	10	10
Nitrite	14797-65-0	1	1
Sulfate	14808-79-8	250	--
Sulfide	18496-25-8	--	--
Total organic carbon (TOC)	TOC	--	--

MCL - Maximum Contaminant Level
CAS - Chemical Abstract Service
NCGWQS - North Carolina 2L Groundwater Standard

TABLE 5-2A
Summary of VOCs Detected During October 2005 DPT Groundwater Screening
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Station ID	**NCGWQS**	**MCL-Groundwater**	**Frequency**			IR35-IS100		IR35-IS101		IR35-IS102	
Sample ID						IR35-GW-IS100-20-24-05D	IR35-GW-IS100-45-49-05D	IR35-GW-IS101-20-24-05D	IR35-GW-IS101-45-49-05D	IR35-GW-IS102-20-24-05D	IR35-GW-IS102-40-44-05D
Sample Date						10/17/05	10/17/05	10/17/05	10/17/05	10/18/05	10/18/05
Chemical Name			**Frequency**	**Max Value**	**Max Location**						
Volatile Organic Compounds (UG/L)											
1,1-Dichloroethene	7	7	2 / 44	3.52	IR35-GW-IS101-20-24-05D	0.42 J	1.77	3.52	0.39 J	1 U	1 U
1,2-Dichloropropane	0.51	5	5 / 44	0.22 J	IR35-GW-IS117-40-44-05DDP	1 U	1 U	2 U	1 U	1 U	1 U
2-Butanone	4,200	--	5 / 44	5.75 J	IR35-GW-IS106-45-49-05D	25 U	25 U	50 U	25 U	25 U	25 U
Acetone	700	--	16 / 44	20.9 J	IR35-GW-IS101-45-49-05D	25 U	13 J	50 U	20.9 J	25 U	25 U
Benzene	1	5	36 / 44	23	IR35-GW-IS110-20-24-05D	1.01	1.02	9.52	1.53	7.64	3.86
Carbon disulfide	700	--	5 / 44	1.53	IR35-GW-IS105-20-24-05D	0.38 J	1 U	2 U	1 U	1 U	1 U
Chloroform	70	80	1 / 44	0.24 J	IR35-GW-IS106-45-49-05D	1 U	1 U	2 U	1 U	1 U	1 U
Ethylbenzene	550	700	36 / 44	19.7	IR35-GW-IS110-20-24-05D	0.29 J	1.02	3.74	1.28	1.46	1.02
Methyl-tert-butyl ether (MTBE)	200	--	3 / 44	0.57 J	IR35-GW-IS102-20-24-05D	1 U	5 U	2 U	1 U	0.57 J	1 U
Toluene	1,000	1,000	29 / 44	22.4	IR35-GW-IS110-20-24-05D	1.01	1	6.08	2.87	1.37	1.38
Trichloroethene	2.8	5	32 / 44	294	IR35-GW-IS105-20-24-05D	129	291	183	208	0.83 J	0.31 J
Vinyl chloride	0.015	2	16 / 44	15.9	IR35-GW-IS101-20-24-05D	3.7	3.55	15.9	3.26	1 U	1 U
cis-1,2-Dichloroethene	70	70	40 / 44	1150	IR35-GW-IS101-20-24-05D	805	121	1,150	216	7.98	7.18
Isopropylbenzene	70	--	11 / 44	9.24	IR35-GW-IS110-20-24-05D	1 U	1 U	2.16	0.21 J	1 U	1 U
m- and p-Xylene	350	--	12 / 44	12.9	IR35-GW-IS110-20-24-05D	2 U	0.87 J	2.02 J	0.9 J	2 U	2 U
o-Xylene	350	--	14 / 44	7.48	IR35-GW-IS110-20-24-05D	1 U	0.33 J	1.54 J	0.38 J	0.18 J	1 U
trans-1,2-Dichloroethene	100	100	29 / 44	335	IR35-GW-IS101-20-24-05D	134	19.1	335	18.4	0.82 J	0.33 J

Denotes Detection
J - Reported Value is Estimated
U - Analyte Not Detected
NA - Not analyzed
NCGWQS - North Carolina 2L Groundwater Standard
MCL - Maximum Contaminant Level

TABLE 5-2A
Summary of VOCs Detected During October 2005 DPT Groundwater Screening
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Station ID	**NCGWQS**	**MCL-Groundwater**	**Frequency**			IR35-IS103		IR35-IS104		IR35-IS105	
Sample ID						IR35-GW-IS103-20-24-05D	IR35-GW-IS103-40-44-05D	IR35-GW-IS104-20-24-05D	IR35-GW-IS104-40-44-05D	IR35-GW-IS105-20-24-05D	IR35-GW-IS105-45-49-05D
Sample Date						10/18/05	10/18/05	10/18/05	10/18/05	10/17/05	10/17/05
Chemical Name			**Frequency**	**Max Value**	**Max Location**						
Volatile Organic Compounds (UG/L)											
1,1-Dichloroethene	7	7	2 / 44	3.52	IR35-GW-IS101-20-24-05D	1 U	1 U	1 U	0.28 J	1.68	0.44 J
1,2-Dichloropropane	0.51	5	5 / 44	0.22 J	IR35-GW-IS117-40-44-05DDP	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone	4,200	--	5 / 44	5.75 J	IR35-GW-IS106-45-49-05D	25 U	25 U	25 U	25 U	25 U	4.36 J
Acetone	700	--	16 / 44	20.9 J	IR35-GW-IS101-45-49-05D	25 U	5.42 J	25 U	25 U	3.57 J	17.5 J
Benzene	1	5	36 / 44	23	IR35-GW-IS110-20-24-05D	0.34 J	0.74 J	1 U	0.64 J	4.85	1.2
Carbon disulfide	700	--	5 / 44	1.53	IR35-GW-IS105-20-24-05D	1 U	1 U	1 U	1 U	1.53	1 U
Chloroform	70	80	1 / 44	0.24 J	IR35-GW-IS106-45-49-05D	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	550	700	36 / 44	19.7	IR35-GW-IS110-20-24-05D	0.65 J	1.04	0.62 J	0.96 J	1.26	1.21
Methyl-tert-butyl ether (MTBE)	200	--	3 / 44	0.57 J	IR35-GW-IS102-20-24-05D	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	1,000	1,000	29 / 44	22.4	IR35-GW-IS110-20-24-05D	0.23 J	1.4	0.64 J	1.09	2.73	1.9
Trichloroethene	2.8	5	32 / 44	294	IR35-GW-IS105-20-24-05D	1 U	7.53	0.29 J	68.4	294	58.9
Vinyl chloride	0.015	2	16 / 44	15.9	IR35-GW-IS101-20-24-05D	1 U	0.4 U	1 U	1.58	9.55	2.05
cis-1,2-Dichloroethene	70	70	40 / 44	1150	IR35-GW-IS101-20-24-05D	0.38 J	10.9	0.77 J	105	876	82.4
Isopropylbenzene	70	--	11 / 44	9.24	IR35-GW-IS110-20-24-05D	1 U	1 U	1 U	1 U	1.11	1 U
m- and p-Xylene	350	--	12 / 44	12.9	IR35-GW-IS110-20-24-05D	2 U	2 U	2 U	2 U	0.66 J	0.46 J
o-Xylene	350	--	14 / 44	7.48	IR35-GW-IS110-20-24-05D	0.23 J	1 U	1 U	1 U	0.46 J	0.2 J
trans-1,2-Dichloroethene	100	100	29 / 44	335	IR35-GW-IS101-20-24-05D	1 U	0.43 J	1 U	11.1	177	12.2

Denotes Detection
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NA - Not analyzed
NCGWQS - North Carolina 2L Groundwater Standard
MCL - Maximum Contaminant Level

TABLE 5-2A
Summary of VOCs Detected During October 2005 DPT Groundwater Screening
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Station ID	**NCGWQS**	**MCL-Groundwater**	**Frequency**			IR35-IS106			IR35-IS107	
Sample ID						IR35-GW-IS106-20-24-05D	IR35-GW-IS106-20-24-05DDP	IR35-GW-IS106-45-49-05D	IR35-GW-IS107-20-24-05D	IR35-GW-IS107-40-44-05D
Sample Date						10/17/05	10/17/05	10/17/05	10/18/05	10/18/05
Chemical Name			**Frequency**	**Max Value**	**Max Location**					
Volatile Organic Compounds (UG/L)										
1,1-Dichloroethene	7	7	2 / 44	3.52	IR35-GW-IS101-20-24-05D	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	0.51	5	5 / 44	0.22 J	IR35-GW-IS117-40-44-05DDP	1 U	1 U	1 U	1 U	1 U
2-Butanone	4,200	--	5 / 44	5.75 J	IR35-GW-IS106-45-49-05D	25 U	25 U	5.75 J	25 U	25 U
Acetone	700	--	16 / 44	20.9 J	IR35-GW-IS101-45-49-05D	4.64 J	5.93 J	17.1 J	25 U	25 U
Benzene	1	5	36 / 44	23	IR35-GW-IS110-20-24-05D	19.2	10.4	2.21	1 U	0.39 J
Carbon disulfide	700	--	5 / 44	1.53	IR35-GW-IS105-20-24-05D	1 U	1 U	1 U	0.81 J	1 U
Chloroform	70	80	1 / 44	0.24 J	IR35-GW-IS106-45-49-05D	1 U	1 U	0.24 J	1 U	1 U
Ethylbenzene	550	700	36 / 44	19.7	IR35-GW-IS110-20-24-05D	7.5	3.79	2.13	2.81	1.14
Methyl-tert-butyl ether (MTBE)	200	--	3 / 44	0.57 J	IR35-GW-IS102-20-24-05D	0.47 J	0.33 J	1 U	1 U	1 U
Toluene	1,000	1,000	29 / 44	22.4	IR35-GW-IS110-20-24-05D	2.46	1.57	1.84	0.4 J	1.22
Trichloroethene	2.8	5	32 / 44	294	IR35-GW-IS105-20-24-05D	0.82 J	0.34 J	0.61 J	1 U	2.92
Vinyl chloride	0.015	2	16 / 44	15.9	IR35-GW-IS101-20-24-05D	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	70	70	40 / 44	1150	IR35-GW-IS101-20-24-05D	7.7	4.03	3.4	0.27 J	2.87
Isopropylbenzene	70	--	11 / 44	9.24	IR35-GW-IS110-20-24-05D	1.64	1.2	0.31 J	4.53	0.23 J
m- and p-Xylene	350	--	12 / 44	12.9	IR35-GW-IS110-20-24-05D	1.3 J	0.84 J	0.6 J	2 U	0.45 J
o-Xylene	350	--	14 / 44	7.48	IR35-GW-IS110-20-24-05D	1.41	0.85 J	0.38 J	1 U	0.18 J
trans-1,2-Dichloroethene	100	100	29 / 44	335	IR35-GW-IS101-20-24-05D	1.37	0.59 J	1 U	1 U	1 U

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TABLE 5-2A
Summary of VOCs Detected During October 2005 DPT Groundwater Screening
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Station ID	**NCGWQS**	**MCL-Groundwater**	**Frequency**			IR35-IS108		IR35-IS109		
Sample ID						IR35-GW-IS108-20-24-05D	IR35-GW-IS108-40-44-05D	IR35-GW-IS109-20-24-05D	IR35-GW-IS109-20-24-05DDP	IR35-GW-IS109-40-44-05D
Sample Date						10/18/05	10/18/05	10/18/05	10/18/05	10/18/05
Chemical Name			**Frequency**	**Max Value**	**Max Location**					
Volatile Organic Compounds (UG/L)										
1,1-Dichloroethene	7	7	2 / 44	3.52	IR35-GW-IS101-20-24-05D	1 U	1 U	1 U	1 U	0.21 J
1,2-Dichloropropane	0.51	5	5 / 44	0.22 J	IR35-GW-IS117-40-44-05DDP	1 U	1 U	1 U	1 U	1 U
2-Butanone	4,200	--	5 / 44	5.75 J	IR35-GW-IS106-45-49-05D	25 U	25 U	25 U	25 U	25 U
Acetone	700	--	16 / 44	20.9 J	IR35-GW-IS101-45-49-05D	25 U	4.45 J	25 U	25 U	25 U
Benzene	1	5	36 / 44	23	IR35-GW-IS110-20-24-05D	1 U	0.99 J	1 U	1 U	0.88 J
Carbon disulfide	700	--	5 / 44	1.53	IR35-GW-IS105-20-24-05D	1 U	1 U	1 U	1 U	1 U
Chloroform	70	80	1 / 44	0.24 J	IR35-GW-IS106-45-49-05D	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	550	700	36 / 44	19.7	IR35-GW-IS110-20-24-05D	0.25 J	0.99 J	0.51 J	0.49 J	0.89 J
Methyl-tert-butyl ether (MTBE)	200	--	3 / 44	0.57 J	IR35-GW-IS102-20-24-05D	1 U	1 U	1 U	1 U	1 U
Toluene	1,000	1,000	29 / 44	22.4	IR35-GW-IS110-20-24-05D	0.37 J	1.39	0.4 J	0.44 J	1.13
Trichloroethene	2.8	5	32 / 44	294	IR35-GW-IS105-20-24-05D	1 U	53.4	0.83 J	0.88 J	69.1
Vinyl chloride	0.015	2	16 / 44	15.9	IR35-GW-IS101-20-24-05D	1 U	0.85 J	1 U	1 U	1.13
cis-1,2-Dichloroethene	70	70	40 / 44	1150	IR35-GW-IS101-20-24-05D	1 U	57.5	4.99	5.18	97.4
Isopropylbenzene	70	--	11 / 44	9.24	IR35-GW-IS110-20-24-05D	1 U	1 U	1 U	1 U	1 U
m- and p-Xylene	350	--	12 / 44	12.9	IR35-GW-IS110-20-24-05D	2 U	2 U	2 U	2 U	2 U
o-Xylene	350	--	14 / 44	7.48	IR35-GW-IS110-20-24-05D	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	100	100	29 / 44	335	IR35-GW-IS101-20-24-05D	1 U	6.94	0.41 J	0.37 J	12.8

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Operable Unit No. 10 (Site 35)
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MCB Camp Lejeune
North Carolina

Station ID	**NCGWQS**	**MCL-Groundwater**	**Frequency**			IR35-IS110		IR35-IS111		IR35-IS112	
Sample ID						IR35-GW-IS110-20-24-05D	IR35-GW-IS110-45-49-05D	IR35-GW-IS111-20-24-05D	IR35-GW-IS111-45-49-05D	IR35-GW-IS112-20-24-05D	IR35-GW-IS112-40-44-05D
Sample Date						10/17/05	10/17/05	10/17/05	10/17/05	10/18/05	10/18/05
Chemical Name			**Frequency**	**Max Value**	**Max Location**						
Volatile Organic Compounds (UG/L)											
1,1-Dichloroethene	7	7	2 / 44	3.52	IR35-GW-IS101-20-24-05D	4 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	0.51	5	5 / 44	0.22 J	IR35-GW-IS117-40-44-05DDP	4 U	1 U	1 U	1 U	1 U	1 U
2-Butanone	4,200	--	5 / 44	5.75 J	IR35-GW-IS106-45-49-05D	100 U	4.69 J	25 U	3.43 J	25 U	25 U
Acetone	700	--	16 / 44	20.9 J	IR35-GW-IS101-45-49-05D	100 U	18.4 J	25 U	12.9 J	25 U	25 U
Benzene	1	5	36 / 44	23	IR35-GW-IS110-20-24-05D	23	4.99	0.19 J	0.6 J	0.51 J	0.81 J
Carbon disulfide	700	--	5 / 44	1.53	IR35-GW-IS105-20-24-05D	4 U	0.29 J	0.29 J	1 U	1 U	1 U
Chloroform	70	80	1 / 44	0.24 J	IR35-GW-IS106-45-49-05D	4 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	550	700	36 / 44	19.7	IR35-GW-IS110-20-24-05D	19.7	3.17	1 U	1.06	0.88 J	0.57 J
Methyl-tert-butyl ether (MTBE)	200	--	3 / 44	0.57 J	IR35-GW-IS102-20-24-05D	4 U	1 U	1 U	1 U	1 U	1 U
Toluene	1,000	1,000	29 / 44	22.4	IR35-GW-IS110-20-24-05D	22.4	5.23	1.02	1.45	1.47	0.87 J
Trichloroethene	2.8	5	32 / 44	294	IR35-GW-IS105-20-24-05D	4 U	1 U	1 U	1 U	23.5	12.8
Vinyl chloride	0.015	2	16 / 44	15.9	IR35-GW-IS101-20-24-05D	4 U	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	70	70	40 / 44	1150	IR35-GW-IS101-20-24-05D	4.8	1.99	1 U	5.74	16.7	27.6
Isopropylbenzene	70	--	11 / 44	9.24	IR35-GW-IS110-20-24-05D	9.24	1.31	1 U	1 U	1 U	1 U
m- and p-Xylene	350	--	12 / 44	12.9	IR35-GW-IS110-20-24-05D	12.9	1.62 J	2 U	2 U	0.5 J	2 U
o-Xylene	350	--	14 / 44	7.48	IR35-GW-IS110-20-24-05D	7.48	1.1	1 U	1 U	0.21 J	1 U
trans-1,2-Dichloroethene	100	100	29 / 44	335	IR35-GW-IS101-20-24-05D	4 U	1 U	1 U	1 U	1.56	2.31

Denotes Detection
J - Reported Value is Estimated
U - Analyte Not Detected
NA - Not analyzed
NCGWQS - North Carolina 2L Groundwater Standard
MCL - Maximum Contaminant Level

TABLE 5-2A
Summary of VOCs Detected During October 2005 DPT Groundwater Screening
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Station ID	**NCGWQS**	**MCL-Groundwater**	**Frequency**			IR35-IS113			IR35-IS114	
Sample ID						IR35-GW-IS113-20-24-05D	IR35-GW-IS113-40-44-05D	IR35-GW-IS113-40-44-05DDP	IR35-GW-IS114-20-24-05D	IR35-GW-IS114-40-44-05D
Sample Date						10/19/05	10/19/05	10/19/05	10/19/05	10/19/05
Chemical Name			**Frequency**	**Max Value**	**Max Location**					
Volatile Organic Compounds (UG/L)										
1,1-Dichloroethene	7	7	2 / 44	3.52	IR35-GW-IS101-20-24-05D	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	0.51	5	5 / 44	0.22 J	IR35-GW-IS117-40-44-05DDP	1 U	1 U	1 U	1 U	1 U
2-Butanone	4,200	--	5 / 44	5.75 J	IR35-GW-IS106-45-49-05D	25 U	25 U	25 U	25 U	25 U
Acetone	700	--	16 / 44	20.9 J	IR35-GW-IS101-45-49-05D	25 U	6.25 J	25 U	25 U	4.46 J
Benzene	1	5	36 / 44	23	IR35-GW-IS110-20-24-05D	1 U	1.29	1.5	1.54	3.14
Carbon disulfide	700	--	5 / 44	1.53	IR35-GW-IS105-20-24-05D	1 U	1 U	1 U	1 U	1 U
Chloroform	70	80	1 / 44	0.24 J	IR35-GW-IS106-45-49-05D	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	550	700	36 / 44	19.7	IR35-GW-IS110-20-24-05D	1 U	0.99 J	1.26	1 U	1.01
Methyl-tert-butyl ether (MTBE)	200	--	3 / 44	0.57 J	IR35-GW-IS102-20-24-05D	1 U	1 U	1 U	1 U	1 U
Toluene	1,000	1,000	29 / 44	22.4	IR35-GW-IS110-20-24-05D	1 U	2.02 U	1.84 U	1 U	2.82
Trichloroethene	2.8	5	32 / 44	294	IR35-GW-IS105-20-24-05D	2.43	28.7	55.6	1 U	47.1
Vinyl chloride	0.015	2	16 / 44	15.9	IR35-GW-IS101-20-24-05D	1 U	0.73 J	0.65 J	1 U	2.31
cis-1,2-Dichloroethene	70	70	40 / 44	1150	IR35-GW-IS101-20-24-05D	11.6	40.6	48.8	8.69	165
Isopropylbenzene	70	--	11 / 44	9.24	IR35-GW-IS110-20-24-05D	1 U	1 U	1 U	1 U	1 U
m- and p-Xylene	350	--	12 / 44	12.9	IR35-GW-IS110-20-24-05D	2 U	0.51 J	0.55 J	2 U	0.53 J
o-Xylene	350	--	14 / 44	7.48	IR35-GW-IS110-20-24-05D	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	100	100	29 / 44	335	IR35-GW-IS101-20-24-05D	1.47	2.75	6.17	0.24 J	19.6

Denotes Detection
J - Reported Value is Estimated
U - Analyte Not Detected
NA - Not analyzed
NCGWQS - North Carolina 2L Groundwater Standard
MCL - Maximum Contaminant Level

TABLE 5-2A
Summary of VOCs Detected During October 2005 DPT Groundwater Screening
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Station ID	**NCGWQS**	**MCL-Groundwater**	**Frequency**			IR35-IS115		IR35-IS116		IR35-IS117		
Sample ID						IR35-GW-IS115-20-24-05D	IR35-GW-IS115-45-49-05D	IR35-GW-IS116-20-24-05D	IR35-GW-IS116-40-44-05D	IR35-GW-IS117-20-24-05D	IR35-GW-IS117-40-44-05D	IR35-GW-IS117-40-44-05DDP
Sample Date						10/18/05	10/18/05	10/18/05	10/18/05	10/19/05	10/19/05	10/19/05
Chemical Name			**Frequency**	**Max Value**	**Max Location**							
Volatile Organic Compounds (UG/L)												
1,1-Dichloroethene	7	7	2 / 44	3.52	IR35-GW-IS101-20-24-05D	1 U	1 U	1 U	1 U	1 U	0.21 J	0.24 J
1,2-Dichloropropane	0.51	5	5 / 44	0.22 J	IR35-GW-IS117-40-44-05DDP	1 U	1 U	1 U	1 U	1 U	0.21 J	0.22 J
2-Butanone	4,200	--	5 / 44	5.75 J	IR35-GW-IS106-45-49-05D	25 U	3.84 J	25 U	25 U	25 U	25 U	25 U
Acetone	700	--	16 / 44	20.9 J	IR35-GW-IS101-45-49-05D	25 U	14.8 J	25 U	25 U	25 U	3.89 J	5.43 J
Benzene	1	5	36 / 44	23	IR35-GW-IS110-20-24-05D	1 U	0.56 J	1 U	0.65 J	0.51 J	0.71 J	0.77 J
Carbon disulfide	700	--	5 / 44	1.53	IR35-GW-IS105-20-24-05D	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	70	80	1 / 44	0.24 J	IR35-GW-IS106-45-49-05D	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	550	700	36 / 44	19.7	IR35-GW-IS110-20-24-05D	1 U	0.82 J	1 U	1.27	1 U	0.8 J	0.81 J
Methyl-tert-butyl ether (MTBE)	200	--	3 / 44	0.57 J	IR35-GW-IS102-20-24-05D	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	1,000	1,000	29 / 44	22.4	IR35-GW-IS110-20-24-05D	1 U	1.62 U	1 U	1 U	1 U	2.54 U	2.55 U
Trichloroethene	2.8	5	32 / 44	294	IR35-GW-IS105-20-24-05D	1 U	0.71 J	1 U	5.03	0.25 J	88.6	61.6
Vinyl chloride	0.015	2	16 / 44	15.9	IR35-GW-IS101-20-24-05D	1 U	1 U	1 U	1 U	1 U	1.17	1.72
cis-1,2-Dichloroethene	70	70	40 / 44	1150	IR35-GW-IS101-20-24-05D	1 U	4.21	1 U	5.68	4.72	106	107
Isopropylbenzene	70	--	11 / 44	9.24	IR35-GW-IS110-20-24-05D	1 U	1 U	1 U	1 U	1 U	1 U	1 U
m- and p-Xylene	350	--	12 / 44	12.9	IR35-GW-IS110-20-24-05D	2 U	0.58 J	2 U	2 U	2 U	0.63 J	0.64 J
o-Xylene	350	--	14 / 44	7.48	IR35-GW-IS110-20-24-05D	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	100	100	29 / 44	335	IR35-GW-IS101-20-24-05D	1 U	1 U	1 U	0.52 J	0.31 J	11.8	11.1

Denotes Detection
J - Reported Value is Estimated
U - Analyte Not Detected
NA - Not analyzed
NCGWQS - North Carolina 2L Groundwater Standard
MCL - Maximum Contaminant Level

TABLE 5-2A
Summary of VOCs Detected During October 2005 DPT Groundwater Screening
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Station ID	**NCGWQS**	**MCL-Groundwater**	**Frequency**			IR35-IS118		IR35-IS119	
Sample ID						IR35-GW-IS118-20-24-05D	IR35-GW-IS118-40-44-05D	IR35-GW-IS119-20-24-05D	IR35-GW-IS119-40-44-05D
Sample Date						10/19/05	10/19/05	10/19/05	10/19/05
Chemical Name			**Frequency**	**Max Value**	**Max Location**				
Volatile Organic Compounds (UG/L)									
1,1-Dichloroethene	7	7	2 / 44	3.52	IR35-GW-IS101-20-24-05D	1 U	0.51 J	1 U	1 U
1,2-Dichloropropane	0.51	5	5 / 44	0.22 J	IR35-GW-IS117-40-44-05DDP	1 U	1 U	1 U	1 U
2-Butanone	4,200	--	5 / 44	5.75 J	IR35-GW-IS106-45-49-05D	25 U	25 U	25 U	25 U
Acetone	700	--	16 / 44	20.9 J	IR35-GW-IS101-45-49-05D	25 U	25 U	25 U	25 U
Benzene	1	5	36 / 44	23	IR35-GW-IS110-20-24-05D	7.32	2.76	1.06	4.78
Carbon disulfide	700	--	5 / 44	1.53	IR35-GW-IS105-20-24-05D	1 U	1 U	1 U	1 U
Chloroform	70	80	1 / 44	0.24 J	IR35-GW-IS106-45-49-05D	1 U	1 U	1 U	1 U
Ethylbenzene	550	700	36 / 44	19.7	IR35-GW-IS110-20-24-05D	1 U	0.86 J	1 U	1.06
Methyl-tert-butyl ether (MTBE)	200	--	3 / 44	0.57 J	IR35-GW-IS102-20-24-05D	1 U	1 U	1 U	1 U
Toluene	1,000	1,000	29 / 44	22.4	IR35-GW-IS110-20-24-05D	1 U	2.67 U	1.43 U	1.91 U
Trichloroethene	2.8	5	32 / 44	294	IR35-GW-IS105-20-24-05D	1 U	132	1 U	10.4
Vinyl chloride	0.015	2	16 / 44	15.9	IR35-GW-IS101-20-24-05D	1 U	2.69	0.4 U	1.07
cis-1,2-Dichloroethene	70	70	40 / 44	1150	IR35-GW-IS101-20-24-05D	0.7 J	291	0.91 J	81.8
Isopropylbenzene	70	--	11 / 44	9.24	IR35-GW-IS110-20-24-05D	1 U	1 U	1 U	0.49 J
m- and p-Xylene	350	--	12 / 44	12.9	IR35-GW-IS110-20-24-05D	2 U	0.51 J	2 U	2 U
o-Xylene	350	--	14 / 44	7.48	IR35-GW-IS110-20-24-05D	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	100	100	29 / 44	335	IR35-GW-IS101-20-24-05D	1 U	46.6	1 U	8.85

Denotes Detection
J - Reported Value is Estimated
U - Analyte Not Detected
NA - Not analyzed
NCGWQS - North Carolina 2L Groundwater Standard
MCL - Maximum Contaminant Level

TABLE 5-2B
Summary of VOCs Reported During January/February 2006 DPT Groundwater Screening
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Station ID	**NCGWQS**	**MCL-Groundwater**	**Frequency**			IR35-IS200		IR35-IS201		IR35-IS202	
Sample ID						IR35-GW-IS200-20-24-06A	IR35-GW-IS200-40-44-06A	IR35-GW-IS201-20-24-06A	IR35-GW-IS201-40-44-06A	IR35-GW-IS202-20-24-06A	IR35-GW-IS202-40-44-06A
Sample Date						01/31/06	01/31/06	01/31/06	01/31/06	01/31/06	01/31/06
Chemical Name			**Frequency**	**Max Value**	**Max Location**						
Volatile Organic Compounds (UG/L)											
1,1-Dichloroethane	70	--	3 / 42	0.25 J	IR35-GW-IS211-40-44-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	7	7	5 / 52	0.61	IR35-GW-IS219-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Butanone	4,200	--	21 / 42	2.5	IR35-GW-IS212-40-44-06A	1 J	1.5 J	2.5 U	1.8 J	2.5 U	1.4 J
Benzene	1	5	39 / 42	21	IR35-GW-IS213-20-24-06A	0.16 J	0.35 J	0.13 J	0.36 J	0.1 J	0.2 J
Bromodichloromethane	0.56	80	1 / 42	1	IR35-GW-IS204-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Carbon disulfide	700	--	10 / 42	0.89	IR35-GW-IS218-20-24-06A	0.5 U	0.5 U	0.13 J	0.5 U	0.5 U	0.5 U
Chloroform	70	80	4 / 42	2.5	IR35-GW-IS204-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Cyclohexane	--	--	6 / 42	0.44 J	IR35-GW-IS205-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dibromochloromethane	0.41	80	1 / 42	0.6	IR35-GW-IS204-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dichlorodifluoromethane (Freon-12)	1,400	--	1 / 42	0.4 J	IR35-GW-IS218-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	550	700	41 / 42	19	IR35-GW-IS218-20-24-06A	0.2 J	0.7	0.16 J	0.63	0.21 J	0.61
Methyl acetate	--	--	2 / 42	2.6	IR35-GW-IS213-40-44-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methyl-tert-butyl ether (MTBE)	200	--	1 / 42	0.1 J	IR35-GW-IS208-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylcyclohexane	--	--	6 / 42	1.7	IR35-GW-IS218-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylene chloride	4.6	5	2 / 42	0.24 J	IR35-GW-IS201-40-44-06A	0.5 U	0.5 U	0.5 U	0.24 J	0.5 U	0.5 U
Tetrachloroethene	0.7	5	1 / 42	0.5	IR35-GW-IS219-40-44-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	1,000	1,000	42 / 42	34	IR35-GW-IS216-20-24P-06A	1	1.2	1.2	1.3	0.56	1.1
Trichloroethene	2.8	5	6 / 42	4.1	IR35-GW-IS219-40-44-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.015	2	3 / 42	6.9	IR35-GW-IS219-20-24P-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Xylene, total	530	10,000	31 / 42	11	IR35-GW-IS218-20-24-06A	0.56	0.75	0.64	0.75	0.5 U	0.74
cis-1,2-Dichloroethene	70	70	6 / 42	830	IR35-GW-IS219-20-24P-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Isopropylbenzene	70	--	10 / 42	6.2	IR35-GW-IS216-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
m- and p-Xylene	350	--	3 / 42	6.4	IR35-GW-IS216-20-24-06A	0.38 J	0.51 J	0.44 J	0.52 J	1 U	0.51 J
o-Xylene	350	--	31 / 42	4.8	IR35-GW-IS218-20-24-06A	0.17 J	0.22 J	0.17 J	0.21 J	0.5 U	0.21 J
trans-1,2-Dichloroethene	100	100	4 / 42	190	IR35-GW-IS219-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Denotes detection

J - Reported Value is Estimated
U - Analyte Not Detected
NA - Not analyzed
NCGWQS - North Carolina 2L Groundwater Standard
MCL - Maximum Contaminant Level
DPT - Direct Push Technology

TABLE 5-2B
Summary of VOCs Reported During January/February 2006 DPT Groundwater Screening
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Station ID	**NCGWQS**	**MCL-Groundwater**	**Frequency**			IR35-IS203		IR35-IS204		IR35-IS205	
Sample ID						IR35-GW-IS203-20-24-06A	IR35-GW-IS203-40-44-06A	IR35-GW-IS204-20-24-06A	IR35-GW-IS204-40-44-06A	IR35-GW-IS205-20-24-06A	IR35-GW-IS205-40-44-06A
Sample Date						01/31/06	01/31/06	01/31/06	01/31/06	01/31/06	01/31/06
Chemical Name			**Frequency**	**Max Value**	**Max Location**						
Volatile Organic Compounds (UG/L)											
1,1-Dichloroethane	70	--	3 / 42	0.25 J	IR35-GW-IS211-40-44-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	7	7	5 / 52	0.61	IR35-GW-IS219-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Butanone	4,200	--	21 / 42	2.5	IR35-GW-IS212-40-44-06A	2.5 U	1.4 J	1.9 J	1.4 J	2.5 U	1.7 J
Benzene	1	5	39 / 42	21	IR35-GW-IS213-20-24-06A	0.11 J	0.18 J	0.15 J	0.2 J	0.22 J	0.4 J
Bromodichloromethane	0.56	80	1 / 42	1	IR35-GW-IS204-20-24-06A	0.5 U	0.5 U	1	0.5 U	0.5 U	0.5 U
Carbon disulfide	700	--	10 / 42	0.89	IR35-GW-IS218-20-24-06A	0.5 U	0.5 U	0.76	0.5 U	0.12 J	0.5 U
Chloroform	70	80	4 / 42	2.5	IR35-GW-IS204-20-24-06A	0.5 U	0.5 U	2.5	0.5 U	0.5 U	0.5 U
Cyclohexane	--	--	6 / 42	0.44 J	IR35-GW-IS205-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.44 J	0.5 U
Dibromochloromethane	0.41	80	1 / 42	0.6	IR35-GW-IS204-20-24-06A	0.5 U	0.5 U	0.6	0.5 U	0.5 U	0.5 U
Dichlorodifluoromethane (Freon-12)	1,400	--	1 / 42	0.4 J	IR35-GW-IS218-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	550	700	41 / 42	19	IR35-GW-IS218-20-24-06A	0.11 J	0.49 J	0.18 J	0.63	1.1	0.84
Methyl acetate	--	--	2 / 42	2.6	IR35-GW-IS213-40-44-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methyl-tert-butyl ether (MTBE)	200	--	1 / 42	0.1 J	IR35-GW-IS208-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylcyclohexane	--	--	6 / 42	1.7	IR35-GW-IS218-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.11 J	0.32 J
Methylene chloride	4.6	5	2 / 42	0.24 J	IR35-GW-IS201-40-44-06A	0.5 U	0.17 J	0.5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene	0.7	5	1 / 42	0.5	IR35-GW-IS219-40-44-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	1,000	1,000	42 / 42	34	IR35-GW-IS216-20-24P-06A	1	0.95	0.89	1.2	1.5	1.7
Trichloroethene	2.8	5	6 / 42	4.1	IR35-GW-IS219-40-44-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.015	2	3 / 42	6.9	IR35-GW-IS219-20-24P-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Xylene, total	530	10,000	31 / 42	11	IR35-GW-IS218-20-24-06A	0.49 J	0.5	0.36 J	0.63	0.78	1
cis-1,2-Dichloroethene	70	70	6 / 42	830	IR35-GW-IS219-20-24P-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Isopropylbenzene	70	--	10 / 42	6.2	IR35-GW-IS216-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
m- and p-Xylene	350	--	3 / 42	6.4	IR35-GW-IS216-20-24-06A	0.34 J	0.36 J	0.24 J	0.44 J	0.54 J	0.7 J
o-Xylene	350	--	31 / 42	4.8	IR35-GW-IS218-20-24-06A	0.13 J	0.13 J	0.11 J	0.17 J	0.22 J	0.3 J
trans-1,2-Dichloroethene	100	100	4 / 42	190	IR35-GW-IS219-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Denotes detection

J - Reported Value is Estimated
U - Analyte Not Detected
NA - Not analyzed
NCGWQS - North Carolina 2L Groundwater Standard
MCL - Maximum Contaminant Level
DPT - Direct Push Technology

TABLE 5-2B
Summary of VOCs Reported During January/February 2006 DPT Groundwater Screening
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Station ID	**NCGWQS**	**MCL-Groundwater**	**Frequency**			IR35-IS206		IR35-IS207	IR35-IS208	IR35-IS209	
Sample ID						IR35-GW-IS206-20-24-06A	IR35-GW-IS206-40-44-06A	IR35-GW-IS207-20-24-06A	IR35-GW-IS208-20-24-06A	IR35-GW-IS209-20-24-06A	IR35-GW-IS209-40-44-06A
Sample Date						01/31/06	01/31/06	01/31/06	02/01/06	02/01/06	02/01/06
Chemical Name			**Frequency**	**Max Value**	**Max Location**						
Volatile Organic Compounds (UG/L)											
1,1-Dichloroethane	70	--	3 / 42	0.25 J	IR35-GW-IS211-40-44-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	7	7	5 / 52	0.61	IR35-GW-IS219-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Butanone	4,200	--	21 / 42	2.5	IR35-GW-IS212-40-44-06A	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	1.7 J
Benzene	1	5	39 / 42	21	IR35-GW-IS213-20-24-06A	0.14 J	0.13 J	0.5 U	0.2 J	0.5 U	0.38 J
Bromodichloromethane	0.56	80	1 / 42	1	IR35-GW-IS204-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Carbon disulfide	700	--	10 / 42	0.89	IR35-GW-IS218-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.14 J	0.5 U
Chloroform	70	80	4 / 42	2.5	IR35-GW-IS204-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Cyclohexane	--	--	6 / 42	0.44 J	IR35-GW-IS205-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dibromochloromethane	0.41	80	1 / 42	0.6	IR35-GW-IS204-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dichlorodifluoromethane (Freon-12)	1,400	--	1 / 42	0.4 J	IR35-GW-IS218-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	550	700	41 / 42	19	IR35-GW-IS218-20-24-06A	0.17 J	0.54	0.17 J	1.5	0.21 J	0.95
Methyl acetate	--	--	2 / 42	2.6	IR35-GW-IS213-40-44-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methyl-tert-butyl ether (MTBE)	200	--	1 / 42	0.1 J	IR35-GW-IS208-20-24-06A	0.5 U	0.5 U	0.5 U	0.1 J	0.5 U	0.5 U
Methylcyclohexane	--	--	6 / 42	1.7	IR35-GW-IS218-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylene chloride	4.6	5	2 / 42	0.24 J	IR35-GW-IS201-40-44-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene	0.7	5	1 / 42	0.5	IR35-GW-IS219-40-44-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	1,000	1,000	42 / 42	34	IR35-GW-IS216-20-24P-06A	0.37 J	0.6	0.42 J	1.4	0.68	1.3
Trichloroethene	2.8	5	6 / 42	4.1	IR35-GW-IS219-40-44-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.015	2	3 / 42	6.9	IR35-GW-IS219-20-24P-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Xylene, total	530	10,000	31 / 42	11	IR35-GW-IS218-20-24-06A	0.5 U	0.5 U	0.5 U	0.33 J	0.5 U	0.24 J
cis-1,2-Dichloroethene	70	70	6 / 42	830	IR35-GW-IS219-20-24P-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Isopropylbenzene	70	--	10 / 42	6.2	IR35-GW-IS216-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
m- and p-Xylene	350	--	3 / 42	6.4	IR35-GW-IS216-20-24-06A	1 U	1 U	1 U	0.3 J	1 U	0.21 J
o-Xylene	350	--	31 / 42	4.8	IR35-GW-IS218-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trans-1,2-Dichloroethene	100	100	4 / 42	190	IR35-GW-IS219-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Denotes detection

J - Reported Value is Estimated
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NA - Not analyzed
NCGWQS - North Carolina 2L Groundwater Standard
MCL - Maximum Contaminant Level
DPT - Direct Push Technology

TABLE 5-2B
Summary of VOCs Reported During January/February 2006 DPT Groundwater Screening
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Station ID	**NCGWQS**	**MCL-Groundwater**	**Frequency**			IR35-IS210		IR35-IS211			IR35-IS212	
Sample ID						IR35-GW-IS210-20-24-06A	IR35-GW-IS210-40-44-06A	IR35-GW-IS211-20-24-06A	IR35-GW-IS211-40-44-06A	IR35-GW-IS211-40-44P-06A	IR35-GW-IS212-20-24-06A	IR35-GW-IS212-40-44-06A
Sample Date						01/31/06	01/31/06	01/31/06	01/31/06	01/31/06	02/01/06	02/01/06
Chemical Name			**Frequency**	**Max Value**	**Max Location**							
Volatile Organic Compounds (UG/L)												
1,1-Dichloroethane	70	--	3 / 42	0.25 J	IR35-GW-IS211-40-44-06A	0.5 U	0.5 U	0.5 U	0.25 J	0.13 J	0.5 U	0.5 U
1,1-Dichloroethene	7	7	5 / 52	0.61	IR35-GW-IS219-20-24-06A	0.5 U	0.5 U	0.5 U	0.24 J	0.16 J	0.5 U	0.5 U
2-Butanone	4,200	--	21 / 42	2.5	IR35-GW-IS212-40-44-06A	2.5 U	1.4 J	2.5 U	2.5 U	1.6 J	2.5 U	2.5
Benzene	1	5	39 / 42	21	IR35-GW-IS213-20-24-06A	0.12 J	0.58	0.5 U	6.1	6.5	0.4 J	0.45 J
Bromodichloromethane	0.56	80	1 / 42	1	IR35-GW-IS204-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Carbon disulfide	700	--	10 / 42	0.89	IR35-GW-IS218-20-24-06A	0.5 U	0.5 U	0.13 J	0.11 J	0.5 U	0.5 U	0.5 U
Chloroform	70	80	4 / 42	2.5	IR35-GW-IS204-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Cyclohexane	--	--	6 / 42	0.44 J	IR35-GW-IS205-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.16 J
Dibromochloromethane	0.41	80	1 / 42	0.6	IR35-GW-IS204-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dichlorodifluoromethane (Freon-12)	1,400	--	1 / 42	0.4 J	IR35-GW-IS218-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	550	700	41 / 42	19	IR35-GW-IS218-20-24-06A	0.24 J	0.96	0.14 J	0.83	1.2	0.48 J	1.6
Methyl acetate	--	--	2 / 42	2.6	IR35-GW-IS213-40-44-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methyl-tert-butyl ether (MTBE)	200	--	1 / 42	0.1 J	IR35-GW-IS208-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylcyclohexane	--	--	6 / 42	1.7	IR35-GW-IS218-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1.1
Methylene chloride	4.6	5	2 / 42	0.24 J	IR35-GW-IS201-40-44-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene	0.7	5	1 / 42	0.5	IR35-GW-IS219-40-44-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	1,000	1,000	42 / 42	34	IR35-GW-IS216-20-24P-06A	0.68	0.74	0.53	2.3	2.5	1.4	1.4
Trichloroethene	2.8	5	6 / 42	4.1	IR35-GW-IS219-40-44-06A	0.5 U	0.5 U	0.5 U	0.15 J	0.1 J	0.5 U	0.5 U
Vinyl chloride	0.015	2	3 / 42	6.9	IR35-GW-IS219-20-24P-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Xylene, total	530	10,000	31 / 42	11	IR35-GW-IS218-20-24-06A	0.22 J	0.63	0.56	1.1	1	0.53	0.59
cis-1,2-Dichloroethene	70	70	6 / 42	830	IR35-GW-IS219-20-24P-06A	0.5 U	0.42 J	0.5 U	0.49 J	0.45 J	0.5 U	0.5 U
Isopropylbenzene	70	--	10 / 42	6.2	IR35-GW-IS216-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2.5
m- and p-Xylene	350	--	3 / 42	6.4	IR35-GW-IS216-20-24-06A	0.21 J	0.47 J	0.41 J	0.64 J	0.49 J	0.37 J	0.37 J
o-Xylene	350	--	31 / 42	4.8	IR35-GW-IS218-20-24-06A	0.5 U	0.13 J	0.14 J	0.4 J	0.51	0.11 J	0.17 J
trans-1,2-Dichloroethene	100	100	4 / 42	190	IR35-GW-IS219-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Denotes detection

J - Reported Value is Estimated
U - Analyte Not Detected
NA - Not analyzed
NCGWQS - North Carolina 2L Groundwater Standard
MCL - Maximum Contaminant Level
DPT - Direct Push Technology

TABLE 5-2B
Summary of VOCs Reported During January/February 2006 DPT Groundwater Screening
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Station ID	**NCGWQS**	**MCL-Groundwater**	**Frequency**			IR35-IS213			IR35-IS214	IR35-IS215	
Sample ID						IR35-GW-IS213-20-24-06A	IR35-GW-IS213-20-24P-06A	IR35-GW-IS213-40-44-06A	IR35-GW-IS214-20-24-06A	IR35-GW-IS215-20-24-06A	IR35-GW-IS215-40-44-06A
Sample Date						02/01/06	02/01/06	02/01/06	02/01/06	02/01/06	02/01/06
Chemical Name			**Frequency**	**Max Value**	**Max Location**						
Volatile Organic Compounds (UG/L)											
1,1-Dichloroethane	70	--	3 / 42	0.25 J	IR35-GW-IS211-40-44-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.18 J	0.5 U
1,1-Dichloroethene	7	7	5 / 52	0.61	IR35-GW-IS219-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.14 J	0.5 U
2-Butanone	4,200	--	21 / 42	2.5	IR35-GW-IS212-40-44-06A	2.5 U	1.3 J	0.92 J	2.5 U	2.5 U	0.86 J
Benzene	1	5	39 / 42	21	IR35-GW-IS213-20-24-06A	21	19	0.46 J	21	0.29 J	9.5
Bromodichloromethane	0.56	80	1 / 42	1	IR35-GW-IS204-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Carbon disulfide	700	--	10 / 42	0.89	IR35-GW-IS218-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.12 J	0.5 U
Chloroform	70	80	4 / 42	2.5	IR35-GW-IS204-20-24-06A	0.5 U	0.5 U	0.12 J	0.5 U	0.5	0.5 U
Cyclohexane	--	--	6 / 42	0.44 J	IR35-GW-IS205-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dibromochloromethane	0.41	80	1 / 42	0.6	IR35-GW-IS204-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dichlorodifluoromethane (Freon-12)	1,400	--	1 / 42	0.4 J	IR35-GW-IS218-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	550	700	41 / 42	19	IR35-GW-IS218-20-24-06A	3	2.9	1.1	3.7	0.15 J	1.5
Methyl acetate	--	--	2 / 42	2.6	IR35-GW-IS213-40-44-06A	0.5 U	0.5 U	2.6	0.5 U	0.5 U	0.5 U
Methyl-tert-butyl ether (MTBE)	200	--	1 / 42	0.1 J	IR35-GW-IS208-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylcyclohexane	--	--	6 / 42	1.7	IR35-GW-IS218-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylene chloride	4.6	5	2 / 42	0.24 J	IR35-GW-IS201-40-44-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene	0.7	5	1 / 42	0.5	IR35-GW-IS219-40-44-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	1,000	1,000	42 / 42	34	IR35-GW-IS216-20-24P-06A	8.5	8	1.4	11	0.5	2.4
Trichloroethene	2.8	5	6 / 42	4.1	IR35-GW-IS219-40-44-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.23 J
Vinyl chloride	0.015	2	3 / 42	6.9	IR35-GW-IS219-20-24P-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Xylene, total	530	10,000	31 / 42	11	IR35-GW-IS218-20-24-06A	2.7	2.6	0.39 J	3.4	0.5 U	1.3
cis-1,2-Dichloroethene	70	70	6 / 42	830	IR35-GW-IS219-20-24P-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Isopropylbenzene	70	--	10 / 42	6.2	IR35-GW-IS216-20-24-06A	0.82	0.72	0.5 U	1.3	0.5 U	0.5 U
m- and p-Xylene	350	--	3 / 42	6.4	IR35-GW-IS216-20-24-06A	0.96 J	0.95 J	0.23 J	1.4	1 U	0.46 J
o-Xylene	350	--	31 / 42	4.8	IR35-GW-IS218-20-24-06A	1.6	1.5	0.14 J	1.8	0.5 U	0.76
trans-1,2-Dichloroethene	100	100	4 / 42	190	IR35-GW-IS219-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.14 J

Denotes detection

J - Reported Value is Estimated
U - Analyte Not Detected
NA - Not analyzed
NCGWQS - North Carolina 2L Groundwater Standard
MCL - Maximum Contaminant Level
DPT - Direct Push Technology

TABLE 5-2B
Summary of VOCs Reported During January/February 2006 DPT Groundwater Screening
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Station ID	NCGWQS	MCL-Groundwater	Frequency			IR35-IS216				IR35-IS217	
Sample ID						IR35-GW-IS216-20-24-06A	IR35-GW-IS216-20-24P-06A	IR35-GW-IS216-40-44-06A	IR35-GW-IS216-40-44P-06A	IR35-GW-IS217-20-24-06A	IR35-GW-IS217-40-44-06A
Sample Date						02/01/06	02/01/06	02/01/06	02/01/06	02/01/06	02/01/06
Chemical Name			**Frequency**	**Max Value**	**Max Location**						
Volatile Organic Compounds (UG/L)											
1,1-Dichloroethane	70	--	3 / 42	0.25 J	IR35-GW-IS211-40-44-06A	0.5 U	1.3 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	7	7	5 / 52	0.61	IR35-GW-IS219-20-24-06A	0.5 U	1.3 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Butanone	4,200	--	21 / 42	2.5	IR35-GW-IS212-40-44-06A	2.5 U	6.3 U	1.7 J	1.2 J	1.2 J	2.1 J
Benzene	1	5	39 / 42	21	IR35-GW-IS213-20-24-06A	7.3	5.9	0.34 J	0.28 J	0.11 J	0.56
Bromodichloromethane	0.56	80	1 / 42	1	IR35-GW-IS204-20-24-06A	0.5 U	1.3 U	0.5 U	0.5 U	0.5 U	0.5 U
Carbon disulfide	700	--	10 / 42	0.89	IR35-GW-IS218-20-24-06A	0.63	1.3 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroform	70	80	4 / 42	2.5	IR35-GW-IS204-20-24-06A	0.5 U	1.3 U	0.5 U	0.5 U	0.5 U	0.5 U
Cyclohexane	--	--	6 / 42	0.44 J	IR35-GW-IS205-20-24-06A	0.14 J	1.3 U	0.5 U	0.5 U	0.5 U	0.5 U
Dibromochloromethane	0.41	80	1 / 42	0.6	IR35-GW-IS204-20-24-06A	0.5 U	1.3 U	0.5 U	0.5 U	0.5 U	0.5 U
Dichlorodifluoromethane (Freon-12)	1,400	--	1 / 42	0.4 J	IR35-GW-IS218-20-24-06A	0.5 U	1.3 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	550	700	41 / 42	19	IR35-GW-IS218-20-24-06A	9.6	8.7	1.1	1.2	0.5 U	1
Methyl acetate	--	--	2 / 42	2.6	IR35-GW-IS213-40-44-06A	0.5 U	1.3 U	0.5 U	0.5 U	0.5 U	0.5 U
Methyl-tert-butyl ether (MTBE)	200	--	1 / 42	0.1 J	IR35-GW-IS208-20-24-06A	0.5 U	1.3 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylcyclohexane	--	--	6 / 42	1.7	IR35-GW-IS218-20-24-06A	0.25 J	1.3 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylene chloride	4.6	5	2 / 42	0.24 J	IR35-GW-IS201-40-44-06A	0.5 U	1.3 U	0.5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene	0.7	5	1 / 42	0.5	IR35-GW-IS219-40-44-06A	0.5 U	1.3 U	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	1,000	1,000	42 / 42	34	IR35-GW-IS216-20-24P-06A	28	34	1.9	1.8	0.48 J	1.8
Trichloroethene	2.8	5	6 / 42	4.1	IR35-GW-IS219-40-44-06A	0.5 U	1.3 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.015	2	3 / 42	6.9	IR35-GW-IS219-20-24P-06A	0.5 U	1.3 U	0.5 U	0.5 U	0.5 U	0.5 U
Xylene, total	530	10,000	31 / 42	11	IR35-GW-IS218-20-24-06A	12 D	9.1	0.56	0.57	0.5 U	0.58
cis-1,2-Dichloroethene	70	70	6 / 42	830	IR35-GW-IS219-20-24P-06A	0.5 U	1.3 U	0.5 U	0.5 U	0.5 U	0.5 U
Isopropylbenzene	70	--	10 / 42	6.2	IR35-GW-IS216-20-24-06A	6.2	6.1	0.23 J	0.17 J	0.5 U	0.5 U
m- and p-Xylene	350	--	3 / 42	6.4	IR35-GW-IS216-20-24-06A	6.4	8.3 D	0.38 J	0.39 J	1 U	0.39 J
o-Xylene	350	--	31 / 42	4.8	IR35-GW-IS218-20-24-06A	3.1	2.7	0.16 J	0.16 J	0.5 U	0.15 J
trans-1,2-Dichloroethene	100	100	4 / 42	190	IR35-GW-IS219-20-24-06A	0.5 U	1.3 U	0.5 U	0.5 U	0.5 U	0.5 U

Denotes detection

J - Reported Value is Estimated
U - Analyte Not Detected
NA - Not analyzed
NCGWQS - North Carolina 2L Groundwater Standard
MCL - Maximum Contaminant Level
DPT - Direct Push Technology

TABLE 5-2B
Summary of VOCs Reported During January/February 2006 DPT Groundwater Screening
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Station ID	**NCGWQS**	**MCL-Groundwater**	**Frequency**			IR35-IS218		IR35-IS219		
Sample ID						IR35-GW-IS218-20-24-06A	IR35-GW-IS218-40-44-06A	IR35-GW-IS219-20-24-06A	IR35-GW-IS219-20-24P-06A	IR35-GW-IS219-40-44-06A
Sample Date						02/01/06	02/01/06	02/01/06	02/01/06	02/01/06
Chemical Name			**Frequency**	**Max Value**	**Max Location**					
Volatile Organic Compounds (UG/L)										
1,1-Dichloroethane	70	--	3 / 42	0.25 J	IR35-GW-IS211-40-44-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	7	7	5 / 52	0.61	IR35-GW-IS219-20-24-06A	0.5 U	0.5 U	0.61	0.59	0.5 U
2-Butanone	4,200	--	21 / 42	2.5	IR35-GW-IS212-40-44-06A	2.5 U	0.95 J	2.5 U	2.5 U	1 J
Benzene	1	5	39 / 42	21	IR35-GW-IS213-20-24-06A	17	4.5	0.36 J	0.34 J	1.5
Bromodichloromethane	0.56	80	1 / 42	1	IR35-GW-IS204-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Carbon disulfide	700	--	10 / 42	0.89	IR35-GW-IS218-20-24-06A	0.89	0.11 J	0.5 U	0.5 U	0.5 U
Chloroform	70	80	4 / 42	2.5	IR35-GW-IS204-20-24-06A	0.13 J	0.5 U	0.5 U	0.5 U	0.5 U
Cyclohexane	--	--	6 / 42	0.44 J	IR35-GW-IS205-20-24-06A	0.25 J	0.5 U	0.16 J	0.15 J	0.5 U
Dibromochloromethane	0.41	80	1 / 42	0.6	IR35-GW-IS204-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dichlorodifluoromethane (Freon-12)	1,400	--	1 / 42	0.4 J	IR35-GW-IS218-20-24-06A	0.4 J	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	550	700	41 / 42	19	IR35-GW-IS218-20-24-06A	19	1.5	0.46 J	0.54	0.71
Methyl acetate	--	--	2 / 42	2.6	IR35-GW-IS213-40-44-06A	0.5 U	0.5 U	0.69	0.5 U	0.5 U
Methyl-tert-butyl ether (MTBE)	200	--	1 / 42	0.1 J	IR35-GW-IS208-20-24-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylcyclohexane	--	--	6 / 42	1.7	IR35-GW-IS218-20-24-06A	1.7	0.12 J	0.5 U	0.5 U	0.5 U
Methylene chloride	4.6	5	2 / 42	0.24 J	IR35-GW-IS201-40-44-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene	0.7	5	1 / 42	0.5	IR35-GW-IS219-40-44-06A	0.5 U	0.5 U	0.5 U	0.5 U	0.5
Toluene	1,000	1,000	42 / 42	34	IR35-GW-IS216-20-24P-06A	13	4.9	1.4	1.6	1.8
Trichloroethene	2.8	5	6 / 42	4.1	IR35-GW-IS219-40-44-06A	0.5 U	0.5 U	4	3.7	4.1
Vinyl chloride	0.015	2	3 / 42	6.9	IR35-GW-IS219-20-24P-06A	0.5 U	0.5 U	6.8	6.9	0.22 J
Xylene, total	530	10,000	31 / 42	11	IR35-GW-IS218-20-24-06A	11	1.2	0.37 J	0.47 J	0.46 J
cis-1,2-Dichloroethene	70	70	6 / 42	830	IR35-GW-IS219-20-24P-06A	0.5 U	0.5 U	820	830	11
Isopropylbenzene	70	--	10 / 42	6.2	IR35-GW-IS216-20-24-06A	3	0.17 J	0.5 U	0.5 U	0.5 U
m- and p-Xylene	350	--	3 / 42	6.4	IR35-GW-IS216-20-24-06A	5.2	0.55 J	0.33 J	0.33 J	0.33 J
o-Xylene	350	--	31 / 42	4.8	IR35-GW-IS218-20-24-06A	4.8	0.62	0.5 U	0.1 J	0.11 J
trans-1,2-Dichloroethene	100	100	4 / 42	190	IR35-GW-IS219-20-24-06A	0.5 U	0.5 U	190	190	2.3

Denotes detection

J - Reported Value is Estimated
U - Analyte Not Detected
NA - Not analyzed
NCGWQS - North Carolina 2L Groundwater Standard
MCL - Maximum Contaminant Level
DPT - Direct Push Technology

TABLE 5-3
Summary of Groundwater Quality Parameters - April 2006
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Well ID	**Sample Date**	**Purge Volume** (gallons)	**Purge Rate** (L/min)	**pH** (SU)	**Conductivity** (mS/cm)	**DO** (mg/L)	**Temperature** (^{o}C)	**ORP** (mV)	**Turbidity** (NTU)
IR35-MW01DW	4/23/2006	8.0	0.3	7.11	0.480	0.00	20.00	-132	1.49
IR35-MW02	4/23/2006	6.5	0.3	6.86	0.218	0.00	18.89	-83	4.78
IR35-MW03DW	4/24/2006	9.9	0.2	7.40	0.432	0.00	18.82	-124	0.89
IR35-MW04	4/23/2006	2.4	0.3	6.13	0.170	8.70	19.00	134	53.9
IR35-MW06	4/23/2006	2.5	0.3	4.47	0.024	2.90	17.88	386	9.47
IR35-MW06DW	4/24/2006	10.5	0.3	7.14	0.530	0.00	20.80	-88	1.31
IR35-MW07DW	6/22/2006	7.5	0.4	7.51	0.963	1.70	20.62	-109	6.6
IR35-MW09	4/24/2006	1.0	0.2	7.39	0.323	0.00	17.41	82	8.17
IR35-MW09IW	4/24/2006	3.5	0.4	7.61	0.279	0.00	18.04	-114	9.0
IR35-MW10	4/24/2006	1.6	0.2	6.70	0.627	0.70	17.40	-38	902
IR35-MW10IW	4/24/2006	4.0	0.2	6.80	0.733	0.28	18.24	-159	0.49
IR35-MW14	4/25/2006	4.0	0.4	6.88	0.346	0.00	17.52	77	1.07
IR35-MW14IW	4/25/2006	3.5	0.4	7.39	0.313	0.00	19.23	-102	3.46
IR35-MW29	4/24/2006	1.6	0.2	5.56	0.212	0.00	17.84	-155	1.21
IR35-MW29IW	4/24/2006	6.5	0.2	7.00	0.579	0.24	19.93	-147	0.21
IR35-MW30	4/23/2006	2.2	0.2	4.40	0.095	0.00	17.97	5	1.54
IR35-MW30IW	4/23/2006	6.25	0.2	7.05	0.637	0.00	19.96	-139	0.93
IR35-MW30DW	4/23/2006	10.0	0.2	7.50	0.586	0.25	19.96	-151	1.59
IR35-MW31	4/24/2006	0.7	0.1	6.60	0.204	0.00	19.08	180	1.38
IR35-MW31IW	4/24/2006	5.5	0.4	7.66	0.282	0.00	20.60	-74	1.75
IR35-MW32	4/23/2006	2.0	0.2	4.70	0.239	1.27	16.94	288	3.16
IR35-MW32IW	4/23/2006	5.8	0.2	6.96	0.680	0.46	18.91	-128	0.36
IR35-MW34	4/24/2006	1.5	0.1	6.23	0.137	0.00	18.20	209	5.63
IR35-MW34IW	4/24/2006	5.5	0.5	7.50	0.537	0.00	20.98	-86	5.31

TABLE 5-3
Summary of Groundwater Quality Parameters - April 2006
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Well ID	**Sample Date**	**Purge Volume** (gallons)	**Purge Rate** (L/min)	**pH** (SU)	**Conductivity** (mS/cm)	**DO** (mg/L)	**Temperature** (^{o}C)	**ORP** (mV)	**Turbidity** (NTU)
IR35-MW37	4/25/2006	1.3	0.2	4.37	0.09	0.12	16.80	341	373
IR35-MW37IW	4/25/2006	6.2	0.5	6.90	0.630	0.00	19.20	113	2.89
IR35-MW38	6/22/2006	2.3	0.3	6.05	0.241	2.10	20.60	8	0
IR35-MW38IW	6/22/2006	5.8	0.4	7.07	2.730	7.06	20.00	-135	5.0
IR35-MW39IW	4/23/2006	6.5	0.4	7.56	0.241	0.00	21.01	-197	2.18
IR35-MW40IW	4/24/2006	6.1	0.4	7.00	0.720	0.00	21.50	-132	2.3
IR35-MW47	6/20/2006	3.0	0.2	7.50	0.554	0.00	20.10	-12	160
IR35-MW47IW	6/21/2006	5.25	0.4	7.34	0.410	4.27	20.48	-142	3.6
IR35-MW49A	6/21/2006	2.4	0.3	7.08	0.498	10.13	18.39	-121	0
IR35-MW49IW	6/21/2006	4.75	0.4	7.21	0.419	12.14	20.19	-137	2.9
IR35-MW55	6/21/2006	5.0	0.4	6.47	0.488	0.79	18.13	-101	62
IR35-MW55IW	6/21/2006	5.0	0.4	6.78	0.624	1.44	19.26	43	55
IR35-MW60	6/22/2006	6.0	0.3	5.29	0.121	10.03	18.00	219	2
IR35-MW60IW	6/22/2006	4.0	0.6	7.16	N/A	0.00	19.26	-9	101
IR35-MW62A	6/21/2006	2.5	0.3	6.92	0.547	7.52	18.55	-162	14.2
IR35-MW63IW	6/21/2006	4.75	0.4	7.28	0.384	8.72	17.95	-151	1.4
IR35-MW64IW	6/21/2006	5.8	0.5	7.07	0.376	1.74	19.10	-192	1.4
IR35-MW66	4/23/2006	4.0	0.5	5.18	0.2	2.60	17.90	34	6.39
IR35-MW68IW	4/23/2006	6.0	0.4	7.66	0.272	0.00	19.63	-31	0.93
IR35-MW69IW	4/24/2006	5.3	0.4	6.91	0.760	2.53	20.50	-104	2.8
IR35-MW70IW	4/23/2006	7.25	0.3	6.94	0.580	0.00	20.20	-106	1.88
IR35-MW71IW	4/23/2006	6.5	0.5	7.72	0.245	0.00	19.82	-135	4.45
IR35-MW72	6/20/2006	2.0	0.2	6.95	**	0.00	20.36	-149	**
IR35-MW72IW	6/20/2006	6.8	0.3	7.14	0.539	1.73	20.55	-88	78.4

TABLE 5-3
Summary of Groundwater Quality Parameters - April 2006
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Well ID	**Sample Date**	**Purge Volume** (gallons)	**Purge Rate** (L/min)	**pH** (SU)	**Conductivity** (mS/cm)	**DO** (mg/L)	**Temperature** (^{o}C)	**ORP** (mV)	**Turbidity** (NTU)
IR35-MW72DW	8/6/2006	9.0	0.4	8.36	0.445	1.51	26.23	-31	160
IR35-MW73	6/20/2006	3.5	0.2	5.81	**	0.00	20.04	-6	135
IR35-MW73IW	6/19/2006	8.1	0.3	7.83	0.484	2.68	21.33	-215	447
IR35-MW74	6/20/2006	6.0	0.2	6.20	0.000	5.87	**	183	95.4
IR35-MW74IW	6/20/2006	7.0	0.3	6.86	0.529	10.10	20.20	-121	23.1
IR35-MW80DW	4/25/2006	9.3	0.1	7.99	0.217	0.00	21.54	-137	2.52
IR35-MW80IW	6/19/2006	6.9	0.2	7.46	0.708	3.18	24.00	-166	216
IR35-MW81	8/6/2006	5.5	0.1	7.34	0.534	1.40	20.39	-137	19
IR35-MW81IW	8/6/2006	8.0	0.1	7.35	0.589	1.09	21.30	-93	18.5

** Reading incorrect due to problem with Horiba probe

L/min - liters per minute
SU - Standard Unit
mS/cm - milliSiemens per centimeter
mg/L - milligrams per liter
^{o}C - degrees Celsius
mV - milliVolt
NTU - Nephelometric Turbidity Unit
ORP - Oxidation Reduction Potential

TABLE 5-4
Detected Concentrations of VOCs and Geochemical Parameters in the Surfical Aquifer
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Station ID **Sample ID** **Sample Date**	**NCGWQS**	**MCL-Groundwater**	**Frequency**			IR35-MW02 IR35-GW02-06B 04/23/06	IR35-MW04 IR35-GW04-06B 04/23/06	IR35-MW06 IR35-GW06-06B 04/23/06	IR35-MW09 IR35-GW09-06B 04/24/06	IR35-MW10 IR35-GW10-06B 04/24/06	IR35-MW14 IR35-GW14-06B 04/25/06	IR35-MW29 IR35-GW29-06B 04/24/06	IR35-MW29 IR35-GW29-06BDUP 04/24/06	IR35-MW30 IR35-GW30-06B 04/23/06
Chemical Name			**Frequency**	**Max Value**	**Max Location**									
Volatile Organic Compounds (UG/L)														
1,1,2,2-Tetrachloroethane	0.17	--	2 / 23	100	IR35-GW32-06B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	--	5	2 / 23	1.7 J	IR35-GW73-06B	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
1,1-Dichloroethene	7	7	6 / 23	2.3	IR35-GW31-06B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.67	0.5 U	0.5 U	0.5 U
Benzene	1	5	3 / 23	22	IR35-GW29-06B	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	0.5 U	0.5 U	22	22	0.5 UJ
Bromoform	4.43	80	1 / 23	0.87	IR35-GW32-06B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	550	700	1 / 23	11	IR35-GW29-06B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	11	11	0.5 U
Tetrachloroethene	0.7	5	2 / 23	0.72	IR35-GW66-06B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
Toluene	1,000	1,000	1 / 23	20	IR35-GW29-06B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	20	20	0.5 U
Trichloroethene	2.8	5	11 / 23	35 J	IR35-GW55-06B	0.5 U	0.5 U	0.5 U	0.5 U	2.2	21	2.8	4	0.5 U
Vinyl chloride	0.015	2	8 / 23	19 J	IR35-GW31-06B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Xylene, total	530	10,000	1 / 23	17	IR35-GW29-06B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	17	16	0.5 U
cis-1,2-Dichloroethene	70	70	12 / 23	120	IR35-GW14-06B	0.5 U	0.5 U	0.5 U	0.5 U	21	120	81	100	0.5 U
isopropylbenzene	70	--	1 / 23	9	IR35-GW29-06B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	9	8.2	0.5 U
trans-1,2-Dichloroethene	100	100	11 / 23	32	IR35-GW29-06B	0.5 U	0.5 U	0.5 U	0.5 U	1.5	6.6	26	32	0.5 U
Total Metals (UG/L)														
Iron	300	--	20 / 22	50,000	IR35-GW72-06B	18,000	470	2,500	790	1,300	1,400	630	540	2,600
Wet Chemistry (MG/L)														
Alkalinity	--	--	19 / 23	510	IR35-GW72-06B	190	49	20 U	290	340	330	78	140	20 U
Chloride	250	--	23 / 23	45	IR35-GW32-06B	9.8	6.2	9.3	23 J	22 J	31 J	37 J	37 J	15
Ferric iron	--	--	3 / 23	47	IR35-GW72-06B	13	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ferrous iron	--	--	5 / 23	6.9 J	IR35-GW72-06B	5.3 J	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	2.7 J
Methane	--	--	9 / 23	2	IR35-GW29-06B	1.3	0.014 U	0.014 U	0.014 U	0.083	0.0052 U	2	1.9	0.04
Nitrate	10	10	13 / 23	13 J	IR35-GW32-06B2	0.13 UJ	2.5 J	0.15 J	0.5 J	0.13 U	0.14	0.94 J	0.34 J	0.13 UJ
Nitrite	1	1	0 / 23	0.13 U	--	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
Sulfate	250	--	23 / 23	160	IR35-GW09-06B	56	36	18	160	24	80 J	10	14	39
Total organic carbon (TOC)	--	--	4 / 23	53	IR35-GW10-06B	10 U	10 U	10 U	10 U	53	26	10 U	10 U	10 U

Notes:
U- Analyte not detected
J- Reported value is estimated
UJ- Analyte not detected. Quanitation limit is imprecise
NA- Not Analyzed
MCL - Maximum Contaminant Level
NCGWQS - North Carolina 2L Groundwater Standard

TABLE 5-4
Detected Concentrations of VOCs and Geochemical Parameters in the Surfical Aquifer
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Station ID	**NCGWQS**	**MCL-Groundwater**	**Frequency**			IR35-MW31	IR35-MW32	IR35-MW34	IR35-MW37		IR35-MW38	IR35-MW47	IR35-MW49	IR35-MW55
Sample ID						IR35-GW31-06B	IR35-GW32-06B	IR35-GW34-06B	IR35-GW37-06B	IR35-GW37-06BDUP	IR35-GW38-06B	IR35-GW47-06B	IR35-GW49-06B	IR35-GW55-06B
Sample Date						04/24/06	04/23/06	04/24/06	04/25/06	04/25/06	06/22/06	06/21/06	06/21/06	06/21/06
Chemical Name			**Frequency**	**Max Value**	**Max Location**									
Volatile Organic Compounds (UG/L)														
1,1,2,2-Tetrachloroethane	0.17	--	2 / 23	100	IR35-GW32-06B	0.5 U	100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
1,1,2-Trichloroethane	--	5	2 / 23	1.7 J	IR35-GW73-06B	0.5 U	1.2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
1,1-Dichloroethene	7	7	6 / 23	2.3	IR35-GW31-06B	2.3	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.42 J	0.73 J
Benzene	1	5	3 / 23	22	IR35-GW29-06B	0.45 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
Bromoform	4.43	80	1 / 23	0.87	IR35-GW32-06B	0.5 U	0.87	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
Ethylbenzene	550	700	1 / 23	11	IR35-GW29-06B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
Tetrachloroethene	0.7	5	2 / 23	0.72	IR35-GW66-06B	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
Toluene	1,000	1,000	1 / 23	20	IR35-GW29-06B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
Trichloroethene	2.8	5	11 / 23	35 J	IR35-GW55-06B	4.1	13	0.5 U	0.5 U	0.5 U	0.5 U	18 J	3.6 J	35 J
Vinyl chloride	0.015	2	8 / 23	19 J	IR35-GW31-06B	19	1	0.5 U	0.5 U	0.5 U	0.5 U	1.2 J	7 J	1.4 J
Xylene, total	530	10,000	1 / 23	17	IR35-GW29-06B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
cis-1,2-Dichloroethene	70	70	12 / 23	120	IR35-GW14-06B	40	29	0.5 U	0.5 U	0.5 U	0.5 U	75 J	110 J	96 J
isopropylbenzene	70	--	1 / 23	9	IR35-GW29-06B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
trans-1,2-Dichloroethene	100	100	11 / 23	32	IR35-GW29-06B	4.8	12	0.5 U	0.5 U	0.5 U	0.5 U	6.5 J	6.1 J	15 J
Total Metals (UG/L)														
Iron	300	--	20 / 22	50,000	IR35-GW72-06B	280	600	5,800	350	360	3,000	200 U	420	16,000
Wet Chemistry (MG/L)														
Alkalinity	--	--	19 / 23	510	IR35-GW72-06B	160	20 U	120	20 U	20 U	160	300	290	190
Chloride	250	--	23 / 23	45	IR35-GW32-06B	25 J	45	27 J	14 J	13 J	7.6 J	9.6 J	11 J	17 J
Ferric iron	--	--	3 / 23	47	IR35-GW72-06B	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	14
Ferrous iron	--	--	5 / 23	6.9 J	IR35-GW72-06B	1 U	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	2.6 J
Methane	--	--	9 / 23	2	IR35-GW29-06B	0.086	0.014 U	0.014 U	0.0005 U	0.0005 U	0.12	0.014 U	0.026	0.014 U
Nitrate	10	10	13 / 23	13 J	IR35-GW32-06B2	1.8 J	13 J	1.3 J	0.32	0.35	0.13 U	0.21	0.13 U	0.32
Nitrite	1	1	0 / 23	0.13 U	--	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
Sulfate	250	--	23 / 23	160	IR35-GW09-06B	59	30	59	24 J	23 J	14	30 J	28 J	87 J
Total organic carbon (TOC)	--	--	4 / 23	53	IR35-GW10-06B	10 U	10 U	10 U	10 U	10 U	13	10 U	10 U	10 U

Notes:
U- Analyte not detected
J- Reported value is estimated
UJ- Analyte not detected. Quanitation limit is imprecise
NA- Not Analyzed
MCL - Maximum Contaminant Level
NCGWQS - North Carolina 2L Groundwater Standard

TABLE 5-4
Detected Concentrations of VOCs and Geochemical Parameters in the Surfical Aquifer
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Station ID **Sample ID** **Sample Date**	**NCGWQS**	**MCL-Groundwater**	**Frequency**			IR35-MW60 IR35-GW60-06B 06/22/06	IR35-MW62 IR35-GW62-06B 06/21/06	IR35-MW66 IR35-GW66-06B 04/23/06	IR35-MW72 IR35-GW72-06B 06/21/06	IR35-MW73 IR35-GW73-06B 06/21/06	IR35-MW74 IR35-GW74-06B 06/20/06	IR35-GW81 IR35-GW81-06C 8/6/06
Chemical Name			**Frequency**	**Max Value**	**Max Location**							
Volatile Organic Compounds (UG/L)												
1,1,2,2-Tetrachloroethane	0.17	--	2 / 23	100	IR35-GW32-06B	0.5 U	0.5 UJ	0.5 U	0.5 UJ	20 J	0.5 U	0.5 U
1,1,2-Trichloroethane	--	5	2 / 23	1.7 J	IR35-GW73-06B	0.5 U	0.5 UJ	0.5 U	0.5 UJ	1.7 J	0.5 U	0.5 U
1,1-Dichloroethene	7	7	6 / 23	2.3	IR35-GW31-06B	0.5 U	0.37 J	0.5 UJ	0.5 UJ	0.53 J	0.5 U	0.5 U
Benzene	1	5	3 / 23	22	IR35-GW29-06B	0.5 U	0.5 J	0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.5 U
Bromoform	4.43	80	1 / 23	0.87	IR35-GW32-06B	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.5 U
Ethylbenzene	550	700	1 / 23	11	IR35-GW29-06B	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.5 U
Tetrachloroethene	0.7	5	2 / 23	0.72	IR35-GW66-06B	0.5 U	0.5 UJ	0.72	0.5 UJ	0.5 J	0.5 U	0.5 U
Toluene	1,000	1,000	1 / 23	20	IR35-GW29-06B	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.5 U
Trichloroethene	2.8	5	11 / 23	35 J	IR35-GW55-06B	0.5 U	2.2 J	4.3	0.5 UJ	32 J	0.5 U	0.5 U
Vinyl chloride	0.015	2	8 / 23	19 J	IR35-GW31-06B	0.5 U	9.4 J	1.3	0.5 UJ	1.7 J	0.5 U	0.5 U
Xylene, total	530	10,000	1 / 23	17	IR35-GW29-06B	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 UJ	0.5 U	NA
cis-1,2-Dichloroethene	70	70	12 / 23	120	IR35-GW14-06B	0.5 U	68 J	19	0.5 UJ	18 J	0.5 U	0.53
isopropylbenzene	70	--	1 / 23	9	IR35-GW29-06B	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.5 U
trans-1,2-Dichloroethene	100	100	11 / 23	32	IR35-GW29-06B	0.5 U	2.3 J	4.3	0.5 UJ	6 J	0.5 U	0.5 U
Total Metals (UG/L)												
Iron	300	--	20 / 22	50,000	IR35-GW72-06B	200 U	8,600	450	50,000	5,700	760	NA
Wet Chemistry (MG/L)												
Alkalinity	--	--	19 / 23	510	IR35-GW72-06B	28	330	29	510	79	400	200
Chloride	250	--	23 / 23	45	IR35-GW32-06B	7.7 J	8.5 J	17	9.3 J	22 J	10 J	5.6
Ferric iron	--	--	3 / 23	47	IR35-GW72-06B	10 U	10 U	10 U	47	10 U	10 U	10 U
Ferrous iron	--	--	5 / 23	6.9 J	IR35-GW72-06B	1 UJ	1 UJ	1 UJ	6.9 J	4.1 J	1 U	1 U
Methane	--	--	9 / 23	2	IR35-GW29-06B	0.013 U	0.21	0.096	0.014 U	0.014 U	0.014 U	14 U
Nitrate	10	10	13 / 23	13 J	IR35-GW32-06B2	0.13 U	0.13 U	0.64 J	0.13 U	0.13 U	0.79	0.13 U
Nitrite	1	1	0 / 23	0.13 U	--	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
Sulfate	250	--	23 / 23	160	IR35-GW09-06B	27 J	72 J	85	160 J	100 J	77 J	28
Total organic carbon (TOC)	--	--	4 / 23	53	IR35-GW10-06B	10 U	10 U	10 U	12	10 U	10 U	10 U

Notes:
U- Analyte not detected
J- Reported value is estimated
UJ- Analyte not detected. Quanitation limit is imprecise
NA- Not Analyzed
MCL - Maximum Contaminant Level
NCGWQS - North Carolina 2L Groundwater Standard

TABLE 5-5
Detected Concentrations of VOCs and Geochemical Parameters in the Upper Castle Hayne Aquifer
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Station ID	**NCGWQS**	**MCL**	**Frequency**			IR35-MW09IW	IR35-MW10IW		IR35-MW14IW	IR35-MW29IW	IR35-MW30IW	IR35-MW31IW	IR35-MW32IW	
Sample ID						IR35-GW09IW-06B	IR35-GW10IW-06B	IR35-GW10IW-06BDUP	IR35-GW14IW-06B	IR35-GW29IW-06B	IR35-GW30IW-06B	IR35-GW31IW-06B	IR35-GW32IW-06B	IR35-GW32IW-06BDUP
Sample Date						04/24/06	04/24/06	04/24/06	04/25/06	04/24/06	04/23/06	04/24/06	04/23/06	04/23/06
Chemical Name			**Frequency**	**Max Value**	**Max Location**									
Volatile Organic Compounds (UG/L)														
1,1-Dichloroethene	7	7	9 / 27	2.9	IR35-GW74IW-06B	0.5 U	1.2	1.3 J	0.5 U	0.5 U	0.48 J	0.56	0.5 U	0.5 UJ
Benzene	1	5	12 / 27	8.8	IR35-GW39IW-06B	5.6	4.5	5.2 J	2	1.7	1.7 J	0.51	3.5 J	3.2 J
Chloroform	70	80	1 / 27	1.3	IR35-GW81IW-06C	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
Ethylbenzene	550	700	3 / 27	0.54	IR35-GW09IW-06B	0.54	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene	0.7	5	2 / 27	1.5	IR35-GW29IW-06B	0.5 U	0.5 U	0.5 U	0.5 UJ	1.5	0.5 U	0.5 U	0.89	0.79
Toluene	1,000	1,000	7 / 27	5.5	IR35-GW37IW-06B	1.2	0.94	0.93 J	0.5 U	0.5 U	0.5	0.5 U	1.5	1.2
Trichloroethene	2.8	5	20 / 27	180 J	IR35-GW55IW-06B	0.6	23	23 J	15	30	110	29	24	22
Vinyl chloride	0.015	2	17 / 27	250 J	IR35-GW73IW-06B	0.31 J	4	5 J	2	1.5	0.91	2	3.6	2.7
Xylene, total	530	10,000	2 / 27	2.5	IR35-GW37IW-06B	0.37 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	70	70	24 / 27	760	IR35-GW72IW-06B	22	200	240	70	86	50	150	97	94
trans-1,2-Dichloroethene	100	100	18 / 27	47	IR35-GW72IW-06B	5.2	14	15 J	6.3	27	9.1	14	12	8.5
Total Metals (UG/L)														
Iron	300	--	23 / 25	1,800	IR35-GW10IW-06B	1,700	1,800	1,800	2,400	780	1,000	610	950	930
Wet Chemistry (MG/L)														
Alkalinity	--	--	27 / 27	360	IR35-GW30IW/74IW-06B	310	350	330	330	230	360	310	310	330
Chloride	250	--	27 / 27	340 J	IR35-GW34IW-06B	26 J	21 J	24 J	24 J	18 J	35	22 J	23	39
Ferric iron	--	--	0 / 27	10 U	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ferrous iron	--	--	0 / 27	1 U	--	1 UJ	1 UJ	1 UJ	1 UJ	1 U	1 UJ	1 U	1 UJ	1 UJ
Methane	--	--	16 / 27	1.8	IR35-GW39IW-06B	0.63	0.8	0.57	0.0005 U	0.29	0.49	0.054	0.96	1.2
Nitrate	10	10	13 / 27	1.6 J	IR35-GW31IW-06B	0.13 U	0.13 U	0.16 J	0.13 U	0.86 J	0.13 UJ	1.6 J	0.34 J	0.2 J
Nitrite	1	1	1 / 57	0.17	IR35-MW80IW	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
Sulfate	250	--	27 /27	130	IR35-GW80IW-06B	15	22	24	27 J	23	15	39	53 J	15 J
Total organic carbon (TOC)	--	--	0 / 27	10 U	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Notes:
U- Analyte not detected
J- Reported value is estimated
UJ- Analyte not detected. Quanitation limit is imprecise
NA- Not Analyzed
NCGWQS - North Carolina 2L Groundwater Standard
MCL - Maximum Contaminant Level

TABLE 5-5
Detected Concentrations of VOCs and Geochemical Parameters in the Upper Castle Hayne Aquifer
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Station ID	**NCGWQS**	**MCL**	**Frequency**			IR35-MW34IW	IR35-MW37IW	IR35-MW38IW		IR35-MW39IW	IR35-MW40IW	IR35-MW47IW	IR35-MW49IW
Sample ID						IR35-GW34IW-06B	IR35-GW37IW-06B	IR35-GW38IW-06B	IR35-GW38IW-06BP	IR35-GW39IW-06B	IR35-GW40IW-06B	IR35-GW47IW-06B	IR35-GW49IW-06B
Sample Date						04/24/06	04/25/06	06/22/06	06/22/06	04/23/06	04/24/06	06/21/06	06/21/06
Chemical Name			**Frequency**	**Max Value**	**Max Location**								
Volatile Organic Compounds (UG/L)													
1,1-Dichloroethene	7	7	9 / 27	2.9	IR35-GW74IW-06B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 UJ
Benzene	1	5	12 / 27	8.8	IR35-GW39IW-06B	0.31 J	6.3	0.31 J	0.36 J	8.8	0.5 U	0.5 UJ	0.5 UJ
Chloroform	70	80	1 / 27	1.3	IR35-GW81IW-06C	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ
Ethylbenzene	550	700	3 / 27	0.54	IR35-GW09IW-06B	0.5 U	2.6	0.5 U	0.5 U	0.46 J	0.5 U	0.5 UJ	0.5 UJ
Tetrachloroethene	0.7	5	2 / 27	1.5	IR35-GW29IW-06B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ
Toluene	1,000	1,000	7 / 27	5.5	IR35-GW37IW-06B	0.5 U	5.5	0.5 U	0.5 U	1	0.5 U	0.5 UJ	0.5 UJ
Trichloroethene	2.8	5	20 / 27	180 J	IR35-GW55IW-06B	5.4	0.5 U	0.5 U	0.5 U	0.5 U	2.3	9.8 J	5.9 J
Vinyl chloride	0.015	2	17 / 27	250 J	IR35-GW73IW-06B	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	3.2	1.6 J	1.8 J
Xylene, total	530	10,000	2 / 27	2.5	IR35-GW37IW-06B	0.5 U	2.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ
cis-1,2-Dichloroethene	70	70	24 / 27	760	IR35-GW72IW-06B	14	0.5 U	0.33 J	0.31 J	3	76	37 J	77 J
trans-1,2-Dichloroethene	100	100	18 / 27	47	IR35-GW72IW-06B	0.5 U	0.5 U	0.5 U	0.5 U	0.5	3	3.1 J	1.1 J
Total Metals (UG/L)													
Iron	300	--	23 / 25	1,800	IR35-GW10IW-06B	990	750	1,200	1,100	1,700	1,000	310	510
Wet Chemistry (MG/L)													
Alkalinity	--	--	27 / 27	360	IR35-GW30IW/74IW-06B	310	280	300	280	300	260	240	270
Chloride	250	--	27 / 27	340 J	IR35-GW34IW-06B	340 J	22 J	7.8 J	7.2 J	16	76 J	11 J	13 J
Ferric iron	--	--	0 / 27	10 U	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ferrous iron	--	--	0 / 27	1 U	--	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
Methane	--	--	16 / 27	1.8	IR35-GW39IW-06B	0.052	0.0005 U	0.062	0.061	1.8	0.24	0.014 U	0.036
Nitrate	10	10	13 / 27	1.6 J	IR35-GW31IW-06B	0.14 J	0.21	0.13 U	0.13 U	0.13 UJ	0.13 U	0.13 U	0.13 U
Nitrite	1	1	1 / 57	0.17	IR35-MW80IW	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
Sulfate	250	--	27 /27	130	IR35-GW80IW-06B	18	12 J	29	12	5.3	38	8.1 J	6.9 J
Total organic carbon (TOC)	--	--	0 / 27	10 U	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Notes:
U- Analyte not detected
J- Reported value is estimated
UJ- Analyte not detected. Quanitation limit is imprecise
NA- Not Analyzed
NCGWQS - North Carolina 2L Groundwater Standard
MCL - Maximum Contaminant Level

TABLE 5-5
Detected Concentrations of VOCs and Geochemical Parameters in the Upper Castle Hayne Aquifer
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Station ID	**NCGWQS**	**MCL**	**Frequency**			IR35-MW55IW	IR35-MW60IW		IR35-MW63IW	IR35-MW64IW	IR35-MW68IW	IR35-MW69IW	IR35-MW70IW	IR35-MW71IW
Sample ID						IR35-GW55IW-06B	IR35-GW60IW-06B	IR35-GW60IW-06BP	IR35-GW63IW-06B	IR35-GW64IW-06B	IR35-GW68IW-06B	IR35-GW69IW-06B	IR35-GW70IW-06B	IR35-GW71IW-06B
Sample Date						06/21/06	06/22/06	06/22/06	06/21/06	06/21/06	04/23/06	04/24/06	04/23/06	04/23/06
Chemical Name			**Frequency**	**Max Value**	**Max Location**									
Volatile Organic Compounds (UG/L)														
1,1-Dichloroethene	7	7	9 / 27	2.9	IR35-GW74IW-06B	1.5 J	0.5 U	0.5 U	0.5 UJ	1.4 J	0.67	0.5 U	0.5 U	0.5 UJ
Benzene	1	5	12 / 27	8.8	IR35-GW39IW-06B	0.5 UJ	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	1.6 J	0.5 U
Chloroform	70	80	1 / 27	1.3	IR35-GW81IW-06C	0.5 UJ	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	550	700	3 / 27	0.54	IR35-GW09IW-06B	0.5 UJ	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene	0.7	5	2 / 27	1.5	IR35-GW29IW-06B	0.5 UJ	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	1,000	1,000	7 / 27	5.5	IR35-GW37IW-06B	0.5 UJ	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene	2.8	5	20 / 27	180 J	IR35-GW55IW-06B	180 J	0.5 U	0.5 U	0.77 J	4.9 J	24	0.5 U	1.1	0.5 U
Vinyl chloride	0.015	2	17 / 27	250 J	IR35-GW73IW-06B	6.6 J	0.5 U	0.5 U	0.5 UJ	6.7 J	1	0.5 U	0.5 U	0.5 U
Xylene, total	530	10,000	2 / 27	2.5	IR35-GW37IW-06B	0.5 UJ	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	70	70	24 / 27	760	IR35-GW72IW-06B	370 J	0.5 U	0.5 U	8 J	140 J	27	4.4	0.5 U	10
trans-1,2-Dichloroethene	100	100	18 / 27	47	IR35-GW72IW-06B	33 J	0.5 U	0.5 U	0.5 UJ	14 J	2.8	0.5 U	0.5 U	0.5 U
Total Metals (UG/L)														
Iron	300	--	23 / 25	1,800	IR35-GW10IW-06B	200 U	1,500	1,300	470	1,600	650	660	1,000	1,600
Wet Chemistry (MG/L)														
Alkalinity	--	--	27 / 27	360	IR35-GW30IW/74IW-06B	330	260	250	270	240	110	280	260	260
Chloride	250	--	27 / 27	340 J	IR35-GW34IW-06B	13 J	27 J	27 J	17 J	14 J	13	59 J	15	19
Ferric iron	--	--	0 / 27	10 U	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ferrous iron	--	--	0 / 27	1 U	--	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U	1 UJ	1 UJ
Methane	--	--	16 / 27	1.8	IR35-GW39IW-06B	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.025	0.014 U	0.16	0.03
Nitrate	10	10	13 / 27	1.6 J	IR35-GW31IW-06B	0.21	0.13 U	0.13 U	0.13 U	0.13 U	1.5 J	0.17 J	0.15 J	0.43 J
Nitrite	1	1	1 / 57	0.17	IR35-MW80IW	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
Sulfate	250	--	27 /27	130	IR35-GW80IW-06B	130 J	9.7	9.9	5.5 J	13 J	11	62	20	81
Total organic carbon (TOC)	--	--	0 / 27	10 U	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Notes:
U- Analyte not detected
J- Reported value is estimated
UJ- Analyte not detected. Quanitation limit is imprecise
NA- Not Analyzed
NCGWQS - North Carolina 2L Groundwater Standard
MCL - Maximum Contaminant Level

TABLE 5-5
Detected Concentrations of VOCs and Geochemical Parameters in the Upper Castle Hayne Aquifer
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Station ID **Sample ID** **Sample Date**	**NCGWQS**	**MCL**	**Frequency**			IR35-MW72IW IR35-GW72IW-06B 06/20/06	IR35-MW73IW IR35-GW73IW-06B 06/21/06	IR35-MW74IW IR35-GW74IW-06B 06/20/06	IR35-MW74IW IR35-GW74IW-06BP 06/20/06	IR35-MW80IW IR35-GW80IW-06B 06/22/06	IR35-GW81IW IR35-GW81IW-06C 8/6/06
Chemical Name			**Frequency**	**Max Value**	**Max Location**						
Volatile Organic Compounds (UG/L)											
1,1-Dichloroethene	7	7	9 / 27	2.9	IR35-GW74IW-06B	2.3	1.5 J	2.9	1.4	0.5 U	0.5 U
Benzene	1	5	12 / 27	8.8	IR35-GW39IW-06B	0.5 UJ	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
Chloroform	70	80	1 / 27	1.3	IR35-GW81IW-06C	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	1.3
Ethylbenzene	550	700	3 / 27	0.54	IR35-GW09IW-06B	0.5 UJ	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene	0.7	5	2 / 27	1.5	IR35-GW29IW-06B	0.5 UJ	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	1,000	1,000	7 / 27	5.5	IR35-GW37IW-06B	0.5 UJ	0.5 UJ	0.5 U	0.5 U	0.58	0.5 U
Trichloroethene	2.8	5	20 / 27	180 J	IR35-GW55IW-06B	24 J	1.5 J	0.5 U	6.6	27	0.5 U
Vinyl chloride	0.015	2	17 / 27	250 J	IR35-GW73IW-06B	12 J	250 J	24 J	2.9 J	1.8	0.5 U
Xylene, total	530	10,000	2 / 27	2.5	IR35-GW37IW-06B	0.5 UJ	0.5 UJ	0.5 U	0.5 U	0.5 U	NA
cis-1,2-Dichloroethene	70	70	24 / 27	760	IR35-GW72IW-06B	760	210 J	150	150	170	0.42 J
trans-1,2-Dichloroethene	100	100	18 / 27	47	IR35-GW72IW-06B	47	17 J	0.81 J	3.3 J	7.4	0.5 U
Total Metals (UG/L)											
Iron	300	--	23 / 25	1,800	IR35-GW10IW-06B	200 U	200 U	580	520	640	NA
Wet Chemistry (MG/L)											
Alkalinity	--	--	27 / 27	360	IR35-GW30IW/74IW-06B	260	230	360	310	300	220
Chloride	250	--	27 / 27	340 J	IR35-GW34IW-06B	13 J	11 J	14 J	14 J	12 J	5.6
Ferric iron	--	--	0 / 27	10 U	--	10 U	10 U	10 U	10 U	10 U	10 U
Ferrous iron	--	--	0 / 27	1 U	--	1 U	1 UJ	1 U	1 U	1 UJ	1 U
Methane	--	--	16 / 27	1.8	IR35-GW39IW-06B	0.014 U	0.014 U	0.041	0.035	0.23	14 U
Nitrate	10	10	13 / 27	1.6 J	IR35-GW31IW-06B	0.13 U	0.13 U	0.13 U	0.13 U	0.18	0.13 U
Nitrite	1	1	1 / 57	0.17	IR35-MW80IW	0.13 U	0.13 U	0.13 U	0.13 U	0.17	0.13 U
Sulfate	250	--	27 /27	130	IR35-GW80IW-06B	39 J	66 J	16 J	13 J	130	38
Total organic carbon (TOC)	--	--	0 / 27	10 U	--	10 U	10 U	10 U	10 U	10 U	10 U

Notes:
U- Analyte not detected
J- Reported value is estimated
UJ- Analyte not detected. Quanitation limit is imprecise
NA- Not Analyzed
NCGWQS - North Carolina 2L Groundwater Standard
MCL - Maximum Contaminant Level

TABLE 5-6
Detected Concentrations of VOCs and Geochemical Parameters in the Mid-Castle Hayne Aquifer
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Station ID **Sample ID** **Sample Date**	**NCGWQS**	**MCL-Groundwater**	**Frequency**			IR35-MW01DW IR35-GW01DW-06B 04/23/06	IR35-MW03DW IR35-GW03DW-06B 04/24/06	IR35-MW06DW IR35-GW06DW-06B 04/24/06	IR35-MW07DW IR35-GW07DW-06B 06/22/06	IR35-MW30DW IR35-GW30DW-06B 04/23/06	IR35-GW72DW IR35-GW72DW-06C 8/6/06	IR35-MW80DW IR35-GW80DW-06B 04/25/06
Chemical Name			**Frequency**	**Max Value**	**Max Location**							
Volatile Organic Compounds (UG/L)												
Chloroform	70	80	1 / 7	4.2	IR35-GW72DW-06C	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	4.2	0.7 U
Methylene chloride	4.6	5	1 / 7	0.4 J	IR35-GW72DW-06C	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.4 J	0.5 U
Trichloroethene	2.8	5	2 / 7	1.8	IR35-GW72DW-06C	0.5 U	0.64	0.5 U	0.5 U	0.5 U	1.8	0.5 U
Vinyl chloride	0.015	2	1 / 7	1.8	IR35-GW72DW-06C	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1.8	0.5 U
cis-1,2-Dichloroethene	70	70	3 / 7	51	IR35-GW72DW-06C	0.32 J	5.2	0.5 U	0.5 U	0.5 U	51	0.5 U
trans-1,2-Dichloroethene	100	100	1 / 7	1.1	IR35-GW72DW-06C	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1.1	0.5 U
Total Metals (UG/L)												
Iron	300	--	4 / 7	640	IR35-GW03DW-06B	540	640	200 U	260	200 U	NA	220
Wet Chemistry (MG/L)												
Alkalinity	--	--	7 / 7	560	IR35-GW80DW-06B	160	230	290	280	270	270	560
Chloride	250	--	7 / 7	49 J	IR35-GW03DW-06B	24	49 J	46 J	45 J	29	16	43 J
Ferric iron	--	--	0 / 7	10 U	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ferrous iron	--	--	1 / 7	1.5 J	IR35-GW80DW-06B	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U	1.5 J
Methane	--	--	2 / 7	19	IR35-GW72DW-06C	0.014 U	0.062	0.014 U	0.014 U	0.014 U	19	0.005 U
Nitrate	10	10	1 / 7	0.23 J	IR35-GW01DW-06B2	0.23 J	0.13 U	0.13 U	0.13 U	0.13 UJ	0.13 U	0.13 U
Nitrite	1	1	0 / 7	0.13	--	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
Sulfate	250	--	7 / 7	78	IR35-GW30DW-06B	27	11	5.2	6.2 J	78	7.7	49 J
Total organic carbon (TOC)	--	--	0 / 7	10 U	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Notes:
U- Analyte not detected
J- Reported value is estimated
UJ- Analyte not detected. Quanitation limit is imprecise
NA- Not Analyzed
NCGWQS - North Carolina 2L Groundwater Standard
MCL - Maximum Contaminant Level

TABLE 5-7
Summary of Natural Attenuation Indicator Parameters
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Natural Attenuation Indicator Parameter	**Range of Results** (April, June, or August 2006)	**Condition Needed for Reductive Dechlorination**	**Favorable / Unfavorable**
Surficial Aquifer Zone			
ORP	-162 mV to +341 mV	Less than +50 mV (favorable) Less than -100 mV (ideal)	Favorable
Dissolved Oxygen	0.00 mg/L to 10.13 mg/L	Less than 1.0 mg/L	Favorable
Nitrate	<0.13 mg/L to 13 mg/L	Less than 1.0 mg/L	Favorable
Ferrous Iron	Measurable in 5 of 23 wells	Measurable Levels	Unfavorable
Sulfate	10 mg/L to 160 mg/L	Less than 20 mg/L	Unfavorable
Methane	<0.014 mg/L to 2.0 mg/L	Measurable Levels	Favorable
Alkalinity	<20 mg/L to 510 mg/L	Twice the background concentration (Greater than 20 mg/L)	Favorable
Total Organic Carbon	<10 mg/L to 230 mg/L	Greater than 20 mg/L	Unfavorable
Chloride	5.6 mg/L to 45 mg/L	Greater than the background concentration (14 mg/L in the Surficial aquifer zone)	Unfavorable
Upper Castle Hayne Aquifer Zone			
ORP	-215 mV to +219 mV	Less than +50 mV (favorable) Less than -100 mV (ideal)	Ideal to Favorable
Dissolved Oxygen	0.00 mg/L to 12.14 mg/L	Less than 1.0 mg/L	Favorable
Nitrate	<0.13 mg/L to 1.6 mg/L	Less than 1.0 mg/L	Favorable
Ferrous Iron	Measurable in 0 of 27 wells	Measurable Levels	Unfavorable
Sulfate	5.5 mg/L to 130 mg/L	Less than 20 mg/L	Unfavorable
Methane	<0.0005 mg/L to 1.8 mg/L	Measurable Levels	Favorable
Alkalinity	110 mg/L to 360 mg/L	Twice the background concentration (Greater than 280 mg/L)	Unfavorable
Total Organic Carbon	<10 mg/L	Greater than 20 mg/L	Unfavorable
Chloride	7.2 mg/L to 340 mg/L	Greater than the background concentration (16 mg/L in the Upper Castle Hayne aquifer zone)	Favorable
Mid-Castle Hayne Aquifer Zone			
ORP	-151 mV to -31 mV	Less than +50 mV (favorable) Less than -100 mV (ideal)	Ideal
Dissolved Oxygen	0.00 mg/L to 1.70 mg/L	Less than 1.0 mg/L	Favorable
Nitrate	<0.13 mg/L to 0.23 mg/L	Less than 1.0 mg/L	Favorable
Ferrous Iron	Measurable in 1 of 7 wells	Measurable Levels	Unfavorable
Sulfate	5.2 mg/L to 78 mg/L	Less than 20 mg/L	Favorable
Methane	<0.014 mg/L to 19.0 mg/L	Measurable Levels	Favorable
Alkalinity	160 mg/L to 560 mg/L	Twice the background concentration (Greater than 225 mg/L)	Unfavorable
Total Organic Carbon	<10 mg/L	Greater than 20 mg/L	Unfavorable
Chloride	16 mg/L to 49 mg/L	Greater than the background concentration (24 mg/L in the Mid-Castle Hayne aquifer	Favorable

Notes:
mV - millivolts
mg/L - milligrams per liter
ORP - Oxidation-Reduction Potential

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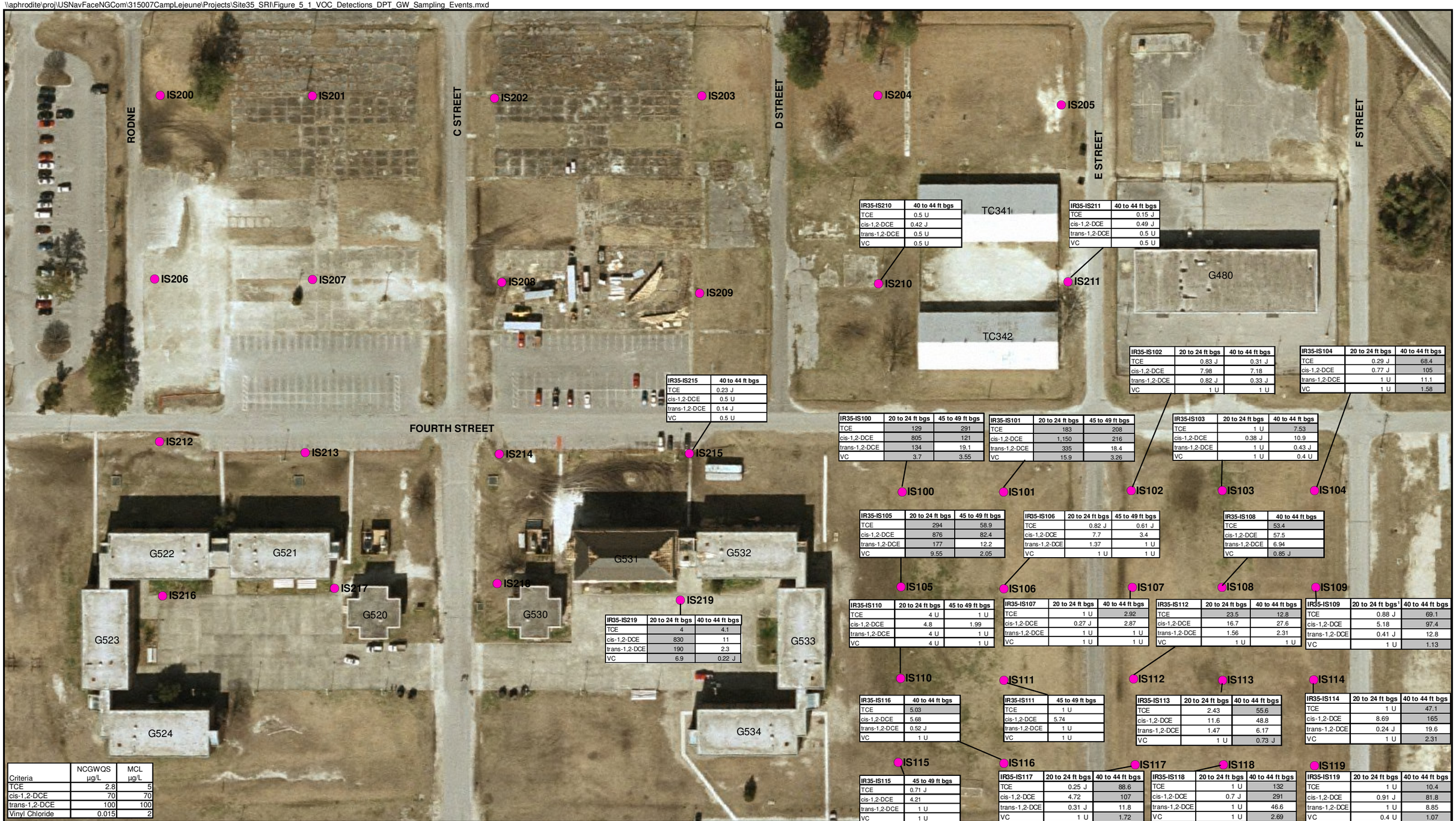

IR35-IS210	40 to 44 ft bgs
TCE	0.5 U
cis-1,2-DCE	0.42 J
trans-1,2-DCE	0.5 U
VC	0.5 U

IR35-IS211	40 to 44 ft bgs
TCE	0.15 J
cis-1,2-DCE	0.49 J
trans-1,2-DCE	0.5 U
VC	0.5 U

IR35-IS215	40 to 44 ft bgs
TCE	0.23 J
cis-1,2-DCE	0.5 U
trans-1,2-DCE	0.14 J
VC	0.5 U

IR35-IS102	20 to 24 ft bgs	40 to 44 ft bgs
TCE	0.83 J	0.31 J
cis-1,2-DCE	7.98	7.18
trans-1,2-DCE	0.82 J	0.33 J
VC	1 U	1 U

IR35-IS104	20 to 24 ft bgs	40 to 44 ft bgs
TCE	0.29 J	68.4
cis-1,2-DCE	0.77 J	105
trans-1,2-DCE	1 U	11.1
VC	1 U	1.58

IR35-IS100	20 to 24 ft bgs	45 to 49 ft bgs
TCE	129	291
cis-1,2-DCE	805	121
trans-1,2-DCE	134	19.1
VC	3.7	3.55

IR35-IS101	20 to 24 ft bgs	45 to 49 ft bgs
TCE	183	208
cis-1,2-DCE	1,150	216
trans-1,2-DCE	335	18.4
VC	15.9	3.26

IR35-IS103	20 to 24 ft bgs	40 to 44 ft bgs
TCE	1 U	7.53
cis-1,2-DCE	0.38 J	10.9
trans-1,2-DCE	1 U	0.43 J
VC	1 U	0.4 U

IR35-IS105	20 to 24 ft bgs	45 to 49 ft bgs
TCE	294	58.9
cis-1,2-DCE	876	82.4
trans-1,2-DCE	177	12.2
VC	9.55	2.05

IR35-IS106	20 to 24 ft bgs	45 to 49 ft bgs
TCE	0.82 J	0.61 J
cis-1,2-DCE	7.7	3.4
trans-1,2-DCE	1.37	1 U
VC	1 U	1 U

IR35-IS108	40 to 44 ft bgs
TCE	53.4
cis-1,2-DCE	57.5
trans-1,2-DCE	6.94
VC	0.85 J

IR35-IS219	20 to 24 ft bgs	40 to 44 ft bgs
TCE	4	4.1
cis-1,2-DCE	830	11
trans-1,2-DCE	190	2.3
VC	6.9	0.22 J

IR35-IS110	20 to 24 ft bgs	45 to 49 ft bgs
TCE	4 U	1 U
cis-1,2-DCE	4.8	1.99
trans-1,2-DCE	4 U	1 U
VC	4 U	1 U

IR35-IS107	20 to 24 ft bgs	40 to 44 ft bgs
TCE	1 U	2.92
cis-1,2-DCE	0.27 J	2.87
trans-1,2-DCE	1 U	1 U
VC	1 U	1 U

IR35-IS112	20 to 24 ft bgs	40 to 44 ft bgs
TCE	23.5	12.8
cis-1,2-DCE	16.7	27.6
trans-1,2-DCE	1.56	2.31
VC	1 U	1 U

IR35-IS109	20 to 24 ft bgs[1]	40 to 44 ft bgs
TCE	0.88 J	69.1
cis-1,2-DCE	5.18	97.4
trans-1,2-DCE	0.41 J	12.8
VC	1 U	1.13

IR35-IS116	40 to 44 ft bgs
TCE	5.03
cis-1,2-DCE	5.68
trans-1,2-DCE	0.52 J
VC	1 U

IR35-IS111	45 to 49 ft bgs
TCE	1 U
cis-1,2-DCE	5.74
trans-1,2-DCE	1 U
VC	1 U

IR35-IS113	20 to 24 ft bgs	40 to 44 ft bgs
TCE	2.43	55.6
cis-1,2-DCE	11.6	48.8
trans-1,2-DCE	1.47	6.17
VC	1 U	0.73 J

IR35-IS114	20 to 24 ft bgs	40 to 44 ft bgs
TCE	1 U	47.1
cis-1,2-DCE	8.69	165
trans-1,2-DCE	0.24 J	19.6
VC	1 U	2.31

IR35-IS115	45 to 49 ft bgs
TCE	0.71 J
cis-1,2-DCE	4.21
trans-1,2-DCE	1 U
VC	1 U

IR35-IS117	20 to 24 ft bgs	40 to 44 ft bgs
TCE	0.25 J	88.6
cis-1,2-DCE	4.72	107
trans-1,2-DCE	0.31 J	11.8
VC	1 U	1.72

IR35-IS118	20 to 24 ft bgs	40 to 44 ft bgs
TCE	1 U	132
cis-1,2-DCE	0.7 J	291
trans-1,2-DCE	1 U	46.6
VC	1 U	2.69

IR35-IS119	20 to 24 ft bgs	40 to 44 ft bgs
TCE	1 U	10.4
cis-1,2-DCE	0.91 J	81.8
trans-1,2-DCE	1 U	8.85
VC	0.4 U	1.07

Criteria	NCGWQS µg/L	MCL µg/L
TCE	2.8	5
cis-1,2-DCE	70	70
trans-1,2-DCE	100	100
Vinyl Chloride	0.015	2

Legend

- DPT Sample Location

Note:
- Shaded values exceed groundwater standards
- All concentrations are in µg/L
- TCE - Trichloroethene
- cis-1,2-DCE - cis-1,2-Dichloroethene
- trans-1,2-DCE - trans-1,2-Dichloroethene
- VC - Vinyl Chloride
- U - Analyte not detected
- J - reported value is estimated

- IS100 - IS119 were sampled in October 2005
- IS200 - IS219 were sampled in February 2006

N

0 100 200 Feet

1 inch equals 100 feet

Figure 5-1
VOC Detections from the DPT Groundwater Sampling Events
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

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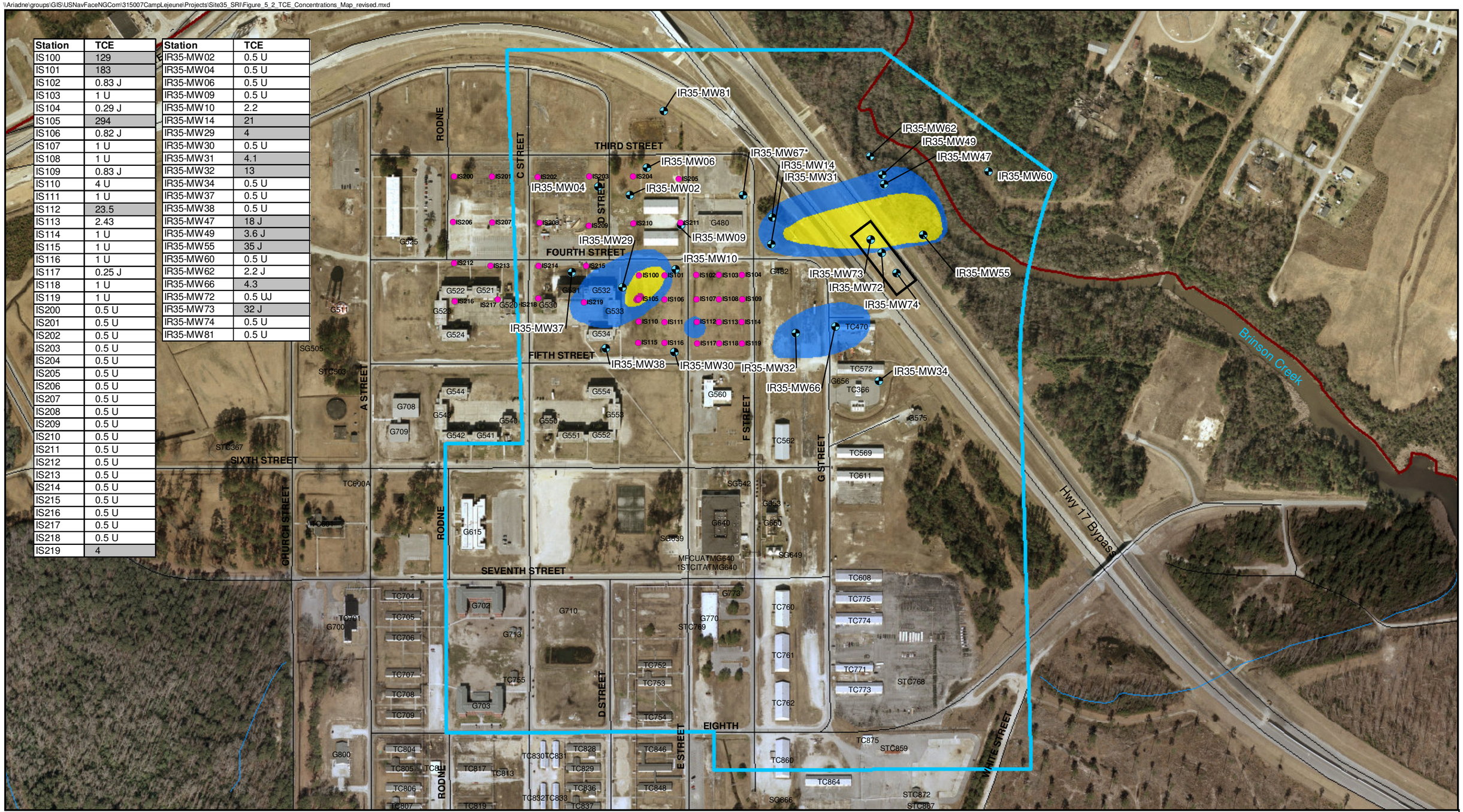
Station	TCE
IS100	129
IS101	183
IS102	0.83 J
IS103	1 U
IS104	0.29 J
IS105	294
IS106	0.82 J
IS107	1 U
IS108	1 U
IS109	0.83 J
IS110	4 U
IS111	1 U
IS112	23.5
IS113	2.43
IS114	1 U
IS115	1 U
IS116	1 U
IS117	0.25 J
IS118	1 U
IS119	1 U
IS200	0.5 U
IS201	0.5 U
IS202	0.5 U
IS203	0.5 U
IS204	0.5 U
IS205	0.5 U
IS206	0.5 U
IS207	0.5 U
IS208	0.5 U
IS209	0.5 U
IS210	0.5 U
IS211	0.5 U
IS212	0.5 U
IS213	0.5 U
IS214	0.5 U
IS215	0.5 U
IS216	0.5 U
IS217	0.5 U
IS218	0.5 U
IS219	4

Station	TCE
IR35-MW02	0.5 U
IR35-MW04	0.5 U
IR35-MW06	0.5 U
IR35-MW09	0.5 U
IR35-MW10	2.2
IR35-MW14	21
IR35-MW29	4
IR35-MW30	0.5 U
IR35-MW31	4.1
IR35-MW32	13
IR35-MW34	0.5 U
IR35-MW37	0.5 U
IR35-MW38	0.5 U
IR35-MW47	18 J
IR35-MW49	3.6 J
IR35-MW55	35 J
IR35-MW60	0.5 U
IR35-MW62	2.2 J
IR35-MW66	4.3
IR35-MW72	0.5 UJ
IR35-MW73	32 J
IR35-MW74	0.5 U
IR35-MW81	0.5 U



Legend

- Shallow Monitoring Wells
- DPT Groundwater Location
- Road Centerline
- Approximate Location of Pilot Study
- Maximum Extent of Previous Groundwater Investigations
- Base Boundary

TCE Concentrations in the 2 to 25 Foot bgs Interval

- > 280 µg/L
- > 28 µg/L
- > 2.8 µg/L

U Not Detected
J Estimate Value

Note:
- All concentrations are reported in µg/L. Contours have been interpolated between monitoring well locations. Actual conditions may differ from those shown on this figure.
- Shaded values exceed NCGWQS (2.8 µg/L)
- IS100 - IS119 were sampled in October 2005
- IS200 - IS219 were sampled in February 2006
- Monitoring wells sampled in June 2006
- * Monitoring well not sampled

N

0 400 800 Feet

1 inch equals 400 feet

Figure 5-2
Groundwater TCE Concentrations (2 to 25 feet bgs)
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

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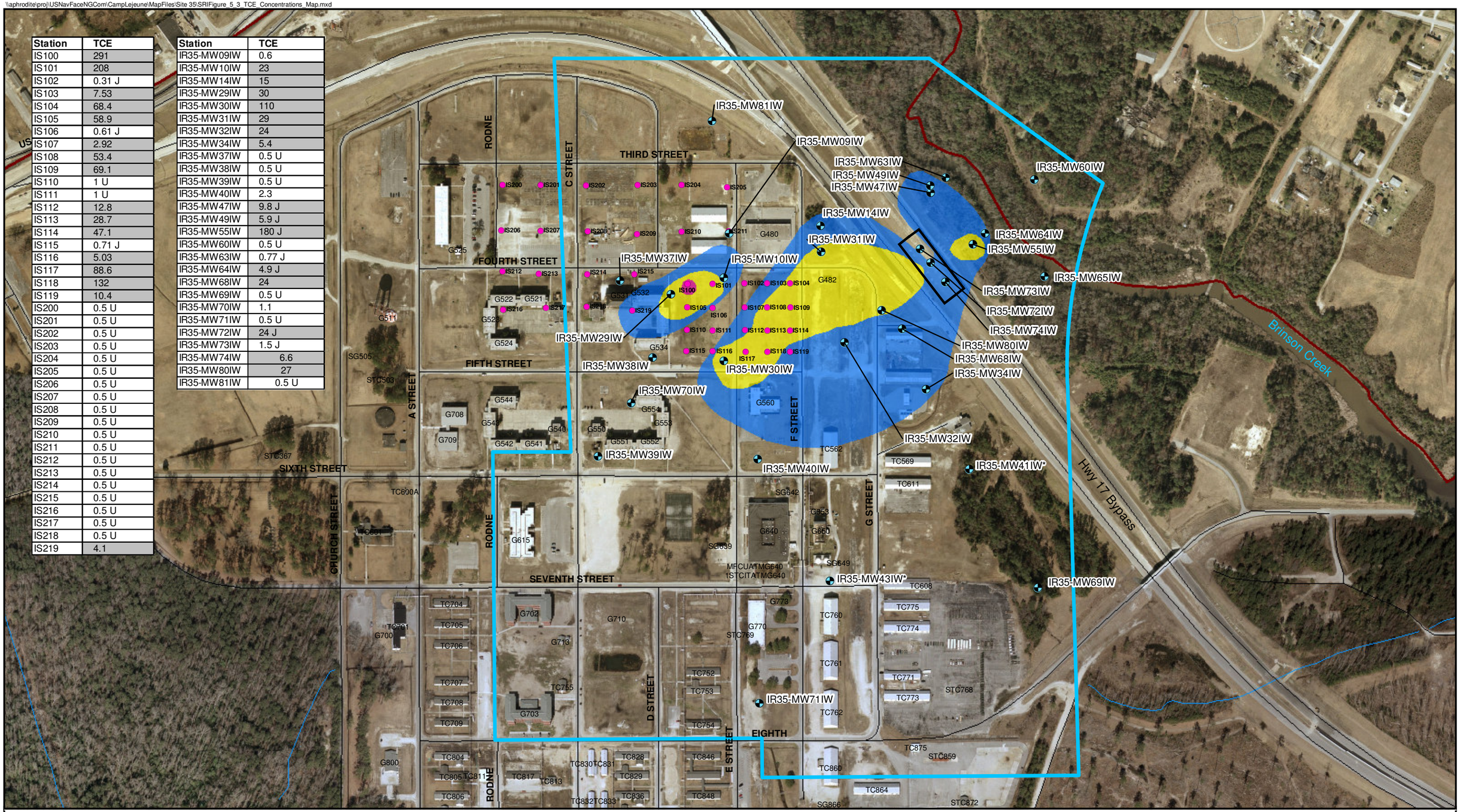
Station	TCE
IS100	291
IS101	208
IS102	0.31 J
IS103	7.53
IS104	68.4
IS105	58.9
IS106	0.61 J
IS107	2.92
IS108	53.4
IS109	69.1
IS110	1 U
IS111	1 U
IS112	12.8
IS113	28.7
IS114	47.1
IS115	0.71 J
IS116	5.03
IS117	88.6
IS118	132
IS119	10.4
IS200	0.5 U
IS201	0.5 U
IS202	0.5 U
IS203	0.5 U
IS204	0.5 U
IS205	0.5 U
IS206	0.5 U
IS207	0.5 U
IS208	0.5 U
IS209	0.5 U
IS210	0.5 U
IS211	0.5 U
IS212	0.5 U
IS213	0.5 U
IS214	0.5 U
IS215	0.5 U
IS216	0.5 U
IS217	0.5 U
IS218	0.5 U
IS219	4.1

Station	TCE
IR35-MW09IW	0.6
IR35-MW10IW	23
IR35-MW14IW	15
IR35-MW29IW	30
IR35-MW30IW	110
IR35-MW31IW	29
IR35-MW32IW	24
IR35-MW34IW	5.4
IR35-MW37IW	0.5 U
IR35-MW38IW	0.5 U
IR35-MW39IW	0.5 U
IR35-MW40IW	2.3
IR35-MW47IW	9.8 J
IR35-MW49IW	5.9 J
IR35-MW55IW	180 J
IR35-MW60IW	0.5 U
IR35-MW63IW	0.77 J
IR35-MW64IW	4.9 J
IR35-MW68IW	24
IR35-MW69IW	0.5 U
IR35-MW70IW	1.1
IR35-MW71IW	0.5 U
IR35-MW72IW	24 J
IR35-MW73IW	1.5 J
IR35-MW74IW	6.6
IR35-MW80IW	27
IR35-MW81IW	0.5 U



Legend

- Intermediate Monitoring Wells
- DPT Sample Locations
- Road Centerline
- Approximate Location of Pilot Study
- Maximum Extent of Previous Groundwater Investigations
- Base Boundary

TCE Concentrations in the 26 to 46 Foot bgs Interval

- >280 µg/L
- >28 µg/L
- >2.8 µg/L
- U Not Detected
- J Estimate Value

Note:
- All concentrations are reported in µg/L. Contours have been interpolated between monitoring well locations. Actual conditions may differ from those shown on this figure.
- Shaded values exceed NCGWQS (2.8 µg/L)
- IS100 - IS119 were sampled in October 2005
- IS200 - IS 219 were sampled in February 2006
- Monitoring wells sampled in June 2006
- * Monitoring wells not sampled

N

0 400 800 Feet

1 inch equals 400 feet

Figure 5-3
Groundwater TCE Concentrations (26 to 46 feet bgs)
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

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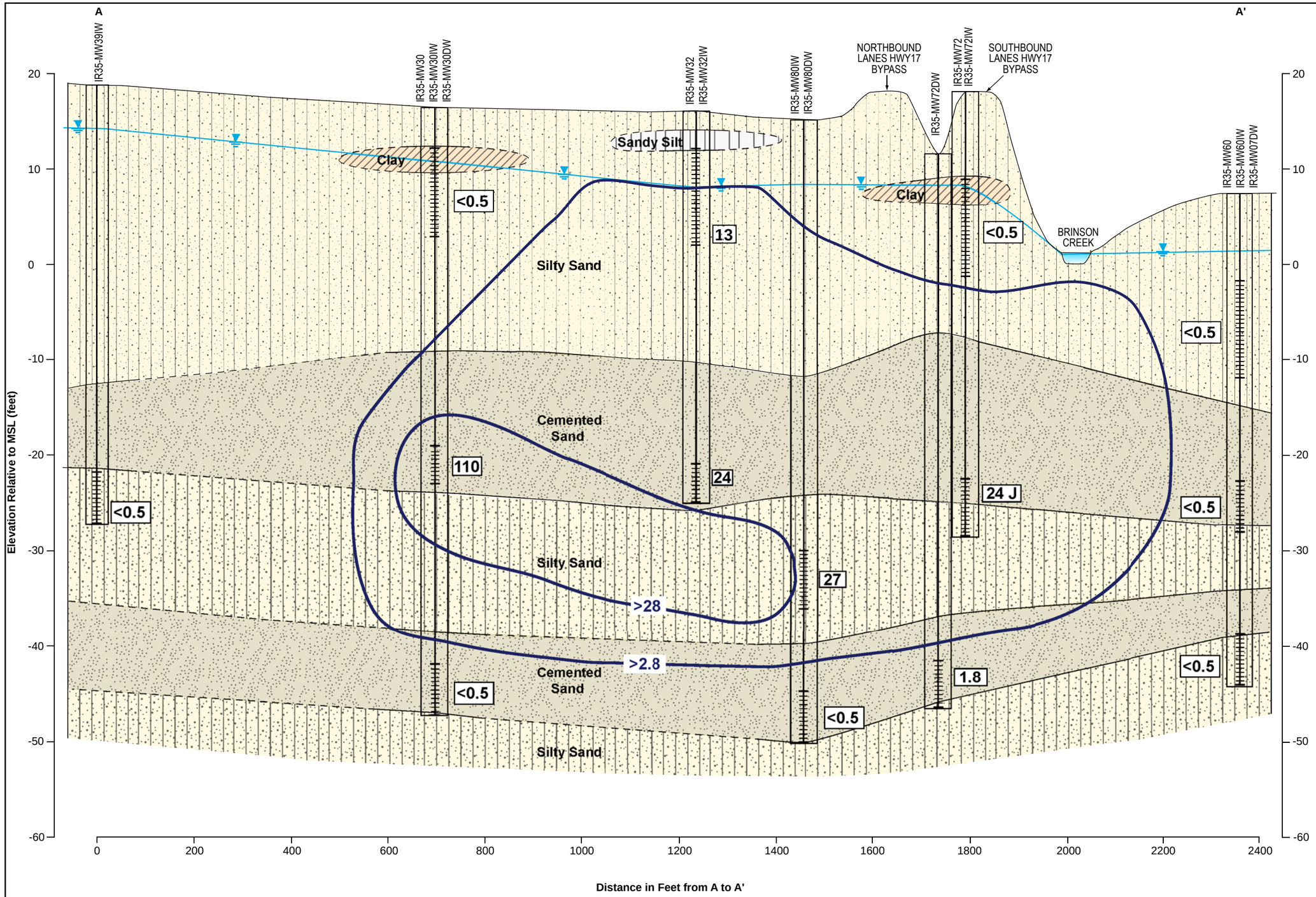

Horizontal : 1" = 200'
Vertical: 1" = 10'
V.E. = 20x

LEGEND

- Clay
- Silty Sand
- Cemented sand
- Sandy Silt
- Screened Interval
- Inferred geologic contact
- Water table elevation
- >2.8 TCE isocontour
- 1.8 Detected concentration in µg/L (June 2006)
- J Estimated Value

NOTE

1) The depth and thickness of the subsurface strata indicated on this section (profile) were generalized from and interpolated between test locations. Information on actual subsurface conditions apply only to the specific locations indicated. Subsurface conditions and water levels at other locations may differ from conditions occurring at the indicated locations.
2) All water levels were measured during sampling event in June 2006.

Figure 5-4
Cross Sectional View of TCE Distribution (A-A')
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

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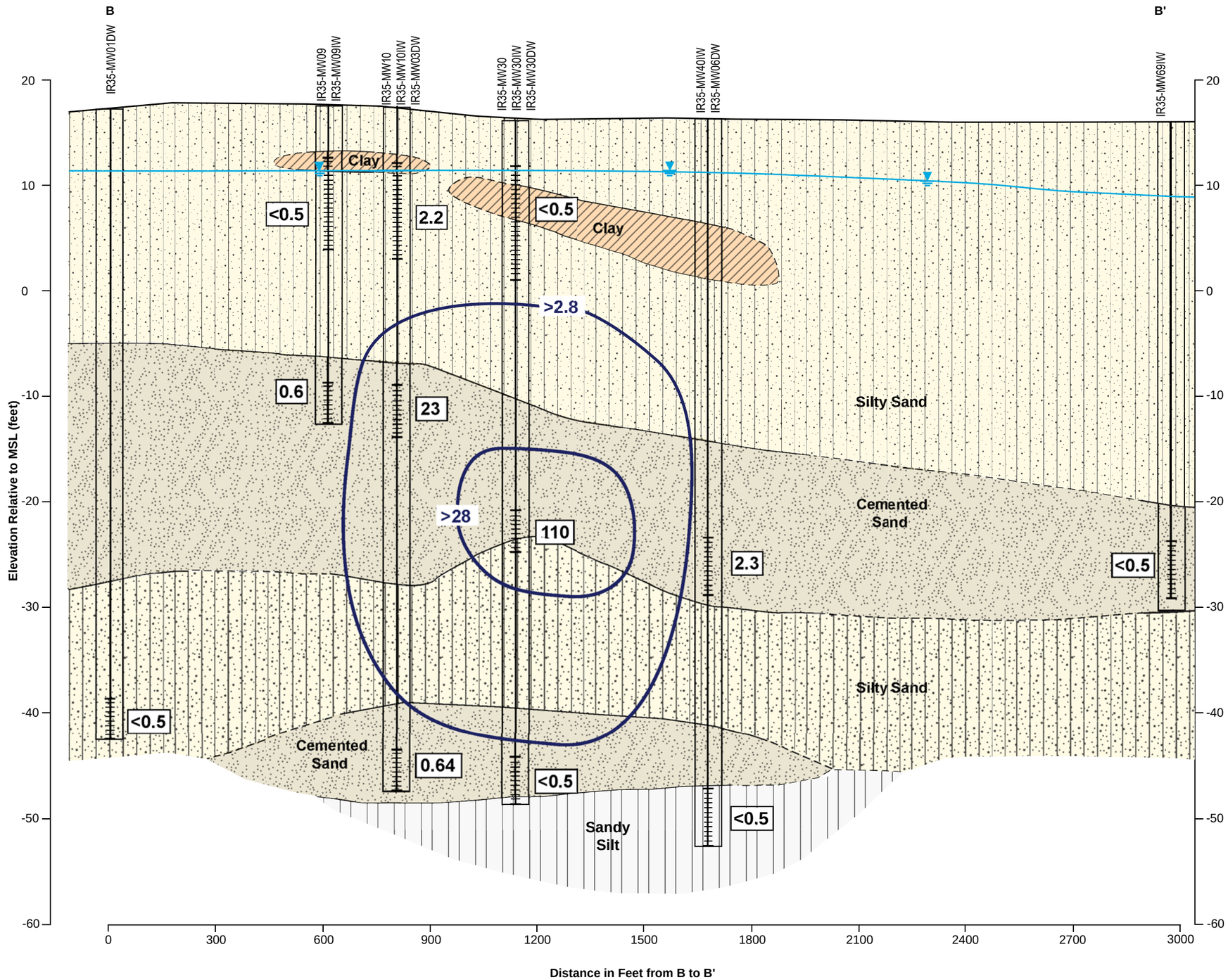
ES032009015MKE Figure5-4_A-A_v8.ai 03.18.09 sls



Horizontal : 1" = 300'
Vertical: 1" = 10'
V.E. = 30x

LEGEND

- Clay
- Silty Sand
- Cemented sand
- Sandy Silt
- Screened Interval
- Inferred geologic contact
- Water table elevation
- >2.8 TCE Isocontour
- 2.3 Detected Concentration in µg/L (June 2006)

NOTE

1) The depth and thickness of the subsurface strata indicated on this section (profile) were generalized from and interpolated between test locations. Information on actual subsurface conditions apply only to the specific locations indicated. Subsurface conditions and water levels at other locations may differ from conditions occurring at the indicated locations.
2) All water levels were measured during sampling event in June 2006.

Figure 5-5
Cross Sectional View of TCE Distribution (B-B')
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

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ES032009015MKE Figure_5-5_B-B'_v3.ai 03.18.09 sls

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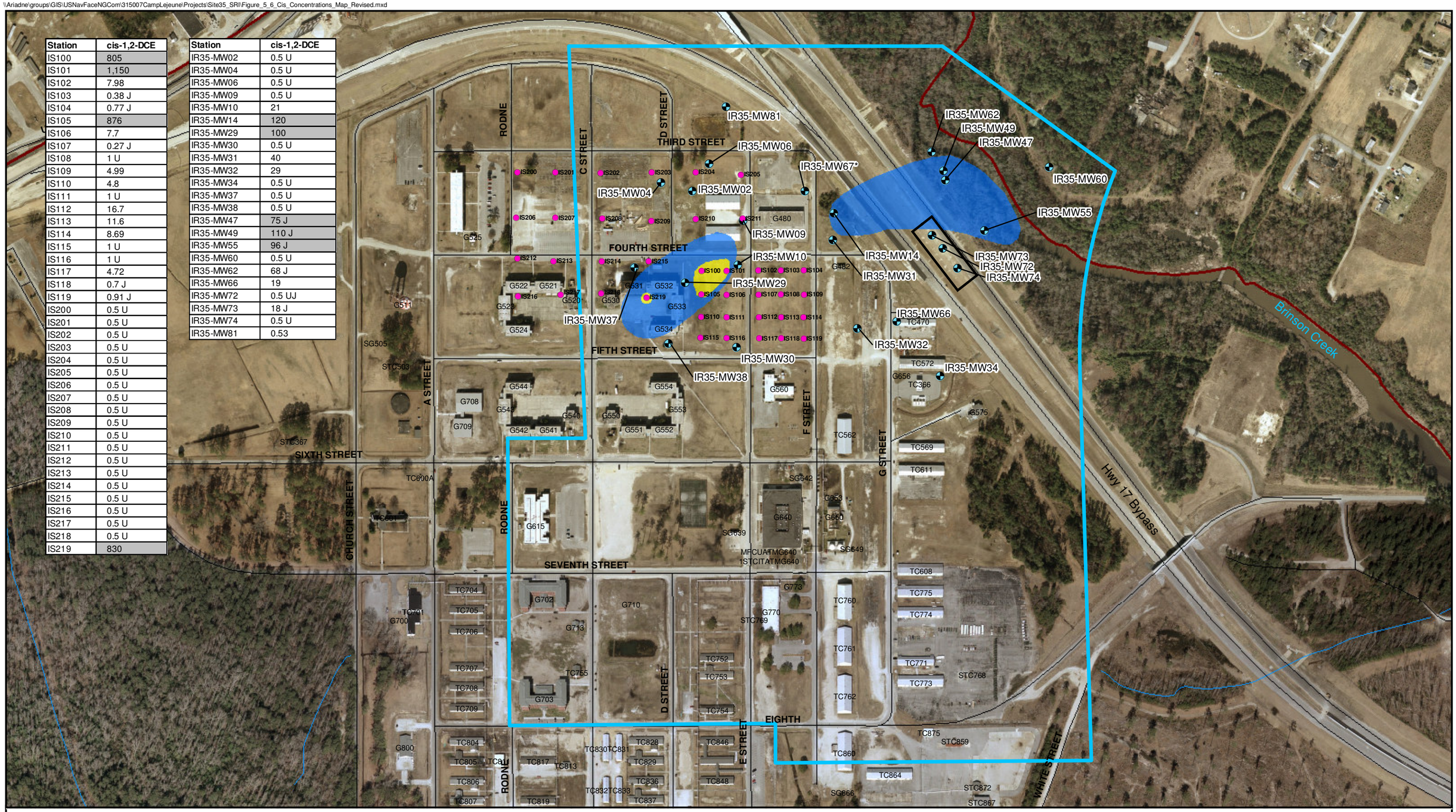
Station	cis-1,2-DCE
IS100	805
IS101	1,150
IS102	7.98
IS103	0.38 J
IS104	0.77 J
IS105	876
IS106	7.7
IS107	0.27 J
IS108	1 U
IS109	4.99
IS110	4.8
IS111	1 U
IS112	16.7
IS113	11.6
IS114	8.69
IS115	1 U
IS116	1 U
IS117	4.72
IS118	0.7 J
IS119	0.91 J
IS200	0.5 U
IS201	0.5 U
IS202	0.5 U
IS203	0.5 U
IS204	0.5 U
IS205	0.5 U
IS206	0.5 U
IS207	0.5 U
IS208	0.5 U
IS209	0.5 U
IS210	0.5 U
IS211	0.5 U
IS212	0.5 U
IS213	0.5 U
IS214	0.5 U
IS215	0.5 U
IS216	0.5 U
IS217	0.5 U
IS218	0.5 U
IS219	830

Station	cis-1,2-DCE
IR35-MW02	0.5 U
IR35-MW04	0.5 U
IR35-MW06	0.5 U
IR35-MW09	0.5 U
IR35-MW10	21
IR35-MW14	120
IR35-MW29	100
IR35-MW30	0.5 U
IR35-MW31	40
IR35-MW32	29
IR35-MW34	0.5 U
IR35-MW37	0.5 U
IR35-MW38	0.5 U
IR35-MW47	75 J
IR35-MW49	110 J
IR35-MW55	96 J
IR35-MW60	0.5 U
IR35-MW62	68 J
IR35-MW66	19
IR35-MW72	0.5 UJ
IR35-MW73	18 J
IR35-MW74	0.5 U
IR35-MW81	0.53



Legend

- DPT Groundwater Location
- Shallow Monitoring Wells
- Road Centerline
- Base Boundary
- Approximate Location of Pilot Study
- Maximum Extent of Previous Groundwater Investigations

Cis-1,2-DCE Concentrations in the 2 to 25 Foot bgs Interval

- >700 µg/L
- >70 µg/L

U Not Detected
J Estimate Value

Note:
- All concentrations are reported in µg/L. Contours have been interpolated between monitoring well locations. Actual conditions may differ from those shown on this figure.
- Shaded values exceed NCGWQS (70 µg/L)
- IS100 - IS119 were sampled in October 2005
- IS200 - IS219 were sampled in February 2006
- Monitoring wells sampled in June 2006
- * Monitoring well not sampled

N

0 400 800 Feet

1 inch equals 400 feet

Figure 5-6
Groundwater Cis-1,2-DCE Concentrations (2 to 25 feet bgs)
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

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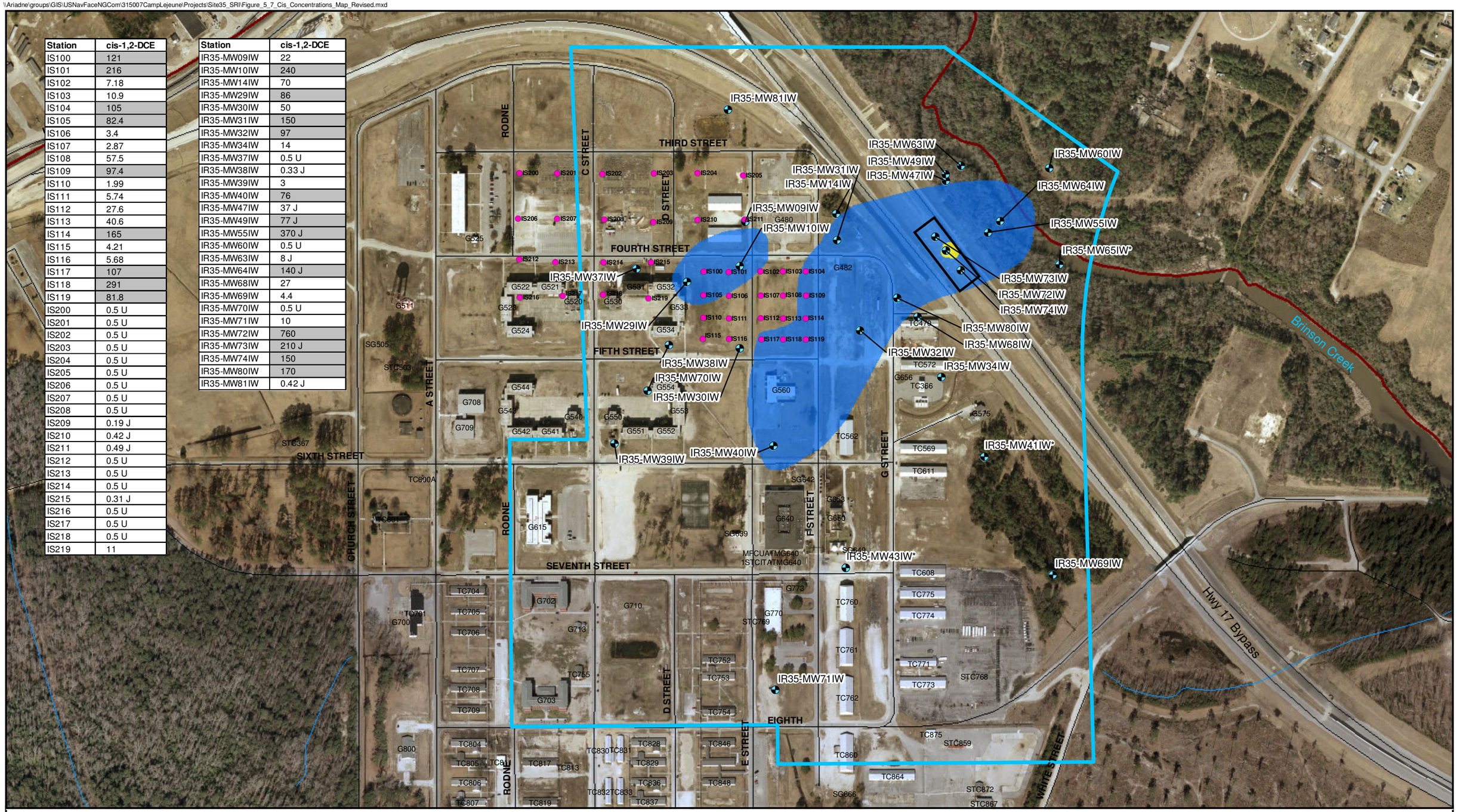
Station	cis-1,2-DCE
IS100	121
IS101	216
IS102	7.18
IS103	10.9
IS104	105
IS105	82.4
IS106	3.4
IS107	2.87
IS108	57.5
IS109	97.4
IS110	1.99
IS111	5.74
IS112	27.6
IS113	40.6
IS114	165
IS115	4.21
IS116	5.68
IS117	107
IS118	291
IS119	81.8
IS200	0.5 U
IS201	0.5 U
IS202	0.5 U
IS203	0.5 U
IS204	0.5 U
IS205	0.5 U
IS206	0.5 U
IS207	0.5 U
IS208	0.5 U
IS209	0.19 J
IS210	0.42 J
IS211	0.49 J
IS212	0.5 U
IS213	0.5 U
IS214	0.5 U
IS215	0.31 J
IS216	0.5 U
IS217	0.5 U
IS218	0.5 U
IS219	11

Station	cis-1,2-DCE
IR35-MW09IW	22
IR35-MW10IW	240
IR35-MW14IW	70
IR35-MW29IW	86
IR35-MW30IW	50
IR35-MW31IW	150
IR35-MW32IW	97
IR35-MW34IW	14
IR35-MW37IW	0.5 U
IR35-MW38IW	0.33 J
IR35-MW39IW	3
IR35-MW40IW	76
IR35-MW47IW	37 J
IR35-MW49IW	77 J
IR35-MW55IW	370 J
IR35-MW60IW	0.5 U
IR35-MW63IW	8 J
IR35-MW64IW	140 J
IR35-MW68IW	27
IR35-MW69IW	4.4
IR35-MW70IW	0.5 U
IR35-MW71IW	10
IR35-MW72IW	760
IR35-MW73IW	210 J
IR35-MW74IW	150
IR35-MW80IW	170
IR35-MW81IW	0.42 J



Legend

- DPT Groundwater Location
- Intermediate Monitoring Wells
- Road Centerline
- Approximate Location of Pilot Study
- Base Boundary
- Maximum Extent of Previous Groundwater Investigations

Cis-1,2-DCE Concentrations in the 26 to 46 Foot bgs Interval

- >700 µg/L
- >70 µg/L
- U Not Detected
- J Estimate Value

Note:
- All concentrations are reported in µg/L. Contours have been interpolated between monitoring well locations. Actual conditions may differ from those shown on this figure.
- Shaded values exceed NCGWQS (70 µg/L)
- IS100 - IS119 were sampled in October 2005
- IS200 - IS219 were sampled in February 2006
- Monitoring wells sampled in June 2006
- * Monitoring wells not sampled

N

0 400 800 Feet

1 inch equals 400 feet

Figure 5-7
Groundwater Cis-1,2-DCE Concentrations (26 to 46 feet bgs)
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

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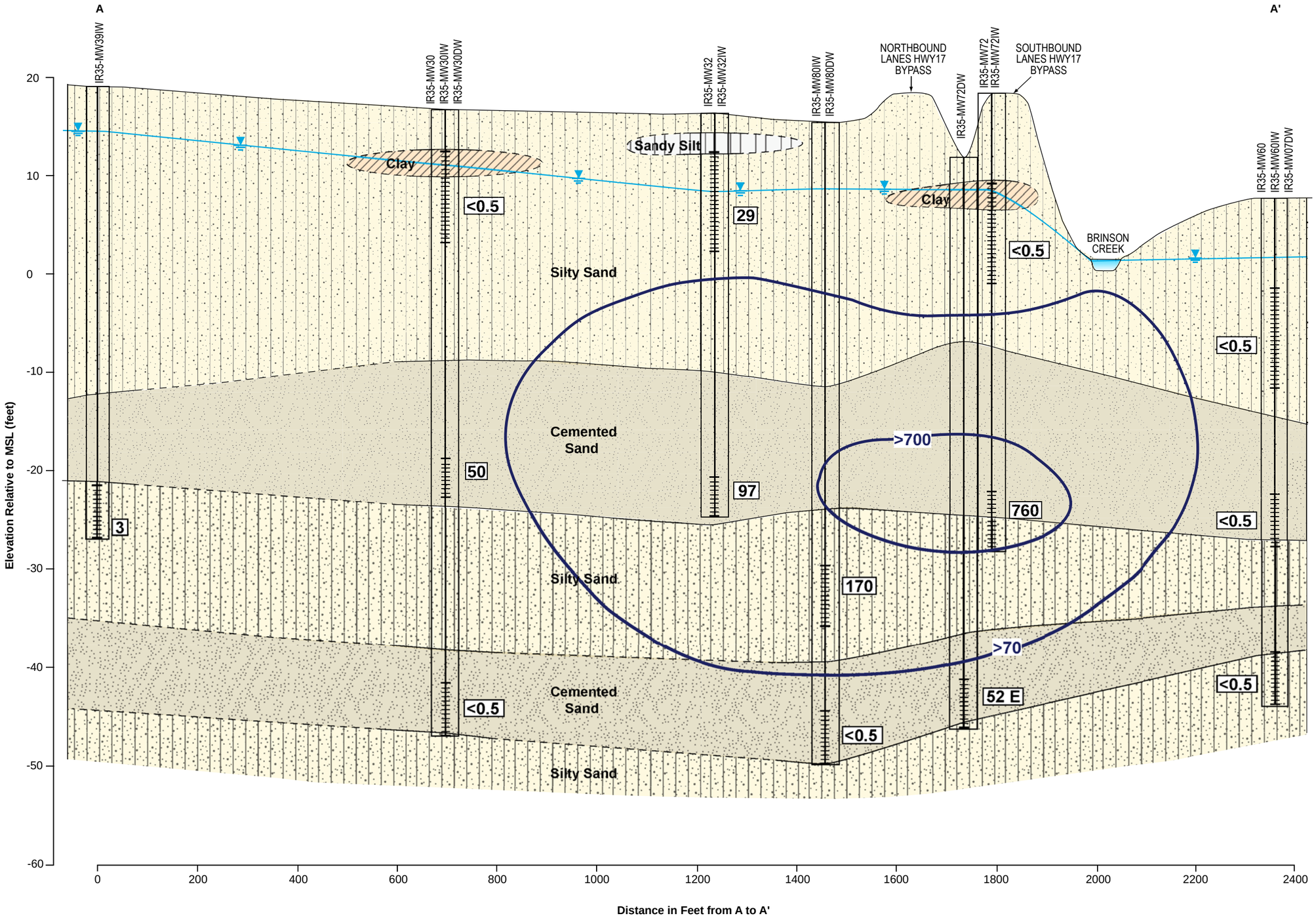

NOTE

1) The depth and thickness of the subsurface strata indicated on this section (profile) were generalized from and interpolated between test locations. Information on actual subsurface conditions apply only to the specific locations indicated. Subsurface conditions and water levels at other locations may differ from conditions occurring at the indicated locations.

2) All water levels were measured during sampling event in June 2006.

Figure 5-8
Cross Sectional View of
cis-1,2 DCE Distribution (A-A')
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

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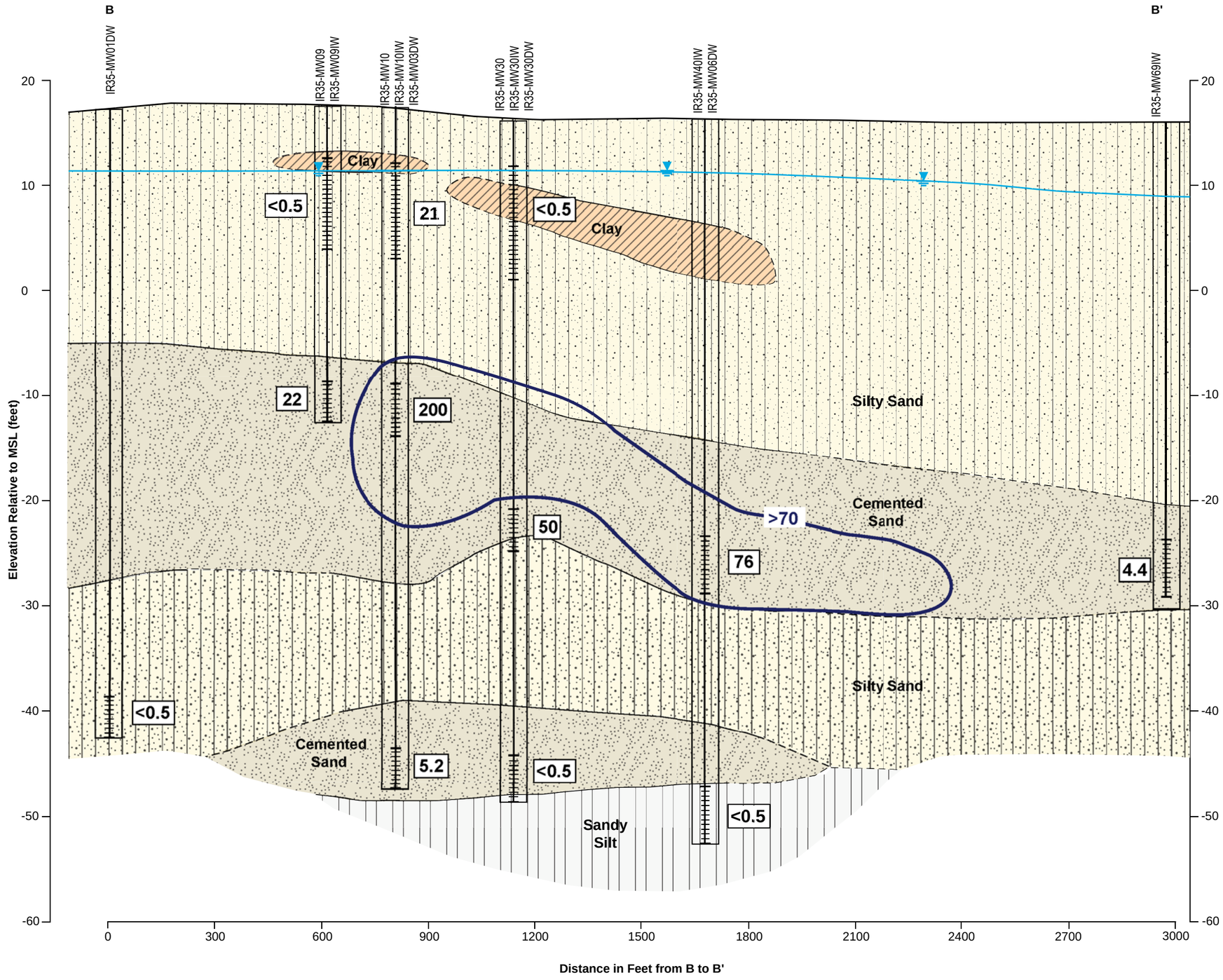

Horizontal : 1" = 300'
Vertical: 1" = 10'
V.E. = 30x

LEGEND

- Clay
- Silty Sand
- Cemented sand
- Sandy Silt
- Screened Interval
- Inferred geologic contact
- Water table elevation
- >70 cis-1,2 DCE Isocontour
- 4.4 Detected Concentration in µg/L (June 2006)

NOTE

1) The depth and thickness of the subsurface strata indicated on this section (profile) were generalized from and interpolated between test locations. Information on actual subsurface conditions apply only to the specific locations indicated. Subsurface conditions and water levels at other locations may differ from conditions occurring at the indicated locations.
2) All water levels were measured during sampling event in June 2006.

Figure 5-9
Cross Sectional View of cis-1,2 DCE Distribution (B-B')
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

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ES032009015MKE Figure_5-9_B-B'_v4.ai 03.18.09 sls

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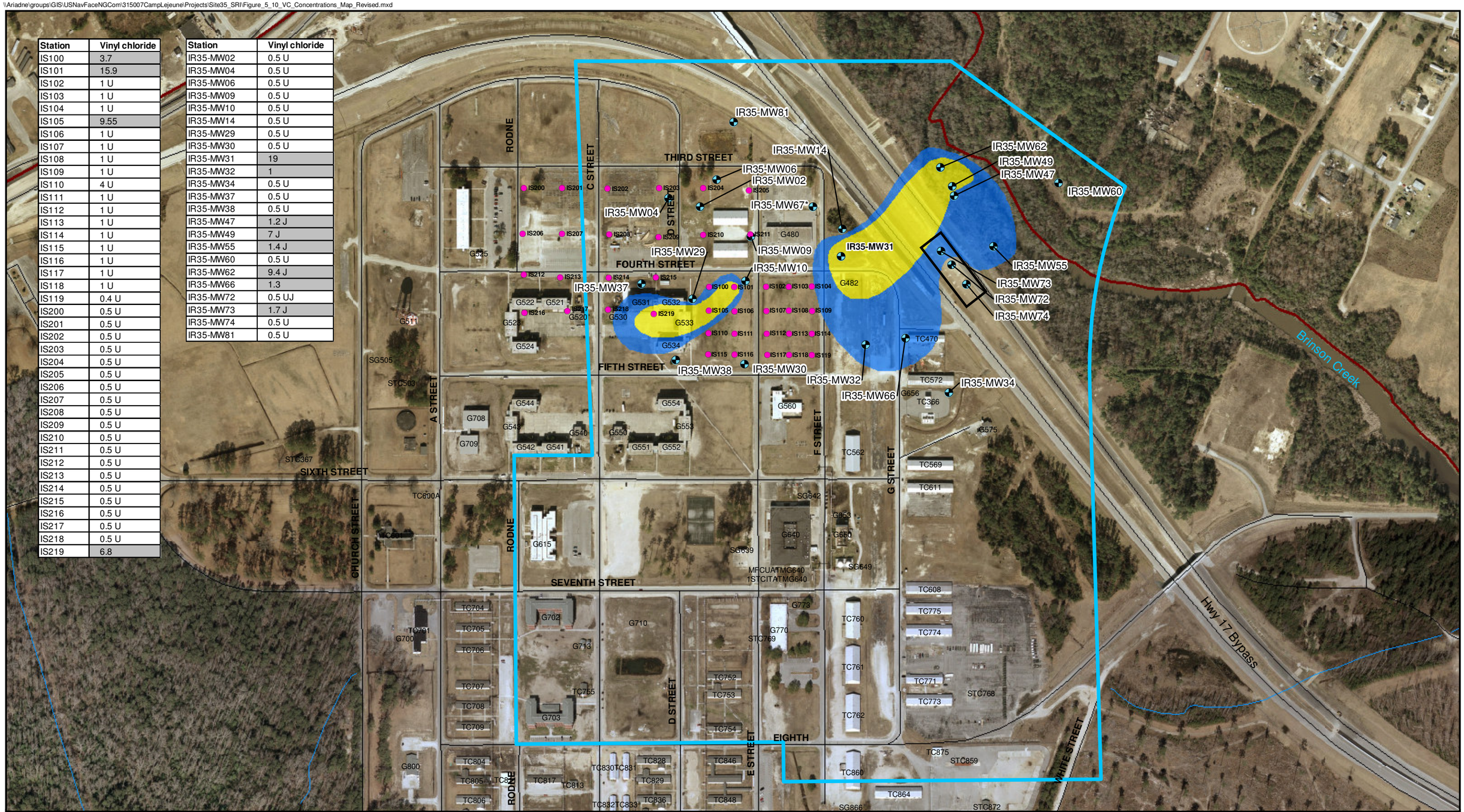
Station	Vinyl chloride
IS100	3.7
IS101	15.9
IS102	1 U
IS103	1 U
IS104	1 U
IS105	9.55
IS106	1 U
IS107	1 U
IS108	1 U
IS109	1 U
IS110	4 U
IS111	1 U
IS112	1 U
IS113	1 U
IS114	1 U
IS115	1 U
IS116	1 U
IS117	1 U
IS118	1 U
IS119	0.4 U
IS200	0.5 U
IS201	0.5 U
IS202	0.5 U
IS203	0.5 U
IS204	0.5 U
IS205	0.5 U
IS206	0.5 U
IS207	0.5 U
IS208	0.5 U
IS209	0.5 U
IS210	0.5 U
IS211	0.5 U
IS212	0.5 U
IS213	0.5 U
IS214	0.5 U
IS215	0.5 U
IS216	0.5 U
IS217	0.5 U
IS218	0.5 U
IS219	6.8

Station	Vinyl chloride
IR35-MW02	0.5 U
IR35-MW04	0.5 U
IR35-MW06	0.5 U
IR35-MW09	0.5 U
IR35-MW10	0.5 U
IR35-MW14	0.5 U
IR35-MW29	0.5 U
IR35-MW30	0.5 U
IR35-MW31	19
IR35-MW32	1
IR35-MW34	0.5 U
IR35-MW37	0.5 U
IR35-MW38	0.5 U
IR35-MW47	1.2 J
IR35-MW49	7 J
IR35-MW55	1.4 J
IR35-MW60	0.5 U
IR35-MW62	9.4 J
IR35-MW66	1.3
IR35-MW72	0.5 UJ
IR35-MW73	1.7 J
IR35-MW74	0.5 U
IR35-MW81	0.5 U



Legend

- DPT Groundwater Location
- Shallow Monitoring Wells
- Road Centerline
- Base Boundary
- Approximate Location of Pilot Study
- Maximum Extent of Previous Groundwater Investigations

VC Concentrations in the 2 to 25 Foot bgs Screened Interval

- > 5.0 µg/L
- Detected Concentration

U Not Detected
J Estimate Value

Note:
- All concentrations are reported in µg/L. Contours have been interpolated between monitoring well locations. Actual conditions may differ from those shown on this figure.
- Shaded values exceed NCGWQS (0.015 µg/L)
- IS100 - IS119 were sampled in October 2005
- IS200 - IS219 were sampled in February 2006
- Monitoring wells sampled in June 2006
- * Monitoring well not sampled

N

0 400 800 Feet

1 inch equals 400 feet

Figure 5-10
Vinyl Chloride Concentrations (2 to 25 feet bgs)
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

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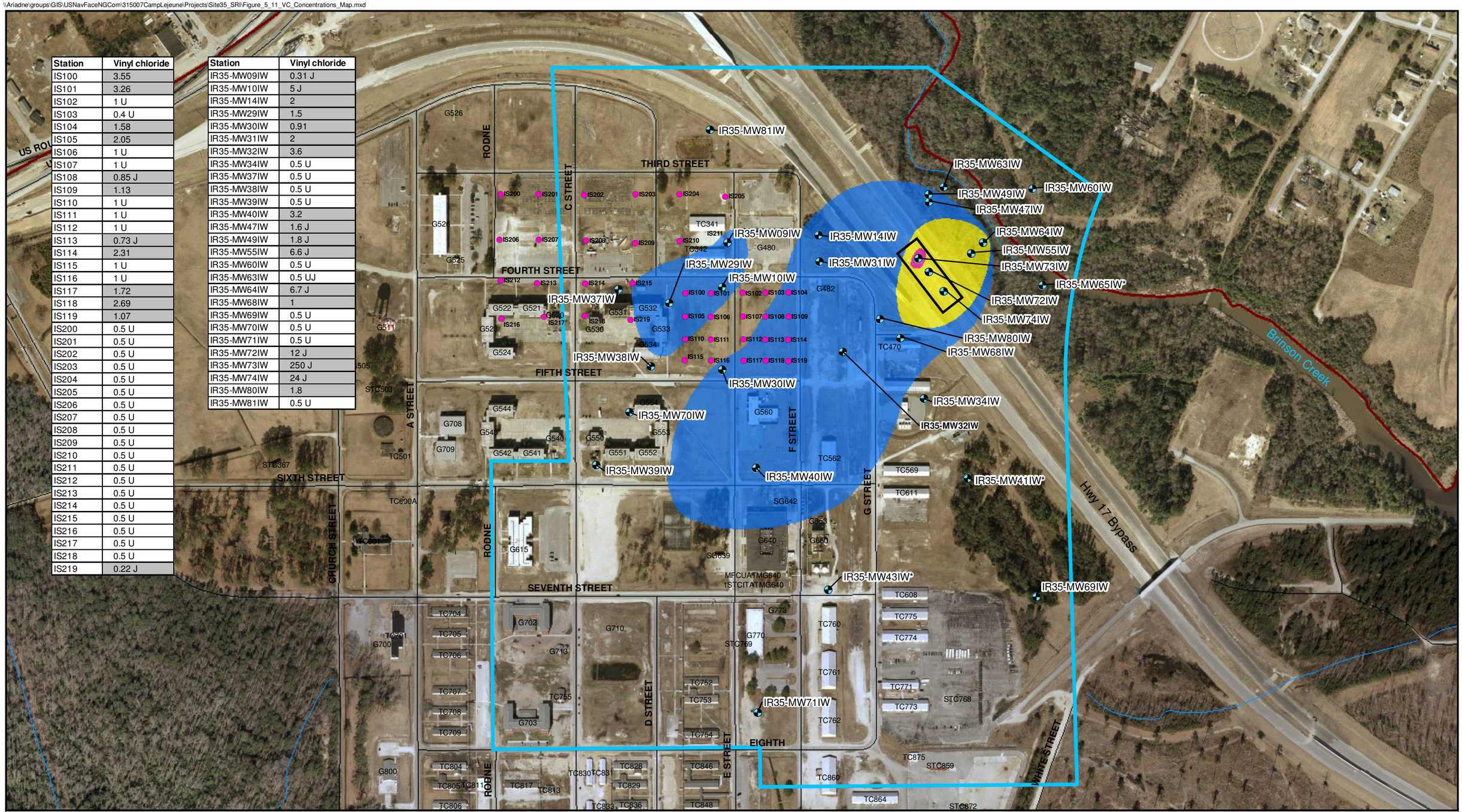

Station	Vinyl chloride
IS100	3.55
IS101	3.26
IS102	1 U
IS103	0.4 U
IS104	1.58
IS105	2.05
IS106	1 U
IS107	1 U
IS108	0.85 J
IS109	1.13
IS110	1 U
IS111	1 U
IS112	1 U
IS113	0.73 J
IS114	2.31
IS115	1 U
IS116	1 U
IS117	1.72
IS118	2.69
IS119	1.07
IS200	0.5 U
IS201	0.5 U
IS202	0.5 U
IS203	0.5 U
IS204	0.5 U
IS205	0.5 U
IS206	0.5 U
IS207	0.5 U
IS208	0.5 U
IS209	0.5 U
IS210	0.5 U
IS211	0.5 U
IS212	0.5 U
IS213	0.5 U
IS214	0.5 U
IS215	0.5 U
IS216	0.5 U
IS217	0.5 U
IS218	0.5 U
IS219	0.22 J

Station	Vinyl chloride
IR35-MW09IW	0.31 J
IR35-MW10IW	5 J
IR35-MW14IW	2
IR35-MW29IW	1.5
IR35-MW30IW	0.91
IR35-MW31IW	2
IR35-MW32IW	3.6
IR35-MW34IW	0.5 U
IR35-MW37IW	0.5 U
IR35-MW38IW	0.5 U
IR35-MW39IW	0.5 U
IR35-MW40IW	3.2
IR35-MW47IW	1.6 J
IR35-MW49IW	1.8 J
IR35-MW55IW	6.6 J
IR35-MW60IW	0.5 U
IR35-MW63IW	0.5 UJ
IR35-MW64IW	6.7 J
IR35-MW68IW	1
IR35-MW69IW	0.5 U
IR35-MW70IW	0.5 U
IR35-MW71IW	0.5 U
IR35-MW72IW	12 J
IR35-MW73IW	250 J
IR35-MW74IW	24 J
IR35-MW80IW	1.8
IR35-MW81IW	0.5 U

Legend

- Intermediate Monitoring Wells
- DPT Groundwater Location
- Road Centerline
- Approximate Location of Pilot Study
- Maximum Extent of Previous Groundwater Investigations
- Base Boundary

VC Concentrations in the 26 to 46 Foot bgs Interval

- >50 µg/L
- >5.0 µg/L
- Detected Concentration
- U Not Detected
- J Estimate Value

Note:
- All concentrations are reported in µg/L. Contours have been interpolated between monitoring well locations. Actual conditions may differ from those shown on this figure.
- Shaded values exceed NCGWQS (0.015 µg/L)
- IS100 - IS119 were sampled in October 2005
- IS200 - IS219 were sampled in February 2006
- Monitoring wells sampled in June 2006
- * Monitoring wells not sampled

N

0 400 800 Feet

1 inch equals 400 feet

Figure 5-11
Groundwater Vinyl Chloride Concentrations (26 to 46 feet bgs)
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

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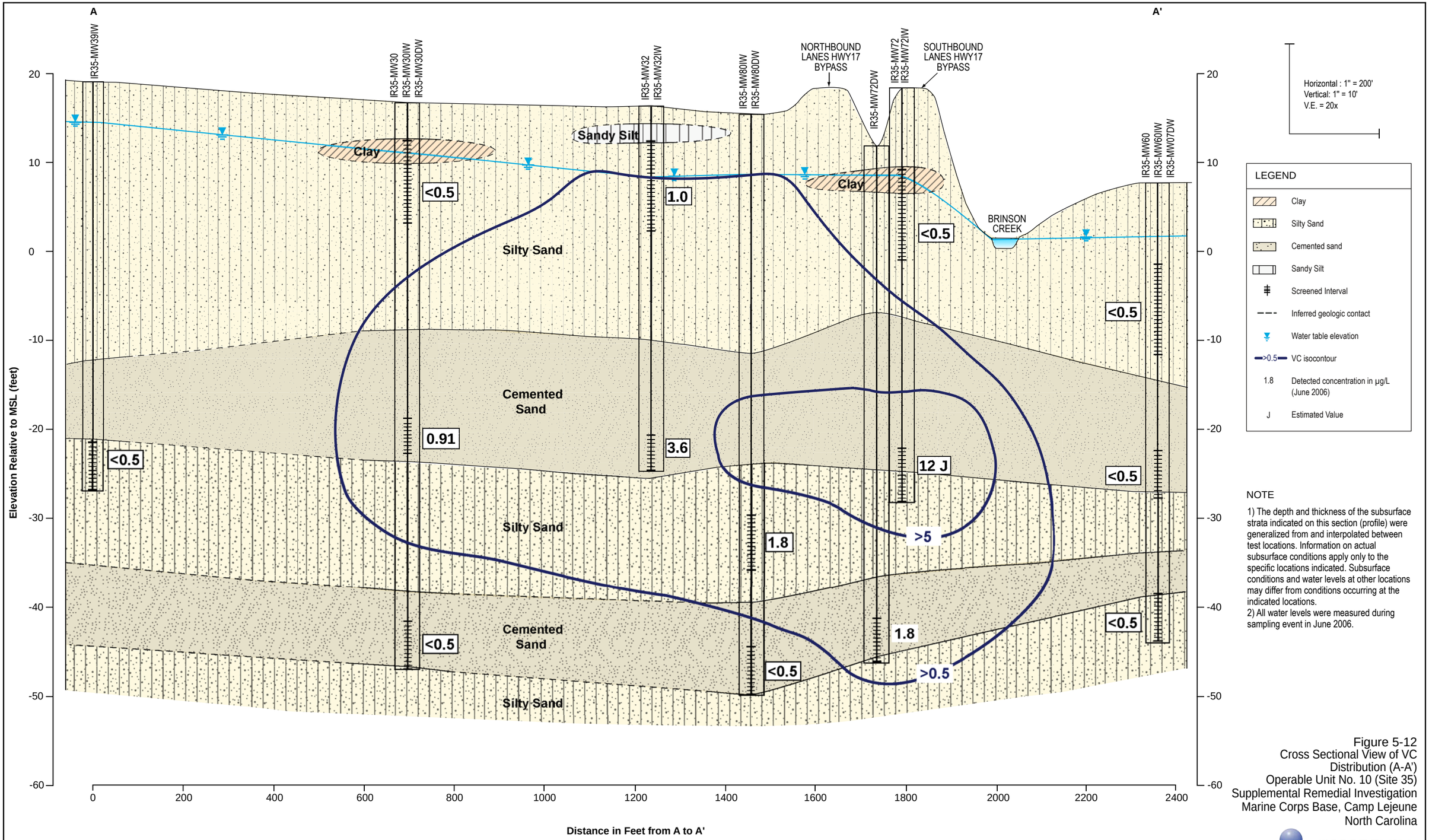

NOTE

1) The depth and thickness of the subsurface strata indicated on this section (profile) were generalized from and interpolated between test locations. Information on actual subsurface conditions apply only to the specific locations indicated. Subsurface conditions and water levels at other locations may differ from conditions occurring at the indicated locations.
2) All water levels were measured during sampling event in June 2006.

Figure 5-12
Cross Sectional View of VC Distribution (A-A')
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

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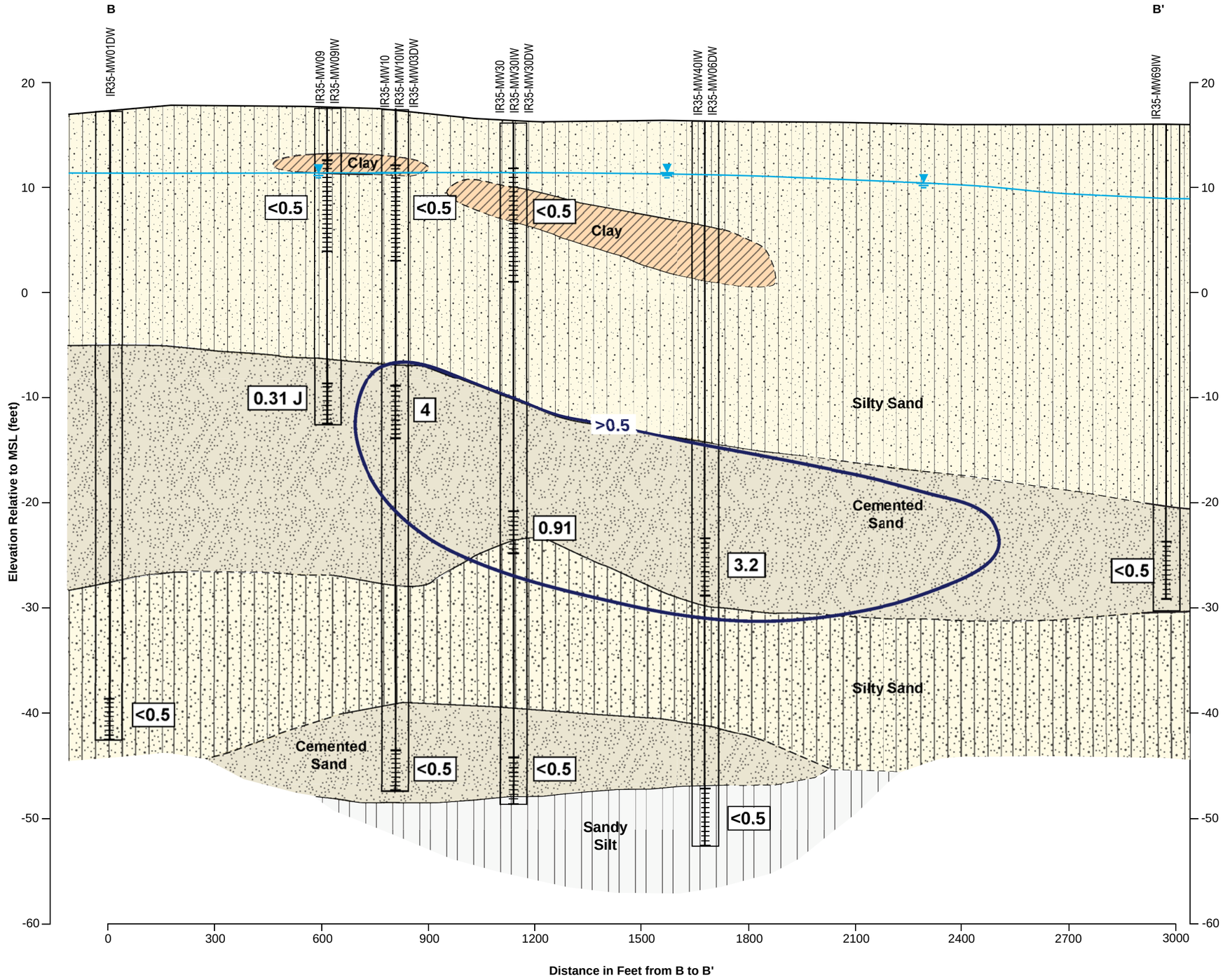

Horizontal : 1" = 300'
Vertical: 1" = 10'
V.E. = 30x

LEGEND

- Clay
- Silty Sand
- Cemented sand
- Sandy Silt
- Screened Interval
- Inferred geologic contact
- Water table elevation
- >0.5 VC Isocontour
- J Estimated Value
- 3.2 Detected Concentration in µg/L (June 2006)

NOTE

1) The depth and thickness of the subsurface strata indicated on this section (profile) were generalized from and interpolated between test locations. Information on actual subsurface conditions apply only to the specific locations indicated. Subsurface conditions and water levels at other locations may differ from conditions occurring at the indicated locations.
2) All water levels were measured during sampling event in June 2006.

Figure 5-13
Cross Sectional View of VC Distribution (B-B')
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

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ES032009015MKE Figure_5-13_B-B'_v4.ai 03.18.09 sls

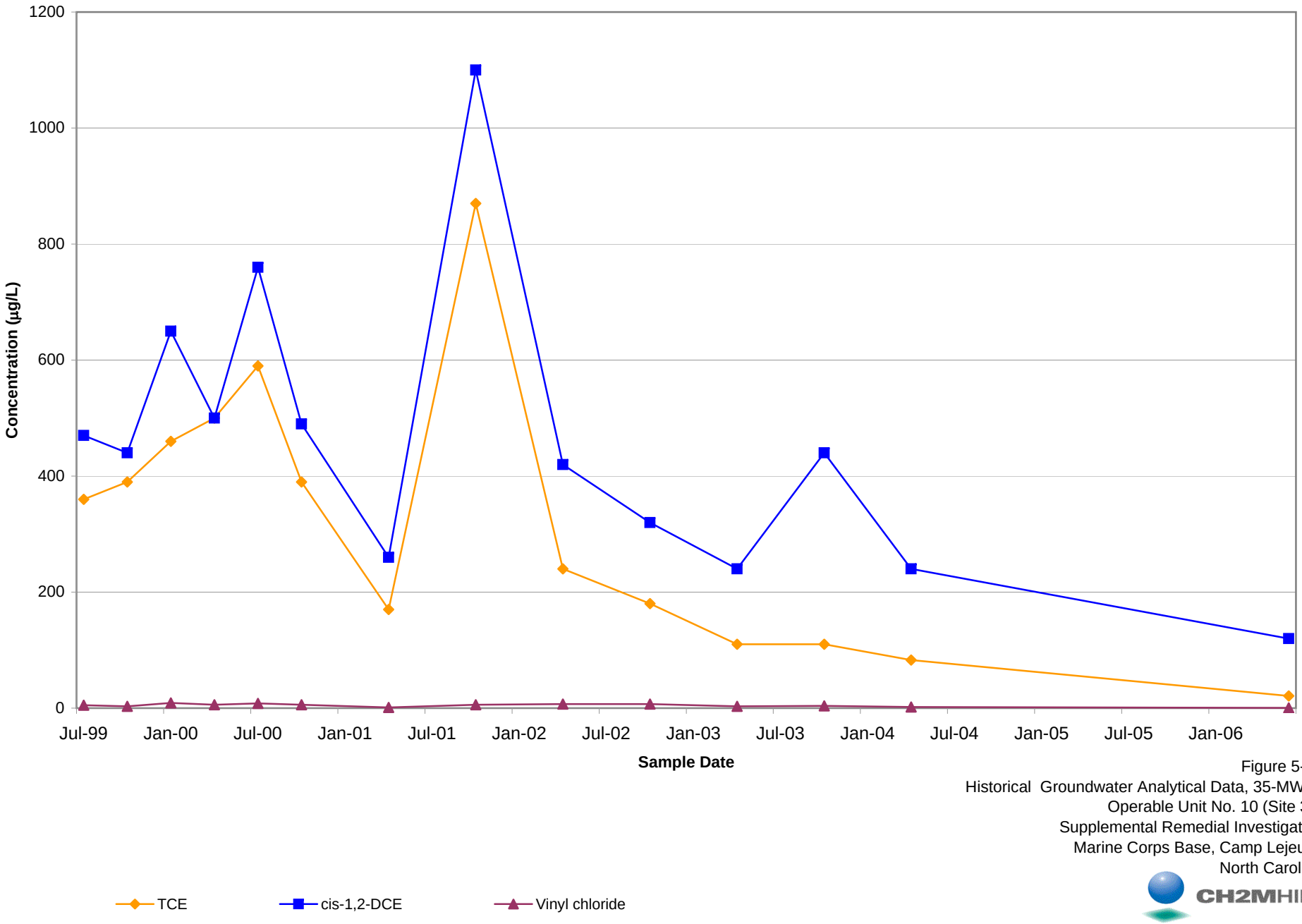

Figure 5-14
Historical Groundwater Analytical Data, 35-MW14
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

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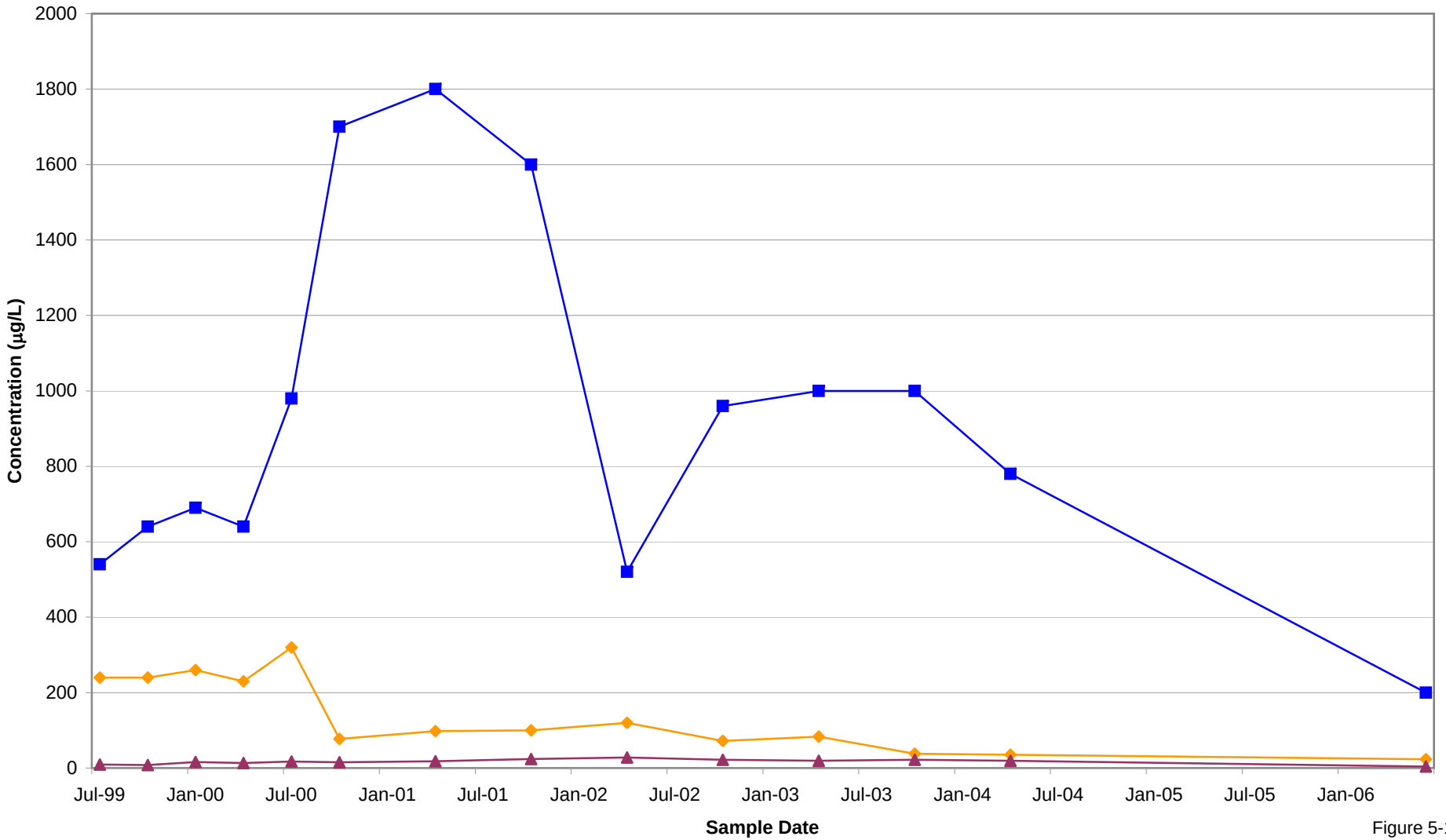

Figure 5-15
Historical Groundwater Analytical Data, 35-MW10IW
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

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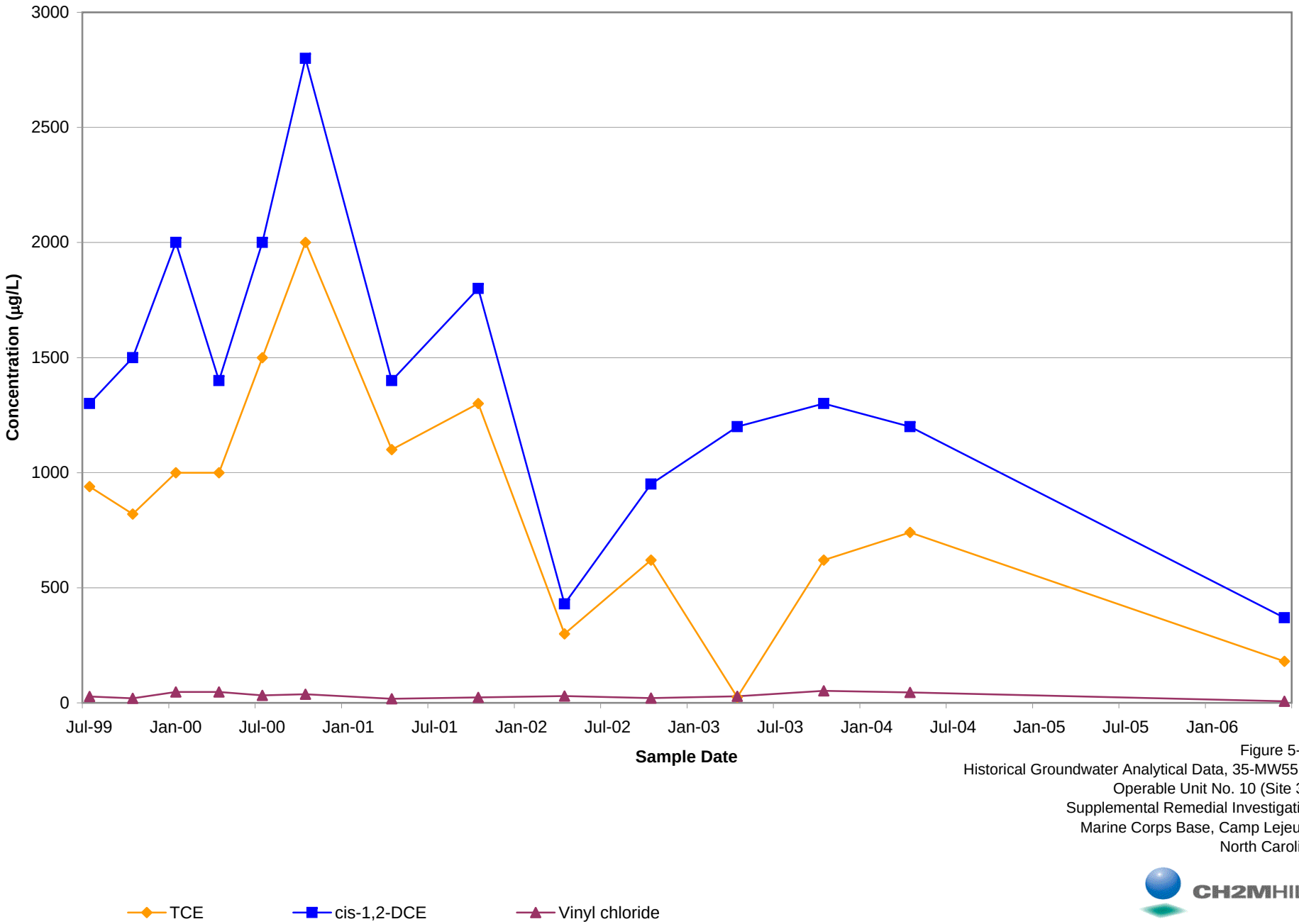

Figure 5-16
Historical Groundwater Analytical Data, 35-MW55IW
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

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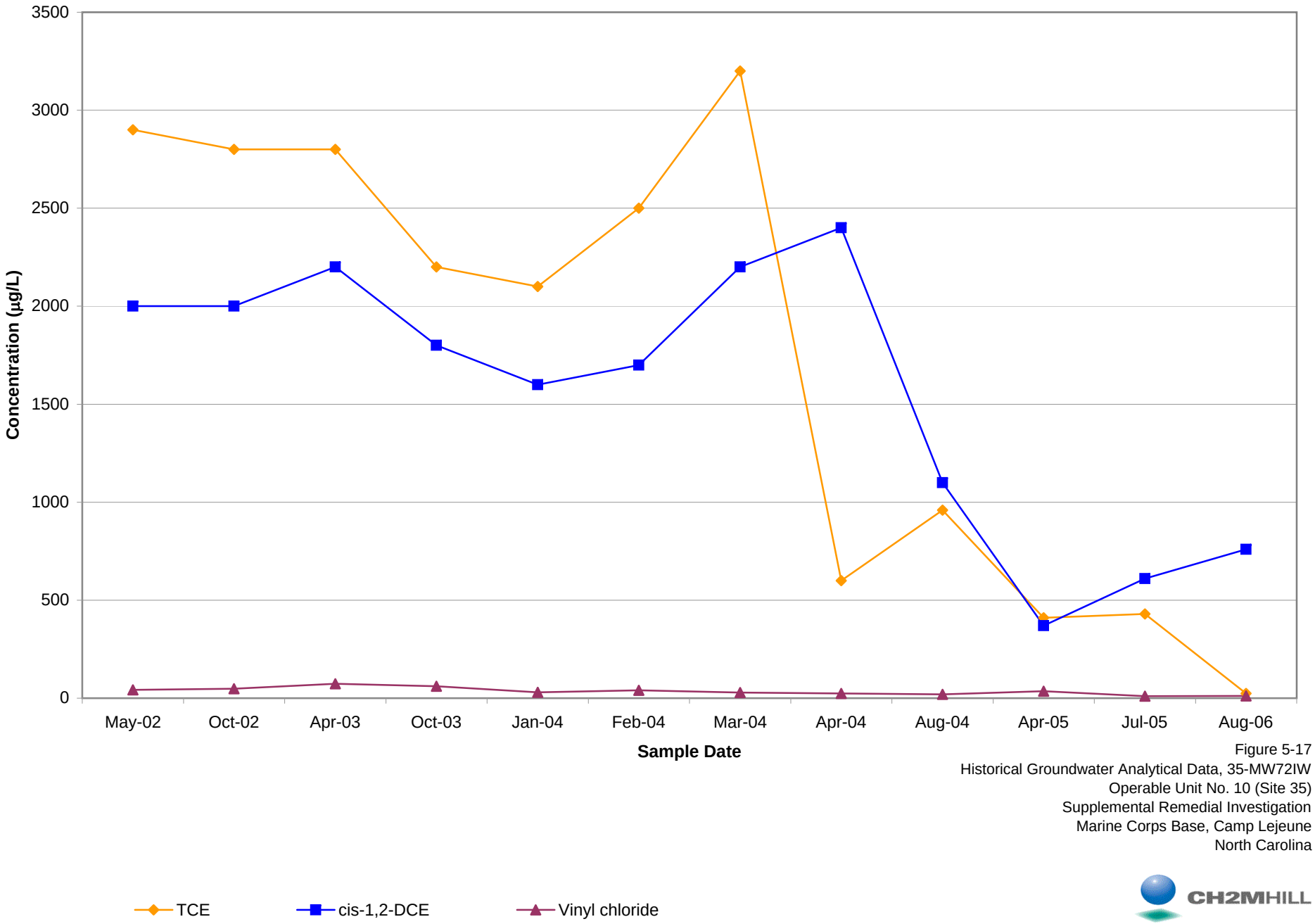

Figure 5-17
Historical Groundwater Analytical Data, 35-MW72IW
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

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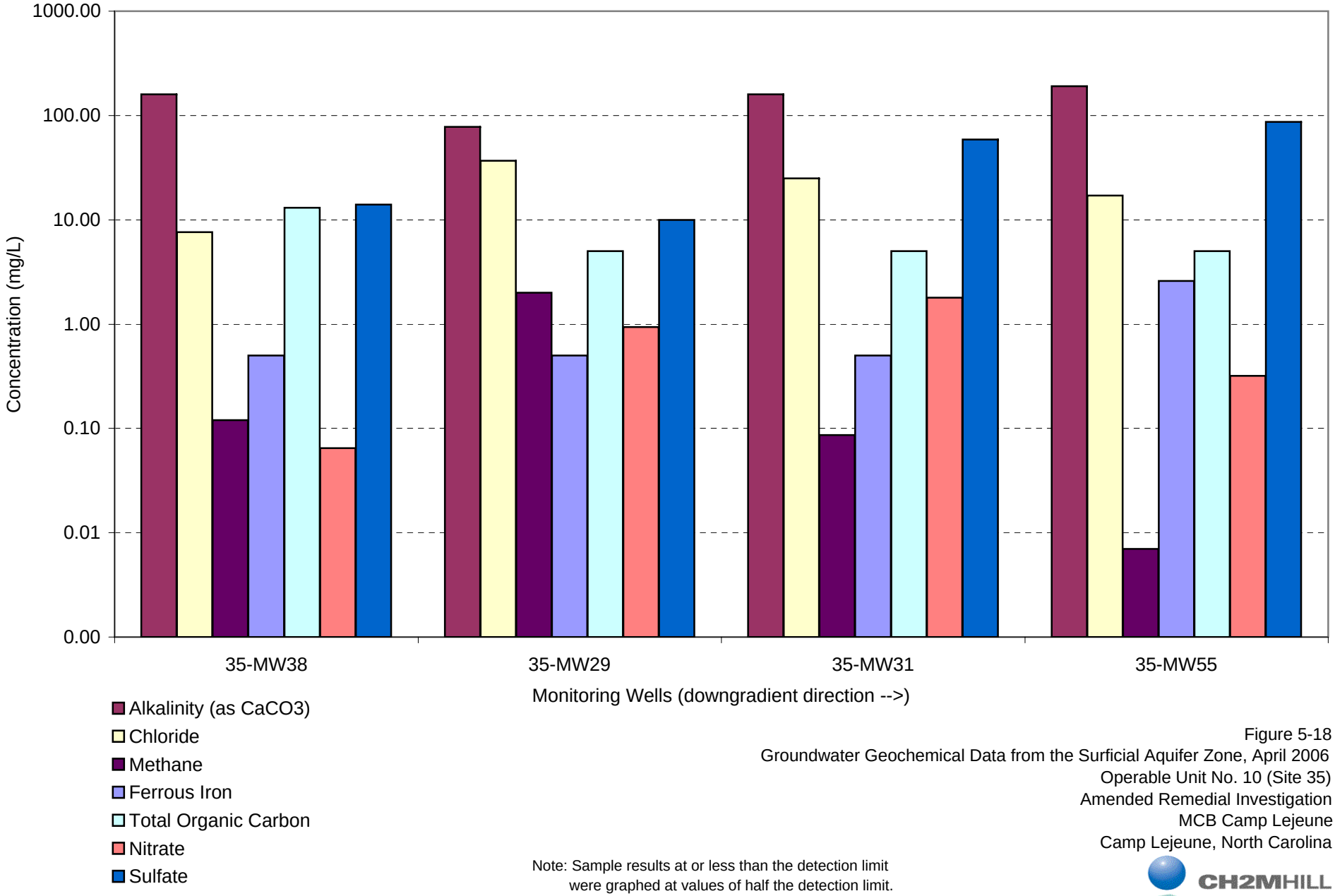

Note: Sample results at or less than the detection limit were graphed at values of half the detection limit.

Figure 5-18
Groundwater Geochemical Data from the Surficial Aquifer Zone, April 2006
Operable Unit No. 10 (Site 35)
Amended Remedial Investigation
MCB Camp Lejeune
Camp Lejeune, North Carolina

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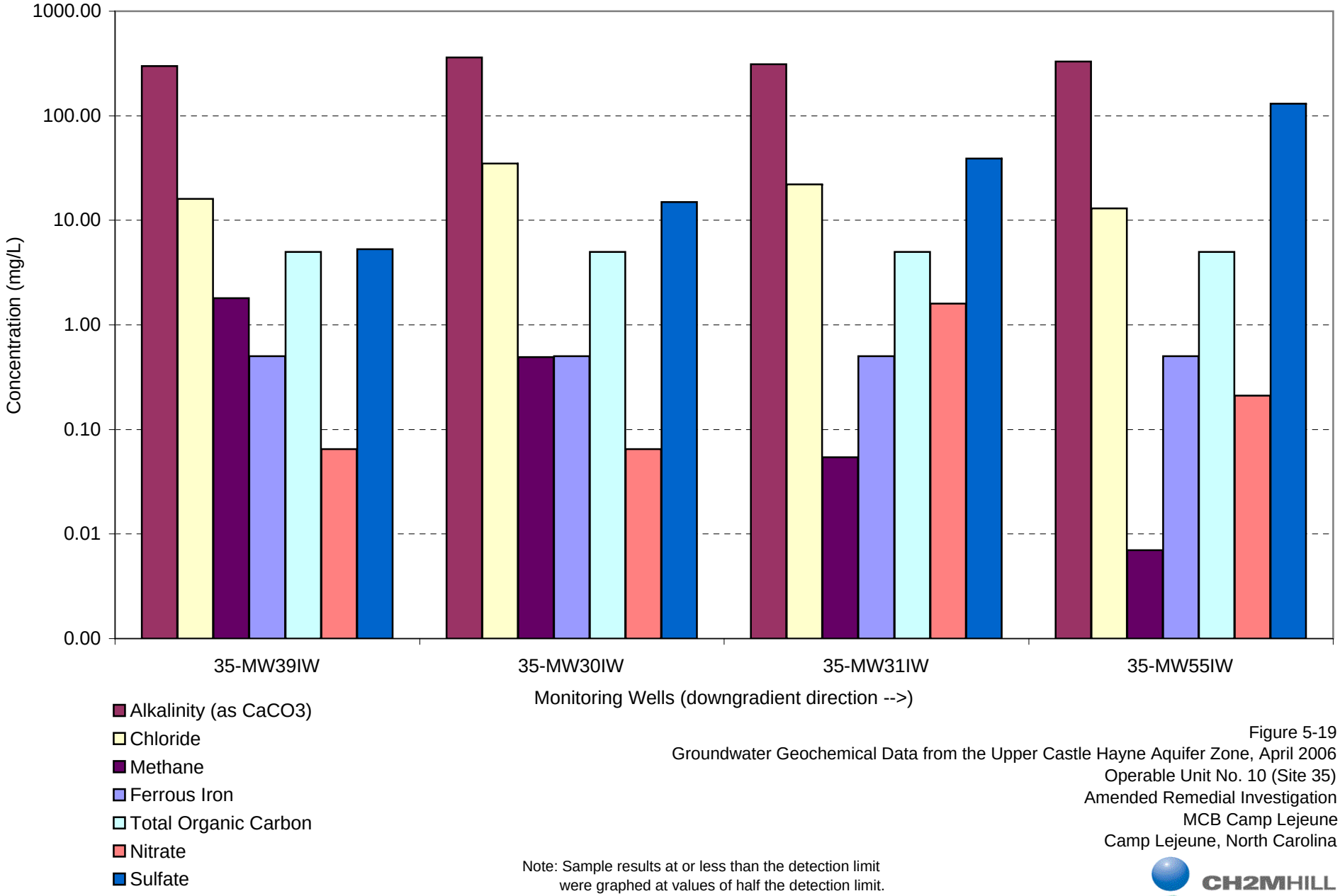

Figure 5-19
Groundwater Geochemical Data from the Upper Castle Hayne Aquifer Zone, April 2006
Operable Unit No. 10 (Site 35)
Amended Remedial Investigation
MCB Camp Lejeune
Camp Lejeune, North Carolina

Note: Sample results at or less than the detection limit were graphed at values of half the detection limit.

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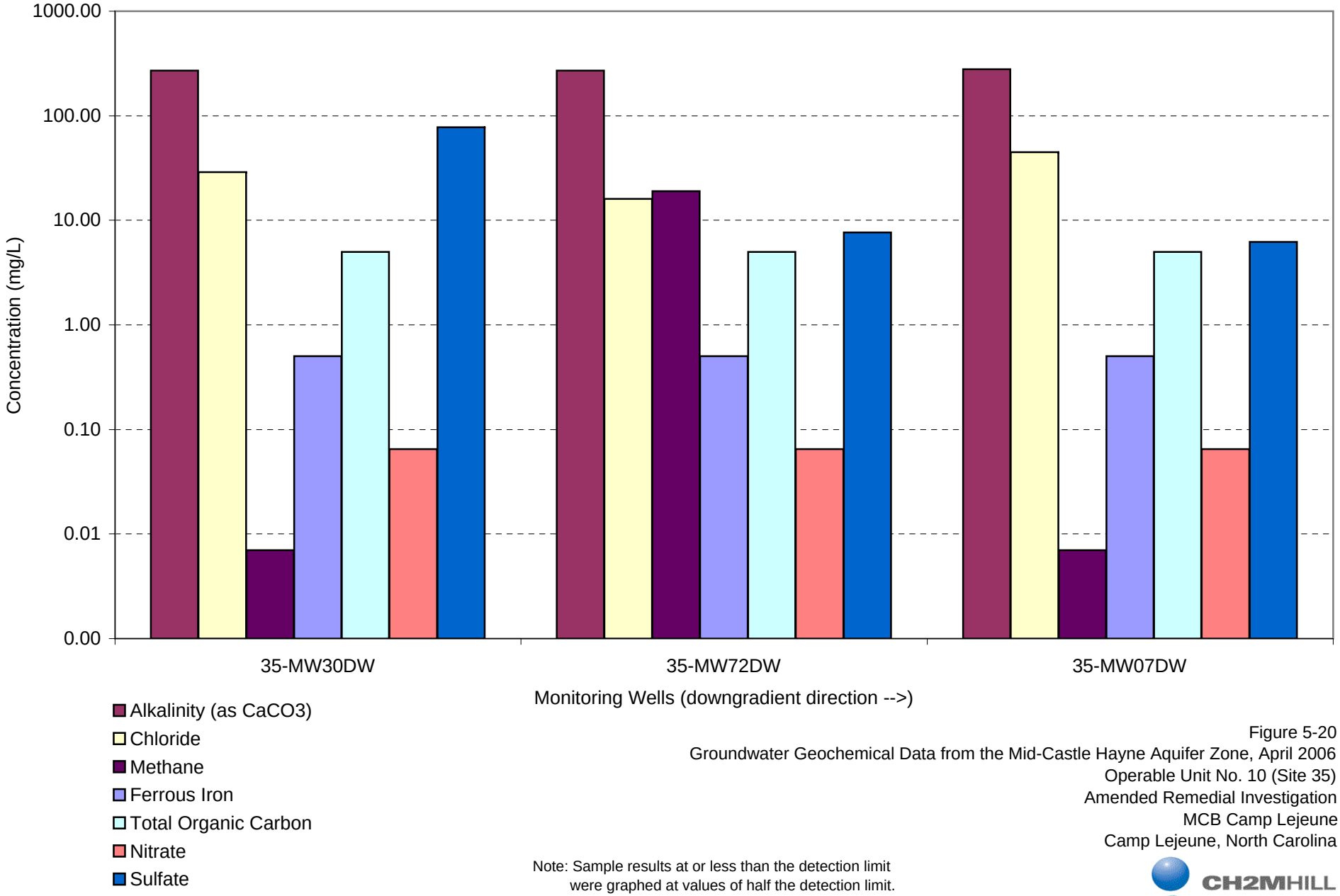

Figure 5-20
Groundwater Geochemical Data from the Mid-Castle Hayne Aquifer Zone, April 2006
Operable Unit No. 10 (Site 35)
Amended Remedial Investigation
MCB Camp Lejeune
Camp Lejeune, North Carolina

Note: Sample results at or less than the detection limit were graphed at values of half the detection limit.

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SECTION 6

Contaminant Fate and Transport

The fate and transport of compounds in soil and groundwater at Site 35 are discussed in this section to support the nature and extent of contamination section and ecological risk assessment in progress, and to aid in defining remedial alternatives.

6.1 Contaminant Mobility and Persistence

The probable behavior of contaminants at the Site is determined by their physical, chemical, and biological interaction with the environment. The mobility and persistence of chemicals in the environment are two key characteristics in determining probable behavior. Mobility is the potential for a chemical to migrate from a site, and persistence is a measure of how long a chemical will remain in the environment. Mobility and persistence of chemicals depend both on the physical and chemical characteristics of the contaminants and those of the hydrogeologic units. One important aspect of understanding the mobility and persistence of site contaminants is their predominant role in the evaluation of the extent at which natural attenuation is occurring at the site.

Natural attenuation, as defined by the USEPA Office of Research and Development and Office of Solid Waste and Emergency Response, is

> *The biodegradation, dispersion, dilution, sorption, volatilization, and/or chemical and biochemical stabilization of contaminants to effectively reduce contaminant toxicity, mobility, or volume to levels that are protective of human health and the environment.* (USEPA, 1999).

These natural attenuation processes are described further in the following sections.

6.1.1 Contaminant Groups

Organic constituents have been detected in groundwater at this Site. As discussed in Section 5, the predominant site-related contaminants are chlorinated VOCs; however, a benzene plume from fuel-related hydrocarbon contamination also persists at the Site. The fate and transport of the three most prevalent chlorinated compounds detected at Site 35 (TCE, cis-1,2-DCE, and vinyl chloride) are discussed in the following sections.

6.1.2 Physical and Chemical Properties of Representative Compounds

Various basic physical and chemical properties affect the transport of chemicals in the environment at this Site. The following are considered to be the most important properties:

- Sorption
- Volatilization
- Degradation
- Bioaccumulation
- Liquids in non-aqueous phases

The following general and chemical-specific profiles briefly describe how the chemical and physical properties (i.e., water solubility and specific gravity) of the site-related organic compounds affect their mobility and persistence in the environment. **Table 6-1** contains data for the representative chemicals on the physical and chemical properties that are relevant to fate and transport. **Table 5-3** contains data on pH, conductivity, temperature, dissolved oxygen, ORP, and turbidity in groundwater obtained during sampling. The processes acting on the site-related chlorinated VOCs are briefly described below.

Sorption

Sorption is the tendency for chemicals to adsorb to and desorb from materials in the media through which the contaminants are being transported. The subsurface materials likely to sorb chemicals typically are clays and organic material. The soils and sediments beneath Site 35 consist mainly of fine sand, trace to some silt, and trace to little clay. This material would be less likely to sorb chemicals.

The conventional measure of sorption is the distribution coefficient (K_d) of soil and geologic material for the chemical. The K_d for organic chemicals is the product of a partition coefficient (K_{oc}) of the chemical and the fraction of organic carbon (f_{oc}) in the soil. In general, chemicals with a K_{oc} greater than 10,000 milliliters per gram (ml/g), or a log K_{oc} greater than 4 (for example, many SVOCs) have high degrees of adsorption and consequentially low mobility, whereas chemicals with a K_{oc} lower than 1,000 ml/g or log K_{oc} lower than 3 (for example, many VOCs) have lower degrees of adsorption and consequentially higher mobility.

Of all the site-related chlorinated VOCs, TCE has the highest log K_{oc}, thus a greater tendency for sorption relative to the other site-related chlorinated VOCs. Vinyl chloride has the lowest log K_{oc}, thus a lower tendency for sorption relative to the other site-related chlorinated VOCs. All three of the VOCs listed have similar log K_{oc} values and all are considered to have a medium to high mobility in soil. Chlorinated VOCs in the non-aqueous and aqueous phase generally do not tend to partition into soil, but will remain or partition into the non-aqueous and aqueous liquids. The high mobility of these compounds indicates that leaching from soil to groundwater is likely. A higher K_{oc} also contributes to greater bioaccumulation.

The migration rates of different dissolved contaminants vary depending on a chemical's degree of adsorption. As a first estimate, dissolved contaminants will move at the rate of groundwater flow, or by advection.

In-situ aquifer testing performed at Site 35 indicate that the average hydraulic conductivity value for the Surficial aquifer is 0.628 ft/day, the average hydraulic conductivity for the upper Castle Hayne aquifer is approximately 4.2 ft/day, and the average hydraulic conductivity for the mid-Castle Hayne aquifer is approximately 6.5 ft/day. Using effective porosity values for silts and sands in the range of 25 to 35 percent (Freeze and Cherry, 1979), seepage velocity within the Surficial aquifer was determined to be in the range of 0.005 ft/day to 0.008 ft/day (1.8 to 2.9 ft/year), and seepage velocity within the more conductive Castle Hayne aquifer was determined to be in the range of 0.09 ft/day to 0.13 ft/day (32.9 to 47.5 ft/year).

Typically, contaminants will not move as rapidly as the groundwater because of adsorption of the contaminant on the geologic media. For each contaminant detected at the Site, it is theoretically possible to calculate a retardation coefficient, which is an estimate of the degree

to which the contaminant is slowed by adsorption in relation to the groundwater-flow velocity. Soil retardation coefficients for VOCs at Site 35 are listed in **Table 6-2**. The retardation coefficient is calculated according to the following equation:

$$R = 1 + p_b \, x \, K_d / n_e$$

where:

R = Retardation coefficient (dimensionless)
p_b = Bulk density (gm/cm^3)
K_d = Distribution coefficient (ml/gm)
n_e = Effective porosity (dimensionless)

The effect of retardation is estimated by dividing the groundwater-flow velocity by R, which provides a value of migration that is either equal to the flow rate (in the case of no retardation) or less than the flow rate (in the presence of retardation).

For the reasons discussed earlier in this section, estimates of the rates of contaminant migration are approximate and the estimates of R have an even greater level of uncertainty than do the estimates of the rates of groundwater flow.

Volatilization

Volatilization is the tendency for some chemicals, particularly VOCs, to change from a liquid or adsorbed state to a gas. A conventional measure of volatility is Henry's Law Constant (K_h). Values of K_h for the representative chemicals are provided in **Table 6-1**.

Compounds with K_h values higher than 10^{-3} atmosphere-cubic meter per mole (atm-m^3/M) (for example, TCE, cis-1,2-DCE and vinyl chloride) are expected to volatilize readily from water to air, whereas those with K_h values lower than 10^{-5} atm-m^3/M are relatively non-volatile.

The dominant process for removing chlorinated VOCs from shallow soil is volatilization into the atmosphere, indicated by this chemical group's relatively high vapor pressure and K_h. For this reason, chlorinated VOCs infrequently occur in shallow soil. Chlorinated VOCs in shallow groundwater will likely volatilize into soil gas overlying the water table. The vapor pressure and K_h indicate that of the three site-related CVOCs, vinyl chloride will volatilize at a significantly greater rate than the others, followed by cis-1,2-DCE, and TCE.

Once in the atmosphere, chlorinated VOCs tend to remain in the gas phase. Some of the gaseous chlorinated VOCs, however, may be solubilized in water and fall as rain.

Degradation

Degradation is the transformation of one chemical to another either biotically (biodegradation) or abiotically through such processes as hydrolysis and photolysis. Biodegradation occurs when microorganisms convert one chemical to another as part of their respiration process. Hydrolysis is the reaction of a chemical with water and photolysis is the result of exposing the chemical to light.

Degradation is commonly expressed as a half-life that composites the degradation by whatever processes may be operating. Estimates of half-lives for the representative chemicals are provided in **Table 6-1**.

Chlorinated VOCs can undergo biodegradation through three different pathways: use as an electron acceptor (reductive dechlorination) which occurs under anaerobic conditions, use as an electron donor (oxidation), or co-metabolism.

The most significant biodegradation process for TCE and cis-1,2-DCE occurs via reductive dechlorination (USEPA, 1998). During reductive dechlorination, which is usually microbially- mediated, chlorinated VOCs serve as electron acceptors contingent on the availability of an adequate supply of electron donors. Anthropogenic (that is, fuel hydrocarbons, landfill leachate, etc.) or natural organic carbon sources act as electron donors. A chlorine atom is removed from the chlorinated VOC during the process and is replaced with a hydrogen atom. Chlorinated VOCs are eventually transformed into innocuous byproducts, such as carbon dioxide, ethane, ethene, and water, as shown on **Figure 6-1**.

The rate of reductive dechlorination appears to decrease significantly as the degree of chlorination decreases. Thus, TCE tends to degrade more rapidly than cis-1,2-DCE and vinyl chloride. These less chlorinated compounds have been found to degrade as electron donors under aerobic conditions.

Concentrations of parent (TCE) and daughter products (cis-1,2-DCE and vinyl chloride) and concentrations of NAIPs are used to determine whether reductive dechlorination is occurring at a site. The EPA guidance document provides guidelines to determine whether concentrations of these compounds are low or high enough to suggest that reductive dechlorination or another biodegradation process is occurring at a site (USEPA, 1999).

Concentrations of daughter products and chloride ions that are greater than background concentrations or that increase downgradient through the plume indicate that reductive dechlorination may be occurring. Low concentrations of DO, nitrate, ferric (III) iron, sulfate, and carbon dioxide also suggest reductive dechlorination is occurring. High concentrations of TOC and dissolved hydrogen are also indicative of active reductive dechlorination.

In addition to reductive dechlorination, cis-1,2-DCE and vinyl chloride may also degrade via oxidation. Increased concentrations of carbon dioxide, DO, dissolved hydrogen, and alkalinity above background concentrations may indicate that oxidation, as opposed to reduction, of these compounds is occurring. Ethene and ethane concentrations in excess of those indicated in the USEPA guidance document (USEPA, 1999) would indicate that reductive dechlorination is acting on vinyl chloride. Ethene and ethane were not detected in any groundwater samples collected during the Site 35 SRI monitoring events.

Bioaccumulation

Bioaccumulation is the process of chemicals adsorbing to and accumulating in plants and the organ tissue of animals. SVOCs tend to have higher octanol-water partition coefficient (K_{ow}) values and CVOCs tend to have lower K_{ow} values. This would indicate that VOCs would tend to remain in the aqueous phase and would not readily bioaccumulate.

The more highly chlorinated VOCs at Site 35, such as TCE, will tend to bioaccumulate slightly more readily than less chlorinated VOCs, such as cis-1,2-DCE and vinyl chloride, which have a lower K_{ow} values.

Non-Aqueous Phase Liquids

Because of their relatively low solubility, chlorinated VOCs, with the exception of vinyl chloride, can occur in aquifers as dense non-aqueous phase liquids (DNAPLs) when present at concentrations greater than their solubility, creating an insoluble contaminant mass in free-phase form. They are referred to as dense because they are denser than water when present in free-phase and, therefore, will sink through the aquifer. The DNAPL will slowly partition (dissolve) into the surrounding groundwater at a rate and concentration dependent on the solubility of the compound, temperature, chemical characteristics of the groundwater, and other factors.

Dissolved concentrations of chlorinated VOCs in groundwater at approximately 1 to 5 percent of a compound's solubility would suggest the presence of DNAPL in the subsurface. The maximum concentrations of TCE, cis-1,2-DCE, and vinyl chloride observed in the April, June, and August 2006 monitoring well sampling events at Site 35 were 180 µg/L (35-MW55IW), 760 µg/L (35-MW72IW) and 250 µg/L (35-MW73IW), respectively. All of these compounds were present at concentrations less than 1 percent of their respective solubilities, indicating that the presence of DNAPL TCE, cis-1,2-DCE, and vinyl chloride are not likely. It should be noted that DNAPL has not historically been observed at the Site.

LNAPL associated with fuel-hydrocarbon contamination at the Site has historically been observed in 35-MW67, located north of Building G480 in the identified BTEX "hot spot" area. As with DNAPLs, LNAPLs will slowly dissolve into the surrounding groundwater at a rate and concentration dependent on the solubility of the compound, temperature, chemical characteristics of the groundwater, and other factors. LNAPL was observed in 35-MW67 during the April and June 2006 sampling events. The maximum concentration of benzene observed during the monitoring well sampling events at Site 35 was 22 µg/L (35-MW29), which is less than 1 percent of its solubility, indicating that the free product is not currently dissolving in groundwater.

6.1.3 Physical Properties of the Aquifer

The following physical mechanisms are considered to be the most important aquifer properties in controlling the fate and transport of contaminants dissolved in groundwater during migration:

- Advection
- Dispersion

Advection is the transport of dissolved contaminants by the bulk motion of flowing groundwater. It is the primary transport mechanism for dissolved contamination along the hydraulic gradient. Advection controls the rate and direction of contaminant migration. The average groundwater flow velocity at Site 35 has been calculated to range from 2.3 to 4.6 feet/year in the Surficial aquifer, and 24.5 to 49 feet/year in the Castle Hayne aquifer. Within the developed area of Site 35 (west of and including the U.S. Highway 17 Bypass) a slight downward potential exists between the Surficial and upper Castle Hayne aquifers

(0.003 ft/ft) and within the Castle Hayne aquifer (0.017 ft/ft). Within the wetland area of Site 35 (west of Brinson Creek), an upward potential exists, averaging 0.053 ft/ft between

Dispersion is the spreading of dissolved contaminants from the path they would be expected to follow during advection. It results from the spatial variation in aquifer permeability, fluid mixing, and molecular diffusion. Dispersion primarily controls the concentration of the contaminant at any point in the flow system.

Dispersion occurs in moving groundwater because of local variations in flow velocities caused by the variability of the hydraulic conductivity of the porous media. Typically, the degree of dispersion is greater in the direction of water flow than in directions perpendicular to it. The concentrations of the chemicals at the center of the contaminant plume will decrease as dispersion dilutes the contaminant mass. Some contaminants will migrate more rapidly than the center of mass of the concentration and some will migrate more slowly. The center of mass would move at the rate estimated by dividing the groundwater-flow velocity by the retardation coefficient of the migrating chemical, as described earlier.

6.2 Contaminant Migration for Site 35

This section discusses the likely site-specific source area(s) at Site 35 and potential mechanisms for contaminant release and migration from that area. The discussion is organized by media within the site that may experience contaminant transport.

Fundamental to describing fate and transport at the Site is the conceptual site model (CSM), which is described in this section. The CSM qualitatively defines the various contaminant sources, release mechanisms, relative rates of migration and persistence of contaminants, and migration pathways for contaminants at the site.

6.2.1 Source Areas

Based on field investigations associated with the SRI, the highest contaminant concentrations are located in two primary areas:

- The area east of Building G533 and south of Building TC342
- The area extending from east of Building G480 (former Fuel Farm area) to Brinson Creek

The contamination appears to be the result of historic activities conducted at Site 35, as the area east of Building G533 was reportedly used for weapons cleaning and the area southeast of Building G480 was the former location of Building TC474, a vehicle maintenance garage. These findings support conclusions drawn by previous site investigations (Baker, 1995a).

6.2.2 Releases from Soil to the Atmosphere

CVOCs were historically detected in subsurface soils in several areas of Site 35. Impacted soil was removed from 1995 to 1996 (OHM, 1997), and subsequent soil sampling has not identified chlorinated VOCs remaining in subsurface soils. However, volatilization, which is the primary mechanism for releasing volatile contaminants from soil to the atmosphere, may be considered part of the potential contaminant release at Site 35.

6.2.3 Releases from Soil to Groundwater

Percolation of precipitation through the unsaturated soil can dissolve contaminants and strip them from soil, then transport them to the underlying groundwater. Thus, surface and subsurface soil can serve as sources of contaminants to groundwater.

6.2.4 Migration of Contaminants in Groundwater

This section addresses the migration of contaminants within the Surficial and upper Castle Hayne aquifers and any potential for downward migration into the mid-Castle Hayne aquifer or lateral migration through the Surficial and upper Castle Hayne aquifers to downgradient surface water bodies.

General Conceptual Model of Groundwater Flow

Recharge to the Groundwater System. Stormwater runoff at Site 35 tends to drain northeast into Brinson Creek. Precipitation that falls within the vicinity of Site 35 will run off the surface of the ground toward the storm sewer system, evaporate or transpire into the air, or infiltrate the ground surface. Most runoff will occur in the vicinity of buildings, roadways, and paved areas at Site 35. Stormwater runoff is collected and conveyed via manmade drainage ditches, storm drains, or catch basins, ultimately discharging to Brinson Creek. Most infiltration occurs in areas of the Site that are grass or gravel covered and the ground is flat or has only a low slope (comprising the majority of Site 35). Much of the area within the U.S. Highway 17 Bypass ROW is grass covered; however, the shoulders are steeply sloped which causes the majority of precipitation to run off. Precipitation that falls within the wetland area bordering the west side of Brinson Creek infiltrates into the subsurface or evaporates. Any infiltrating water moves by gravity downward through the unsaturated soil. At some depth, the infiltrating water reaches the water table and enters the shallow groundwater system.

Hydrogeology of the Surficial, upper Castle Hayne, or mid-Castle Hayne aquifers. Site 35 is underlain by the Surficial aquifer (Surficial aquifer), Castle Hayne confining unit, and the Castle Hayne aquifer The Castle Hayne confining unit, represented within the lower portion of the Belgrade Fm., appears to be laterally discontinuous and only provides semi-confining conditions to the Castle Hayne aquifer at Site 35. In addition, the lateral discontinuity of the confining unit within the area of Site 35 enables hydraulic communication and downward vertical gradient between the Surficial aquifer and the upper Castle Hayne aquifer.

The static water level elevations within the unconfined Surficial aquifer during the June 2006 gauging event ranged from approximately sea level to 13.21 feet msl. In general, groundwater flow direction within the Surficial aquifer at Site 35 is to the northeast towards Brinson Creek. The horizontal hydraulic gradient in June 2006 within the Surficial aquifer at Site 35 ranged from approximately 0.003 ft/ft to approximately 0.018 ft/ft closer to Brinson Creek.

Static water level elevations within the upper Castle Hayne aquifer during the June 2006 gauging event ranged from 2.04 feet msl to 13.98 feet msl. In general, groundwater flow direction within the upper Castle Hayne aquifer is to the northeast. The horizontal

hydraulic gradient within the upper Castle Hayne aquifer at Site 35 was approximately 0.008 ft/ft.

Static water level elevations within the mid-Castle Hayne aquifer during the June 2006 gauging event ranged from 2.85 ft msl to 11.65 feet msl. In general the groundwater flow direction within the mid-Castle Hayne aquifer is to the northeast. The horizontal hydraulic gradient within the mid-Castle Hayne aquifer at Site 35 was approximately 0.005 ft/ft.

Vertical hydraulic potentials were calculated between the Surficial aquifer and upper Castle Hayne aquifer upper Castle Hayne aquifer and within the Castle Hayne aquifer using the June 2006 water level data, between adjacent wells screened in the respective intervals. Between the Surficial and upper Castle Hayne aquifers, slight downward potentials exist in the developed area of the Site (west of and including the U.S. Highway 17 Bypass) ranging from 0.002 ft/ft to 0.004; while upward potentials exist in the wetland area adjacent to Brinson Creek ranging from 0.042 ft/ft to 0.066 ft/ft. Within the Castle Hayne aquifer, slight downward potentials exist in the developed area of the Site ranging from 0.009 ft/ft to 0.025 ft/ft, while an upward potential exists in the wetland area adjacent to Brinson Creek of 0.051 ft/ft.

According to Baker, the hydraulic conductivity for the Surficial aquifer is 0.628 feet per day (ft/day) (Baker, 1995a). Slug test data indicated hydraulic conductivity values for the upper Castle Hayne aquifer ranged from 1.9 ft/day to 7.1 ft/day, with an average hydraulic conductivity of 4.2 ft/day. Slug test data indicated hydraulic conductivity values for the mid-Castle Hayne aquifer ranged from 0.4 ft/day to 12.5 ft/day, with an average hydraulic conductivity of 6.5 ft/day. The shelly cemented sands within the Castle Hayne aquifer appear to provide a more conductive zone for groundwater movement as compared to the undifferentiated silty sands of the Surficial aquifer. Using effective porosity values for silts and sands in the range of 25 to 35 percent (Freeze and Cherry, 1979), a seepage velocity within the Surficial aquifer was calculated to be in the range of 0.005 ft/day to 0.008 ft/day (1.8 to 2.9 ft/year), and a seepage velocity within the more conductive Castle Hayne aquifer was calculated to be in the range of 0.09 ft/day to 0.13 ft/day (32.9 to 47.5 ft/year).

Discharge from the Groundwater System. VOCs were generally present in relatively low concentrations in the Surficial aquifer at Site 35 during the SRI monitoring well sampling events. Two distinct VOC plumes are present within the Surficial aquifer, which appear to be associated with:

- Weapons cleaning activities conducted in the field east of Building G533
- Vehicle maintenance activities conducted at former Building TC474 located southeast of Building G480 and the former Fuel Farm area

The VOC plume associated with Building G533 generally extends from the paved area east of Building G530 to just south of Building TC342. The VOC plume associated with the former Fuel Farm area generally extends from east of Building G480 to Brinson Creek. However, the upgradient extent of vinyl chloride is slightly larger, extending further south and west of Building G480.

Higher VOC concentrations, compared to the concentrations detected in the Surficial aquifer, were detected in the upper Castle Hayne aquifer at Site 35 during the SRI

monitoring well sampling events. Similar to the Surficial aquifer, two distinct VOC plumes are present within the upper Castle Hayne aquifer, which appear to be associated with Building G533 and the former Fuel Farm area. The VOC plume associated with Building G533 extends from the paved area east of Building G530 to the area around Building TC342. The VOC plume associated with the former Fuel Farm area generally extends from Building G640 to Brinson Creek.

The presence of VOCs within the Surficial and upper Castle Hayne aquifers during the SRI monitoring well sampling events and the groundwater flow direction within both aquifers suggests that the plume is migrating towards Brinson Creek (Surficial aquifer) and the New River (mid-Castle Hayne aquifer). However, surface water and sediment data collected between 1998 and 2004 has not identified chlorinated VOCs in Brinson Creek. Furthermore, groundwater data collected during the SRI did not identify chlorinated VOCs in groundwater east of Brinson Creek.

Conceptual Model of Contaminant Transport

Previous sections have described how contaminants were potentially released and transported to the groundwater, and how groundwater moves at the Site. In this section, the migration of contaminants in groundwater at Site 35 is described. First, the upgradient contamination conditions are discussed. These conditions provide a background against which possible effects of the Site on the groundwater can be evaluated. Then the migration of contamination through the groundwater underlying the Site and the likely effects of the Site on the groundwater, including biological and abiotic degradation, are discussed. Finally, the potential for discharge of contaminated groundwater to surface water is discussed.

Upgradient. Groundwater flow in the Surficial, upper Castle Hayne, or mid-Castle Hayne aquifers upgradient of Site 35 is generally to the northeast. VOCs were not detected at concentrations exceeding their respective NCGWQS in upgradient monitoring wells (southwest of Building G533) in the Surficial, upper Castle Hayne, or mid-Castle Hayne aquifers.

Source Area. VOC impacted groundwater at Site 35 exists in the Surficial aquifer, but is most prevalent in the upper Castle Hayne aquifer. Generally, VOC impacted groundwater is not present within the mid-Castle Hayne aquifer. The exception to this is at 35-MW72DW, located in the former pilot study area, in which vinyl chloride was detected just above the NCGWQS.

Based upon groundwater flow direction, migration of VOCs appears to be northeastward toward Brinson Creek in the Surficial aquifer and toward the New River in the Castle Hayne aquifer. A factor that would decrease the apparent migration rate of contaminants in groundwater is degradation, biological or otherwise. The presence of cis-1,2-DCE, trans-1,2-DCE, and vinyl chloride in the vast majority of wells at Site 35 during the SRI sampling events indicates that TCE is actively degrading. The mass concentrations of daughter products are similar to TCE concentrations in most cases.

Vertical migration of the VOCs is occurring between the Surficial and upper Castle Hayne aquifers at Site 35 as evidenced by the presence of VOCs in wells screened in the upper Castle Hayne aquifer. As discussed in Section 4.3.2, slight downward vertical potentials have been inferred between the Surficial and upper Castle Hayne aquifers. In general, VOCs

do not appear to be migrating vertically within the Castle Hayne aquifer. Vinyl chloride was reported above the NCGWQS as deep as 58 feet bgs in 35-MW72DW, located in the former pilot study area. However, VOCs were not detected above their NCGWQS in samples collected from monitoring wells screened from approximately 60 to 65 ft bgs (35-MW30DW and 35-MW80DW), located upgradient of 35-MW72DW.

Downgradient. Site 35 is bordered downgradient by Brinson Creek, which is the ultimate receptor for the majority of surface water run off and groundwater discharging from the Surficial aquifer. The New River appears to be the ultimate receptor for groundwater discharging from the Castle Hayne aquifer. Multiple Surficial and upper Castle Hayne aquifer monitoring wells located adjacent to Brinson Creek were sampled during the SRI field activities. Within the Surficial and upper Castle Hayne aquifers, TCE and its daughter products were detected above their NCGWQS in several monitoring wells located less than 150 feet from Brinson Creek. VOCs were not detected in groundwater samples collected from monitoring wells located east of Brinson Creek. The presence of cis-1,2-DCE, trans-1,2-DCE and vinyl chloride in monitoring wells west of Brinson Creek indicates that TCE is actively degrading downgradient of Site 35.

6.3 BIOCHLOR Modeling

Predictive modeling was conducted as part of the SRI to estimate the time for groundwater impacts to achieve NCGWQS via the processes of natural attenuation and the potential for chlorinated VOC concentrations to reach Brinson Creek. Groundwater fate and transport modeling was performed using BIOCHLOR Version 2.2 (Aziz et al., 2002).

BIOCHLOR is a screening level model that utilizes the three dimensional analytical model by Domenico (1987). BIOCHLOR can simulate one-dimensional advection, three-dimensional dispersion, linear adsorption, and biotransformation via reductive dechlorination. Reductive dechlorination is assumed to occur under anaerobic conditions and dissolved solvent degradation is assumed to follow a sequential first-order decay process.

It should be noted the model used in this evaluation is a screening level tool intended to facilitate decision-making. Further, the model is not designed to account for complexities such as multiple source areas, the presence of additional carbon sources (such as petroleum products) and previously implemented remedial actions. Therefore, the model output should only be used as estimates when evaluating remedial technologies and not as actual future concentrations.

6.3.1 Model Development

For purposes of this evaluation, only the flow path in the upper Castle Hayne aquifer was modeled, as chlorinated VOC concentrations only slightly exceed the applicable NCGWQS in the Surficial and mid-Castle Hayne aquifers. The selected flow path parallels the estimated groundwater flow path from the source area to a potential point of discharge at Brinson Creek. Based on a comparison of current and historical data, the model was set up with a plume centerline that extends from the presumed source area adjacent to Building G533, through IR35-MW30IW northeast through monitoring wells IR35-MW85IW, IR35-MW86IW, IR35-MW80IW, IR35-MW55IW, IR35-MW64IW and then on to Brinson Creek.

Brinson Creek is approximately 1,540 feet downgradient of the presumed source area. Considering these additional monitoring wells in the model flow path resulted in a more robust calibration.

6.3.2 BIOCHLOR Model Calibration

The pilot study conducted from 2003 to 2005 achieved 72 to 85 percent total VOC reduction in the vicinity of well 35-MW73IW (**Figure 5-3**). As a result, groundwater data collected downgradient of the pilot study area during the SRI sampling event in 2006 does not represent groundwater concentrations which would result solely from natural attenuation. Therefore, the model was calibrated to groundwater concentrations along the plume centerline based on 1996 groundwater data collected during the Supplemental Groundwater Investigation (Baker, 1996).

Model inputs include: the source area decay coefficient, constituent half-life (biological decay rate), release date, initial source area concentration, source zone width and thickness, soil density, fraction organic carbon, constituent partition coefficients, aquifer hydraulic conductivity, hydraulic gradient, effective porosity, and longitudinal dispersivity. The individual decay coefficients for the model were estimated by model calibration using constituent half-lives. Initial source area concentrations were also estimated by model calibration.

The BIOCHLOR model can be set up to include up to two biodegradation zones. This allows the individual decay constants to be varied within the plume. A two-zone model is appropriate for plumes that undergo rapid biodegradation near the source area, but lower rates of degradation further downgradient. However, a two zone model can only be used when the plume is at steady state near the source area, meaning the source is constant. This assumption is not appropriate for plumes where source area concentrations are relatively low and DNAPL is not present.

The Site 35 model was set up as a single zone model such that decay coefficients (determined by constituent half-lives) remained constant in the upgradient and downgradient portions of the plume. The single zone approach was chosen following review of the concentration profiles along the plume centerline.

Historical time-series data was used to estimate the source area decay rate. The decay rate was estimated by plotting constituent concentrations in monitoring well 35-MW30IW on a logarithmic scale versus time and fitting a trendline (Appendix G). The slope of the trendline is the estimated source area decay rate. The source area decay rate was estimated from this calculation to be 0.1 per year. The initial source concentrations for TCE12,000 µg/L), cis-1,2-DCE (1,000 µg/L), and vinyl chloride (0 µg/L) were based on a release date of 1957, based on archival research of maintenance shop operations at Building G533 and on model calibration.

The half-lives estimated through model calibration were 3.5 years for TCE, 3.8 years for cis-1,2-DCE, and 0.20 years for vinyl chloride. These half-lives are within the range of published literature values and of the BIOCHLOR User's Manual.

Model inputs and the results of the model calibration are shown in the calibration run included in **Table 6-3** and **Appendix G.** The constituent concentrations detected in each well

in 1996 generally match the constituent concentrations predicted by the model. The calibration was also compared to groundwater data collected in 2006, as shown on **Tables 5-4, 5-5,** and **5-6**. Predicted contaminant concentrations in source area well 35-MW30IW are consistent with actual concentrations observed in 2006. However, predicted and actual concentrations in downgradient well 35-MW73IW can not be directly compared due to the effects of the pilot study on downgradient groundwater concentrations.

6.3.3 BIOCHLOR Model Prediction

The calibrated model was used to predict constituent concentrations and the maximum plume extent for each constituent at dates of 2018 (10 years from present), 2028 (20 years from present), 2038 (30 years from present), and 2048 (40 years from present). The results are summarized in **Table 6-4** and the model runs are provided in **Appendix G**.

The model predicts TCE, cis-1,2-DCE, and vinyl chloride will each attenuate below the NCGWQS within the next 20 to 40 years. Specifically, the model predicts TCE will fall below the NCGWQS of 2.8 µg/L within approximately the next 40 years, cis-1,2-DCE will fall below the NCGWQS of 70 µg/L within approximately the next 20 years, and vinyl chloride concentrations will fall below the groundwater standard of 0.015 µg/L within approximately the next 40 years. It should be noted, however, the presence of petroleum compounds within the aquifer may speed reductive dechlorination by acting as an additional carbon source.

In addition, the model predicts that the concentration of VC in groundwater discharging to Brinson Creek may exceed the surface water quality standard (2.4 µg/L) within the next 10 years, and will attenuate to below the surface water quality standard within approximately 20 years. The concentrations of TCE and cis-1,2-DCE in Brinson Creek are not expected to exceed surface water quality standards. It should be noted that the predicted concentrations are based on groundwater data collected prior to corrective action at Site 35. As mentioned previously, remedial measures have been successful in reducing chlorinated VOC concentrations within the downgradient plume. Therefore, constituent concentrations may attenuate more quickly than predicted by the model.

TABLE 6-1
Physical, Chemical and Half-Life Data of Represe
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Chemical	**Molecular Weight** (g/mole)	**Specific Gravity** (unitless)	**Water Solubility** (mg/L)	**Vapor Pressure** (mm Hg @ 25°C)	**K_h** (atm-m^3/mole)	**kP_a**	**Log K_{oc}** (ml/g)	**K_{oc}** (ml/g)
Trichloroethene	131.39 (1)	1.46 (1)	1100 (1)	57.8 (1)	0.00892 (3)	NA	2.11 (6)	130 (6)
Cis-1,2-Dichloroethene	96.94 (1)	1.28 (3)	3500 (3)	200 (3)	0.0075 (3)	NA	2.10 (6)	125 (6)
Vinyl Chloride	62.50 (4)	0.91 (4)	1100 (4)	2660 (4)	0.0265 (4)	NA	1.48 (6)	30 (6)

Chemical	**Log K_{ow}** (ml/g)	**Half-Life Range (days)**					
		Soil		**Groundwater**		**Surface Water**	
		Low	**High**	**Low**	**High**	**Low**	**High**
Trichloroethene	2.42 (3)	180 (2)	365 (2)	320 (2)	1,640 (2)	180 (2)	365 (2)
Cis-1,2-Dichloroethene	1.86 (3)	28 (2)	180 (2)	56 (2)	2,875 (2)	28 (2)	180 (2)
Vinyl Chloride	0.60 (4)	Rapid (5)		18 (5)		0.0194 (5)	

K_{oc} = Organic carbon partition coefficient
K_{ow} = Octanol-water partition coefficient
K_h= Henry's Law Constant
NA = Indicates parameter not appropriate for the chemical
g/mole - grams per mole
mg/L - milligrams per liter
mm Hg - millimeters of Mercury
atm-m3/mole - atmosphere-cubic meter per mole
ml/g - milliliters per gram

Data sources:
(1) Montgomery and Welkom. 1989. Groundwater Chemicals Desk Reference. Volume 1.
(2) Howard, Ph. H. et al. 1991. *Handbook of Environmental Degradation Rates.*
(3) United States Environmental Protection Agency. October 1990. *Subsurface Contamination Reference Guide.*
(4) Montgomery, John H. 1996. Groundwater Chemicals Desk Reference. Second Edition.
(5) Montgomery, John H. Groundwater Chemicals Desk Reference. Third Edition.
(6) United States Environmental Protection Agency. 2000. *BIOCHLOR: Natural Attenuation Decision Support System User's Manual Version 1.0*.

TABLE 6-2
Soil Retardation Coefficients for Representative Chemicals
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Chemicals	**Log K_{oc}**	**K_d**	**R**
Trichloroethene	2.1	0.15	1.8
Cis-1,2-Dichloroethene	1.5	0.04	1.2
Vinyl Chloride	0.39	0.00	1.0

K_{oc} = Organic carbon partition coefficient
K_d = Distribution coefficient
R = Retardation coefficient = $1 + K_d \times \rho_b / n_e$
ρ_b = Soil bulk density = 1.85 grams per cubic centimeter
n_e = Effective porosity = 0.35
NA = Not applicable; K_d provided
For organics, $K_d = K_{oc}$ x fraction of organic carbon, estimated to be 0.0012 for soil based on site-specific measurements cited in Woodward-Clyde, et. al., August 1990. *Multimedia exposure Assessment Model (Multimed) for Evaluating the Land Disposal of Wastes -- Model Theory.*

TABLE 6-3
Summary of BIOCHLOR Input and Calibration
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Input Parameters

Parameter	Value	Units	Basis
Hydraulic Conductivity	0.0015	cm/sec	Calculated from site data
Hydraulic Gradient	0.008	ft/ft	Calculated from site data between monitoring well IR35-MW30 and IR35-MW55
Effective Porosity	0.2	-	Typical of site soils; model calibration
Longitudinal Dispersivity	29.21	ft	Calculated from estimated plume length using Xu and Eckstein equation. Based on 1,540 ft long current TCE plume.
Transverse Dispersivity Ratio	0.05	-	Model calibration
Vertical Dispersivity Ratio	1.E-99	-	Conservatively assumes little vertical dispersion
Soil Bulk Density	1.6	kg/L	Typical of site soils; model calibration
Fraction Organic Carbon	0.001	-	Typical of site soils; model calibration; verified using field data from Hotspot Report (Baker, 2003)
PCE Partition Coefficient	426	L/kg	BIOCHLOR Default Value
TCE Partition Coefficient	130	L/kg	BIOCHLOR Default Value
DCE Partition Coefficient	125	L/kg	BIOCHLOR Default Value
VC Partition Coefficient	30	L/kg	BIOCHLOR Default Value
Ethene Partition Coefficient	302	L/kg	BIOCHLOR Default Value
PCE Half-Life	1.2	years	Most conservative value from range in BIOCHLOR Manual
TCE Half-Life	3.5	years	Literature values; model calibration
DCE Half-Life	3.8	years	Literature values; model calibration
VC Half-Life	0.20	years	Literature values; model calibration
Calibration Simulation Time	51	years	Release date of 1957 based on site history
Model Area Width	600	ft	Potential plume width
Modeled Area Length	1,540	ft	Distance along plume centerline from source located at Building G533 to Brinson Creek
Source Thickness in Saturated Zone	20	ft	Estimated based on site conditions; model calibration
Width	250	ft	Estimated source width; model calibration
Source Area Decay Rate	0.09	1/yr	Estimated based on historical data (**Appendix G**); model calibration
Initial TCE Concentration	12,000	µg/L	Estimated based on site conditions; model calibration
Initial DCE Concentration	1,000	µg/L	Estimated based on site conditions, lack of *trans*-1,2-DCE compared to *cis*-1,2-DCE; model calibration
Initial VC Concentration	0	µg/L	Estimated based on site conditions; model calibration

TABLE 6-3
Summary of BIOCHLOR Input and Calibration
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Model Calibration

Calibration to May-June 2008 data *Feasibility Study (CH2M HILL, 2008)*		TCE		DCE		VC	
Well ID	**Distance from Source Area (ft)**	**Model Predicted (µg/L)**	**2008 Actual (µg/L)**	**Model Predicted (µg/L)**	**2008 Actual (µg/L)**	**Model Predicted (µg/L)**	**2008 Actual (µg/L)**
IR35-MW30IW	210	116	110	69	38	2	0.48
IR35-MW85IW	385	111	120	116	110	4	2.5
IR35-MW86IW	525	108	180	152	150	5	1.7
IR35-MW80IW	945	95	30	240	230	8	2.5
IR35-MW55IW	1,435	56	30	202	240	7	11
IR35-MW64IW	1,505	48	0.98	177	70	6	7.7

Notes:

TCE = Trichloroethene; DCE = cis-1,2-Dichloroethene; VC = Vinyl Chloride
cm/sec = centimeters per second
kg/L = kilograms per liter
L/kg = liters per kilogram
µg/L = micrograms per liter

TABLE 6-4
Summary of BIOCHLOR Predictions
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

TCE (Initial Source Concentration 12,000 µg/L)

Date	Maximum Concentration (µg/L)	Distance from Source of Maximum Concentration (ft)	Maximum Plume Extent (ft)	Concentration at Brinson Creek (µg/L)
2018	49.5	Source	At Creek	Below SW Standard
2028	20.1	Source	At Creek	Below SW Standard
2038	8.19	Source	At Creek	Below SW Standard
2048	3.3	Source	At Creek	Below GW Standard

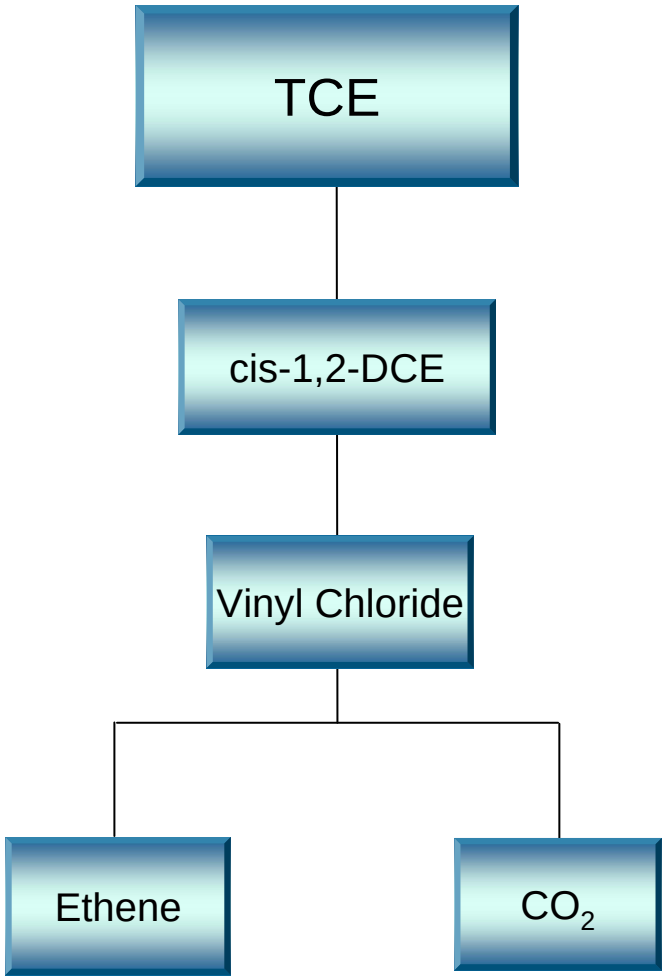
cis-1,2-DCE (Initial Source Concentration 1,000 µg/L)

Date	Maximum Concentration (µg/L)	Distance from Source of Maximum Concentration (ft)	Maximum Plume Extent (ft)	Concentration at Brinson Creek (µg/L)
2018	122	1385	At Creek	Below SW Standard
2028	Below GW Standard	1540	At Creek	Below GW Standard
2038	Below GW Standard	1540	At Creek	Below GW Standard
2048	Below GW Standard	1540	At Creek	Below GW Standard

VC (Initial Source Concentration 0 µg/L)

Date	Maximum Concentration (µg/L)	Distance from Source of Maximum Concentration (ft)	Maximum Plume Extent (ft)	Concentration at Brinson Creek (µg/L)
2018	4	1540	At Creek	Above SW Standard
2028	2	1540	At Creek	Below SW Standard
2038	1	1540	At Creek	Below SW Standard
2048	Below GW Standard	1540	--	Below GW Standard

Notes:
TCE = Trichloroethene, cis-1,2-DCE = cis-1,2-dichloroethene, VC = vinyl chloride
"GW Standard" refers to the North Carolina 2L Groundwater Standard (TCE = 2.8 µg/L, cis-1,2-DCE = 70 µg/L, VC = 0.015 µg/L)
"SW Standard" refers to the North Carolia Surface Water Standard (TCE = 92.4 µg/L, cis-1,2-DCE = 13,000 µg/L,VC = 525 µg/L)
µg/L = micrograms per liter



TCE – Trichloroethene
DCE – Dichloroethene
CO_2 - Carbon Dioxide

Figure 6-1
Degradation Pathway of TCE
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
Marine Corps Base, Camp Lejeune
North Carolina

CH2MHILL

SECTION 7

Human Health Risk Assessment

A HHRA was conducted as part of the original RI (Baker, 1995), evaluating the projected impact of chemicals of potential concern (COPCs) on human health, now and in the future, in a "no further remedial action scenario." The HHRA was conducted in accordance with USEPA Risk Assessment Guidance (USEPA, 1989; 1991) and USEPA Region 4 SRI Risk Guidance (USEPA, 1995). A revision to the HHRA was provided in the Supplemental Groundwater Investigation (Baker, 1996a) to assure that no changes to the conclusions of the HHRA had occurred based on the collection of additional analytical data since the initial risk assessment. The original 1995 HHRA and subsequent revised HHRA indicated that potential exposure to COPCs in groundwater for a hypothetical unrestricted potable use of groundwater could result in cancer risks and non-cancer hazard indices above the risk management levels of 1×10^{-4} and 1, respectively.

This HHRA Addendum was completed to determine whether the conclusions of the previous HHRAs remain valid taking into consideration additional surface water and sediment data collected from Brinson Creek during LTM sampling events (2001 and 2002) and the Focused Natural Attenuation Evaluation (2002); and surface soil and subsurface soil data collected in 2002, groundwater data collected in 2008, and evolution in risk assessment methodology (i.e., changes in exposure point concentration calculations, risk-based screening levels, toxicity criteria, exposure factors and vapor intrusion modeling) since the prior risk assessments were completed. Tables relevant to the HHRA are included in **Appendix H**.

The HHRA examined the data generated during the original RI, Supplemental Groundwater Investigation, additional surface water and sediment sampling in 2001 and 2002, and additional groundwater sampling in 2008, and identified COPCs with respect to the study area. Contaminant intake levels were calculated for potential receptor populations. Toxicological properties are applied in order to estimate potential public health threats posed by detected contaminants. The components of the HHRA included:

- Hazard Identification
- Exposure assessment
- Toxicity assessment
- Risk characterization
- Uncertainty analysis
- Conclusions

Five environmental media were investigated for potential human health risks during this RI: surface soils, subsurface soils, groundwater, surface water, and sediment. Note, additional fish fillet data has not been collected and toxicity criteria for previously identified COPCs in fish fillet, specifically acetone, pesticides, and metals, have not substantially changed since the previous HHRAs. Therefore, quantitative risk estimates for potential ingestion of fish fillets were not included in this HHRA Addendum.

Recent updates to risk-based screening levels, methodology to estimate exposure point concentrations (EPCs) in environmental media, and toxicity criteria were compared along with data collected since the previous HHRAs to confirm COPCs and verify results.

7.1 Hazard Identification

Data generated during the original RI and previous studies at the site were validated and the data set was reduced in the initial HHRA (Baker, 1995a) to obtain the highest quality data set available for quantitative risk analysis and calculations. The samples that were evaluated in this HHRA are shown in **Table 7-1**. Based on the validated data set, COPCs were identified.

The chemicals detected in surface soil samples (collected from 0-to-2 ft bgs), combined surface soil and subsurface soil samples (collected at depths greater than 2 ft bgs), surface water samples, sediment samples, and groundwater samples were screened to select the COPCs using the current media-specific USEPA Regional Screening Levels (RSLs) (USEPA, 2008), as described below. The maximum detected concentration of each chemical in each media was compared to a screening value to select the COPCs. Chemicals with maximum concentrations that exceeded their respective RSL were selected as a COPC. RSLs that are based on the chemical's non-carcinogenic effects were divided by 10 to account for potential exposure to multiple constituents. RSLs that are based on carcinogenic effects were used without adjustment because the target carcinogenic risk used in the RSL calculations is at the low end of USEPA's risk management range (i.e., 1×10^{-6}). See Tables 2.1 through 2.8a in **Appendix H** for the COPC screening for each media.

The screening values used for each media are:

- **Soil—**The maximum detected chemical concentrations in surface soil and combined surface soil and subsurface soil were compared to USEPA RSLs for residential soil contact (USEPA, 2008).
- **Air (Soil)—**Ambient concentrations of fugitive dust and volatile emissions from soil were estimated as part of the COPC screening process to select COPCs for the soil-to-air exposure pathway. The particulate and volatile emissions from soil and associated ambient air concentrations were estimated following USEPA's Soil Screening Guidance Document (USEPA, 1996). The air concentrations were modeled using the maximum detected soil concentrations. These modeled values for surface soil and combined surface and subsurface soil were compared to RSLs for residential ambient air.
- **Surface Water—**The maximum detected chemical concentrations in surface water were compared to the National Recommended Water Quality Criteria (NRWQC) for consumption of water and organisms, if available (USEPA, 2006). If NRWQC were not available, then surface water concentrations were compared to the North Carolina Water Quality Standards (NC2B) for human health (NCDENR, 2007). If NRWQC or NC2B values were not available for a chemical, the maximum detected concentration was compared to its chemical-specific RSL for tap water. The maximum concentration of lead in surface water was detected above the Federal MCL for lead (15 µg/L) at concentrations ranging from 2.1 to 97 µg/L. This range of concentrations is similar to the range of surface water lead concentrations (1.4 to 97 µg/L) evaluated in the initial

HHRA. Therefore, the evaluation of lead in surface water will not show a significant change in resulting potential risks because of the similar concentrations. Therefore, quantitative evaluation of lead in surface water is not included in this HHRA.

- **Sediment—**The maximum detected chemical concentrations in sediment were compared to USEPA RSLs (USEPA, 2008) for residential contact with soil.
- **Vapor Intrusion—**Maximum detected concentrations of volatile constituents in groundwater were compared with the target groundwater concentration from Table 2c from USEPA's *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils* (USEPA, 2002a). Due to change in toxicity values, the vapor intrusion screening level was updated for benzene and TCE using the methodology presented in Appendix D of Subsurface Vapor Intrusion Guidance (USEPA, 2002a), see **Table 2.7A.**

The COPC screening is performed in **Appendix H**, **Tables 2.1** through **2.7A**. Each table includes a designation of those COPCs previously identified in each media, as appropriate. **Table 7-2** lists the COPCs identified using the complete data and updated screening values for each medium. There were no COPCs identified for the particulate/volatile emissions from surface soil-to-air exposure pathway.

Groundwater. The maximum detected concentrations in groundwater were compared with the RSLs for tap water and Federal MCLs for Drinking Water (USEPA, 2003). Since it was concluded in previous HHRAs for Site 35 that hypothetical potable use of groundwater could potentially result in cancer risks and non-cancer hazards above the risk management range, numerical estimates of risks for COPCs with maximum concentrations above RSLs and MCLs were not performed.

The initial HHRA conducted as part of the RI (Baker, 1995) identified a potential risk for future receptors driven by the presence of VOCs (TCE, cis 1,2-DCE, benzene) and metals (antimony, arsenic, barium, beryllium, chromium, manganese and vanadium) in groundwater. The total carcinogenic and noncarcinogenic risks for each receptor under each potential exposure scenario are provided in **Appendix H (Table 6-28**).

A SRIassessment was conducted in 1996 by Baker as part of the SGI, using newly collected inorganic analytical data collected using the low-flow sampling technique. The intent of the supplemental groundwater HHRA was to determine if the noncarcinogenic risks identified in the baseline HHRA were reduced by using the new data set. The supplemental HHRA evaluated risks to future residential child and adult receptors for the following exposure pathways: ingestion of groundwater and dermal contact with groundwater. Based on the results of the low flow groundwater sampling, the supplemental HHRA was able to reduce the future child and adult residential receptors risks associated with metals in groundwater to only arsenic and iron (**Table 6-6** in **Appendix H**).

The analytical results of the groundwater sampling conducted as part of the SRI provided in **Table 5-4** through **5-6** indicate that the predominant VOCs exceeding NCGWQS include TCE, cis-1,2-DCE, VC, and benzene. PCE and 1,1,1,2-PCA were detected in only two or three monitoring well samples at concentrations exceeding the applicable NCGWQS and are not considered COPCs. The SGI laboratory analytical data for total metals in groundwater samples (Table 4.1 in Appendix H) indicate that arsenic, cobalt, iron, lead, vanadium, and

manganese were detected at concentrations greater than twice the mean base background concentration. Iron, vanadium, barium, and manganese were detected in only one of 20 samples, while lead was detected at a concentration exceeding two times the mean base background concentration in only three samples. Therefore these metals are not considered COPCs. Arsenic and cobalt were each detected in four of 20 samples at concentrations exceeding two times the mean base background concentration. Cobalt was not detected at concentrations exceeding the RSL of 11 µg/L and therefore is not considered a risk driver as concluded in the supplemental HHRA.

7.2 Exposure Assessment

Potential source areas and potential migration routes, in conjunction with contaminant fate and transport information, were combined to produce a site conceptual model (see **Table 6-11** of the initial HHRA [Baker, 1995a] provided in **Appendix I**), from which exposure pathways were estimated. The HHRA identified potential migration routes for Site 35 COPCs as:

- Vertical migration of contaminants from surface soil to subsurface soil
- Leaching of contaminants from subsurface soil to water-bearing zones
- Vertical migration from the Surficial aquifer to the Castle Hayne aquifer
- Horizontal migration of groundwater in the direction of Brinson Creek and the New River
- Groundwater discharge into Brinson Creek and the New River
- Wind erosion and subsequent deposition of windblown dust
- Vapor migration from groundwater to indoor air

The following current and future receptors and potential exposure pathways were evaluated in the previous HHRAs and for this HHRA Addendum:

- **Current onsite military personnel**
  - Surface Soil—incidental ingestion, dermal contact, inhalation of fugitive dust (previous HHRAs only)
- **Current Recreational Users of Brinson Creek (Child and Adult)**
  - Biota—ingestion of fish fillets (previous HHRA only)
  - Surface Water and Sediment—ingestion, dermal contact
- **Future Child Residential Receptor**
  - Combined Surface Soil and Subsurface Soil—ingestion, dermal contact, inhalation
  - Groundwater—ingestion, dermal contact, inhalation of VOCs while showering (previous HHRAs only)
- **Future Adult Residential Receptor**
  - Combined Surface Soil and Subsurface Soil—ingestion, dermal contact, inhalation
  - Groundwater—inhalation of VOCs while showering (previous HHRAs only)
- **Future Construction Worker**
  - Combined Surface Soil and Subsurface Soil—ingestion, dermal contact, inhalation

7.2.1 Quantification of Exposure

Exposure is quantified using estimations of chronic daily intakes (CDIs) for each medium considered, for each COPC, in each exposure pathway. Media- and chemical-specific EPCs for each COPC are presented in **Appendix H**, **Tables 3-1** through **3-5**. Two types of CDIs were calculated for each scenario: carcinogenic and noncarcinogenic. The CDI equations and exposure parameter input values (such as ingestion rate) are included in **Appendix H**, **Tables 4-1** through **4-5**.

Exposure Point Concentrations

EPCs are estimated chemical concentrations that a receptor may come in contact with and are specific to each exposure medium. EPCs may be directly measured or estimated using environmental models.

The samples that were evaluated in the risk assessment are shown in **Table 7-1,** along with the data groupings used to calculate the EPCs. Surface soil, subsurface soil, and sediment data previously evaluated in HHRAs and data collected subsequent to the HHRAs were combined into a single dataset used to calculate EPCs. Surface water data collected during the most recent sampling event at each sampling location were used to calculate EPCs for each medium. Note, surface soil location IR35-SS08 (IR35-SS08-00-04291994) was evaluated in the initial HHRA (Baker, 1995a), but was not included in this HHRA. Subsequent to the initial HHRA, pavement has been placed over that location.

The EPCs were calculated in accordance with USEPA guidance (USEPA, 2002b). The EPCs were calculated as the 95 percent upper confidence limit (95 percent UCL) of the arithmetic mean concentration as described below. The maximum detected concentration was used as the EPC in cases where the estimated 95 percent UCL is greater than the maximum detected concentration, or when less than five samples are available for the data grouping.

ProUCL software Version 4.00.02 (USEPA, 2007) was used to determine the distribution that the data fit and to calculate the 95 percent UCLs. ProUCL includes three possible data distribution tests: normal distribution, log-normal distribution, and gamma distribution. The UCL calculation method is then selected based on the data distribution (i.e., normal, lognormal, gamma, or nonparametric if the data do not fit any of the distributions). The recommendations outlined in the ProUCL software documentation were followed to select the appropriate UCL (USEPA, 2007). **Appendix H**, **Tables 3-1** through **3-5** present the EPCs for the COPCs for each media and data grouping.

Estimation of Chemical Intakes for Individual Pathways

Intake is the amount of a chemical entering the exposed receptor's body. COPC intakes are generally expressed as follows:

$$I = \frac{C \ x \ CR \ x \ EF \ x \ ED}{BW \ x \ AT} \ (mg/kg/day)$$

Where:

I = intake (mg/kg-day)

C = chemical concentration at exposure point (the EPC; mg/L or mg/kg)

CR = contact rate, or amount of contaminated medium contacted per unit time or event (L/day, mg/event)

EF = exposure frequency (days/year)

ED = exposure duration (years)

BW = body weight of exposed individual (kg)

AT = averaging time, or period over which exposure is averaged (days)

The intake equation requires specific exposure parameters for each exposure pathway.

An additional parameter, the dermal absorption factor (DABS), is required for the dermal exposure to sediment pathway. DABSs were obtained from USEPA's *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment* (USEPA, 2004). A DABS of 0.13 was used for PAHs, a DABS of 0.14 was used for Aroclors, a DABS of 0.03 was used for arsenic, and a DABS of 0.01 was used for the rest of the inorganic COPCs.

The methods presented in USEPA's RAGS, Part E (USEPA, 2004), for estimating dermal exposure to water were used to evaluate dermal exposure to surface water for the recreational receptors.

Appendix H, Tables 4.1 through **4.5** present the exposure factors that were used for each exposure scenario at the site. Each table includes a designation of those exposure parameters used in the initial HHRA (Baker, 1995a), as appropriate. The substantive changes from the exposure assumptions used in the previous HHRAs and those used in this HHRA are related to dermal contact with soil, sediment, and surface water. There was an incremental increase in the resulting noncancer hazards and cancer risk estimates based on the updated methodology and exposure parameters used to quantify dermal exposures based on recommendations of RAGS Part E (USEPA, 2004). However, incremental increases in noncancer hazards and cancer risk associated with dermal contact in soil, sediment, and surface water do not substantively change the previous risk characterization results for dermal contact with these media.

7.3 Toxicity Assessment

The toxicity of each COPC was determined using a dose-response evaluation to evaluate potential human health and environmental impacts, using information on the nature and magnitude of the exposure. As part of the dose-response evaluation, a carcinogenic slope factor (CSF) and reference dose (RfD) was obtained from USEPA and used for each COPC, as appropriate. The CSF is an exposure index used to estimate the upper-bound lifetime probability of developing cancer as a result of exposure to a particular dose of a potential carcinogen (USEPA, 1989). The RfD is an exposure index for noncarcinogenic effects of chemical substances and is an estimate of the daily exposure level for a human population that is not likely to produce an appreciable risk of adverse effects during a lifetime. See **Tables 5.1 through 6.2** in **Appendix H** for toxicity factors of COPCs at Site 35.

The toxicity criteria used in the previous HHRAs were compared to currently available toxicity criteria. Each table includes a designation of those toxicity criteria previously

included in the initial HHRA, as appropriate. There have been updates to many of the toxicity criteria. The most significant toxicity update is for TCE. The values incorporated in the previous HHRA have been withdrawn. Currently, values from the California EPA have been supported by USEPA regions. The California EPA values for TCE are presented in Tables 5-1 through 6-2 in **Appendix H.** The overall effect of the differences in toxicity factors is an increase in the resulting human health risk and hazard estimates, due to some lower non-cancer endpoint and higher cancer endpoint toxicity values. However, the cumulative risk results would not be significantly altered for those exposure pathways previously evaluated.

7.4 Risk Characterization

Estimated excess lifetime cancer risk (ELCRs) and hazard indices (HIs) were calculated for identified receptor groups possibly exposed to COPCs by the exposure pathways and receptors discussed above. A cancer risk range of 1×10^{-6} to 1×10^{-4} is used to evaluate the calculated ELCR levels. Any ELCR value within or below this range is considered "acceptable"; an ELCR greater than 1×10^{-4} indicates a potential for cancer risks above the risk management range and warrants further evaluation. A noncarcinogenic risk of 1.0 is used as an upper limit to which calculated HI values are compared. An HI greater than one indicates that there is some potential for adverse non-carcinogenic health effects associated with exposure to the contaminants of concern. However, if the HI is greater than one, the target organ/effect specific HIs can be calculated (summing all HQs for constituents that effect the same target organ), to determine if the HI for a specific target organ/effect is greater than one. If the HI for each target organ/effect is not above one, it can be assumed that there is no unacceptable non-carcinogenic hazard to the receptor.

7.4.1 Methods for Evaluating Hazard and Risk

Potential human health risks are discussed independently for carcinogenic and noncarcinogenic constituents because of the different toxicological endpoints, relevant exposure duration, and methods used to characterize risk. Some constituents may produce both noncarcinogenic and carcinogenic effects, and were evaluated in both groups. The methodology used to estimate noncarcinogenic hazards and carcinogenic risks are described below. Both the non-cancer and cancer endpoints were evaluated for each COPC in surface soil, combined surface and subsurface soil, sediment, and surface water.

Non-carcinogenic Hazard Estimation

For each COPC in each environmental medium with a non-cancer endpoint, non-carcinogenic health risks are estimated by comparing the calculated intake to an RfD. The calculated intake divided by the RfD is equal to the hazard quotient (HQ):

$$HQ = Intake / RfD$$

The intake and RfD represent the same exposure period (i.e., chronic or subchronic) and the same exposure route (i.e., oral intakes are divided by oral RfDs). To assess the potential for non-carcinogenic health effects posed by exposure to multiple constituents, a HI approach is used (USEPA, 1989). This approach assumes that non-carcinogenic hazards associated with exposure to more than one constituent are additive. Synergistic or antagonistic interactions

between constituents are not considered. The HI may exceed 1.0 even if all of the individual HQs are less than one. HIs are also added across exposure routes and media to estimate the total non-carcinogenic health effects to a receptor posed by exposure through multiple routes and media.

Carcinogenic Risk Estimation

The potential for carcinogenic effects due to exposure to site-related constituents is evaluated by estimating the ELCR. ELCR is the incremental increase in the probability of developing cancer during one's lifetime in addition to the background probability of developing cancer. For example, an individual exposed to a carcinogen with a calculated cancer risk of 2×10^{-6} indicates that the probability of the individual getting cancer increases by 2 in a million above background levels.

Carcinogenic risk is calculated by multiplying the intake by the CSF.

$$\text{ELCR} = \text{Intake} \times \text{CSF}$$

The combined risk from exposure to multiple constituents was evaluated by adding the risks from individual constituents. Risks were also added across the exposure routes and media if an individual would be exposed through multiple routes and to multiple media.

7.4.2 Risk Assessment Results

The risk calculations for surface soil, combined surface and subsurface soil, sediment, and surface water in this HHRA Addendum are presented in **Appendix H**, Tables 7.1 through 7.7 and include the *Risk Assessment Guidance for Superfund* (RAGS*), Volume 1, Human Health Evaluation Manual Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments* (RAGS Part D; USEPA, 2001) tables, and additional supporting tables. A summary of the results is also shown in **Table 7-3**.

Current/Future Military Personnel (Table 9.1, Appendix H)

The risk assessment assumed that current/future military personnel may be exposed to soil through incidental ingestion and dermal contact. The noncarcinogenic hazard (HI = 0.11) is below USEPA's target HI of 1. The carcinogenic risk (ELCR = 1.8×10^{-6}) is within USEPA's target risk range of 1×10^{-6} to 1×10^{-4}. These results are slightly higher than those presented in the previous HHRAs. However, results continue to demonstrate that no unacceptable risks are expected for soil exposures for the current/future military personnel receptor population.

Future Adult Resident (Table 9.2, Appendix H)

The risk assessment assumed that a future resident could be exposed to combined surface and subsurface soil through incidental ingestion, dermal contact, and inhalation of volatile and fugitive emissions. The noncarcinogenic hazard (HI = 0.30) is below USEPA's target HI of 1. These results support the conclusions of the previous HHRAs for future residential adult soil contact.

Future Child Resident (Table 9.3, Appendix H)

Noncancer hazards and cancer risks associated with incidental ingestion, dermal contact, and inhalation of volatile and fugitive emissions were estimated for combined surface soil

and subsurface soil contact by future child residents. The noncarcinogenic hazard (HI = 1.8) is above USEPA's target HI of 1. These results indicate an increase in the non-cancer hazard in comparison to the results of the previous HHRAs for future residential child soil contact. However, the HI for each target organ / effect is below one.

Future Lifetime (Adult/Child) Resident (Table 9.4, Appendix H)

The risk assessment assumed that a lifetime resident could be exposed to combined surface and subsurface soil through incidental ingestion, dermal contact, and inhalation of volatile and fugitive emissions.

Table 9.4, **Appendix H**, summarizes the carcinogenic risk to the future lifetime resident from contact with soil. The carcinogenic risk (1.0×10^{-5}) is within USEPA's target risk range of 10^{-6} to 10^{-4}.

Future Construction Worker (Table 9.5, Appendix H)

The risk assessment assumed that a future construction worker may be exposed to combined surface and subsurface soil through incidental ingestion, dermal contact, and inhalation of volatile and fugitive emissions. The noncarcinogenic hazard (HI = 0.49) is below USEPA's target HI of 1. The carcinogenic risk (ELCR = 1.9×10^{-6}) is within USEPA's target risk range of 1×10^{-6} to 1×10^{-4}. These results are slightly higher than those presented in the previous HHRAs. However, results continue to demonstrate that no unacceptable risks are expected for soil exposures for the future construction worker receptor population.

Current/Future Recreational Adult (Table 9.6, Appendix H)

The risk assessment assumed that a recreational adult could wade in the Brinson Creek and could be exposed to surface water and sediment through incidental ingestion and dermal contact. The noncarcinogenic hazard (HI = 0.0055) is below USEPA's target HI of 1. The carcinogenic risk (ELCR = 2.3×10^{-7}) is below the USEPA's target risk range of 1×10^{-6} to 1×10^{-4}. These results are slightly below those presented in the previous HHRAs. This is likely due to a smaller number of identified COPCs in surface water and sediment.

Current/Future Recreational Child (Table 9.7, Appendix H)

The risk assessment assumed that a recreational child could wade in the Brinson Creek and could be exposed to surface water and sediment through incidental ingestion and dermal contact. The noncarcinogenic hazard (HI = 0.019) is below USEPA's target HI of 1. The carcinogenic risk (ELCR = 2.2×10^{-7}) is below the USEPA's target risk range of 1×10^{-6} to 1×10^{-4}. These results are slightly below those presented in the previous HHRAs. This is likely due to a smaller number of identified COPCs in surface water and sediment.

7.5 Uncertainty Analysis

A number of uncertainties are inherent in the estimates of potential cancer risks and non-cancer health hazards presented in this HHRA. These uncertainties are generally associated with:

- The sampling strategy and site characterization process
- The assumptions and models that make up the risk assessment process

The potential effect of the uncertainties on risk estimates (overestimation or underestimation) varies from readily predicted to difficult to assess. Thus, it is important to specify the assumptions and uncertainties inherent in the risk assessment to place the risk estimates in proper perspective (USEPA, 1989).

7.5.1 Uncertainty of COPC Selection

There were more COPCs selected for further evaluation in this HHRA than those selected for further evaluation in the previous HHRA for surface soil, subsurface soil, and groundwater for potable use. The increased number of COPCs identified in each of these environmental medium potentially contributes to an increase in noncancer hazard and cancer risk estimates for associated exposure pathways than those that were presented in the previous HHRAs. Conversely, there were fewer COPCs identified in surface water and sediment that results in a decrease in the noncancer hazard and cancer risk estimates for associated exposure pathways than those that were presented in the previous HHRAs.

7.5.2 Uncertainty Associated with Exposure Assessment

Uncertainty in the exposure assessment was generally treated with conservative decision rules and assumptions, and therefore, the uncertainty likely overestimates actual exposure to COPCs. The exposure factors used for the quantification of exposure were conservative and reflect upper-bound assumptions on the exposure. For example, actual exposure frequency and duration for military personnel and recreational adult and child are not known but conservative upper-bound assumptions were used in the HHRA to be protective of hypothetical exposures. The reliability of the values chosen for the exposure factors also contributes substantially to the uncertainty of the resulting risk estimates. Because most of the exposure factors are upper-bound assumptions, the resulting risks are worst-case and likely overestimate the actual risk.

7.5.3 Uncertainty Associated with Toxicity Assessment

Uncertainty associated with the noncarcinogenic toxicity factors is included in Tables 5.1 and 5.2 of Appendix A. Several UFs were applied by USEPA to extrapolate dose points from animal studies to humans. These UFs range between 1 and 3,000. Additional modification factors are also used based on the professional judgment of the USEPA. Therefore, there is a degree of conservatism associated with in the noncarcinogenic toxicity criteria, based on the available scientific data for each constituent. The noncarcinogenic toxicity factors are most likely an overestimate of actual toxicity.

The uncertainty associated with CSFs is mostly associated with the low dose extrapolation where carcinogenicity at low doses is assumed to be a linear response. This is a conservative assumption, which introduces uncertainty into slope factors that are extrapolated from this area of the dose-response curve. The CSFs are based on the assumption that there is no threshold level for carcinogenicity; however, most of the experimental studies indicate existence of a threshold level. Therefore, CSFs developed by USEPA represent upper bound estimates. Carcinogenic risks generated in this assessment should be regarded as an upper bound estimate on the potential carcinogenic risks, rather than an accurate representation of carcinogenic risk. The true carcinogenic risk is likely to be less than the predicted value (USEPA, 1989).

There is a large degree of uncertainty associated with the oral to dermal adjustment factors (based on constituent-specific gastrointestinal absorption factors) used to transform the oral RfDs and CSFs based on administered doses to dermal RfDs and CSFs based on absorbed doses. It is not known if the adjustment factor results in an underestimation or overestimation of the actual toxicity associated with dermal exposure.

As noted in Section 7.3, the toxicity criteria used in the previous HHRAs were compared to currently available toxicity criteria. The overall effect of the differences in toxicity factors is an increase in the resulting human health risk and hazard estimates, due to some lower non-cancer endpoint and higher cancer endpoint toxicity values. However, the cumulative risk results have not been significantly altered from the previous HHRAs for those exposure pathways quantitatively evaluated.

7.5.4 Uncertainty Associated with Risk Characterization

Quantitative risk and hazard estimates were not calculated for the groundwater exposure pathways (potable use and groundwater-to-indoor air).

Quantitative risk and hazard estimates for potable use of groundwater were not calculated because the previous HHRAs indicated unacceptable noncancer hazards (HI range 44 to 103) and cancer risks (ELCR range 2.1×10^{-3} to 4.3×10^{-3}). Groundwater COPC concentrations from most recent sampling events results suggest groundwater concentrations have decreased over time for some COPCs, however, multiple constituents remain at or above tap water RSLs and MCLs by as much as two to three orders of magnitude. As previously noted in Section 7.5.3, toxicity criteria would effect an increase in the resulting noncancer hazard and cancer risk estimates, due to some lower non-cancer endpoint and higher cancer endpoint toxicity values. However, the cumulative risk results have not been significantly altered from the previous HHRAs. The lack of quantification of the potable use exposures may underestimate or overestimate numerical risks. However, the current COPC concentrations in groundwater indicate that, if calculated, the cumulative quantitative noncancer hazards and cancer risks for potabale use exposures likely remain above UESPA's target levels.

The risk-based screening conducted to identify COPCs for the groundwater-to-indoor air exposure pathway indicate concentrations of CVOCs one to two orders of magnitude above the risk-based screening level. As previously discussed in Section 2.5.2, CVOC concentrations increase with depth and contaminant distribution is most widespread in the upper Castle Hayne aquifer (between 32 and 42 ft bgs). The highest concentrations are present in a "hot spot" area identified in the vicinity of the U.S. Highway 17 Bypass ROW where buildings are present within 100 feet of CVOC concentrations above the screening criteria. The lateral extent of chlorinated VOC contamination in the upper Castle Hayne aquifer has not been delineated. However, monitored natural attenuation sampling and LTM data show CVOC groundwater concentrations have decreased over time and are expected to continue to decrease due to naturally occurring attenuation process. The use of historical groundwater data in the COPC selection process inherently assumes concentrations have and will continue to remain constant throughout the exposure period, particularly in the case of evaluating groundwater data for potable use and the vapor intrusion exposure pathway. Groundwater concentrations from historical sampling events at individual wells likely represent "worst case" concentrations versus current concentrations. Typically, this would

result in an over-estimation of quantified risk estimates. Therefore, further evaluation of the potential vapor intrusion pathway through collection of site-specific data (i.e., soil gas, sub-slab soil, or indoor air) to support quantitative evaluation may be warranted.

7.6 Summary and Conclusions

This HHRA included a review of the previous HHRAs performed for Site 35 at Camp Lejeune as part of the RI for Operable Unit No. 10, Site 35, (Baker, 1995a) and the calculation of human health risks associated with exposure to groundwater as part of the Supplemental Groundwater Investigation (Baker, 1996a). The previous HHRAs were reviewed to see if any of the previous conclusions would change based on additional surface soil, subsurface soil, sediment, surface water, and groundwater data collected after 1996, and/or due to revisions in the risk assessment guidance/methodology since 1996.

The results of the 1995 initial HHRA identified a slightly elevated risk for current adult recreational users due to potential ingestion of mercury in fish fillets; however the risk was not considered attributable to Site 35 activities. The only risks which exceeded USEPA levels were under the future residential use scenarios, due to ingestion of groundwater. This risk was driven by the presence of CVOCs and metals in groundwater. Evaluation of the Supplemental Groundwater Investigation analytical data identified a potential risk to future child and adult residential receptors due to the presence of TCE, benzene, and arsenic in groundwater. The previous HHRAs indicated potential risks associated with ingestion of groundwater. Groundwater concentrations have not changed significantly. Thus, groundwater risks likely have not substantively changed and numerical risk calculations for groundwater exposures were not performed in this HHRA.

Table 7-3 and Tables 9.1 through 9.7 of **Appendix H** summarize the estimated cancer risks and noncarcinogenic hazard indices based on the evaluation of additional surface soil, subsurface soil, sediment, and surface water data collected and changes in risk assessment methodologies since the previous HHRAs. The results indicate there would be no significant changes to the conclusions of the previous HHRAs, with the exception of the future child resident noncancer HI for soil exposures. The HI for exposure to combined surface and subsurface soil for the future child resident receptor population of 1.8 is above USEPA's target of 1. However, the HI for each target organ / effect is below one. Therefore, it is concluded that there is no unacceptable non-carcinogenic hazard to the future child resident receptor population.

Note, the fish fillet ingestion exposure pathway was not quantitatively evaluated because additional fish fillet data has not been collected since the initial 1995 HHRA. Since the previous HHRAs were conducted, the vapor intrusion exposure pathway from CVOCs in groundwater to indoor air has become recognized as a potentially complete exposure pathway. This pathway was not quantitatively assessed in this HHRA; however, there are current and historical groundwater concentrations two to three orders of magnitude above risk-based screening levels for CVOCs. These exceedances indicate that further evaluation of the groundwater-to-indoor air exposure pathway may be warranted. The inclusion of site-specific data supporting an evaluation of the groundwater-to-indoor air exposure pathway would be preferable to use of groundwater data alone.

TABLE 7-1
Summary of Data Quantitatively Used in the Risk Assessment Addendum
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Medium	Date of Sampling	StationID	SampleID
Surface Soil	05/17/94	IR35-SS01	IR35-SS01-00-05171994
	05/17/94	IR35-SS02	IR35-SS02-00-05171994
	05/18/94	IR35-SS03	IR35-SS03-00-05181994
	05/10/94	IR35-SS04	IR35-SS04-00-05101994
	04/29/94	IR35-SS05	IR35-SS05-00-04291994
	04/29/94	IR35-SS06	IR35-SS06-00-04291994
	05/18/94	IR35-SS07	IR35-SS07-00-05181994
	04/29/94	IR35-SS08	IR35-SS08-00-04291994
	05/18/94	IR35-SS09	IR35-SS09-00-05181994
	05/17/94	IR35-SS10	IR35-SS10-00-05171994
	05/18/94	IR35-SS11	IR35-SS11-00-05181994
	05/18/94	IR35-SS12	IR35-SS12-00-05181994
	05/18/94	IR35-SS13	IR35-SS13-00-05181994
	10/23/02	IR35-SS01	IR35-SS01-02D-10232002
	10/23/02	IR35-SS02	IR35-SS02-02D-10232002
Subsurface Soil	10/25/02	IR35-IS33	IR35-IS33-09-10252002
	10/25/02	IR35-IS33	IR35-IS33-10-10252002
	10/24/02	IR35-IS36	IR35-IS36-06-10242002
	10/24/02	IR35-IS37	IR35-IS37-04-10242002
	10/25/02	IR35-IS40	IR35-IS40-04-10252002
	10/24/02	IR35-IS41	IR35-IS41-03-10242002
	10/24/02	IR35-IS42	IR35-IS42-05-10242002
	10/24/02	IR35-IS43	IR35-IS43-03-10242002
	10/24/02	IR35-IS43	IR35-IS43-04-10242002
	10/25/02	IR35-IS44	IR35-IS44-04-10252002
	10/25/02	IR35-IS44	IR35-IS44-04D-10252002*
	10/25/02	IR35-IS45	IR35-IS45-03-10252002
	10/25/02	IR35-IS46	IR35-IS46-03-10252002
	10/24/02	IR35-IS50	IR35-IS50-05-10242002
	10/25/02	IR35-IS51	IR35-IS51-04-10252002
	10/25/02	IR35-IS52	IR35-IS52-02-10252002
Sediment	04/20/94	IR35-SD01	IR35-SD01-06-04201994
	04/20/94	IR35-SD01	IR35-SD01-612-04201994
	04/20/94	IR35-SD02	IR35-SD02-06-04201994
	04/20/94	IR35-SD02	IR35-SD02-612-04201994
	05/17/94	IR35-SD03	IR35-SD03-06-05171994
	05/17/94	IR35-SD03	IR35-SD03-612-05171994
	04/20/94	IR35-SD04	IR35-SD04-06-04201994
	04/20/94	IR35-SD04	IR35-SD04-612-04201994
	05/17/94	IR35-SD05	IR35-SD05-06-05171994
	05/17/94	IR35-SD05	IR35-SD05-612-05171994
	05/17/94	IR35-SD06	IR35-SD06-06-05171994
	05/17/94	IR35-SD06	IR35-SD06-612-05171994
	04/20/94	IR35-SD07	IR35-SD07-06-04201994
	04/20/94	IR35-SD07	IR35-SD07-612-04201994

TABLE 7-1
Summary of Data Quantitatively Used in the Risk Assessment Addendum
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Medium	Date of Sampling	StationID	SampleID
Sediment (cont.)	04/04/01	IR36-SD01	IR36-SD01-01B-04042001
	07/17/01	IR36-SD01	IR36-SD01-01C-07172001
	04/04/01	IR36-SD02	IR36-SD02-01B-04042001
	07/17/01	IR36-SD02	IR36-SD02-01C-07172001
	04/04/01	IR36-SD03	IR36-SD03-01B-04042001
	07/17/01	IR36-SD03	IR36-SD03-01C-07172001
	04/04/01	IR36-SD04	IR36-SD04-01B-04042001
	07/17/01	IR36-SD04	IR36-SD04-01C-07172001
	05/18/94	IR36-SD05	IR36-SD05-06-05181994
	05/18/94	IR36-SD05	IR36-SD05-612-05181994
	01/13/01	IR36-SD05	IR36-SD05-00-01132001
	01/13/01	IR36-SD05	IR36-SD05-01-01132001
	04/04/01	IR36-SD05	IR36-SD05-01B-04042001
	07/17/01	IR36-SD05	IR36-SD05-01C-07172001
	05/18/94	IR36-SD06	IR36-SD06-06-05181994
	05/18/94	IR36-SD06	IR36-SD06-612-05181994
	05/18/94	IR36-SD07	IR36-SD07-06-05181994
	05/18/94	IR36-SD07	IR36-SD07-612-05181994
	02/16/02	IR35-DS01SD	IR35-DS01SD-02A-02162002
	02/16/02	IR35-DS02SD	IR35-DS02SD-02A-02162002
	02/16/02	IR35-DS03SD	IR35-DS03SD-02A-02162002
	02/15/02	IRBC-SD02	IRBC-SD02-02A-02152002
	02/15/02	IRBC-SD03	IRBC-SD03-02A-02152002
	02/15/02	IRBC-SD04	IRBC-SD04-02A-02152002
	02/15/02	IRBC-SD05	IRBC-SD05-02A-02152002
	02/15/02	IRBC-SD06	IRBC-SD06-02A-02152002
	02/15/02	IRBC-SD07	IRBC-SD07-02A-02152002
	02/15/02	IRBC-SD08	IRBC-SD08-02A-02152002
	02/15/02	IRBC-SD09	IRBC-SD09-02A-02152002
	02/15/02	IRBC-SD10	IRBC-SD10-02A-02152002
	02/15/02	IRBC-SD11	IRBC-SD11-02A-02152002
	02/15/02	IRBC-SD12	IRBC-SD12-02A-02152002
	02/15/02	IRBC-SD13	IRBC-SD13-02A-02152002
	02/15/02	IRBC-SD14	IRBC-SD14-02A-02152002
	02/15/02	IRBC-SD15	IRBC-SD15-02A-02152002
Surface Water	05/31/08	IR35-SW01	IR35-SW01-08B
	05/31/08	IR35-SW02	IR35-SW02-08B
	05/31/08	IR35-SW03	IR35-SW03-08B
	05/31/08	IR35-SW03	IR35-SW03D-08B*
	05/31/08	IR35-SW04	IR35-SW04-08B
	05/31/08	IR35-SW05	IR35-SW05-08B
	05/31/08	IR35-SW06	IR35-SW06-08B

*Duplicate sample
Data from surface and subsurface soil were combined into a single dataset.

TABLE 7-2
Summary of COPCs Evaluated in the Risk Assessment Addendum
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Surface Soil	***Surface Soil - Inhalation***
Benzo(a)anthracene	None
Benzo(a)pyrene	
Benzo(b)fluoranthene	
Dibenz(a,h)anthracene	
Indeno(1,2,3-cd)pyrene	
4,4'-DDD	
4,4'-DDE	
Dieldrin	
Aluminum	
Antimony	
Arsenic	
Cadmium	
Cobalt	
Iron	
Thallium	
Soil*	***Soil* - Inhalation***
Benzene	Ethylbenzene
Ethylbenzene	Naphthalene
Naphthalene	
2-Methylnaphthalene	
Benzo(a)anthracene	
Benzo(a)pyrene	
Benzo(b)fluoranthene	
Dibenz(a,h)anthracene	
Dibenzofuran	
Indeno(1,2,3-cd)pyrene	
4,4'-DDD	
4,4'-DDE	
Dieldrin	
Aluminum	
Antimony	
Arsenic	
Cadmium	
Chromium	
Cobalt	
Iron	
Thallium	

TABLE 7-2
Summary of COPCs Evaluated in the Risk Assessment Addendum
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Surface Water Aluminum Beryllium Iron Lead Mercury Thallium	
Sediment Arsenic	
Groundwater 1,1,2,2-Tetrachloroethane cis-1,2-Dichloroethene Benzene Tetrachloroethene Trichloroethene Vinyl chloride Arsenic	***Groundwater-to-Indoor Air - Inhalation*** 1,1,2,2-Tetrachloroethane cis-1,2-Dichloroethene Benzene Trichloroethene Vinyl chloride

Soil* - Surface and subsurface soils combined.

TABLE 7-3
Summary of Estimated RME Cancer Risks and Hazard Indices
Operable Unit No. 10 (Site 35)
Supplemental Remedial Investigation
MCB Camp Lejeune
North Carolina

Receptors	Soil		Groundwater		Surface Water		Sediment		Fish[1]		TOTALs	
	ELCR	HI	ELCR	HI	ELCR	HI	ELCR	HI	ELCR	HI	ELCR	HI
Future Child Resident	NA	1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.8
Future Adult Resident	NA	0.28	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.28
Future Adult/Child Resident	8.2E-06	NA	NA	NA	NA	NA	NA	NA	NA	NA	8.2E-06	NA
Future Construction Worker	1.9E-06 (100)	0.5 (100)	NA	NA	NA	NA	NA	NA	NA	NA	1.9E-06	0.5
Current Military Personnel	1.8E-06 (100)	0.11 (100)	NA	NA	NA	NA	NA	NA	NA	NA	1.8E-06	0.11
Current Recreational Child	NA	NA	NA	NA	NA	0.014 (71)	2.2E-07	5.6E-03 (29)	NA	NA	2.2E-07	0.02
Current Recreational Adult	NA	NA	NA	NA	NA	0.004 (<0.5)	2.3E-07	1.2E-03 (<0.5)	1.8E-05	1.8 (100)	1.8E-05	1.8

Notes:
1. ELCR and HI results for fish exposure pathways are estimates from the Remedial Investigation (Baker, 1995).

ELCR = Excess LIfetime Cancer Risk
HI = Hazard Index
NA = Not Applicable
( ) = Percent Contribution to Total HI or ELCR

SECTION 8

Ecological Risk Assessment

An ERA was conducted as part of the original RI (Baker, 1995a) to determine whether past site operations at Site 35 adversely impacted terrestrial or ecological communities in and around Site 35. The ERA was conducted in accordance with *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (USEPA, 1994) and *Framework for Ecological Risk Assessment* (USEPA, 1992). Section 8.1 discusses the ERA process followed in the original RI and summarizes the findings of that ERA. As part of the SRI, an ERA Addendum was completed to determine whether the conclusions of the original ERA were still valid. The findings of the ERA Addendum are presented in Section 8.2. Tables relevant to this discussion are presented in **Appendix I**.

8.1 Summary of the 1995 ERA

The components of the ERA included:

- **Problem Formulation—**includes preliminary characterization of exposure and effects
- **Analysis—**Includes evaluation of data to determine exposure and potential effects on ecological receptors from the stressors
- **Risk Characterization—**includes evaluation of the likelihood of adverse effects occurring as a result of exposure to a stressor (i.e., the potential decrease in aquatic and terrestrial populations at Site 35 from site-related contaminants)

8.1.1 Problem Formulation

As part of the original RI (Baker, 1995a), ecological surveys and habitat characterization were conducted and chemical analyses were performed on samples collected from surface soil, surface water, sediment, and aquatic biota. Analytical data was collected from Brinson Creek adjacent to the former fuel farm, upstream of the site and downstream of the site. Based on the characterization and analysis, COPCs and potential ecological receptors were identified. Toxicological information for contaminants detected in the media listed above was then used to evaluate the potential adverse ecological effects to those receptors.

Identification of Contaminants of Potential Concern

The initial list of COPCs, developed in the Baker RI (1995a), is included in **Table 8-1 of Appendix I**. Retention of a chemical as a COPC was based on whether a chemical was detected, exceeded two times the average background, and exceeded the relevant screening values applicable at that time. Further, chemical concentrations that exceeded ten times the associated blank concentration for common laboratory contaminants and five times the blank concentration for other analytes were retained as COPCs. Commonly and naturally occurring chemicals not expected to be site related were eliminated from the evaluation (i.e., calcium, magnesium, potassium, and sodium). Chemicals without available toxicity data, which were detected at a frequency of greater than 10 percent were evaluated qualitatively.

Specifically in soils, anthropogenic contaminants (i.e., PAHs), that were detected in less than ten percent of the samples were not retained as COPCs. Any contaminants remaining after the above evaluations that were detected in more than 5 percent of the surface soil samples were retained as COPCs.

In tissue, chemicals that were considered site related, were not associated in blanks, were detected in surface water or sediment, and detected in greater than 10 percent of tissue samples, were retained as COPCs.

Conceptual Site Model

The ERA identified the primary ecological receptors of contaminants in surface water and sediment as: fish, benthic macroinvertebrates, other aquatic flora and fauna and some terrestrial faunal species. The main routes of potential exposure to surface water/sediment was ingestion or dermal contact, and the exposure points include species living in, or coming into contact with onsite or downstream surface water/sediment.

The ERA identified the primary ecological receptors of contaminants in surface soil as: deer, rabbits, foxes, raccoons, birds and other flora/fauna. The main routes of potential exposure to soil were identified as ingestion, dermal contact, and/or direct uptake (for flora). The point of exposure included species living in, or coming into contact with contaminated surface soil, or bioaccumulation from consumption of smaller organisms.

Assessment and Measurement Endpoints

The conclusion of the screening problem formulation includes the selection of ecological assessment and measurement endpoints, which are based upon the preliminary conceptual site model. The assessment endpoints were decreased integrity of aquatic and terrestrial floral and fauna communities at Site 35 and the adjacent Brinson Creek. Media specific screening values and ecological effects indicators were included as part of the measurement endpoints developed to evaluate each of the assessment endpoints.

8.1.2 Analysis

An aquatic evaluation was completed in Brinson Creek adjacent to Site 35 as well as within three reference water bodies within the White Oak River Watershed. Within each water body, data were collected at upstream, midstream and downstream intervals. Water quality measurements and habitat characterizations were documented at each location.

- **Site 35 – Brinson Creek.** Fish and benthic macroinvertebrates collected for population statistics and tissue analysis.
- **Site 35 – Brinson Creek.** Twenty surface water and sediment samples were collected for chemical analysis.
- **Reference stations – Hadnot Creek, Holland Mill Creek, and Webb Creek.** Three surface water and sediment samples were collected from each water body for chemical analysis to establish regional background.
- **Reference stations - Hadnot Creek, Holland Mill Creek, and Webb Creek.** Fish and benthic macroinvertebrates samples were collected for population statistics and to establish regional background. Fish tissue was collected at Hadnot Creek only.

Individual fish and benthic macroinvertebrate species and abundance were documented. Various ecological indices were calculated to evaluate each community.

Effects Assessment

The purpose of the effects assessment is to establish chemical exposure levels (screening values) that represent conservative thresholds for adverse ecological effects. In addition, the 1995 Baker RI identified semi-quantitative biota indices that provided indications of conservative thresholds for adverse ecological effects.

Potential effects to fish and benthic macroinvertebrates from contaminants detected at Site 35 were evaluated by comparing the exposure levels of COPCs in the surface water and sediments to aquatic reference values (ARVs) current at the time of the assessment. These ARVs included water quality criteria (WQC) from North Carolina and USEPA Region IV and the lower tenth percentile (Effects Range-Low [ER-L]) and the median percentile (Effects Range-Median [ER-M]) of biological effects for sediment. If contaminant concentrations are below the ER-L, adverse effects on the biota are considered unlikely (Long and Morgan, 1991).

In addition, the potential for decreased integrity to the aquatic community was evaluated by comparing the number and type of fish collected in Brinson Creek to the number and type of fish collected at the appropriate offsite background stations. The COPC concentrations detected in the tissue of the fish and crabs collected from Brinson Creek were compared to chemical concentrations in fish collected at offsite locations, fish data collected in other studies, and literature toxicity values to determine if COPCs in the site fish were elevated or present at toxic levels.

The potential for decreased integrity to the benthic macroinvertebrate community was evaluated by comparing the type of species, the species diversity (Shannon-Weiner and Brillouin's Indexes), macroinvertebrate biotic index (MBI), and community similarity (qualitative indices Jaccard coefficient [S_j,] and the Sarenson [S_s,]) of the benthic macro-invertebrates collected in Brinson Creek to the appropriate offsite background stations.

Formal wetland delineations were not conducted at Site 35, although potential wetland areas were noted during the habitat evaluation. The American alligator has been observed in Brinson Creek. However, it is not known if the alligator commonly occurs in or breeds in Brinson Creek. The alligator would be exposed to COPCs, however impacts to the species could not be evaluated.

Potential effects from contaminants to terrestrial plants and invertebrates were evaluated by comparing various studies in the literature for arsenic, barium, chromium, copper, lead, and zinc. No standards, criteria or other screening values for all other COPCs were available at the time of the 1995 assessment (Baker, 1995a).

Potential effects from contaminants detected in soil to fauna, particularly birds, small mammals, reptiles, amphibians, and larger mammals like deer, grey fox, and raccoons were evaluated by comparing the CDIs dose (or total exposure) to toxicity/terrestrial reference values (TRVs) representing acceptable daily doses in mg/kg/day. The upper 95 percent confidence limit or the maximum concentration detected for each constituent was used as the concentration of each COPC in calculating the dose. TRVs were developed from

NOAELs and LOAELs obtained from IRIS and other toxicological data sources available at that time of the assessment (Appendix I, Table 7-14 from Baker, 1995a). The soil to plant transfer coefficients (Bv, Br, and Bb values) for each COPC detected in the soil is presented in Appendix I, Table 7-15 of the OU10 RI Report (Baker, 1995a). The exposure parameters used in the CDI calculations were presented in Appendix I, Table 7- 16 from Baker 1995a.

8.1.3 Risk Characterization

The risk characterization evaluates the potential for decrease in the aquatic and terrestrial populations from contaminants identified at the site.

The Quotient Index (QI) approach was used to characterize the risk to aquatic receptors from exposure to surface water and sediments and to terrestrial receptors from exposure to surface soil, surface water, and biota. The QI equation is dependent on exposure concentration, CDI, surface WQCs, sediment screening values (SSVs), and TRV. A QI greater than unity (1.0) was considered indicative of potential risk. Tables 7-14 to 7-19 in **Appendix I** present input parameters and QIs calculated for aquatic and terrestrial species.

Aquatic Community

Appendix I Tables 7-1 and 7-17 present the comparison of surface water data to WQC and the associated QIs. Lead, mercury and zinc exceeded unity. Mercury was not believed to be site related since it was detected at similar concentrations in samples upstream of the site as in downstream samples. The QI for zinc only exceeded slightly unity at one station (QI= 1.5) and indicated a low potential for risk to the aquatic receptor populations. Lead exceeded unity (QI= 11) at one location at a concentration indicating a moderate potential for decreasing the aquatic receptor population. While not directly stated in Baker (1995a), additional aquatic receptor tissue and community studies suggest that, even though lead and zinc exceeded at one surface water sampling location, no unacceptable risk to aquatic receptor populations are expected.

Tables 7-9 and 7-18 in Appendix I of the OU10 RI (Baker, 1995a) presents the comparison of sediment data to SSVs and the associated QIs. Pesticides exceeded the sediment SSVs throughout Brinson Creek. However, pesticide disposal, storage, and/or preparation activities have not been documented at Site 35. In addition, the risk was not attributed to the site as concentrations of pesticides that exceed NOAA standards were found in close proximity to U.S. Highway 17 (sample 35-SD02, updgradient of Site 35) and to railroad tracks located east of Site 35 (samples 35-SD06 and 36-SD07), shown on Figure 4-11 in **Appendix A**. The more elevated concentrations at the lower end of the reach may be related to it being a depositional area; however, the risk can not attributed to the site based on general knowledge that pesticide contamination is a base-wide issue. A study to determine the background level of pesticides is planned for MCB Camp Lejeune. That study, which will address sediment and soil, will provide evidence for or against the hypothesis that the pesticides in Brinson Creek sediment are related to past management use.

Fish community comparisons were made between the Brinson Creek locations and reference locations that were similar in habitat and field chemistry. The comparison exhibited a relatively diverse community within Brinson Creek. Further, sample location 35-FS01 (**Figure 8-1**) appeared to have a large population of juvenile fish, indicating successful reproduction and therefore suggestion of no negative impacts on the fish community.

Table 7-10 of **Appendix I** presents fish and crab tissue concentrations for several COPCs that were detected at higher concentrations in Brinson Creek than in organisms collected in Hadnot Creek or in other surveys, such as Albemarle and Pamlico Sounds in North Carolina (Benkert, 1992). However, based on fish population statistics and the absence of pathologies, no adverse impacts to the fish community by the elevated COPCs appeared evident (Baker, 1995a).

Table 7-12 of **Appendix I** presents the similarity indices between the benthic macroinvertebrate station at Brinson Creek and Hadnot Creek. Both the S_j and S_s indices were slightly higher in the two reference locations in Hadnot Creek than in the Brinson Creek location (35-BN01) with similar habitat. This suggests a higher quality community was present in Hadnot Creek. Brinson Creek location 35-BN01, which was located upstream from the site, did not appear to be tidally influenced except under extremely high tides, based on observations made during sampling events. Therefore, the station is not significantly influenced by the site, so the slight decrease in the integrity of the benthic community at this location was likely due to naturally occurring conditions.

Table 7-13 of **Appendix I** presents the similarity indices between the benthic macroinvertebrate stations in Brinson Creek and Webb Creek (WC-02). Both the S_j and S_s indices were higher in the reference location than in the Brinson Creek locations. However, it appeared the benthic macroinvertebrate communities in the lower stations of Brinson Creek were normal when compared to ecologically similar reference locations. More species were collected at the six downstream site stations, and the diversity values were higher in three of the site stations than at the reference location. Therefore, it was concluded that potential contributions from the site did not adversely impact Brinson Creek.

Terrestrial Community

Although no standards or criteria were available for soil at the time of the evaluation, six metals were compared to values researched from alternative resources. Concentrations of arsenic in one sample out of 13 exceeded a value that may depress crop levels (Eisler, 1988). Chromium concentrations at two locations were greater than NOAEL for various soil invertebrates (Adriano, 1986). Zinc concentrations were higher than concentration reported to cause adverse impacts to plant and invertebrates (Eisler, 1993). Barium and lead were below screening values. Because concentrations were detected infrequently and did not exceed screening values at a high frequency, significant risk to the terrestrial invertebrate and floral communities was not expected.

Table 7-19 of **Appendix I** presents the QIs calculated for each terrestrial receptor. The most significant contributions to the risk of terrestrial wildlife receptors came from exposure to metals (cadmium and zinc in soil and copper in crayfish tissue). However, the upper confidence level on the mean exceeded the maximum concentrations for cadmium and zinc so the doses were based on the maximum concentrations. These risks were considered overestimated because the populations of quail, rabbit and deer do not spend all their time feeding at the location of maximum concentration.

Copper was not detected in surface water in the wetland adjacent to the creek, detected below screening criteria in surface soil at the site, and detected at lower concentrations at downstream sediment locations. Therefore, crayfish tissue concentrations of copper used in

the dose calculation were not considered site related and overestimated potential risks to the raccoon.

8.1.4 Summary and Conclusions

Results of the ERA conducted as part of the OU10 RI (Baker 1995a) indicated:

- There are no unacceptable risks to the aquatic community surrounding Site 35 that are directly attributable to Site 35 activities.
- Aquatic receptors have not been significantly impacted by surface water and sediment quality.
- There is a potential for adverse impacts to terrestrial receptors due to cadmium concentrations in surface soil, and from copper concentrations unrelated to the site in fish tissue. However, the report indicated that the impact due to cadmium is likely overestimated, since the QI exceeded one in one of ten samples.

8.2 Addendum to the Ecological Risk Assessment

An Addendum to the ERA was completed in January 2007 in order to:

- Determine if there have been any changes in exposure pathways since the completion of the ERA;
- Review the surface water and surface soil data collected since the original RI and evaluate whether the conclusions of the ERA are still valid; and
- Compare the concentrations of site-related constituents detected in surface water to current legally enforceable surface water quality standards [Federal Ambient Water Quality Criteria (AWQC) and North Carolina Waters Quality Standards (NCWQS)].

Components of the Addendum to the ERA are as follows:

- Reductions in exposure
- New potential exposure pathways and receptors
- Evaluation of surface water data collected since the original RI
- Evaluation of surface soil data collected since the original RI
- New groundwater data
- Conclusions

8.2.1 Reductions in Exposure

Although some risks were identified for terrestrial receptors in the surface soils during the 1995 RI, these areas of concern have since been removed/significantly disturbed or covered by concrete with the construction of the U.S. Highway 17 Bypass. Terrestrial habitat evaluated and identified to be at risk in the 1995 Baker RI, no longer exists at the site. **Figure 2-4** shows the area covered under the 1995 RI. A significant portion of this area, mainly the locations of potential source areas of contamination shown in **Figure 2-5**, specifically the Existing/Former UST or AST locations, were removed during the construction of the U.S. Highway 17 Bypass. In addition, the 1995 RI refers to elevated levels

of cadmium in one surface soil sample (35-SS04-00), shown in **Figure 4-3** of **Appendix A**. The soil in this area was removed and/or covered during the construction of the U.S. Highway 17 Bypass.

8.2.2 New Potential Exposure Pathways and Receptors

Due to the expansion of the Site 35 investigation area, one area of potential concern, a wetland, was identified that may present the potential for new and complete exposure pathways to ecological receptors.

The wetland is located at the northwest corner of the Site (**Figure 1** in **Appendix I**). This wetland was identified by a CH2M HILL ecologist during the preparation of the 2006 Amended RI. The wetland is located up-gradient from the Site 35 groundwater plumes, and soil contaminant concentrations exceeding standards in the ERA were located hydrologically downgradient of the wetland. As such, no complete exposure pathway to the wetland exists from the groundwater plumes or soils at the Site.

8.2.3 Evaluation of Surface Water Data Collected Since the Original RI

A review of surface water data collected since the RI was conducted to determine whether the new data would change the conclusions of the ERA and if the post-RI data are lower than enforceable state and federal water quality standards (WQS). Maximum detections and average concentrations were used for the comparison. If a WQS was unavailable, Region 4 ecological screening values were preferentially used. Remaining benchmark data gaps were filled using other commonly used screening values. Because the salinity of the creek likely varies, maximum detected concentrations were compared to the lower of the freshwater and marine WQS or ecological screening values.

No VOCs were detected during RI sampling and the RI report concluded that Brinson Creek is unaffected by VOCs (Baker, 1995a). Further surface water sampling was conducted from 1999 through 2004. Ten VOCs were detected in surface water in these post-RI samples (Table 8-2 of **Appendix I**). Although the majority of the VOCs do not have WQS, all were evaluated because they were previously undetected during the RI. The results of the evaluation indicated that there were no maximum concentrations in excess of WQS or screening values.

Inorganics were detected in surface water during the RI. These same inorganics were also detected in soil or groundwater at the Site, indicating that the inorganic compounds detected in surface water could potentially be related to Site 35. No risk from inorganics was identified for aquatic receptors in the original ERA. Therefore, the ERA addendum for inorganics in surface water focused solely on comparisons of maximum concentrations from the data sets collected since the 1995 RI to WQS (Table 8-3 of **Appendix I**). The surface water data for inorganics are for total concentrations, rather than dissolved. As such, the comparison to WQS, for the majority of inorganics, is conservative because the dissolved fraction is the most biologically relevant.

Maximum concentrations of arsenic and chromium were below both the state and federal WQS (Table 8-3 of **Appendix I**). In contrast, maximum concentrations of lead, mercury, and zinc were greater than one of the two available WQS. The conclusion of the RI was that Site 35 posed no unacceptable risk to aquatic receptors in Brinson Creek. Although this

addendum to the ERA identified exceedances of water quality standards for three inorganics, the following lines of evidence suggest the conclusions of the RI remain correct.

- Concentrations of lead, mercury, and zinc have all decreased between the RI sampling event and the 2002 sampling event.
- Frequency of detection is low. In the most recent data set from 2002, lead, mercury, and zinc were detected in 3 of 12, 2 of 12 and 5 of 12 samples, respectively.
- The average concentration of lead in 2002 was approximately the same as the lowest of the two WQS. The average concentration of zinc in 2002 was lower than both WQS.
- Mercury in 2002 was lower than the federal standard but higher than the North Carolina standard. Review of the origin of the North Carolina standard (Region 4 ecological screening value list) reveals the criteria is based on the marketability of fish. Region 4 indicates more appropriate ecological standards exist. Therefore, no exceedance of the federal standard for aquatic receptors indicates mercury likely poses minimal risk.
- Samples collected in both surface water and site groundwater since late 2002 have been reported as non-detect for mercury. In addition, mercury concentrations in surface water were not considered site related in the RI because the highest mercury concentrations were located upstream of the Site.
- The RI concluded, from analysis of community and tissue data, that there were no adverse impacts to the aquatic communities (Baker, 1995a).
- All the data collected at the site was for total metals. Metals may be found in the water column in dissolved or particulate form (sorbed onto suspended particles [OWRB, 2006]). The dissolved fraction is considered to be more biologically available. In natural waters, the particles contain or absorb metals, resulting in lower proportion of dissolved metals. There is a high likelihood that dissolved concentrations of inorganics in Brinson Creek are substantially lower than total concentrations.

8.2.4 Evaluation of Surface Soil Collected Since the Original RI

In 2002, the Navy conducted a “hot spot” characterization to delineate and characterize any continuing sources associated with the “hot spots” in groundwater (Baker, 2003). Field activities included the collection of subsurface soil samples in addition to groundwater sampling. The information gathered during that field event was used to supplement LTM reporting and the focused NAE at Site 35. During that field sampling event, two surface soil locations were sampled for VOCs in a wetland area immediately west of Brinson Creek. Detected compounds were compared to the list of detected VOC compounds from Brinson Creek to determine whether the wetland was contributing to surface water concentrations or acting as a filter. None of the four VOCs detected in the two surface soil samples were detected in Brinson Creek. In addition, the concentrations of the four compounds in soil were lower than ecological benchmarks (Table 8-4 in **Appendix I**). This information suggests that any link between VOCs at Site 35 and Brinson Creek is minimal and that VOCs in the soil of the wetland to the west of Brinson Creek do not pose a risk to terrestrial receptors. This evaluation agrees with the 1995 RI conclusion that the wetland is not at risk or a source of risk to Brinson Creek.

8.2.5 Conclusion

The results of this addendum to the ERA support the original ERA conclusions that aquatic receptors are unlikely to be at significant risk from releases related to Site 35. The evaluation also indicated that the risks identified for terrestrial receptors in the 1995 ERA have likely been reduced to acceptable levels through a reduction in exposure to contaminated soils located nearest site structures. In addition, the results of VOC detections two 2002 surface soil samples suggest no unacceptable risk to terrestrial invertebrates, further supporting the conclusion of the 1995 ERA for areas immediately west of Brinson Creek.

SECTION 9

Conclusions

This section presents the conclusions reached based upon the SRI activities conducted at Site 35. The objectives of the SRI for Site 35 were to:

- Present a complete history of the investigation activities.
- Describe the environmental setting at the Site, including hydrogeology, geology, hydrology, topography, and anthropogenic factors that may affect the hydrology or contaminant pathways at the Site.
- Characterize the source areas via the collection of analytical data, and evaluate the migration and dispersal characteristics of the releases.
- Assess the nature and extent of site contaminants via the collection and analysis of groundwater samples, and evaluate their fate and transport.
- Evaluate potential receptors by collecting data describing human populations and environmental systems susceptible to contaminant exposure.
- Evaluate the environmental risk posed by the site contaminants.
- Provide recommendations for site management.

9.1 Previous Investigations

The initial phases of investigation at Site 35 focused heavily upon the environmental impacts related to fuel storage activities in the former Fuel Farm area. However, subsequent investigations have addressed the fate and transport of chlorinated solvents and their degradation products. This document serves as a summary of all previous investigations.

9.2 Site Physical Characteristics

The site is located in the northeast corner of Camp Geiger, which is located in the far northwest portion of MCB Camp Lejeune. Ground surface elevations for the developed areas of Site 35 generally range from 14 to 18 ft above msl. Construction of the U.S. Highway 17 Bypass required raising the roadbed, so the natural topography of the Site has been disrupted. The wooded portion of the Site east of the Bypass slopes toward Brinson Creek, with a ground surface elevation generally ranging from 1 to 6 feet above msl. The surface of Site 35 is covered with a mix of vegetation, asphalt roadways, concrete, and buildings. The eastern portion of the Site adjacent to Brinson Creek is heavily wooded. Stormwater is conveyed via manmade drainage ditches, storm drains, and catch basins, and is discharged into Brinson Creek and its tributaries, and then flows southeast into the New River.

The site is underlain by marine and non-marine sediments ranging in age from early Cretaceous to Holocene. Within the vicinity of Site 35, the uppermost Undifferentiated Fm. of Holocene and Pleistocene age sediments consist of mostly fine-to-medium grained sands with a lesser amount of silt and clay, present at depths of 0 to 30 ft bgs. Thin, 0.1 to 0.5 ft thick, discontinuous lenses of silt and clay are found within the Undifferentiated Fm. The Belgrade Fm., confining unit of the Castle Hayne Aquifer, lies directly beneath the Undifferentiated Fm. The approximate thickness of the Belgrade semi-confining unit at Site 35 is 7 feet. This Fm. appears to be laterally discontinuous and only provides semi-confining conditions for the Castle Hayne aquifer unit at Site 35. In addition, the lateral discontinuity of the confining unit within the area of Site 35 enables hydraulic communication and downward vertical gradient between the Surficial aquifer and the upper Castle Hayne aquifer.

The River Bend Fm. underlies the Belgrade Fm. and is composed of sands, silt, shell and fossil fragments, and trace amounts of clay. Sands tend to be cemented within this Fm. The amount of shell fragments decreases with depth to approximately 55 to 65 ft bgs, where a greenish-gray to olive very fine sand to silt is present. Below this layer the composition of the River Bend Fm. changes to a fine to medium grained sand with trace amounts of silts and shells. The River Bend Fm. overlies the Eocene age Castle Hayne Fm.

In general, groundwater flow direction within the Surficial, upper Castle Hayne, or mid-Castle Hayne aquifers at Site 35 is to the northeast. Vertical hydraulic potentials were calculated between the Surficial and upper Castle Hayne aquifers, and within the Castle Hayne aquifer. Between the Surficial and upper Castle Hayne aquifer, slight downward potentials exist in the developed area of the Site (west of and including the U.S. Highway 17 Bypass), while upward potentials exist in the wetland area adjacent to Brinson Creek. Within the Castle Hayne aquifer, slight downward potentials exist in the developed area of the Site, while an upward potential exists in the wetland area adjacent to Brinson Creek.

In-situ aquifer testing has estimated the hydraulic conductivity for the Surficial aquifer to be 0.628 ft/day, 1.9 ft/day to 7.1 ft/day, with an average hydraulic conductivity of 4.2 ft/day for the upper Castle Hayne aquifer, and 0.4 ft/day to 12.5 ft/day, with an average hydraulic conductivity of 6.5 ft/day for the mid-Castle Hayne aquifer ranged. The shelly cemented sands within the Castle Hayne aquifer appear to provide a more conductive zone for groundwater movement as compared to the silty sands of the Surficial aquifer. The seepage velocity within the Surficial aquifer was calculated to be in the range of 0.005 ft/day to 0.008 ft/day (1.8 to 2.9 feet/year), and 0.09 ft/day to 0.13 ft/day (32.9 to 47.5 feet/year) for more conductive Castle Hayne aquifer.

Potable water to MCB Camp Lejeune and the surrounding residential area is provided by public water supply wells that withdraw groundwater from the Castle Hayne aquifer. Although fresh water is present within the surficial, Castle Hayne, Beaufort, and Peedee aquifers, all of which are located below MCB Camp Lejeune, only the Castle Hayne aquifer is used by MCB Camp Lejeune as a water supply source.

9.3 Nature and Extent of Contamination

Soil. Soil samples have been collected from Site 35 as part of Interim Remedial Action RI (Baker, 1994a) and RI (Baker, 1995a) field activities. Based on the analytical results from these investigations, petroleum hydrocarbons were the only potentially site-related contaminants identified in soil. The petroleum hydrocarbon-impacted soils were subsequently excavated and disposed of as part of a soil removal action conducted between 1995 and 1996. Therefore, impacts to soil were not evaluated in this SRI.

Free product has been persistently detected in monitoring well 35-MW67A since 1998, and was detected again during SRI field activities. The free product was previously determined to be kerosene, and the lateral and vertical extent of free phase LNAPL has been defined. The LNAPL is being investigated separately under the UST program, so free product was not evaluated in this SRI.

Groundwater. During the SRI groundwater sampling events, chlorinated VOCs including 1,1,2,2-PCA, cis-1,2-DCE, PCE, TCE, and vinyl chloride exceeded their respective NCGWQS and/or MCLs in groundwater samples collected from one or more of the monitoring wells. Other chlorinated VOCs were detected, but not at concentrations above their respective standards and they are therefore not considered contaminants of concern. Benzene was also detected at concentrations above its NCGWQS.

TCE, cis-1,2-DCE, and vinyl chloride were the most prevalent VOCs detected above their respective NCGWQS during the SRI groundwater sampling events. TCE was reported above its NCGWQS in 24 of the 57 monitoring well locations in the Surficial and upper Castle Hayne aquifers. Cis-1,2-DCE was reported above its NCGWQS in 17 of the 57 monitoring well locations in the Surficial and upper Castle Hayne aquifers. Vinyl chloride was reported above its NCGWQS in 26 of the 57 monitoring well locations at all three sampling depths. The highest concentrations of TCE, cis-1,2-DCE, and vinyl chloride were generally within the upper Castle Hayne aquifer, at the approximate depth of the Castle Hayne semi-confining unit. The maximum concentrations of VOCs within the upper Castle Hayne aquifer were reported in samples collected from monitoring wells located within and immediately downgradient of the former pilot study area. The highest TCE concentration (180 μg/L) was detected at 35-MW55IW, the highest cis-1,2-DCE concentration (760 μg/L) was detected at 35-MW72IW, and the highest vinyl chloride concentration (250 μg/L) was detected at 35-MW73IW.

The impacts to groundwater appear to be related to historical activities conducted in the vicinity of Building G533, which was reportedly used for weapons cleaning and the area southeast of Building G480 that was the former location of Building TC474, a vehicle maintenance garage. In the vicinity of Building G533, the distribution of VOCs within the Surficial and upper Castle Hayne aquifers is quite similar, generally extending from the paved area east of Building G530 to the area around Building TC342. Within the Surficial aquifer, the VOC plume associated with the former Fuel Farm area generally extends from Building G480 to Brinson Creek. The footprint of the VOC plume associated with the former Fuel Farm area is larger in the upper Castle Hayne aquifer, generally extending from Building G560 to Brinson Creek.

Trend analysis in source area wells indicates a considerable decrease in TCE and cis-1,2-DCE over time and relatively stable concentrations of vinyl chloride. The widespread presence of TCE daughter products (cis-1,2-DCE and vinyl chloride) in groundwater is an indicator that reductive dechlorination is occurring to some extent in the surficial and upper Castle Hayne aquifers. Further, the presence of vinyl chloride in numerous Site wells is significant, as vinyl chloride is near the end of the reductive dechlorination process. However, the continued persistence of cis-1,2-DCE and vinyl chloride, as well as the slowed degradation rate, indicate that reductive dechlorination is not proceeding to completion at Site 35.

Analysis of geochemical parameters (including DO, ORP, nitrate, iron, sulfate, alkalinity, methane, TOC, and chloride) generally indicates that conditions for natural attenuation are favorable or that natural attenuation is currently occurring in the Surficial, upper Castle Hayne, or mid-Castle Hayne aquifers. Chlorinated solvents are capable of being depleted by natural processes in each aquifer at Site 35. However, the limited native organic carbon present suggests that the biodegradation process may be slowed and the high sulfate concentrations suggest competitive exclusion of dechlorinating bacteria may be occurring.

Surface Water and Sediment. Surface water and sediment samples have been collected along Brinson Creek as part of the original RI field activities (Baker, 1995a) and the Brinson Creek Surface Water and Sediment Study (Baker, 2002). These studies have concluded that surface water quality has not been impacted by CVOCs in groundwater at the site. These studies also concluded that sediment has been impacted by anthropogenic activity, but the source is unclear. These conclusions have been confirmed by the results of the NAE sampling and routine sampling under the LTM program. Based on these findings, impacts to surface water and sediment were not further evaluated in the SRI.

9.4 Fate and Transport

Based on field investigations associated with the SRI, the highest contaminant concentrations are located in two primary areas: (1) the area east of Building G533 and south of Building TC342 and (2) the area extending from east of Building G480 to east of the former pilot study area. Contaminants detected in the Surficial and upper Castle Hayne aquifers (primarily TCE, cis-1,2- DCE, and vinyl chloride) appear to originate either immediately northeast of Building G533 or immediately east of Building G480 (former Fuel Farm area). The contamination appears to be the result of historical activities conducted at Site 35, supporting conclusions drawn by previous site investigations.

VOC impacted groundwater at Site 35 exists in the Surficial aquifer, but is most prevalent in the upper Castle Hayne aquifer. Generally, VOC impacted groundwater is not present within the mid-Castle Hayne aquifer. The exception to this is at 35-MW72DW, located in the former pilot study area, in which vinyl chloride was detected above its NCGWQS. Based upon the groundwater flow direction and calculated vertical hydraulic potentials, migration of VOCs appears to be northeast toward Brinson Creek (Surficial aquifer) and the New River (Castle Hayne aquifer).

Vertical migration of the VOCs is occurring between the Surficial and upper Castle Hayne aquifers at Site 35 as evidenced by the presence of VOCs in wells screened in the upper

Castle Hayne aquifer. Slight downward vertical potentials have been determined between the Surficial and upper Castle Hayne aquifers. Vinyl chloride was reported above its NCGWQS as deep as 58 feet bgs in 35-MW72DW, located in the former pilot study area. However, VOCs were not detected above their NCGWQS in samples collected from monitoring wells screened from approximately 60 to 65 feet bgs (35-MW30DW and 35-MW80DW), located upgradient of 35-MW72DW. Site 35 is bordered by Brinson Creek, which is the ultimate receptor for the majority of surface water and groundwater in the Surficial aquifer associated with the Site. The New River appears to be the ultimate receptor for groundwater discharging from the Castle Hayne aquifer. Within the Surficial and upper Castle Hayne aquifers, TCE and its daughter products were detected above their NCGWQS in several monitoring wells located less than 150 feet from the creek. No VOCs were detected in monitoring wells located east of Brinson Creek.

In addition, the model predicts that the concentration of VC in groundwater discharging to Brinson Creek may exceed the surface water quality standard (2.4 µg/L) within the next 10 years, and will attenuate to below the surface water quality standard within approximately 20 years. However, the predicted concentration does not account for the effects of the pilot study or dilution. Based on these considerations, the surface water VC concentration in Brinson Creek is not expected to exceed surface water standards. The predicted TCE and cis-1,2-DCE groundwater concentrations at Brinson Creek do not exceed their respective surface water standards of 13,000 µg/L and 525 µg/L.

9.5 Human Health Risk Assessment

An addendum HHRA was completed as part of this RI which reviewed the conclusions of the 1995 Baker RI HHRA (Baker, 1995a) and the supplemental HHRA (Baker, 1996). Additionally, the addendum HHRA incorporated surface and subsurface soil, surface water, sediment and groundwater data that was acquired after 1996 as well as revisions to risk assessment guidance/methods since 1996. Changes included updated screening levels for determining COPCs, updated toxicity values, and updated methods and software to calculate EPCs and UCLs.

Results of the previous HHRA indicated that current site conditions did not present an unacceptable risk. A slightly elevated risk was identified for current adult recreational users due to potential ingestion of mercury in fish fillets; however the risk was not considered attributable to Site 35 activities. The only risks which exceeded USEPA criteria were under the future residential use scenarios, due to ingestion of groundwater. This risk was driven by the presence of CVOCs, arsenic, and iron in groundwater. The results of the addendum HHRA indicate no significant change from the previous HHRA with the exception of the future child resident noncancer hazard index for soil exposures. The HI for exposure to combined surface and subsurface soil for the future child resident receptor population of 1.8 is above USEPA's target of 1. However, the HI for each target organ / effect is below one. Therefore, it is concluded that there is no unacceptable non-carcinogenic hazard to the future child resident receptor population.

9.6 Ecological Risk Assessment

No unacceptable risks to the environment were identified in the original ERA. An addendum to the ERA was prepared to evaluate if there have been any changes in exposure pathways since the completion of the ERA, to compare the concentrations of site-related constituents to current legally enforceable water quality standards, and to evaluate whether the conclusions of the ERA are still valid. The results of the addendum to the ERA support the original ERA conclusions that aquatic receptors are unlikely to be at significant risk from Site 35. The evaluation also indicated that the risks identified for terrestrial receptors in the 1995 ERA have likely been reduced to acceptable levels through a reduction in exposure to contaminated soils located nearest to site structures.

9.7 Summary

The extents of impacted groundwater has been assessed and fully delineated horizontally and vertically in the Surficial and Castle Hayne aquifers, and therefore, no further investigation is required. Two distinct areas of groundwater contamination are present and appear to be associated with:

- The area east of Building G533 and south of Building TC342 within the XX aquifer, and
- The area extending from east of Building G480 (former Fuel Farm area) to Brinson Creek within the Upper Castle Hayne aquifer.

The impacted groundwater (primarily dissolved-phase TCE, cis-1,2-DCE, and vinyl chloride) appears to be the result of historical activities conducted at Site 35, as the area east of Building G533 was reportedly used for weapons cleaning and the area southeast of Building G480 was the former location of Building TC474, a vehicle maintenance garage. VOC contamination appears to be migrating towards Brinson Creek within the Surficial aquifer and upper Castle Hayne aquifer, and toward the New River within the mid-Castle Hayne aquifer, although predictive modeling shows impacted groundwater will reach the New River.

Impacts to surface and subsurface soil was delineated in previous investigations, and removal actions were performed (Baker, 1995; OHM, 1997; Baker, 2003) to eliminate the sources of VOCs and petroleum hydrocarbons. As a result there is no unacceptable risk to military personnel or ecological receptors; there is no need for further investigations into surface and subsurface soil contamination at Site 35.

Detections of inorganic compounds in surface water and sediment samples were reported on multiple occasions (Baker 1995a, Baker 2002, CH2M HILL, CDM, Baker 2003), but were not related to activities at Site 35, and did not pose unacceptable risks to current military personnel or ecological receptors, therefore no further investigation is required.

9.8 Recommendations

Based on the results and conclusions of SRI activities at Site 35 a Feasibility Study is recommended to evaluate appropriate remedial alternatives for Site 35.

SECTION 10

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Appendix A
Historical Analytical Data

Confirmation Study (ESE 1987)

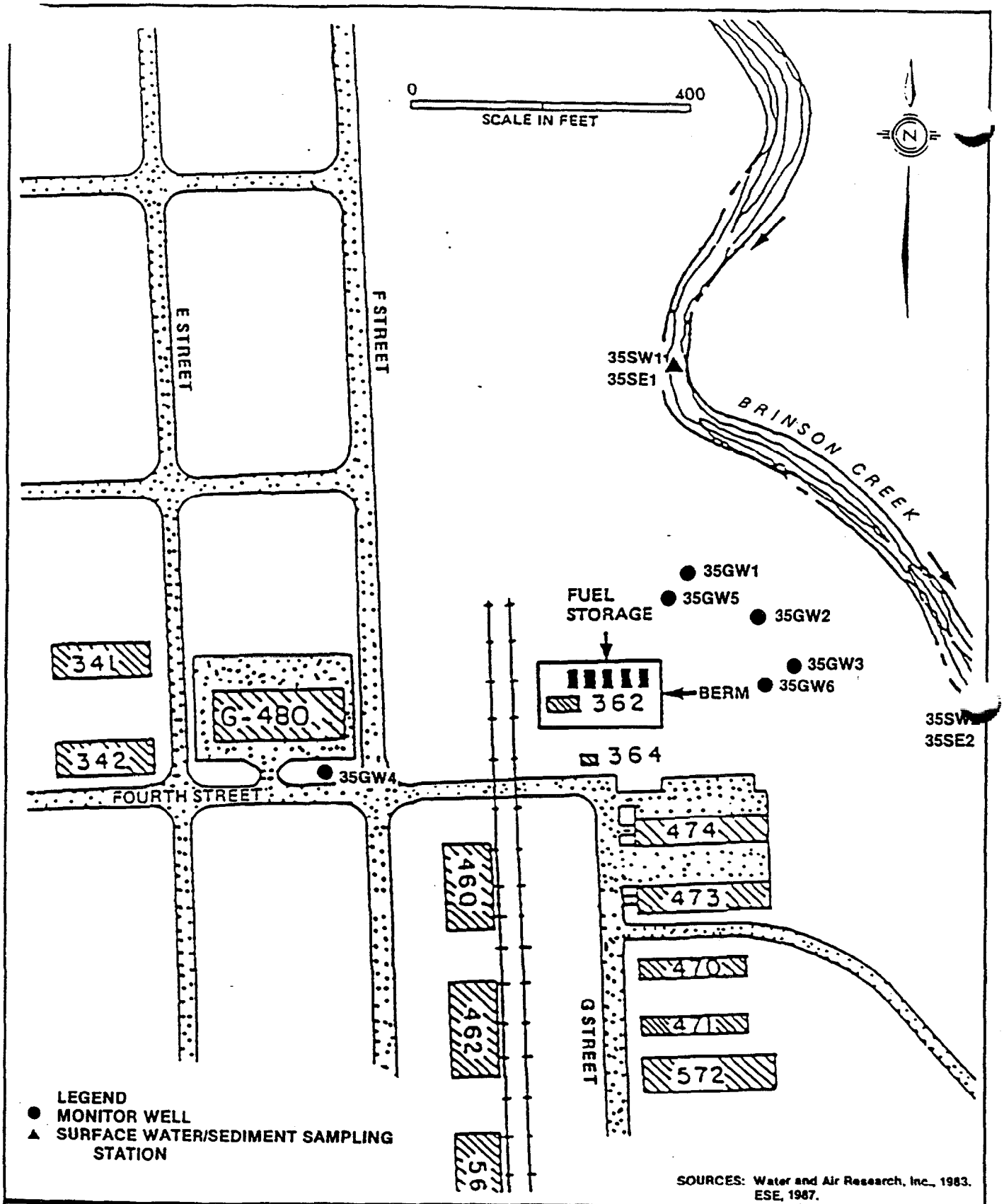


Figure 35-1
SAMPLING LOCATIONS, SITE 35—CAMP GEIGER AREA FUEL FARM

MARINE CORPS BASE CAMP LEJEUNE

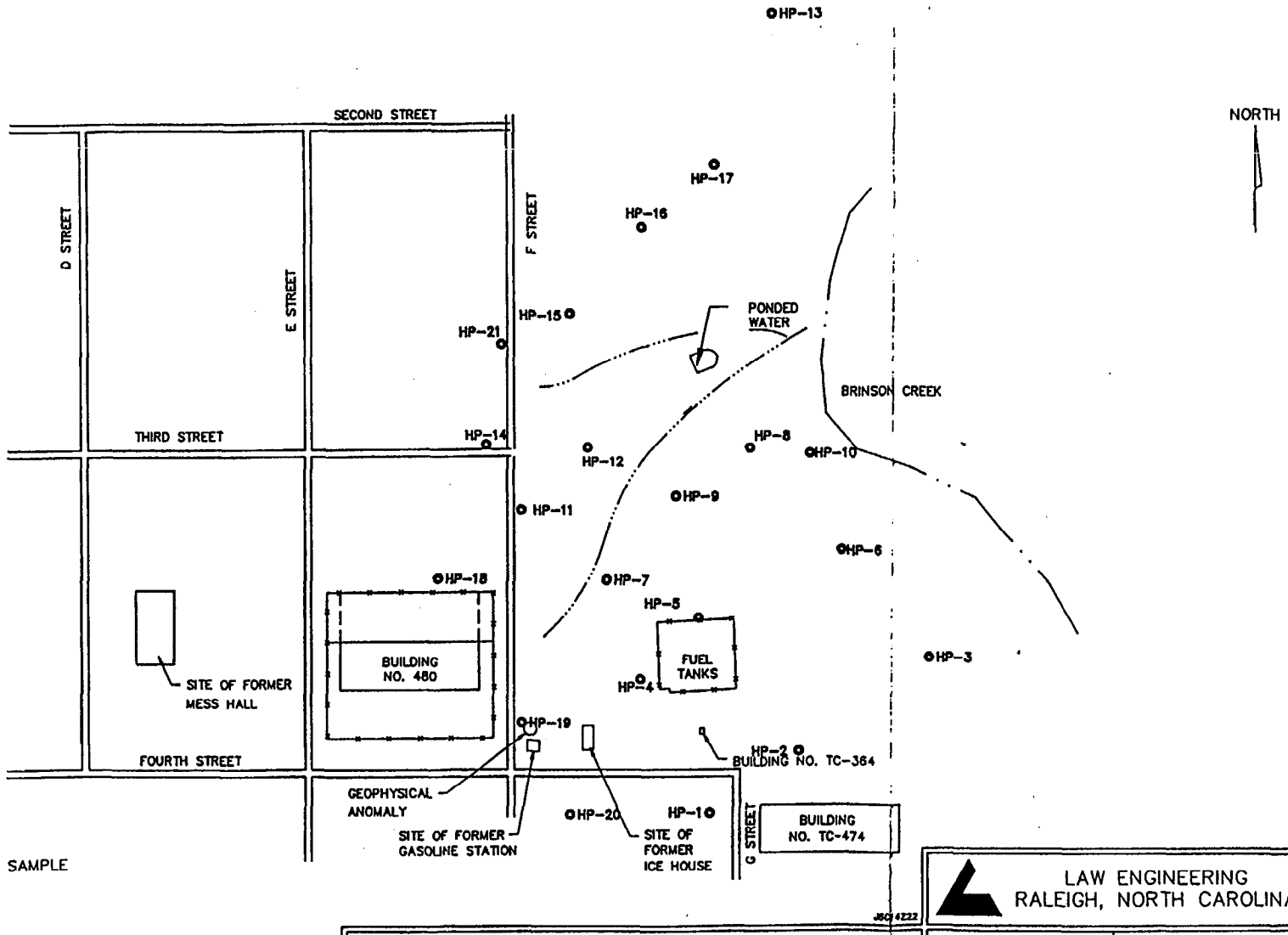
TABLE 35-1. SITE 35 - CAMP GEIGER AREA FUEL FARM
DETECTED TARGET ANALYTES
GROUND WATER SAMPLES

DATE	NC GW STANDARDS	35GW1 8/7/84	35GW2 8/6/84	35GW3 8/7/84	35GW4 12/4/86	35GW4 3/6/87	35GW5 12/4/86	35GW5 3/6/87	35GW6 12/4/86	35GW6 3/6/87
PARAMETER										
BENZENE	1	<0.2	<0.2	<0.2	<1	<1	30	17	<1	1.3
T-1,2-DICHLORO										
ETHENE	70	<0.7	<0.7	<0.7	<1.6	3.2	<1.6	<1.6	28	29
TRICHLOROETHENE	NONE	<0.8	<0.9	<0.9	<1.0	<3	<1.0	<3	11	11
METHYLENE CHLORIDE	5	4	<0.7	<0.7	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8
LEAD		1063	1102	3659	<27	<27	33	<27	<27	<27
OIL & GREASE	NONE	<1000	46000	<1000	200	12000	2000	2000	200	1000

Values reported are concentrations in micrograms per liter (ug/L); this approximates parts per billion (ppb).

Source: ESE, 1990.

Comprehensive Site Assessment (LAW 1992)



LEGEND

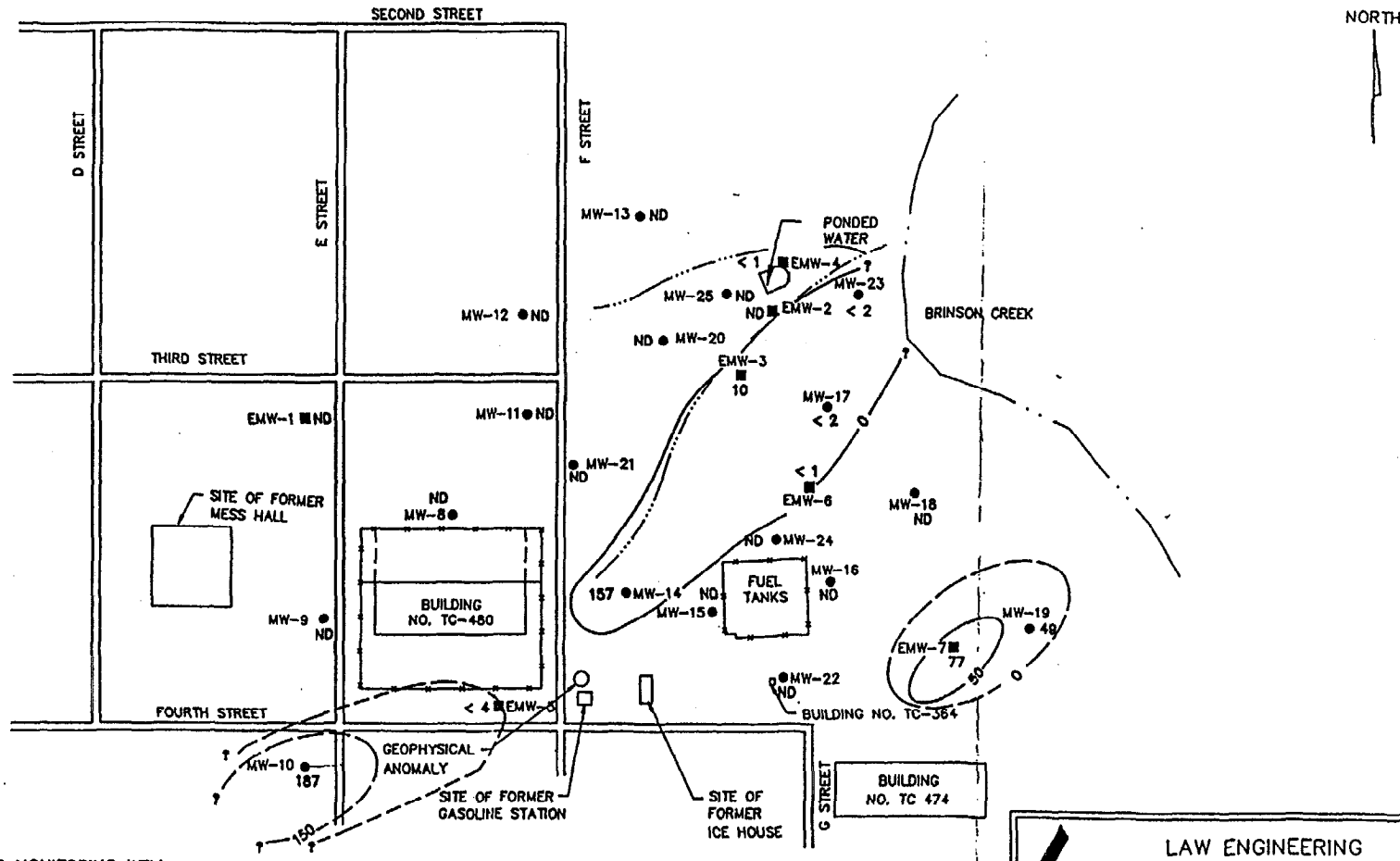
- FENCE
- HP-1 LOCATION OF HYDROPUNCH SAMPLE
- TRANSITORY STREAM
- PERENNIAL STREAM

LAW ENGINEERING
RALEIGH, NORTH CAROLINA

LOCATION OF HYDROPUNCH GROUND-WATER SAMPLES
CAMP GEIGER FUEL FARM
CAMP LEJEUNE, NORTH CAROLINA

DRAWN: DOC	DATE: NOV. 1991
DFT CHECK: DOC	SCALE: 1"=150'
ENG CHECK: WADAVIS	JOB: J47590-6014
APPROVAL: WDAVIS	DWG: 4.4

REFERENCE: JAMES E. STEWART AND ASSOC.; SHT 1&2 OF 2; 9/13/91



LEGEND

- FENCE
- ■EMW-1 LOCATION OF PRE-EXISTING MONITORING WELL
- ●MW-1 LOCATION OF LAW ENGINEERING MONITORING WELL
- 49 CONCENTRATION OF CHLORINATED COMPOUNDS IN ug/L
- ND NONE DETECTED
- TRANSITORY STREAM
- PERENNIAL STREAM

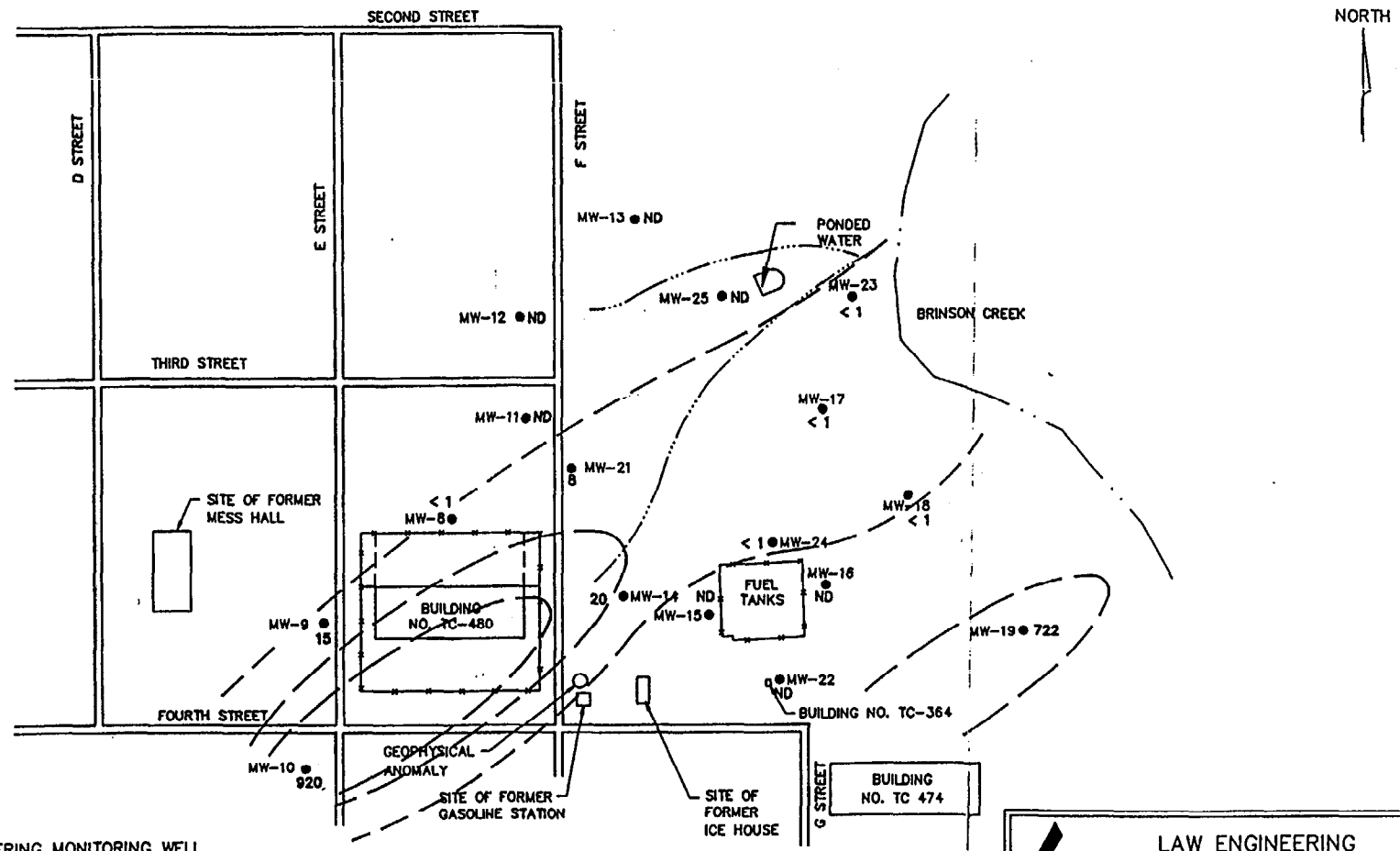
LAW ENGINEERING
RALEIGH, NORTH CAROLINA

ISOPLETH MAP
COMBINED CONCENTRATIONS OF CHLORINATED COMPOUNDS
WATER SAMPLES FROM SHALLOW SCREENED INTERVAL
CAMP GEIGER FUEL FARM
CAMP LEJEUNE, NORTH CAROLINA

DRAWN: DCC	DATE: NOV. 1991
DFT CHECK:	SCALE: 1"=150'
ENG CHECK:	JOB: J47590-6014
APPROVAL:	DWG: 4.9

REFERENCE: JAMES E. STEWART AND ASSOC.; SHT 1&2 OF 2; 9/13/91

1991
Deep Aquifer
Total CVOCs



LEGEND

- FENCE
- ●MW-1 LOCATION OF LAW ENGINEERING MONITORING WELL
- 920 CONCENTRATION OF CHLORINATED COMPOUNDS IN ug/L
- ND NONE DETECTED
- TRANSITORY STREAM
- PERENNIAL STREAM

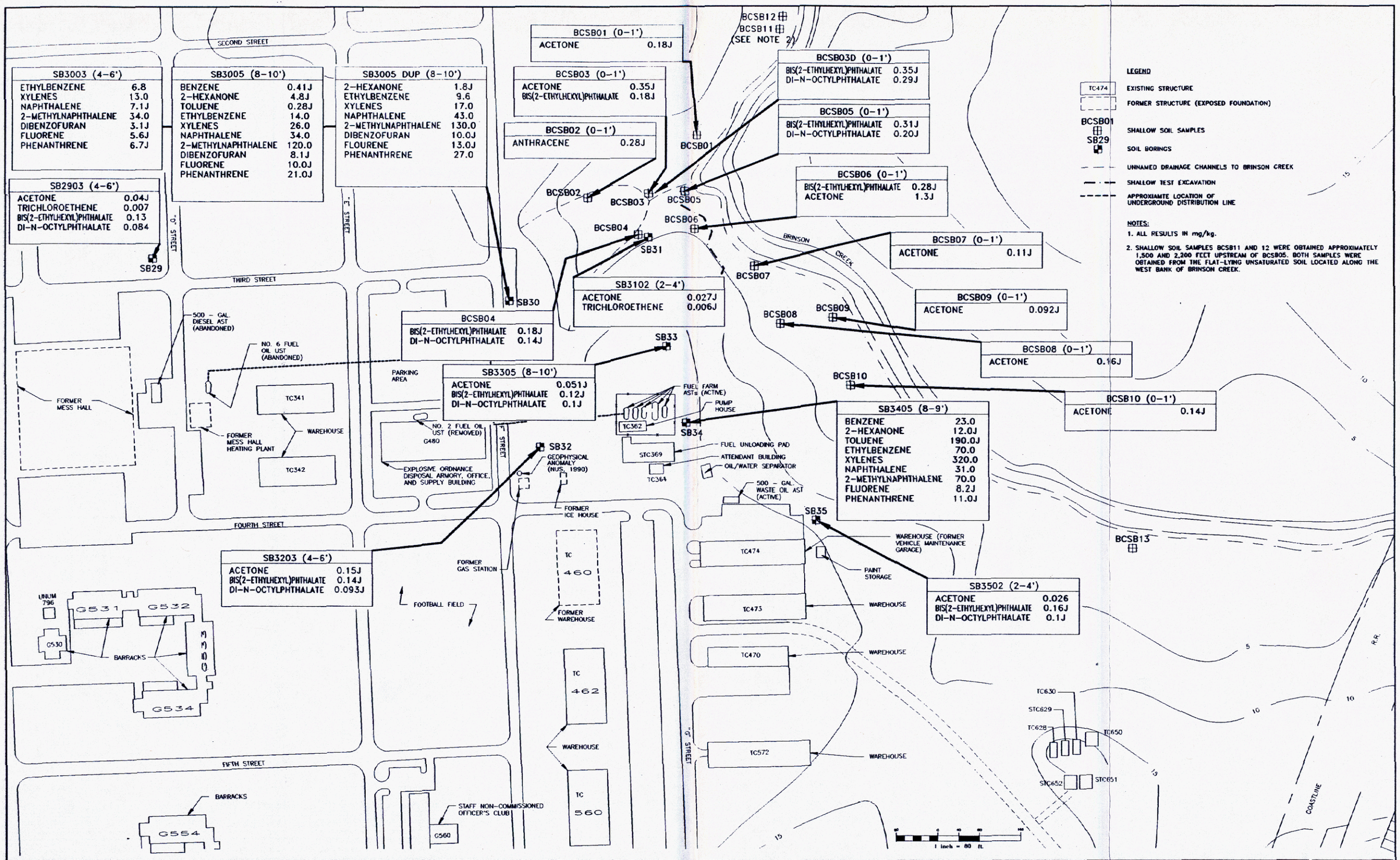
LAW ENGINEERING
RALEIGH, NORTH CAROLINA

ISOPLETH MAP
COMBINED CONCENTRATIONS OF CHLORINATED COMPOUNDS
WATER SAMPLES FROM DEEP SCREENED INTERVAL
CAMP GEIGER FUEL FARM
CAMP LEJEUNE, NORTH CAROLINA

DRAWN: DCC	DATE: NOV. 1991
DFT CHECK:	SCALE: 1"=150'
ENG CHECK:	JOB: J47590-6014
APPROVAL:	DWG: 4.10

REFERENCE: JAMES E. STEWART AND ASSOC.; SHT 1&2 OF 2; 9/13/91

IRA (Baker 1994)



LEGEND

DATE	MARCH 1994
SCALE	1" = 80'
DRAWN	WJH
REVIEWED	DLB
S.O.#	62470-160-0000-05200
CADD#	160505RA

NORTH

INTERIM REMEDIAL ACTION REMEDIAL INVESTIGATION CTO-0160
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

BAKER ENVIRONMENTAL, Inc.
Coraopolis, Pennsylvania

Baker
Baker Environmental, Inc.

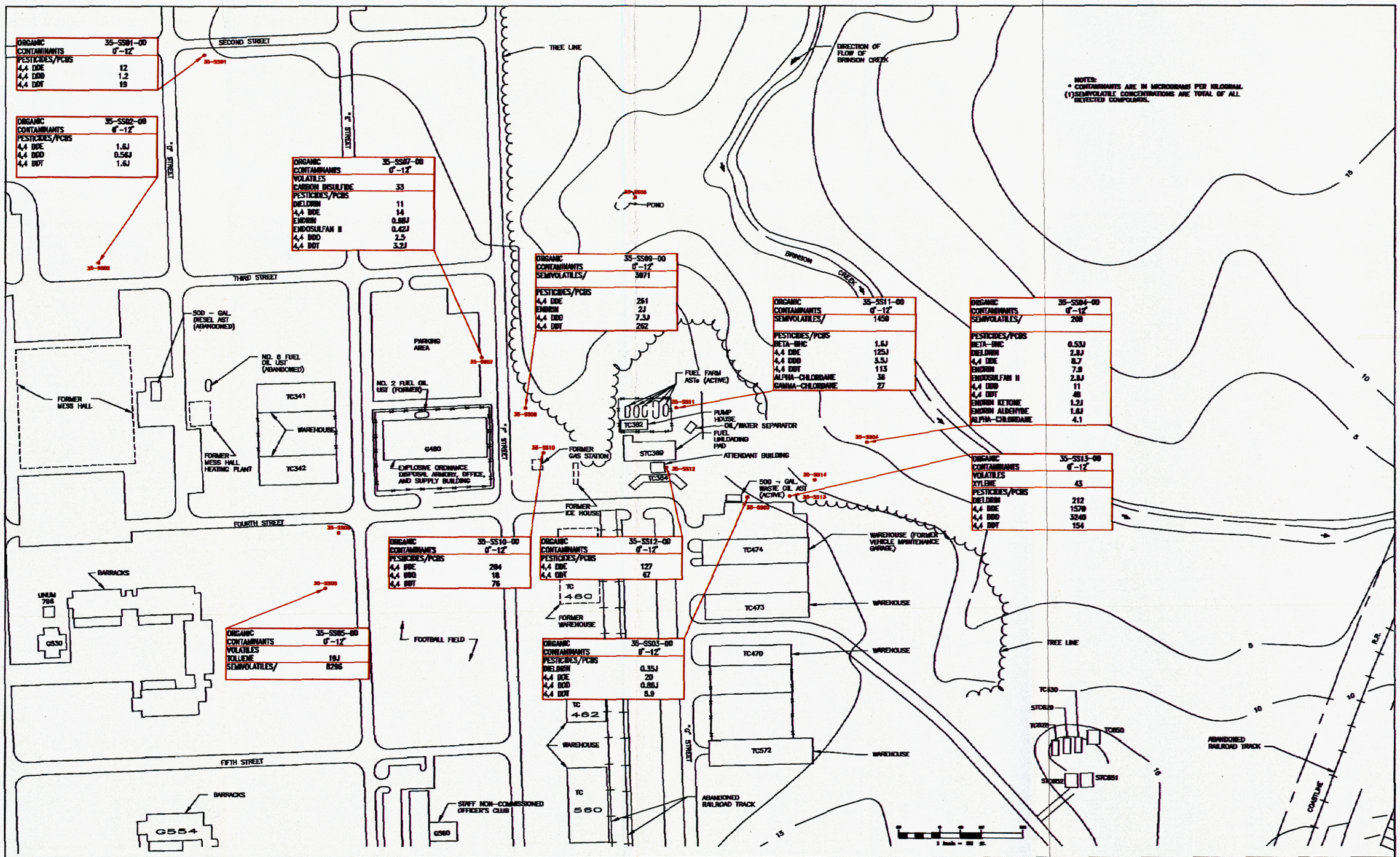
INTERIM REMEDIAL ACTION RI
DETECTED TCL ORGANICS IN SOIL
SITE 35 - CAMP GEIGER AREA FUEL FARM

SCALE 1" = 80' | DATE MARCH 1994

FIGURE No. 4-1

01507V062

Remedial Investigation (Baker 1995)



LEGEND	
-x-x-	FENCE LINE
—15—	CONTOUR LINES DEPICTING SURFICIAL RELIEF
35-SS02	SURFACE SOIL SAMPLE LOCATION

DATE	OCT. 1994
SCALE	1"= 80'
DRAWN	WJH
REVIEWED	JSC
S.O.#	62470-232-0000-07000
CADD#	2329148I

NORTH

SITE 35, CAMP GEIGER AREA FUEL FARM RI/FS
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

BAKER ENVIRONMENTAL, Inc.
Coraopolis, Pennsylvania

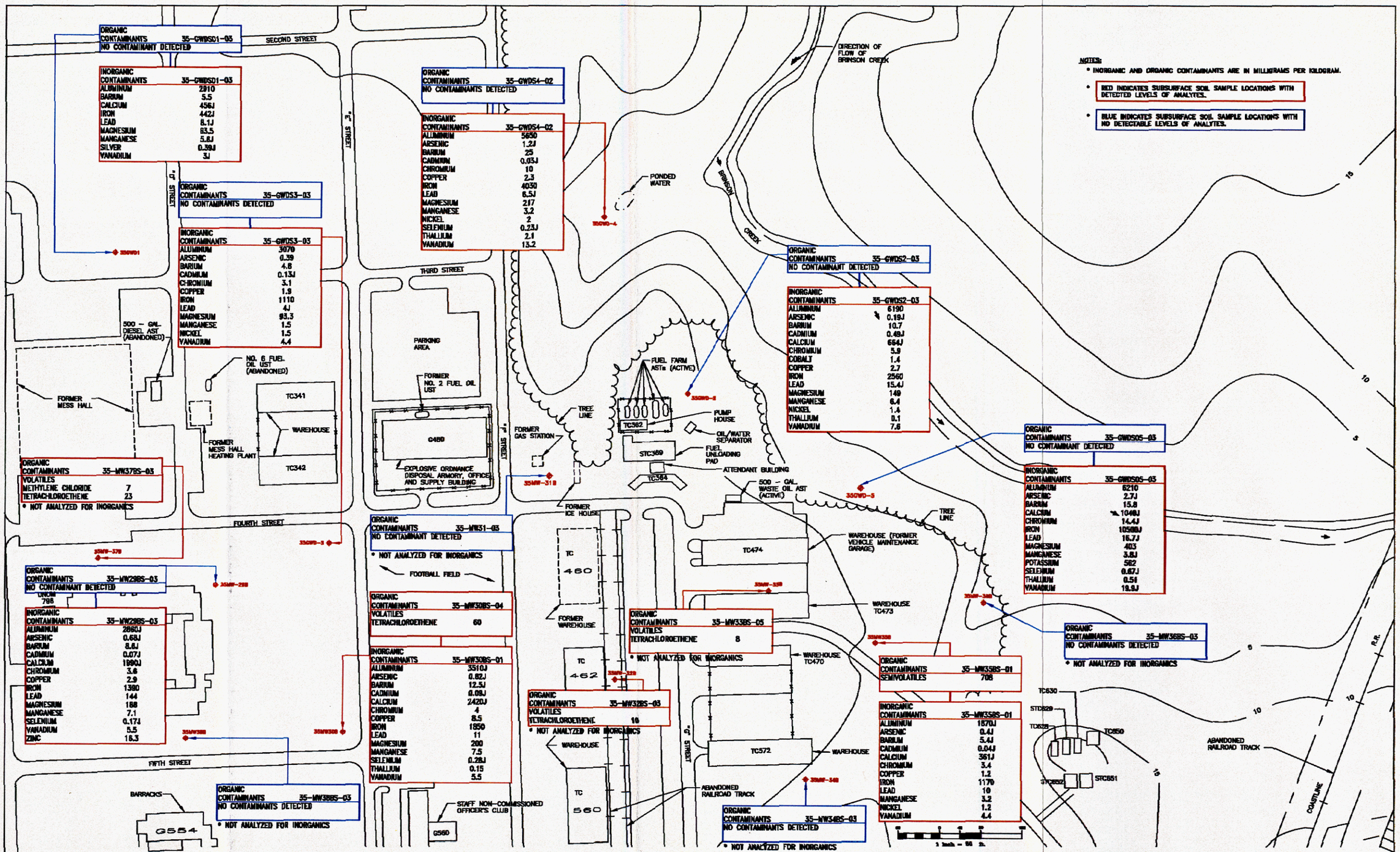
Baker
Baker Environmental, Inc.

DETECTED ORGANICS IN SURFACE SOIL
CONTRACT TASK ORDER - 0232

SCALE 1"= 80' DATE OCT. 1994

FIGURE No. 4-1

01539UB6Y



LEGEND

- FENCE LINE
- 15 — CONTOUR LINES DEPICTING SURFICIAL RELIEF
- 35GW01 — SUBSURFACE SOIL SAMPLE LOCATION/MONITORING WELL INSTALLATION UNDER BAKER RI (1994).

DATE	OCT. 1994
SCALE	1" = 50'
DRAWN	WJH
REVIEWED	JSC
S.O.#	62470-232-0000-07000
CADD#	232915RI

NORTH

SITE 35, CAMP GEIGER AREA FUEL FARM RI/FS
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

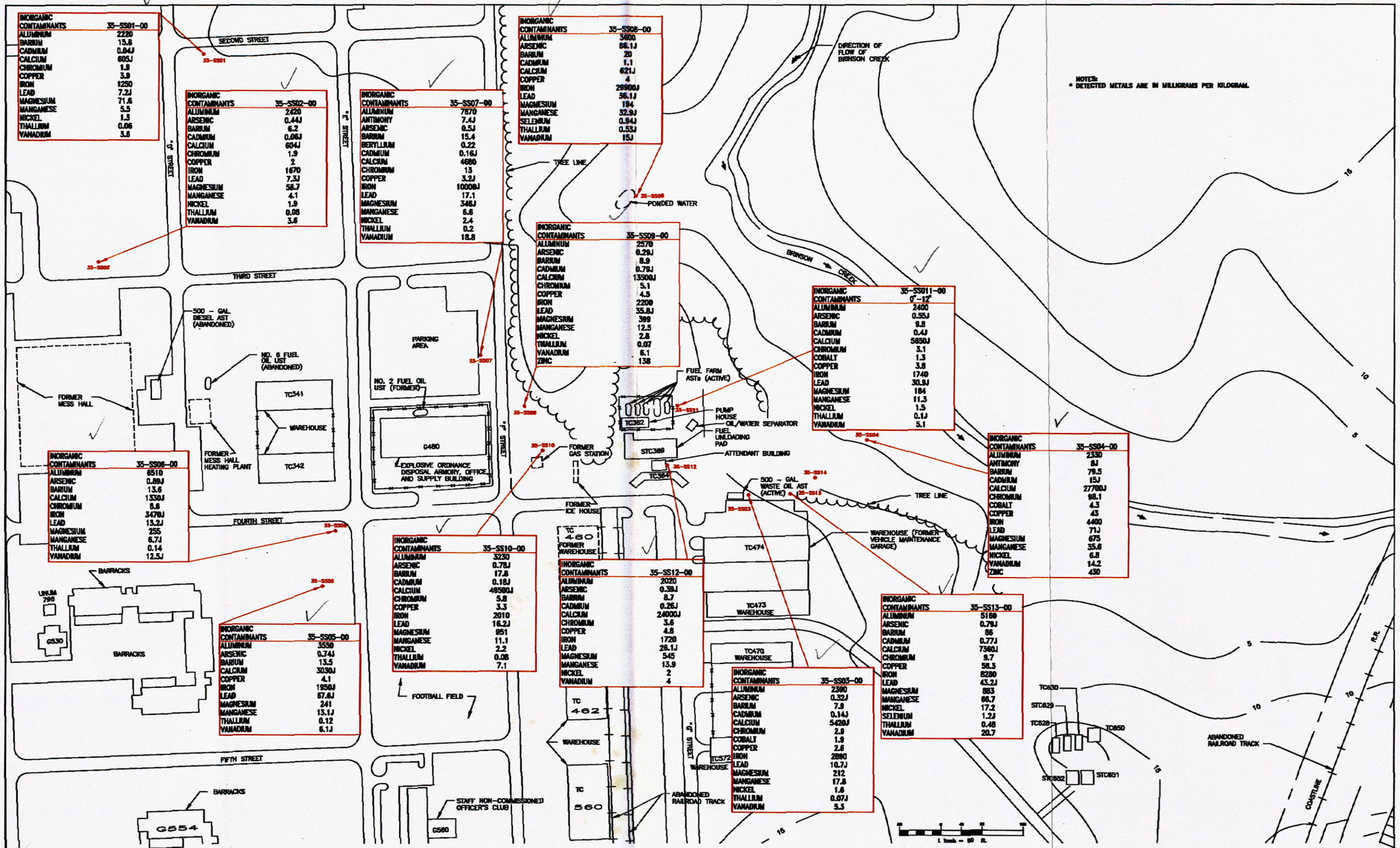
BAKER ENVIRONMENTAL, Inc.
Coraopolis, Pennsylvania

Baker
Baker Environmental, Inc.

DETECTED INORGANICS AND ORGANICS IN SUBSURFACE SOIL
CONTRACT TASK ORDER - 0232

SCALE 1" = 50' | DATE OCT. 1994

FIGURE No. 4-2



NOTES:
• DETECTED METALS ARE IN MILLIGRAMS PER KILOGRAM.

INORGANIC CONTAMINANTS	35-SS01-00
ALUMINUM	2220
BARIUM	15.8
CADMIUM	0.04J
CALCIUM	605J
CHROMIUM	1.9
COPPER	3.9
IRON	1250
LEAD	7.2J
MAGNESIUM	71.6
MANGANESE	5.5
NICKEL	1.3
THALLIUM	0.06
VANADIUM	3.6

INORGANIC CONTAMINANTS	35-SS02-00
ALUMINUM	2620
ARSENIC	0.44J
BARIUM	6.2
CADMIUM	0.06J
CALCIUM	604J
CHROMIUM	1.9
COPPER	2
IRON	1670
LEAD	7.3J
MAGNESIUM	58.7
MANGANESE	4.1
NICKEL	1.9
THALLIUM	0.08
VANADIUM	3.6

INORGANIC CONTAMINANTS	35-SS03-00
ALUMINUM	2390
ARSENIC	0.32J
BARIUM	7.8
CADMIUM	0.14J
CALCIUM	5420J
CHROMIUM	2.9
COBALT	1.9
COPPER	2.6
IRON	2890
LEAD	10.7J
MAGNESIUM	212
MANGANESE	17.8
NICKEL	1.6
THALLIUM	0.07J
VANADIUM	5.3

INORGANIC CONTAMINANTS	35-SS04-00
ALUMINUM	2330
ANTIMONY	8J
BARIUM	79.5
CADMIUM	15J
CALCIUM	27700J
CHROMIUM	95.1
COBALT	4.3
COPPER	43
IRON	4400
LEAD	71J
MAGNESIUM	675
MANGANESE	35.6
NICKEL	6.8
VANADIUM	14.2
ZINC	430

INORGANIC CONTAMINANTS	35-SS05-00
ALUMINUM	3550
ARSENIC	0.74J
BARIUM	13.5
CALCIUM	3030J
COPPER	4.1
IRON	1950J
LEAD	67.6J
MAGNESIUM	241
MANGANESE	13.1J
THALLIUM	0.12
VANADIUM	6.1J

INORGANIC CONTAMINANTS	35-SS06-00
ALUMINUM	8510
ARSENIC	0.89J
BARIUM	13.6
CALCIUM	1330J
CHROMIUM	8.6
IRON	3470J
LEAD	13.2J
MAGNESIUM	255
MANGANESE	6.7J
THALLIUM	0.14
VANADIUM	12.5J

INORGANIC CONTAMINANTS	35-SS07-00
ALUMINUM	7870
ANTIMONY	7.4J
ARSENIC	0.5J
BARIUM	15.4
BERYLLIUM	0.22
CADMIUM	0.16J
CALCIUM	4680
CHROMIUM	13
COPPER	3.2J
IRON	10000J
LEAD	17.1
MAGNESIUM	346J
MANGANESE	6.6
NICKEL	2.4
THALLIUM	0.2
VANADIUM	18.8

INORGANIC CONTAMINANTS	35-SS08-00
ALUMINUM	3600
ARSENIC	66.1J
BARIUM	20
CADMIUM	1.1
CALCIUM	621J
COPPER	4
IRON	29900J
LEAD	36.1J
MAGNESIUM	194
MANGANESE	32.9J
SELENIUM	0.94J
THALLIUM	0.53J
VANADIUM	15J

INORGANIC CONTAMINANTS	35-SS09-00
ALUMINUM	2570
ARSENIC	0.29J
BARIUM	8.9
CADMIUM	0.79J
CALCIUM	13500J
CHROMIUM	5.1
COPPER	4.5
IRON	2200
LEAD	35.8J
MAGNESIUM	399
MANGANESE	12.5
NICKEL	2.8
THALLIUM	0.07
VANADIUM	6.1
ZINC	138

INORGANIC CONTAMINANTS	35-SS10-00
ALUMINUM	3230
ARSENIC	0.78J
BARIUM	17.8
CADMIUM	0.18J
CALCIUM	49500J
CHROMIUM	5.8
COPPER	3.3
IRON	2010
LEAD	16.2J
MAGNESIUM	951
MANGANESE	11.1
NICKEL	2.2
THALLIUM	0.08
VANADIUM	7.1

INORGANIC CONTAMINANTS	35-SS11-00 0'-12'
ALUMINUM	2400
ARSENIC	0.55J
BARIUM	8.8
CADMIUM	0.4J
CALCIUM	5850J
CHROMIUM	3.1
COBALT	1.3
COPPER	3.8
IRON	1740
LEAD	30.9J
MAGNESIUM	184
MANGANESE	11.3
NICKEL	1.5
THALLIUM	0.1J
VANADIUM	5.1

INORGANIC CONTAMINANTS	35-SS12-00
ALUMINUM	2020
ARSENIC	0.39J
BARIUM	8.7
CADMIUM	0.26J
CALCIUM	24000J
CHROMIUM	3.6
COPPER	4.8
IRON	1720
LEAD	26.1J
MAGNESIUM	545
MANGANESE	13.9
NICKEL	2
VANADIUM	4

INORGANIC CONTAMINANTS	35-SS13-00
ALUMINUM	5160
ARSENIC	0.79J
BARIUM	86
CADMIUM	0.77J
CALCIUM	7360J
CHROMIUM	9.7
COPPER	58.5
IRON	8280
LEAD	43.2J
MAGNESIUM	883
MANGANESE	66.7
NICKEL	17.2
SELENIUM	1.2J
THALLIUM	0.48
VANADIUM	20.7

LEGEND

- FENCE LINE
- 15 — CONTOUR LINES DEPICTING SURFICIAL RELIEF
- 35-SS02 — SURFACE SOIL SAMPLE LOCATION

DATE	OCT. 1994
SCALE	1" = 80'
DRAWN	WJH
REVIEWED	JSC
S.O.#	62470-232-0000-07000
CADD#	232943RI

NORTH

SITE 35, CAMP GEIGER AREA FUEL FARM RI/FS
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

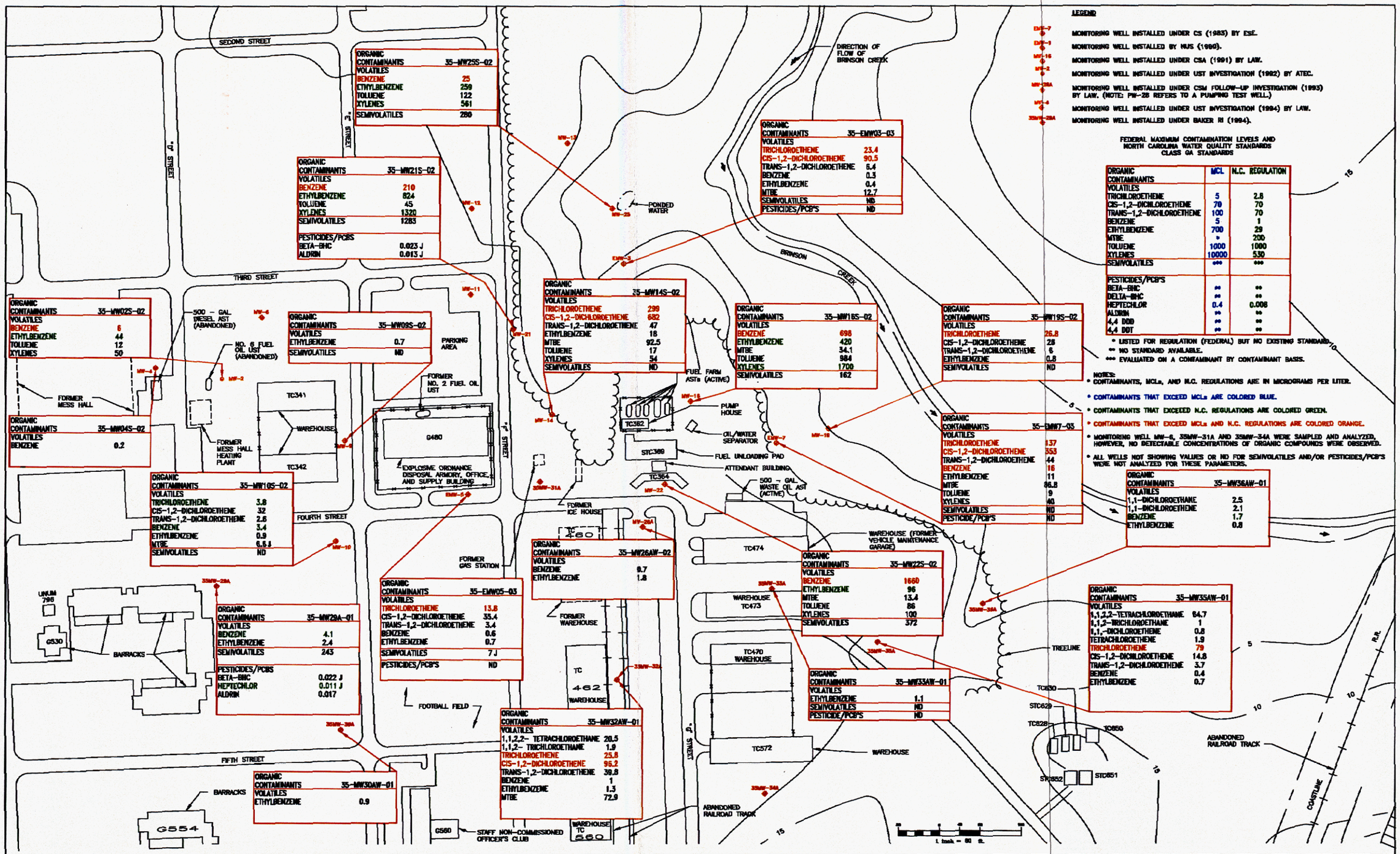
BAKER ENVIRONMENTAL, Inc.
Coraopolis, Pennsylvania

Baker
Baker Environmental, Inc.

DETECTED INORGANICS IN SURFACE SOILS
CONTRACT TASK ORDER - 0232

SCALE 1" = 80' | DATE OCT. 1994

FIGURE No. 4-3



LEGEND

MONITORING WELL INSTALLED UNDER CS (1983) BY ESE.

MONITORING WELL INSTALLED BY NUS (1990).

MONITORING WELL INSTALLED UNDER CSA (1991) BY LAW.

MONITORING WELL INSTALLED UNDER UST INVESTIGATION (1992) BY ATEC.

MONITORING WELL INSTALLED UNDER CSM FOLLOW-UP INVESTIGATION (1993) BY LAW. (NOTE: PW-2B REFERS TO A PUMPING TEST WELL.)

MONITORING WELL INSTALLED UNDER UST INVESTIGATION (1994) BY LAW.

MONITORING WELL INSTALLED UNDER BAKER RI (1994).

FEDERAL MAXIMUM CONTAMINATION LEVELS AND NORTH CAROLINA WATER QUALITY STANDARDS CLASS GA STANDARDS

ORGANIC CONTAMINANTS	MCL	N.C. REGULATION
VOLATILES		
TRICHLOROETHENE	5	2.8
CIS-1,2-DICHLOROETHENE	70	70
TRANS-1,2-DICHLOROETHENE	100	70
BENZENE	5	1
ETHYLBENZENE	700	29
MTBE	*	200
TOLUENE	1000	1000
XYLENES	10000	530
SEMIVOLATILES	***	***
PESTICIDES/PCB'S		
BETA-BHC	**	**
DELTA-BHC	**	**
HEPTECHLOR	0.4	0.008
ALDRIN	**	**
4,4 DDD	**	**
4,4 DDT	**	**

* LISTED FOR REGULATION (FEDERAL) BUT NO EXISTING STANDARD.
** NO STANDARD AVAILABLE.
*** EVALUATED ON A CONTAMINANT BY CONTAMINANT BASIS.

NOTES:
- CONTAMINANTS, MCLs, AND N.C. REGULATIONS ARE IN MICROGRAMS PER LITER.
- CONTAMINANTS THAT EXCEED MCLs ARE COLORED BLUE.
- CONTAMINANTS THAT EXCEED N.C. REGULATIONS ARE COLORED GREEN.
- CONTAMINANTS THAT EXCEED MCLs AND N.C. REGULATIONS ARE COLORED ORANGE.
- MONITORING WELL MW-6, 35MW-31A AND 35MW-34A WERE SAMPLED AND ANALYZED, HOWEVER, NO DETECTABLE CONCENTRATIONS OF ORGANIC COMPOUNDS WERE OBSERVED.
- ALL WELLS NOT SHOWING VALUES OR ND FOR SEMIVOLATILES AND/OR PESTICIDES/PCB'S WERE NOT ANALYZED FOR THESE PARAMETERS.

LEGEND

-#-#- FENCE LINE
—15— CONTOUR LINES DEPICTING SURFICIAL RELIEF

LEGEND CONTINUED IN UPPER RIGHT HAND CORNER.

DATE	OCT. 1994
SCALE	1"= 80'
DRAWN	WJH
REVIEWED	JSC
S.O.#	62470-232-0000-07000
CADD#	232900R1

NORTH

SITE 35, CAMP GEIGER AREA FUEL FARM RI/FS
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

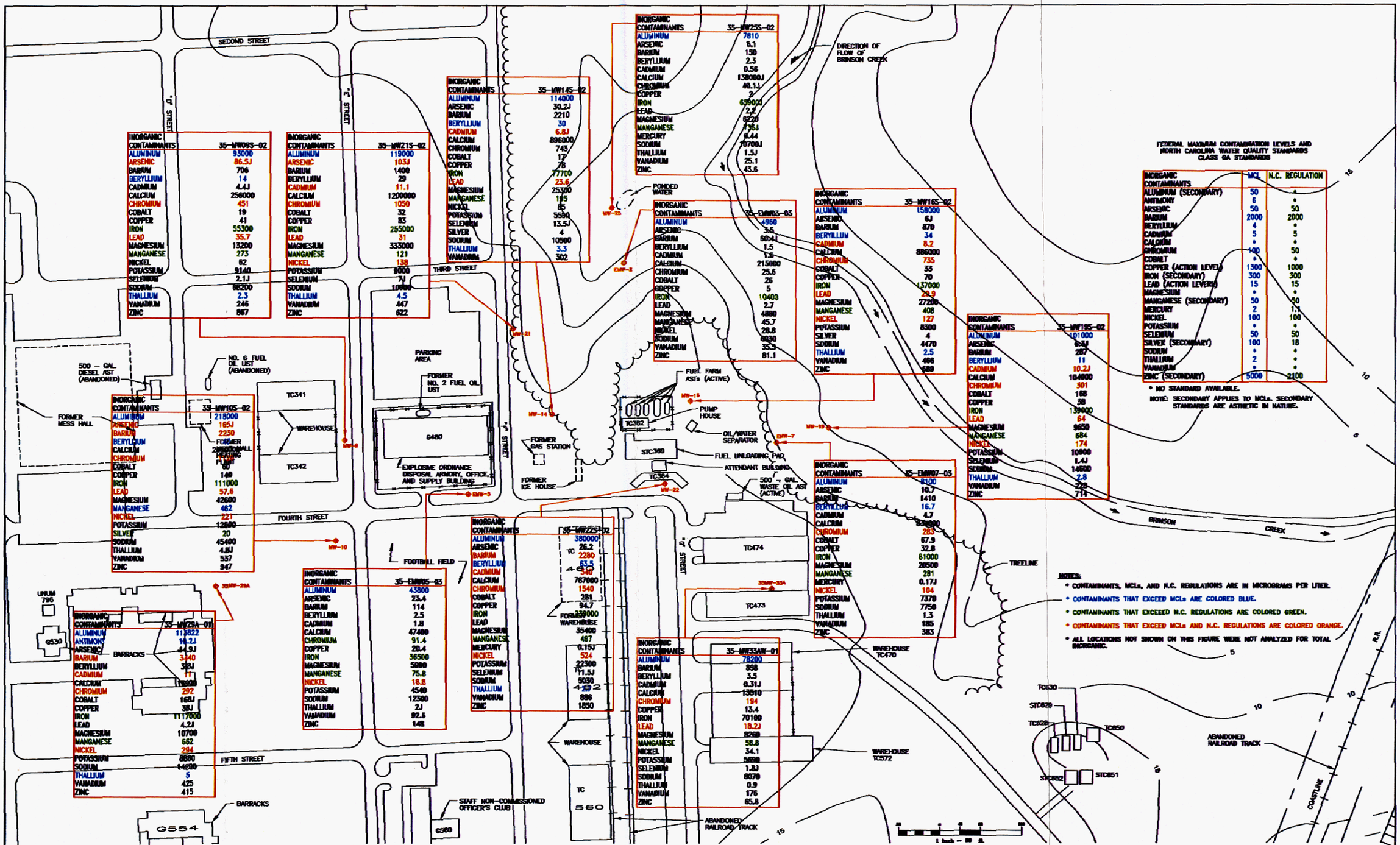
BAKER ENVIRONMENTAL, Inc.
Coraopolis, Pennsylvania

Baker
Baker Environmental, Inc.

DETECTED ORGANICS IN UPPER PORTION OF SURFICIAL AQUIFER
CONTRACT TASK ORDER - 0232

SCALE 1"= 80' | DATE OCT. 1994

FIGURE No. 4-4



INORGANIC CONTAMINANTS	35-MW09S-02
ALUMINUM	93000
ARSENIC	86.5J
BARIUM	706
BERYLLIUM	14
CADMIUM	4.4J
CALCIUM	256000
CHROMIUM	451
COBALT	19
COPPER	41
IRON	55300
LEAD	35.7
MAGNESIUM	13200
MANGANESE	273
NICKEL	62
POTASSIUM	9140
SELENIUM	2.1J
SODIUM	66200
THALLIUM	2.3
VANADIUM	246
ZINC	867

INORGANIC CONTAMINANTS	35-MW21S-02
ALUMINUM	119000
ARSENIC	103J
BARIUM	1400
BERYLLIUM	29
CADMIUM	11.1
CALCIUM	1200000
CHROMIUM	1050
COBALT	32
COPPER	83
IRON	255000
LEAD	31
MAGNESIUM	333000
MANGANESE	121
NICKEL	138
POTASSIUM	9000
SELENIUM	7J
SODIUM	10000
THALLIUM	4.5
VANADIUM	447
ZINC	622

INORGANIC CONTAMINANTS	35-MW14S-02
ALUMINUM	114000
ARSENIC	30.2J
BARIUM	2210
BERYLLIUM	30
CADMIUM	6.8J
CALCIUM	896000
CHROMIUM	743
COBALT	17
COPPER	78
IRON	77700
LEAD	23.6
MAGNESIUM	25300
MANGANESE	165
NICKEL	85
POTASSIUM	5590
SELENIUM	13.5J
SILVER	4
SODIUM	10500
THALLIUM	3.3
VANADIUM	302

INORGANIC CONTAMINANTS	35-MW25S-02
ALUMINUM	7810
ARSENIC	6.1
BARIUM	150
BERYLLIUM	2.3
CADMIUM	0.56
CALCIUM	138000J
CHROMIUM	40.1J
COPPER	2
IRON	69900
LEAD	2.2
MAGNESIUM	6220
MANGANESE	135J
MERCURY	0.44
SODIUM	10700J
THALLIUM	1.5J
VANADIUM	25.1
ZINC	43.6

INORGANIC CONTAMINANTS	35-EMW03-03
ALUMINUM	4960
ARSENIC	3.5
BARIUM	60.4J
BERYLLIUM	1.5
CADMIUM	1.6
CALCIUM	215000
CHROMIUM	25.6
COBALT	26
COPPER	5
IRON	10400
LEAD	2.7
MAGNESIUM	4880
MANGANESE	45.7
NICKEL	28.8
SODIUM	6930
VANADIUM	35.5
ZINC	81.1

INORGANIC CONTAMINANTS	35-MW16S-02
ALUMINUM	158000
ARSENIC	6J
BARIUM	870
BERYLLIUM	34
CADMIUM	8.2
CALCIUM	886000
CHROMIUM	735
COBALT	33
COPPER	70
IRON	137000
LEAD	29.9
MAGNESIUM	27200
MANGANESE	408
NICKEL	127
POTASSIUM	8300
SILVER	4
SODIUM	4470
THALLIUM	2.5
VANADIUM	466
ZINC	689

INORGANIC CONTAMINANTS	35-MW19S-02
ALUMINUM	101000
ARSENIC	6.3J
BARIUM	287
BERYLLIUM	11
CADMIUM	10.2J
CALCIUM	104000
CHROMIUM	301
COBALT	168
COPPER	38
IRON	139000
LEAD	64
MAGNESIUM	9650
MANGANESE	684
NICKEL	174
POTASSIUM	10900
SELENIUM	1.4J
SODIUM	14600
THALLIUM	2.8
VANADIUM	228
ZINC	714

INORGANIC CONTAMINANTS	35-MW10S-02
ALUMINUM	218000
ARSENIC	165J
BARIUM	2250
BERYLLIUM	7
CALCIUM	60
CHROMIUM	140
COBALT	60
COPPER	140
IRON	111000
LEAD	57.6
MAGNESIUM	42600
MANGANESE	462
NICKEL	221
POTASSIUM	12800
SILVER	20
SODIUM	45400
THALLIUM	4.8J
VANADIUM	537
ZINC	947

INORGANIC CONTAMINANTS	35-EMW05-03
ALUMINUM	43800
ARSENIC	23.4
BARIUM	114
BERYLLIUM	2.5
CADMIUM	1.8
CALCIUM	47400
CHROMIUM	91.4
COPPER	20.4
IRON	36500
MAGNESIUM	5080
MANGANESE	75.8
NICKEL	16.8
POTASSIUM	4540
SODIUM	12500
THALLIUM	2J
VANADIUM	92.5
ZINC	148

INORGANIC CONTAMINANTS	35-MW29A-01
ALUMINUM	113822
ANTIMONY	14.2J
ARSENIC	14.9J
BARIUM	3440
BERYLLIUM	3.8J
CADMIUM	11
CALCIUM	118000
CHROMIUM	292
COBALT	168J
COPPER	38J
IRON	1117000
LEAD	4.2J
MAGNESIUM	10700
MANGANESE	662
NICKEL	294
POTASSIUM	8880
SODIUM	14200
THALLIUM	5
VANADIUM	425
ZINC	415

INORGANIC CONTAMINANTS	35-MW25D-02
ALUMINUM	380000
ARSENIC	26.2
BARIUM	2280
BERYLLIUM	63.5
CADMIUM	4.6J
CALCIUM	787000
CHROMIUM	1540
COBALT	281
COPPER	94.7
IRON	239000
LEAD	35400
MAGNESIUM	487
MANGANESE	0.15J
MERCURY	524
NICKEL	22300
POTASSIUM	11.5J
SELENIUM	5030
SODIUM	4.2J
THALLIUM	886
VANADIUM	1850
ZINC	

INORGANIC CONTAMINANTS	35-MW33AW-01
ALUMINUM	78200
BARIUM	898
BERYLLIUM	3.5
CADMIUM	0.31J
CALCIUM	13510
CHROMIUM	194
COPPER	13.4
IRON	70100
LEAD	18.2J
MAGNESIUM	8260
MANGANESE	58.8
NICKEL	34.1
POTASSIUM	5690
SELENIUM	1.8J
SODIUM	8070
THALLIUM	0.9
VANADIUM	176
ZINC	65.8

INORGANIC CONTAMINANTS	35-EMW07-03
ALUMINUM	8100
ARSENIC	10.7
BARIUM	1410
BERYLLIUM	16.7
CADMIUM	4.7
CALCIUM	324000
CHROMIUM	283
COBALT	67.9
COPPER	32.8
IRON	81000
MAGNESIUM	20500
MANGANESE	281
MERCURY	0.17J
NICKEL	104
POTASSIUM	7370
SODIUM	7750
THALLIUM	1.3
VANADIUM	185
ZINC	383

FEDERAL MAXIMUM CONTAMINATION LEVELS AND NORTH CAROLINA WATER QUALITY STANDARDS CLASS GA STANDARDS

INORGANIC CONTAMINANTS	MCL	N.C. REGULATION
ALUMINUM (SECONDARY)	50	*
ANTIMONY	6	*
ARSENIC	50	50
BARIUM	2000	2000
BERYLLIUM	4	*
CADMIUM	5	5
CALCIUM	*	*
CHROMIUM	100	50
COBALT	*	*
COPPER (ACTION LEVEL)	1300	1000
IRON (SECONDARY)	300	300
LEAD (ACTION LEVEL)	15	15
MAGNESIUM	*	*
MANGANESE (SECONDARY)	50	50
MERCURY	2	1.1
NICKEL	100	100
POTASSIUM	*	*
SELENIUM	50	50
SILVER (SECONDARY)	100	18
SODIUM	*	*
THALLIUM	2	*
VANADIUM	*	*
ZINC (SECONDARY)	5000	2100

* NO STANDARD AVAILABLE.

NOTE: SECONDARY APPLIES TO MCLs. SECONDARY STANDARDS ARE ASTHETIC IN NATURE.

NOTES:

- CONTAMINANTS, MCLs, AND N.C. REGULATIONS ARE IN MICROGRAMS PER LITER.
- CONTAMINANTS THAT EXCEED MCLs ARE COLORED BLUE.
- CONTAMINANTS THAT EXCEED N.C. REGULATIONS ARE COLORED GREEN.
- CONTAMINANTS THAT EXCEED MCLs AND N.C. REGULATIONS ARE COLORED ORANGE.
- ALL LOCATIONS NOT SHOWN ON THIS FIGURE WERE NOT ANALYZED FOR TOTAL INORGANIC.

LEGEND

- EMW-7 — MONITORING WELL INSTALLED UNDER CS (1983) BY ESE.
- EMW-3 — MONITORING WELL INSTALLED BY NUS (1990).
- MW-16 — MONITORING WELL INSTALLED UNDER CSA (1991) BY LAW.
- 35MW-29A — MONITORING WELL INSTALLED UNDER BAKER Ø (1994).
- FENCE LINE
- 15 — CONTOUR LINES DEPICTING SURFICIAL RELIEF

DATE	OCT. 1994
SCALE	1" = 80'
DRAWN	WJH
REVIEWED	JSC
S.O.#	62470-232-0000-07000
CADD#	2329028

NORTH

SITE 35, CAMP GEIGER AREA FUEL FARM RI/FS
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

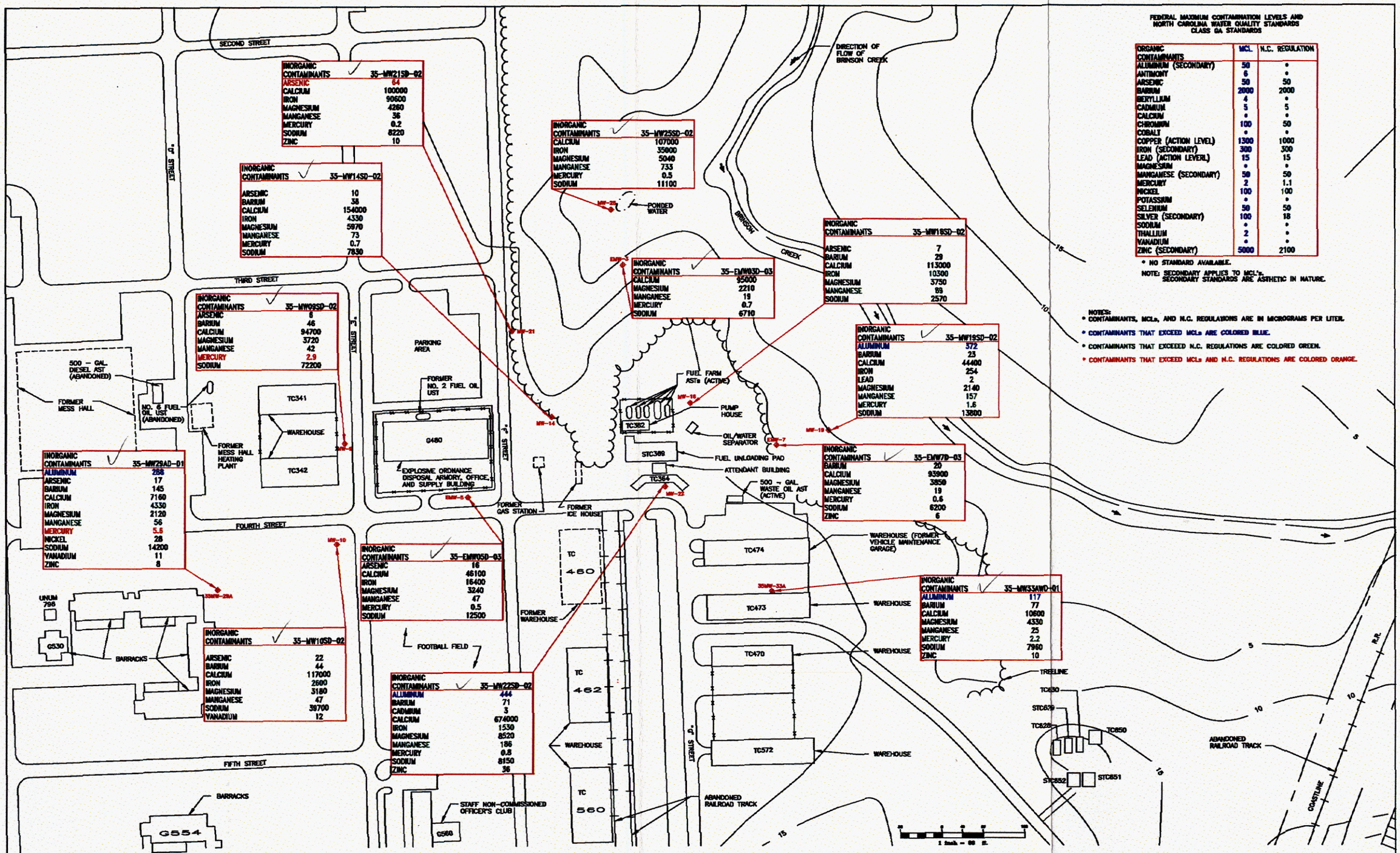
BAKER ENVIRONMENTAL, Inc.
Coraopolis, Pennsylvania

Baker
Baker Environmental, Inc.

DETECTED TOTAL INORGANICS IN UPPER PORTION OF SURFICIAL AQUIFER
CONTRACT TASK ORDER - 0232

SCALE 1" = 80' | DATE OCT. 1994

FIGURE No. 4-5



INORGANIC CONTAMINANTS	35-MW21SD-02
ARSENIC	64
CALCIUM	100000
IRON	90600
MAGNESIUM	4260
MANGANESE	36
MERCURY	0.2
SODIUM	8220
ZINC	10

INORGANIC CONTAMINANTS	35-MW14SD-02
ARSENIC	10
BARIUM	38
CALCIUM	154000
IRON	4330
MAGNESIUM	5970
MANGANESE	73
MERCURY	0.7
SODIUM	7830

INORGANIC CONTAMINANTS	35-MW09SD-02
ARSENIC	6
BARIUM	46
CALCIUM	94700
MAGNESIUM	3720
MANGANESE	42
MERCURY	2.9
SODIUM	72200

INORGANIC CONTAMINANTS	35-MW29AD-01
ALUMINUM	268
ARSENIC	17
BARIUM	145
CALCIUM	7160
IRON	4330
MAGNESIUM	2120
MANGANESE	56
MERCURY	5.6
NICKEL	28
SODIUM	14200
VANADIUM	11
ZINC	8

INORGANIC CONTAMINANTS	35-MW10SD-02
ARSENIC	22
BARIUM	44
CALCIUM	117000
IRON	2600
MAGNESIUM	3180
MANGANESE	47
SODIUM	39700
VANADIUM	12

INORGANIC CONTAMINANTS	35-EMW05D-03
ARSENIC	16
CALCIUM	46100
IRON	16400
MAGNESIUM	3240
MANGANESE	47
MERCURY	0.5
SODIUM	12500

INORGANIC CONTAMINANTS	35-MW22SD-02
ALUMINUM	444
BARIUM	71
CADMIUM	3
CALCIUM	674000
IRON	1530
MAGNESIUM	8520
MANGANESE	186
MERCURY	0.8
SODIUM	8150
ZINC	36

INORGANIC CONTAMINANTS	35-MW25SD-02
CALCIUM	107000
IRON	35000
MAGNESIUM	5040
MANGANESE	733
MERCURY	0.5
SODIUM	11100

INORGANIC CONTAMINANTS	35-EMW03D-03
CALCIUM	95000
MAGNESIUM	2210
MANGANESE	19
MERCURY	0.7
SODIUM	6710

INORGANIC CONTAMINANTS	35-MW16SD-02
ARSENIC	7
BARIUM	29
CALCIUM	113000
IRON	10300
MAGNESIUM	3750
MANGANESE	89
SODIUM	2570

INORGANIC CONTAMINANTS	35-MW19SD-02
ALUMINUM	572
BARIUM	23
CALCIUM	44400
IRON	254
LEAD	2
MAGNESIUM	2140
MANGANESE	157
MERCURY	1.6
SODIUM	13800

INORGANIC CONTAMINANTS	35-EMW7D-03
BARIUM	20
CALCIUM	93900
MAGNESIUM	3850
MANGANESE	19
MERCURY	0.6
SODIUM	6200
ZINC	6

INORGANIC CONTAMINANTS	35-MW33AWD-01
ALUMINUM	117
BARIUM	77
CALCIUM	10600
MAGNESIUM	4330
MANGANESE	25
MERCURY	2.2
SODIUM	7960
ZINC	10

FEDERAL MAXIMUM CONTAMINATION LEVELS AND NORTH CAROLINA WATER QUALITY STANDARDS CLASS GA STANDARDS

ORGANIC CONTAMINANTS	MCL	N.C. REGULATION
ALUMINUM (SECONDARY)	50	*
ANTIMONY	6	*
ARSENIC	50	50
BARIUM	2000	2000
BERYLLIUM	4	*
CADMIUM	5	5
CALCIUM	*	*
CHROMIUM	100	50
COBALT	*	*
COPPER (ACTION LEVEL)	1300	1000
IRON (SECONDARY)	300	300
LEAD (ACTION LEVERL)	15	15
MAGNESIUM	*	*
MANGANESE (SECONDARY)	50	50
MERCURY	2	1.1
NICKEL	100	100
POTASSIUM	*	*
SELENIUM	50	50
SILVER (SECONDARY)	100	18
SODIUM	*	*
THALLIUM	2	*
VANADIUM	*	*
ZINC (SECONDARY)	5000	2100

* NO STANDARD AVAILABLE.

NOTE: SECONDARY APPLIES TO MCL'S. SECONDARY STANDARDS ARE ASTHETIC IN NATURE.

NOTES:
- CONTAMINANTS, MCLs, AND N.C. REGULATIONS ARE IN MICROGRAMS PER LITER.
- CONTAMINANTS THAT EXCEED MCLs ARE COLORED BLUE.
- CONTAMINANTS THAT EXCEEED N.C. REGULATIONS ARE COLORED GREEN.
- CONTAMINANTS THAT EXCEED MCLs AND N.C. REGULATIONS ARE COLORED ORANGE.

LEGEND
- EMW-7 — MONITORING WELL INSTALLED UNDER CS (1995) BY ENE.
- EMW-3 — MONITORING WELL INSTALLED BY NUS (1988).
- MW-20 — MONITORING WELL INSTALLED UNDER CRA (1991) BY LAW.
- 35MW-29A — MONITORING WELL INSTALLED UNDER BAKER RI (1994).
- FENCE LINE
- 15 — CONTOUR LINES DEPICTING SURFICIAL RELIEF

DATE	OCT. 1994
SCALE	1"= 80'
DRAWN	WJH
REVIEWED	JSC
S.O.#	62470-232-0080-07000
CADD#	232903RI

NORTH

SITE 35, CAMP GEIGER AREA FUEL FARM RI/FS
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

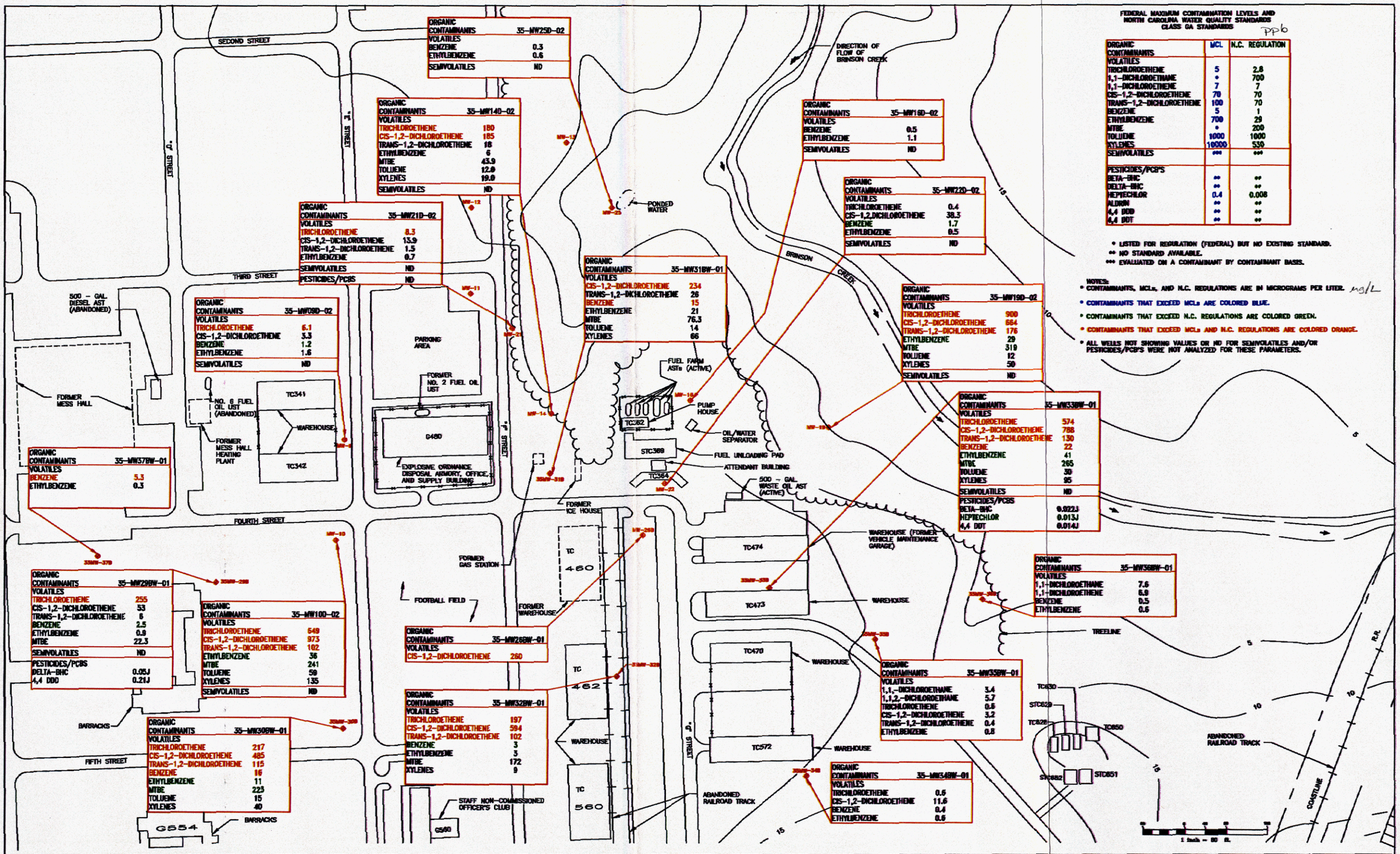
BAKER ENVIRONMENTAL, Inc.
Coraopolis, Pennsylvania

Baker
Baker Environmental, Inc.

DETECTED DISSOLVED INORGANICS IN UPPER PORTION OF SURFICIAL AQUIFER
CONTRACT TASK ORDER - 0232

SCALE 1"= 80' | DATE OCT. 1994

FIGURE No.
4-6



ORGANIC CONTAMINANTS	35-MW25D-02
VOLATILES	
BENZENE	0.3
ETHYLBENZENE	0.6
SEMIVOLATILES	ND

ORGANIC CONTAMINANTS	35-MW14D-02
VOLATILES	
TRICHLOROETHENE	180
CIS-1,2-DICHLOROETHENE	185
TRANS-1,2-DICHLOROETHENE	18
ETHYLBENZENE	6
MTBE	43.9
TOLUENE	12.0
XYLENES	19.0
SEMIVOLATILES	ND

ORGANIC CONTAMINANTS	35-MW21D-02
VOLATILES	
TRICHLOROETHENE	8.3
CIS-1,2-DICHLOROETHENE	13.9
TRANS-1,2-DICHLOROETHENE	1.5
ETHYLBENZENE	0.7
SEMIVOLATILES	ND
PESTICIDES/PCBS	ND

ORGANIC CONTAMINANTS	35-MW09D-02
VOLATILES	
TRICHLOROETHENE	6.1
CIS-1,2-DICHLOROETHENE	3.3
BENZENE	1.2
ETHYLBENZENE	1.6
SEMIVOLATILES	ND

ORGANIC CONTAMINANTS	35-MW37BW-01
VOLATILES	
BENZENE	5.3
ETHYLBENZENE	0.3

ORGANIC CONTAMINANTS	35-MW29BW-01
VOLATILES	
TRICHLOROETHENE	255
CIS-1,2-DICHLOROETHENE	53
TRANS-1,2-DICHLOROETHENE	6
BENZENE	2.5
ETHYLBENZENE	0.9
MTBE	22.3
SEMIVOLATILES	ND
PESTICIDES/PCBS	
DELTA-BHC	0.05J
4,4 DDD	0.21J

ORGANIC CONTAMINANTS	35-MW100-02
VOLATILES	
TRICHLOROETHENE	649
CIS-1,2-DICHLOROETHENE	973
TRANS-1,2-DICHLOROETHENE	102
ETHYLBENZENE	36
MTBE	241
TOLUENE	59
XYLENES	135
SEMIVOLATILES	ND

ORGANIC CONTAMINANTS	35-MW30BW-01
VOLATILES	
TRICHLOROETHENE	217
CIS-1,2-DICHLOROETHENE	485
TRANS-1,2-DICHLOROETHENE	115
BENZENE	16
ETHYLBENZENE	11
MTBE	223
TOLUENE	15
XYLENES	40

ORGANIC CONTAMINANTS	35-MW26BW-01
VOLATILES	
CIS-1,2-DICHLOROETHENE	260

ORGANIC CONTAMINANTS	35-MW32BW-01
VOLATILES	
TRICHLOROETHENE	197
CIS-1,2-DICHLOROETHENE	594
TRANS-1,2-DICHLOROETHENE	102
BENZENE	3
ETHYLBENZENE	3
MTBE	172
XYLENES	9

ORGANIC CONTAMINANTS	35-MW31BW-01
VOLATILES	
CIS-1,2-DICHLOROETHENE	234
TRANS-1,2-DICHLOROETHENE	26
BENZENE	15
ETHYLBENZENE	21
MTBE	76.3
TOLUENE	14
XYLENES	66

ORGANIC CONTAMINANTS	35-MW16D-02
VOLATILES	
BENZENE	0.5
ETHYLBENZENE	1.1
SEMIVOLATILES	ND

ORGANIC CONTAMINANTS	35-MW22D-02
VOLATILES	
TRICHLOROETHENE	0.4
CIS-1,2,DICHLOROETHENE	38.3
BENZENE	1.7
ETHYLBENZENE	0.5
SEMIVOLATILES	ND

ORGANIC CONTAMINANTS	35-MW19D-02
VOLATILES	
TRICHLOROETHENE	900
CIS-1,2-DICHLOROETHENE	664
TRANS-1,2-DICHLOROETHENE	176
ETHYLBENZENE	29
MTBE	319
TOLUENE	12
XYLENES	50
SEMIVOLATILES	ND

ORGANIC CONTAMINANTS	35-MW33BW-01
VOLATILES	
TRICHLOROETHENE	574
CIS-1,2-DICHLOROETHENE	788
TRANS-1,2-DICHLOROETHENE	130
BENZENE	22
ETHYLBENZENE	41
MTBE	265
TOLUENE	30
XYLENES	95
SEMIVOLATILES	ND
PESTICIDES/PCBS	
BETA-BHC	0.022J
HEPTECHLOR	0.013J
4,4 DDT	0.014J

ORGANIC CONTAMINANTS	35-MW36BW-01
VOLATILES	
1,1-DICHLOROETHANE	7.6
1,1-DICHLOROETHENE	6.9
BENZENE	0.5
ETHYLBENZENE	0.6

ORGANIC CONTAMINANTS	35-MW35BW-01
VOLATILES	
1,1,-DICHLOROETHANE	3.4
1,1,2,-DICHLOROETHANE	5.7
TRICHLOROETHENE	0.6
CIS-1,2-DICHLOROETHENE	3.2
TRANS-1,2-DICHLOROETHENE	0.4
ETHYLBENZENE	0.8

ORGANIC CONTAMINANTS	35-MW34BW-01
VOLATILES	
TRICHLOROETHENE	0.6
CIS-1,2-DICHLOROETHENE	11.6
BENZENE	0.4
ETHYLBENZENE	0.6

FEDERAL MAXIMUM CONTAMINATION LEVELS AND NORTH CAROLINA WATER QUALITY STANDARDS CLASS GA STANDARDS

ppb

ORGANIC CONTAMINANTS	MCL	N.C. REGULATION
VOLATILES		
TRICHLOROETHENE	5	2.8
1,1-DICHLOROETHANE	*	700
1,1-DICHLOROETHENE	7	7
CIS-1,2-DICHLOROETHENE	70	70
TRANS-1,2-DICHLOROETHENE	100	70
BENZENE	5	1
ETHYLBENZENE	700	29
MTBE	*	200
TOLUENE	1000	1000
XYLENES	10000	530
SEMIVOLATILES	***	***
PESTICIDES/PCBS		
BETA-BHC	**	**
DELTA-BHC	**	**
HEPTECHLOR	0.4	0.008
ALDRIN	**	**
4,4 DDD	**	**
4,4 DDT	**	**

* LISTED FOR REGULATION (FEDERAL) BUT NO EXISTING STANDARD.
** NO STANDARD AVAILABLE.
*** EVALUATED ON A CONTAMINANT BY CONTAMINANT BASIS.

NOTES:
- CONTAMINANTS, MCLs, AND N.C. REGULATIONS ARE IN MICROGRAMS PER LITER. mg/L
- CONTAMINANTS THAT EXCEED MCLs ARE COLORED BLUE.
- CONTAMINANTS THAT EXCEED N.C. REGULATIONS ARE COLORED GREEN.
- CONTAMINANTS THAT EXCEED MCLs AND N.C. REGULATIONS ARE COLORED ORANGE.
- ALL WELLS NOT SHOWING VALUES OR ND FOR SEMIVOLATILES AND/OR PESTICIDES/PCBS WERE NOT ANALYZED FOR THESE PARAMETERS.

LEGEND
- MONITORING WELL INSTALLED UNDER BAKER RI (1994).
- MONITORING WELL INSTALLED UNDER CSA (1991) BY LAW.
- FENCE LINE
- CONTOUR LINES DEPICTING SURFICIAL RELIEF

DATE	OCT. 1994
SCALE	1"= 80'
DRAWN	WJH
REVIEWED	JSC
S.O.#	62470-232-0000-07000
CADD#	232904RI

NORTH

SITE 35, CAMP GEIGER AREA FUEL FARM RI/FS
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

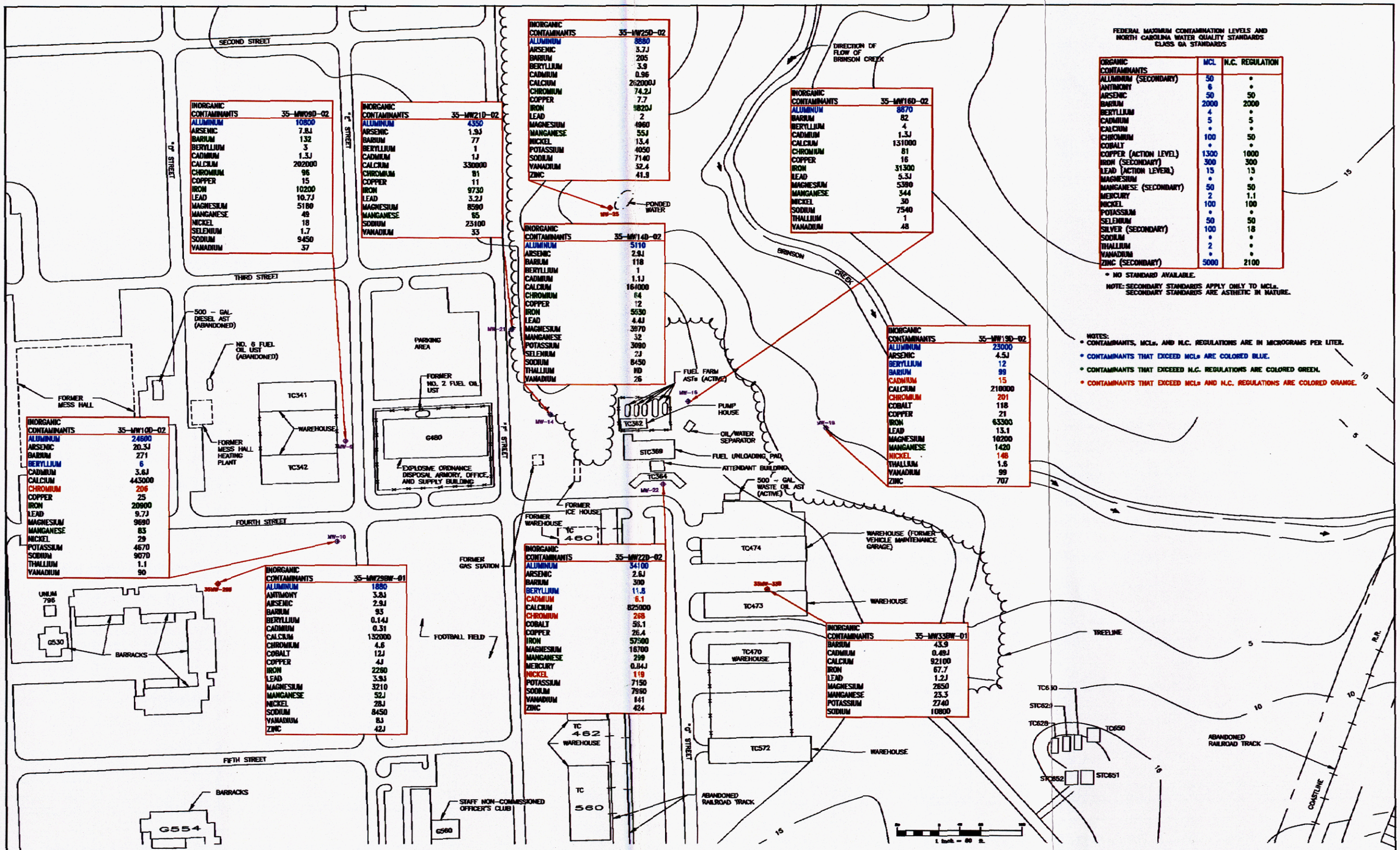
BAKER ENVIRONMENTAL, Inc.
Coraopolis, Pennsylvania

Baker
Baker Environmental, Inc.

DETECTED ORGANICS IN LOWER PORTION OF SURFICIAL AQUIFER
CONTRACT TASK ORDER - 0232

SCALE 1"= 80' DATE OCT. 1994

FIGURE No. 4-7



INORGANIC CONTAMINANTS	35-MW09D-02
ALUMINUM	10800
ARSENIC	7.8J
BARIUM	132
BERYLLIUM	3
CADMIUM	1.3J
CALCIUM	202000
CHROMIUM	96
COPPER	15
IRON	10200
LEAD	10.7J
MAGNESIUM	5180
MANGANESE	49
NICKEL	18
SELENIUM	1.7
SODIUM	9450
VANADIUM	37

INORGANIC CONTAMINANTS	35-MW21D-02
ALUMINUM	4350
ARSENIC	1.9J
BARIUM	77
BERYLLIUM	1
CADMIUM	1J
CALCIUM	330000
CHROMIUM	81
COPPER	11
IRON	9730
LEAD	3.2J
MAGNESIUM	8590
MANGANESE	65
SODIUM	23100
VANADIUM	33

INORGANIC CONTAMINANTS	35-MW25D-02
ALUMINUM	8880
ARSENIC	3.7J
BARIUM	205
BERYLLIUM	3.9
CADMIUM	0.96
CALCIUM	262000J
CHROMIUM	74.2J
COPPER	7.7
IRON	9820J
LEAD	2
MAGNESIUM	4960
MANGANESE	55J
NICKEL	13.4
POTASSIUM	4050
SODIUM	7140
VANADIUM	32.4
ZINC	41.9

INORGANIC CONTAMINANTS	35-MW16D-02
ALUMINUM	8870
BARIUM	82
BERYLLIUM	4
CADMIUM	1.3J
CALCIUM	131000
CHROMIUM	81
COPPER	16
IRON	31300
LEAD	5.3J
MAGNESIUM	5390
MANGANESE	344
NICKEL	30
SODIUM	7540
THALLIUM	1
VANADIUM	48

INORGANIC CONTAMINANTS	35-MW14D-02
ALUMINUM	5110
ARSENIC	2.9J
BARIUM	118
BERYLLIUM	1
CADMIUM	1.1J
CALCIUM	164000
CHROMIUM	64
COPPER	12
IRON	5630
LEAD	4.4J
MAGNESIUM	3870
MANGANESE	32
POTASSIUM	3090
SELENIUM	2J
SODIUM	8450
THALLIUM	ND
VANADIUM	26

INORGANIC CONTAMINANTS	35-MW19D-02
ALUMINUM	23000
ARSENIC	4.5J
BERYLLIUM	12
BARIUM	99
CADMIUM	15
CALCIUM	210000
CHROMIUM	201
COBALT	118
COPPER	21
IRON	63300
LEAD	13.1
MAGNESIUM	10200
MANGANESE	1420
NICKEL	148
THALLIUM	1.6
VANADIUM	99
ZINC	707

INORGANIC CONTAMINANTS	35-MW10D-02
ALUMINUM	24600
ARSENIC	20.3J
BARIUM	271
BERYLLIUM	6
CADMIUM	3.6J
CALCIUM	443000
CHROMIUM	206
COPPER	25
IRON	20900
LEAD	9.7J
MAGNESIUM	9690
MANGANESE	83
NICKEL	29
POTASSIUM	4670
SODIUM	9070
THALLIUM	1.1
VANADIUM	90

INORGANIC CONTAMINANTS	35-MW29BW-01
ALUMINUM	1880
ANTIMONY	3.8J
ARSENIC	2.9J
BARIUM	93
BERYLLIUM	0.14J
CADMIUM	0.31
CALCIUM	132000
CHROMIUM	4.6
COBALT	12J
COPPER	4J
IRON	2260
LEAD	3.9J
MAGNESIUM	3210
MANGANESE	52J
NICKEL	28J
SODIUM	8450
VANADIUM	8J
ZINC	42J

INORGANIC CONTAMINANTS	35-MW22D-02
ALUMINUM	34100
ARSENIC	2.6J
BARIUM	300
BERYLLIUM	11.8
CADMIUM	6.1
CALCIUM	825000
CHROMIUM	268
COBALT	56.1
COPPER	26.4
IRON	57500
MAGNESIUM	16700
MANGANESE	299
MERCURY	0.84J
NICKEL	119
POTASSIUM	7150
SODIUM	7950
VANADIUM	141
ZINC	424

INORGANIC CONTAMINANTS	35-MW33BW-01
BARIUM	43.9
CADMIUM	0.49J
CALCIUM	92100
IRON	67.7
LEAD	1.2J
MAGNESIUM	2650
MANGANESE	23.3
POTASSIUM	2740
SODIUM	10800

FEDERAL MAXIMUM CONTAMINATION LEVELS AND NORTH CAROLINA WATER QUALITY STANDARDS CLASS GA STANDARDS

ORGANIC CONTAMINANTS	MCL	N.C. REGULATION
ALUMINUM (SECONDARY)	50	*
ANTIMONY	6	*
ARSENIC	50	50
BARIUM	2000	2000
BERYLLIUM	4	*
CADMIUM	5	5
CALCIUM	*	*
CHROMIUM	100	50
COBALT	*	*
COPPER (ACTION LEVEL)	1300	1000
IRON (SECONDARY)	300	300
LEAD (ACTION LEVEL)	15	15
MAGNESIUM	*	*
MANGANESE (SECONDARY)	50	50
MERCURY	2	1.1
NICKEL	100	100
POTASSIUM	*	*
SELENIUM	50	50
SILVER (SECONDARY)	100	18
SODIUM	*	*
THALLIUM	2	*
VANADIUM	*	*
ZINC (SECONDARY)	5000	2100

* NO STANDARD AVAILABLE.

NOTE: SECONDARY STANDARDS APPLY ONLY TO MCLs. SECONDARY STANDARDS ARE ASTHETIC IN NATURE.

NOTES:
- CONTAMINANTS, MCLs, AND N.C. REGULATIONS ARE IN MICROGRAMS PER LITER.
- CONTAMINANTS THAT EXCEED MCLs ARE COLORED BLUE.
- CONTAMINANTS THAT EXCEED N.C. REGULATIONS ARE COLORED GREEN.
- CONTAMINANTS THAT EXCEED MCLs AND N.C. REGULATIONS ARE COLORED ORANGE.

LEGEND
- FENCE LINE
- 15 — CONTOUR LINES DEPICTING SURFICIAL RELIEF
- 35MW-29B — MONITORING WELL INSTALLED UNDER BAKER RI (1994).
- MW-15 — MONITORING WELL INSTALLED UNDER CSA (1991) BY LAW.

DATE	MAY 1995
SCALE	1"= 80'
DRAWN	WJH
REVIEWED	JSC
S.O.#	62470-232-0000-07000
CADD#	232905RI

NORTH

SITE 35, CAMP GEIGER AREA FUEL FARM RI/FS
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

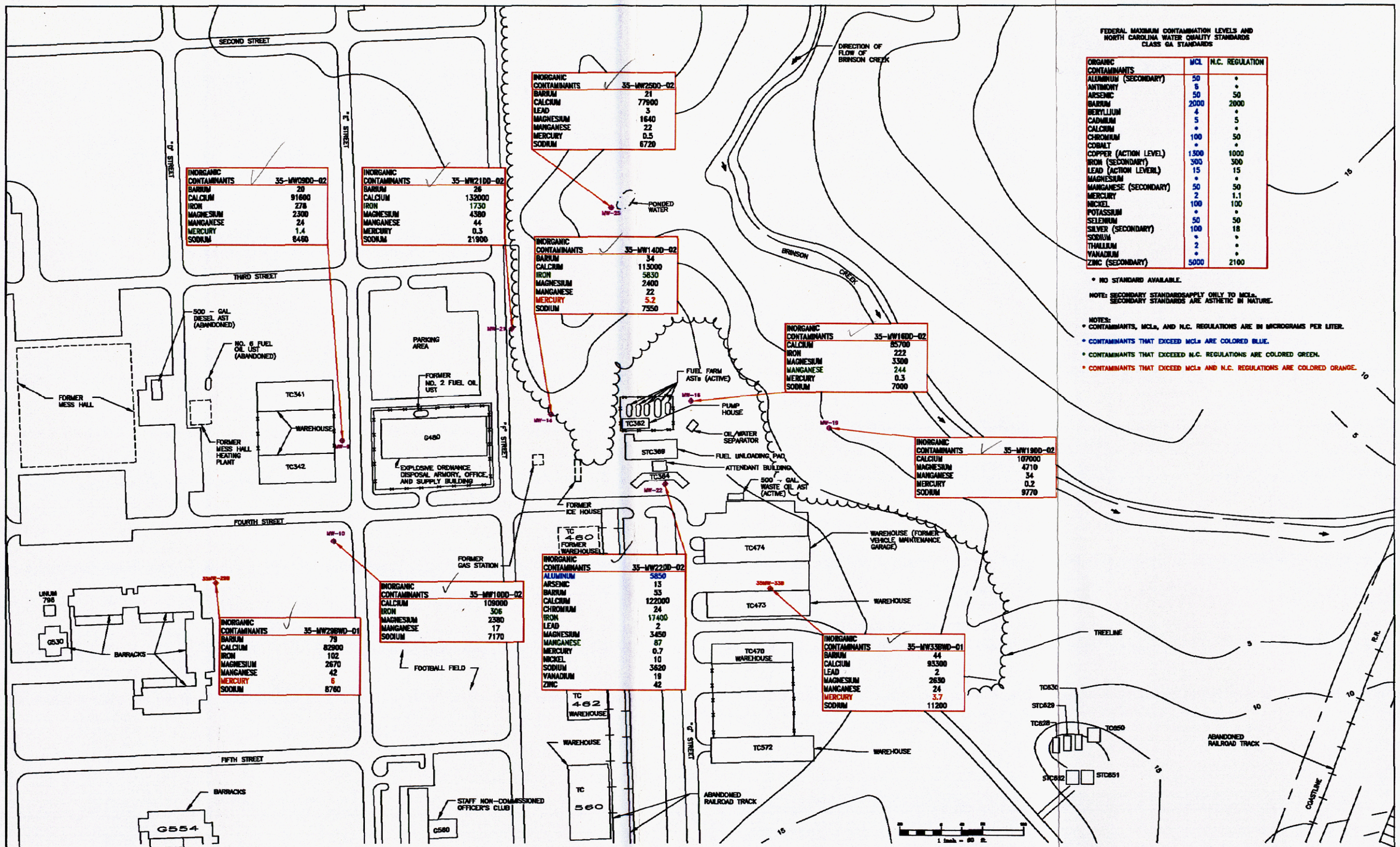
BAKER ENVIRONMENTAL, Inc.
Coraopolis, Pennsylvania

Baker
Baker Environmental, Inc.

DETECTED TOTAL INORGANICS IN LOWER PORTION OF SURFICIAL AQUIFER
CONTRACT TASK ORDER - 0232

SCALE 1"= 80' DATE MAY 1995

FIGURE No. 4-8



INORGANIC CONTAMINANTS	35-MW25DD-02
BARIUM	21
CALCIUM	77900
LEAD	3
MAGNESIUM	1640
MANGANESE	22
MERCURY	0.5
SODIUM	6720

INORGANIC CONTAMINANTS	35-MW09DD-02
BARIUM	20
CALCIUM	91600
IRON	278
MAGNESIUM	2300
MANGANESE	24
MERCURY	1.4
SODIUM	6460

INORGANIC CONTAMINANTS	35-MW21DD-02
BARIUM	26
CALCIUM	132000
IRON	1730
MAGNESIUM	4380
MANGANESE	44
MERCURY	0.3
SODIUM	21900

INORGANIC CONTAMINANTS	35-MW14DD-02
BARIUM	34
CALCIUM	113000
IRON	5830
MAGNESIUM	2400
MANGANESE	22
MERCURY	5.2
SODIUM	7550

INORGANIC CONTAMINANTS	35-MW16DD-02
CALCIUM	85700
IRON	222
MAGNESIUM	3300
MANGANESE	244
MERCURY	0.3
SODIUM	7000

INORGANIC CONTAMINANTS	35-MW19DD-02
CALCIUM	107000
MAGNESIUM	4710
MANGANESE	34
MERCURY	0.2
SODIUM	9770

INORGANIC CONTAMINANTS	35-MW22DD-02
ALUMINUM	5850
ARSENIC	13
BARIUM	53
CALCIUM	122000
CHROMIUM	24
IRON	17400
LEAD	2
MAGNESIUM	3450
MANGANESE	87
MERCURY	0.7
NICKEL	10
SODIUM	3620
VANADIUM	19
ZINC	42

INORGANIC CONTAMINANTS	35-MW10DD-02
CALCIUM	109000
IRON	306
MAGNESIUM	2380
MANGANESE	17
SODIUM	7170

INORGANIC CONTAMINANTS	35-MW29BWD-01
BARIUM	79
CALCIUM	82900
IRON	102
MAGNESIUM	2670
MANGANESE	42
MERCURY	6
SODIUM	8760

INORGANIC CONTAMINANTS	35-MW33BWD-01
BARIUM	44
CALCIUM	93300
LEAD	2
MAGNESIUM	2630
MANGANESE	24
MERCURY	3.7
SODIUM	11200

FEDERAL MAXIMUM CONTAMINATION LEVELS AND NORTH CAROLINA WATER QUALITY STANDARDS CLASS GA STANDARDS

ORGANIC CONTAMINANTS	MCL	N.C. REGULATION
ALUMINUM (SECONDARY)	50	*
ANTIMONY	6	*
ARSENIC	50	50
BARIUM	2000	2000
BERYLLIUM	4	*
CADMIUM	5	5
CALCIUM	*	*
CHROMIUM	100	50
COBALT	*	*
COPPER (ACTION LEVEL)	1300	1000
IRON (SECONDARY)	300	300
LEAD (ACTION LEVERL)	15	15
MAGNESIUM	*	*
MANGANESE (SECONDARY)	50	50
MERCURY	2	1.1
NICKEL	100	100
POTASSIUM	*	*
SELENIUM	50	50
SILVER (SECONDARY)	100	18
SODIUM	*	*
THALLIUM	2	*
VANADIUM	*	*
ZINC (SECONDARY)	5000	2100

* NO STANDARD AVAILABLE.

NOTE: SECONDARY STANDARDSAPPLY ONLY TO MCLs. SECONDARY STANDARDS ARE ASTHETIC IN NATURE.

NOTES:
- CONTAMINANTS, MCLs, AND N.C. REGULATIONS ARE IN MICROGRAMS PER LITER.
- CONTAMINANTS THAT EXCEED MCLs ARE COLORED BLUE.
- CONTAMINANTS THAT EXCEEED N.C. REGULATIONS ARE COLORED GREEN.
- CONTAMINANTS THAT EXCEED MCLs AND N.C. REGULATIONS ARE COLORED ORANGE.

LEGEND
- FENCE LINE
- 15 CONTOUR LINES DEPICTING SURFICIAL RELIEF
- MW-16 MONITORING WELL INSTALLED UNDER CSA (1991) BY LAW.
- 35MW-298 MONITORING WELL INSTALLED UNDER BAKER III (1994).

DATE	OCT. 1994
SCALE	1" = 80'
DRAWN	WJH
REVIEWED	JSC
S.O.#	62470-232-0000-07000
CADD#	232906RI

NORTH

SITE 35, CAMP GEIGER AREA FUEL FARM RI/FS
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

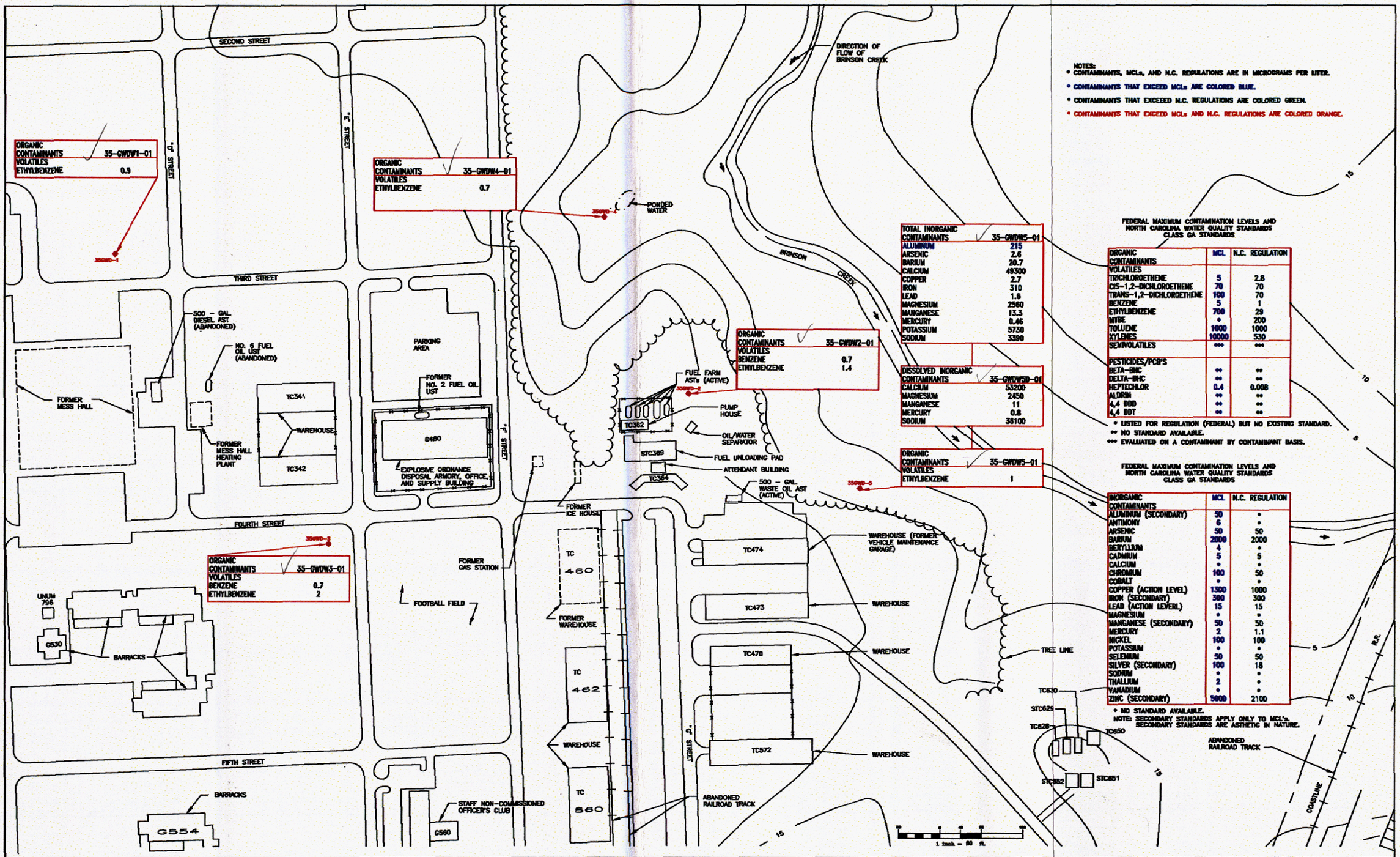
BAKER ENVIRONMENTAL, Inc.
Coraopolis, Pennsylvania

Baker
Baker Environmental, Inc.

DETECTED DISSOLVED INORGANICS IN THE LOWER PORTION OF THE SURFICIAL AQUIFER
CONTRACT TASK ORDER - 0232

SCALE 1" = 80' DATE OCT. 1994

FIGURE No. 4-9



NOTES:
- CONTAMINANTS, MCLs, AND N.C. REGULATIONS ARE IN MICROGRAMS PER LITER.
- CONTAMINANTS THAT EXCEED MCLs ARE COLORED BLUE.
- CONTAMINANTS THAT EXCEEED N.C. REGULATIONS ARE COLORED GREEN.
- CONTAMINANTS THAT EXCEED MCLs AND N.C. REGULATIONS ARE COLORED ORANGE.

FEDERAL MAXIMUM CONTAMINATION LEVELS AND NORTH CAROLINA WATER QUALITY STANDARDS CLASS GA STANDARDS

ORGANIC CONTAMINANTS	MCL	N.C. REGULATION
VOLATILES		
TRICHLOROETHENE	5	2.8
CIS-1,2-DICHLOROETHENE	70	70
TRANS-1,2-DICHLOROETHENE	100	70
BENZENE	5	1
ETHYLBENZENE	700	29
MTBE	*	200
TOLUENE	1000	1000
XYLENES	10000	530
SEMIVOLATILES	***	***
PESTICIDES/PCB'S		
BETA-BHC	**	**
DELTA-BHC	**	**
HEPTECHLOR	0.4	0.008
ALDRIN	**	**
4,4 DDD	**	**
4,4 DDT	**	**

* LISTED FOR REGULATION (FEDERAL) BUT NO EXISTING STANDARD.
** NO STANDARD AVAILABLE.
*** EVALUATED ON A CONTAMINANT BY CONTAMINANT BASIS.

FEDERAL MAXIMUM CONTAMINATION LEVELS AND NORTH CAROLINA WATER QUALITY STANDARDS CLASS GA STANDARDS

INORGANIC CONTAMINANTS	MCL	N.C. REGULATION
ALUMINUM (SECONDARY)	50	*
ANTIMONY	6	*
ARSENIC	50	50
BARIUM	2000	2000
BERYLLIUM	4	*
CADMIUM	5	5
CALCIUM	*	*
CHROMIUM	100	50
COBALT	*	*
COPPER (ACTION LEVEL)	1300	1000
IRON (SECONDARY)	300	300
LEAD (ACTION LEVERL)	15	15
MAGNESIUM	*	*
MANGANESE (SECONDARY)	50	50
MERCURY	2	1.1
NICKEL	100	100
POTASSIUM	*	*
SELENIUM	50	50
SILVER (SECONDARY)	100	18
SODIUM	*	*
THALLIUM	2	*
VANADIUM	*	*
ZINC (SECONDARY)	5000	2100

* NO STANDARD AVAILABLE.
NOTE: SECONDARY STANDARDS APPLY ONLY TO MCL's. SECONDARY STANDARDS ARE ASTHETIC IN NATURE.

LEGEND
- FENCE LINE
- 15 — CONTOUR LINES DEPICTING SURFICIAL RELIEF
- 35GWD-3 — MONITORING WELL INSTALLED UNDER BAKER RI (1994).

DATE	OCT. 1994
SCALE	1"= 80'
DRAWN	WJH
REVIEWED	JSC
S.O.#	62470-232-0000-07000
CADD#	232901RI

NORTH

SITE 35, CAMP GEIGER AREA FUEL FARM RI/FS
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

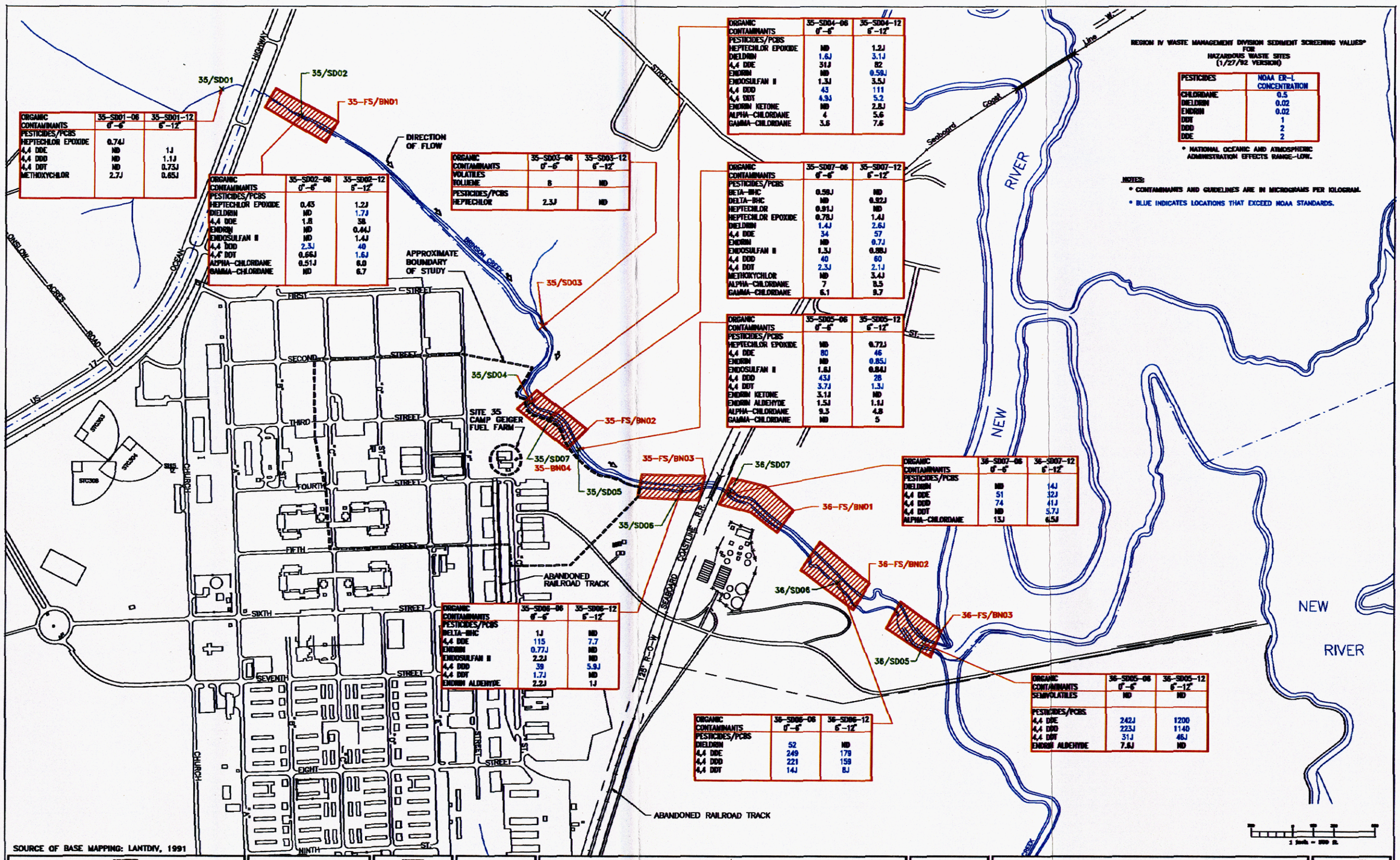
BAKER ENVIRONMENTAL, Inc.
Coraopolis, Pennsylvania

Baker
Baker Environmental, Inc.

DETECTED ORGANICS AND TOTAL DISSOLVED INORGANICS IN UPPER PORTION OF CASTLE HAYNE AQUIFER
CONTRACT TASK ORDER - 0232

SCALE 1"= 80' DATE OCT. 1994

FIGURE No. 4-10



ORGANIC CONTAMINANTS	35-SD01-06 0'-6"	35-SD01-12 6'-12"
PESTICIDES/PCBS		
HEPTECHLOR EPOXIDE	0.74J	
4,4 DDE	ND	1J
4,4 DDD	ND	1.1J
4,4 DDT	ND	0.73J
METHOXYCHLOR	2.7J	0.65J

ORGANIC CONTAMINANTS	35-SD02-06 0'-6"	35-SD02-12 6'-12"
PESTICIDES/PCBS		
HEPTECHLOR EPOXIDE	0.43	1.2J
DIELDRIN	ND	1.7J
4,4 DDE	1.8	38
ENDRIN	ND	0.44J
ENDOSULFAN II	ND	1.4J
4,4 DDD	2.3J	40
4,4' DDT	0.66J	1.6J
ALPHA-CHLORDANE	0.51J	6.0
GAMMA-CHLORDANE	ND	6.7

ORGANIC CONTAMINANTS	35-SD03-06 0'-6"	35-SD03-12 6'-12"
VOLATILES		
TOLUENE	8	ND
PESTICIDES/PCBS		
HEPTECHLOR	2.3J	ND

ORGANIC CONTAMINANTS	35-SD04-06 0'-6"	35-SD04-12 6'-12"
PESTICIDES/PCBS		
HEPTECHLOR EPOXIDE	ND	1.2J
DIELDRIN	1.6J	3.1J
4,4 DDE	31J	82
ENDRIN	ND	0.58J
ENDOSULFAN II	1.3J	3.5J
4,4 DDD	43	111
4,4 DDT	4.9J	5.2
ENDRIN KETONE	ND	2.8J
ALPHA-CHLORDANE	4	5.6
GAMMA-CHLORDANE	3.6	7.6

ORGANIC CONTAMINANTS	35-SD07-06 0'-6"	35-SD07-12 6'-12"
PESTICIDES/PCBS		
BETA-BHC	0.58J	ND
DELTA-BHC	ND	0.92J
HEPTECHLOR	0.91J	ND
HEPTECHLOR EPOXIDE	0.78J	1.4J
DIELDRIN	1.4J	2.6J
4,4 DDE	34	57
ENDRIN	ND	0.7J
ENDOSULFAN II	1.3J	0.88J
4,4 DDD	40	60
4,4 DDT	2.3J	2.1J
METHOXYCHLOR	ND	3.4J
ALPHA-CHLORDANE	7	8.3
GAMMA-CHLORDANE	6.1	9.7

ORGANIC CONTAMINANTS	35-SD05-06 0'-6"	35-SD05-12 6'-12"
PESTICIDES/PCBS		
HEPTECHLOR EPOXIDE	ND	0.72J
4,4 DDE	80	46
ENDRIN	ND	0.85J
ENDOSULFAN II	1.6J	0.84J
4,4 DDD	43J	28
4,4 DDT	3.7J	1.3J
ENDRIN KETONE	3.1J	ND
ENDRIN ALDEHYDE	1.5J	1.1J
ALPHA-CHLORDANE	9.3	4.8
GAMMA-CHLORDANE	ND	5

ORGANIC CONTAMINANTS	35-SD06-06 0'-6"	35-SD06-12 6'-12"
PESTICIDES/PCBS		
DELTA-BHC	1J	ND
4,4 DDE	115	7.7
ENDRIN	0.77J	ND
ENDOSULFAN II	2.2J	ND
4,4 DDD	39	5.9J
4,4 DDT	1.7J	ND
ENDRIN ALDEHYDE	2.2J	1J

ORGANIC CONTAMINANTS	36-SD07-06 0'-6"	36-SD07-12 6'-12"
PESTICIDES/PCBS		
DIELDRIN	ND	14J
4,4 DDE	51	32J
4,4 DDD	74	41J
4,4 DDT	ND	5.7J
ALPHA-CHLORDANE	13J	6.5J

ORGANIC CONTAMINANTS	36-SD05-06 0'-6"	36-SD05-12 6'-12"
SEMIVOLATILES	ND	ND
PESTICIDES/PCBS		
4,4 DDE	242J	1200
4,4 DDD	223J	1140
4,4 DDT	31J	46J
ENDRIN ALDEHYDE	7.6J	ND

ORGANIC CONTAMINANTS	36-SD06-06 0'-6"	36-SD06-12 6'-12"
PESTICIDES/PCBS		
DIELDRIN	52	ND
4,4 DDE	249	179
4,4 DDD	221	158
4,4 DDT	14J	8J

REGION IV WASTE MANAGEMENT DIVISION SEDIMENT SCREENING VALUES* FOR HAZARDOUS WASTE SITES (1/27/92 VERSION)

PESTICIDES	NOAA ER-L CONCENTRATION
CHLORDANE	0.5
DIELDRIN	0.02
ENDRIN	0.02
DDT	1
DDD	2
DDE	2

* NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION EFFECTS RANGE-LOW.

NOTES:

- CONTAMINANTS AND GUIDELINES ARE IN MICROGRAMS PER KILOGRAM.
- BLUE INDICATES LOCATIONS THAT EXCEED NOAA STANDARDS.

SOURCE OF BASE MAPPING: LANTDIV, 1991

LEGEND

36/SD01 × – LOCATION OF SEDIMENT COLLECTION POINT

36-FS/BN02 – SAMPLE ZONE FOR FISH AND BENTHIC SAMPLES

DATE	OCT. 1994
SCALE	1" = 300'
DRAWN	WJH
REVIEWED	JSC
S.O.#	62470-232-0000-07000
CADD#	232911R1

NORTH

SITE 35, CAMP GEIGER AREA FUEL FARM RI/FS
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

BAKER ENVIRONMENTAL, Inc.
Coraopolis, Pennsylvania

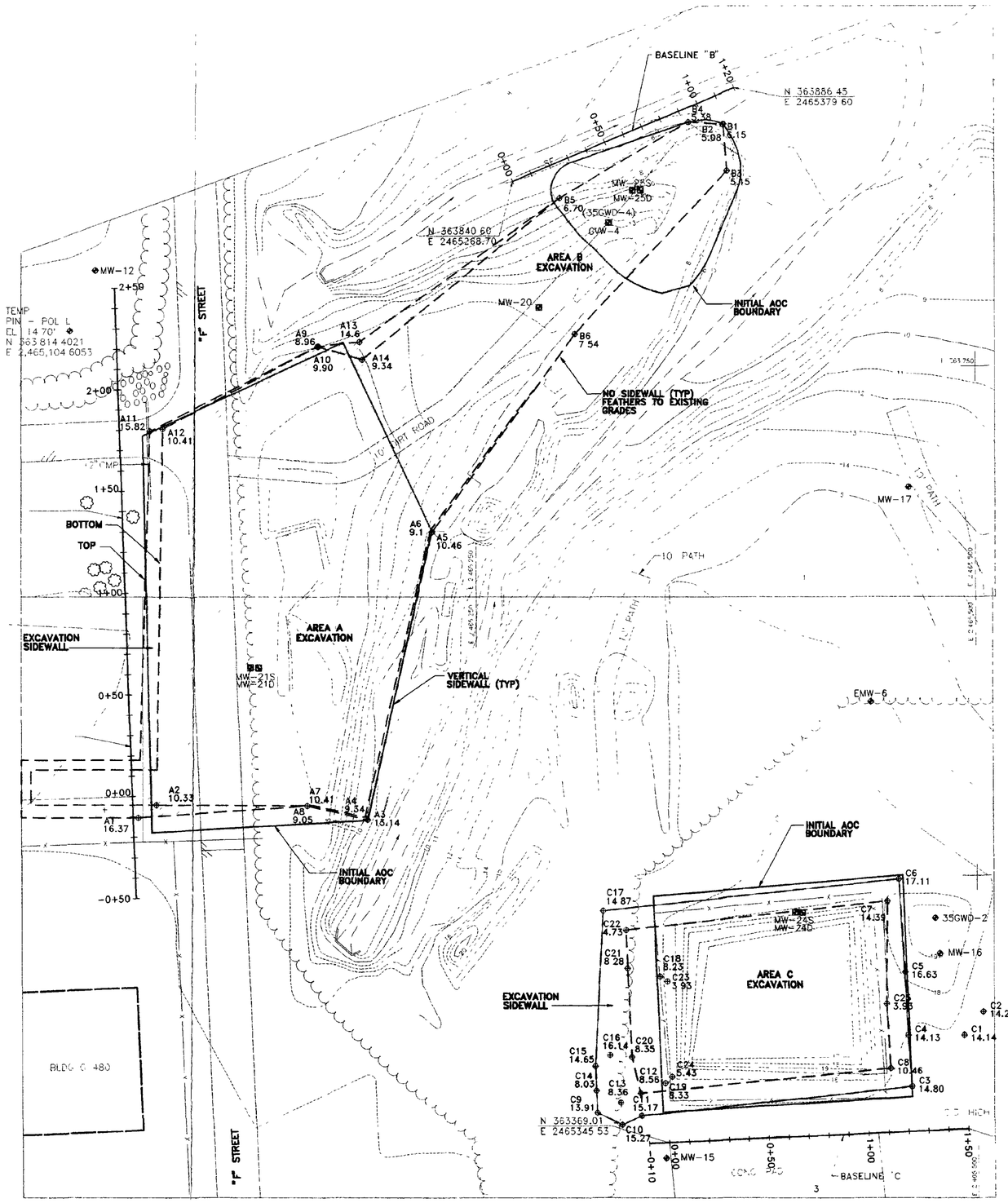
Baker
Baker Environmental, Inc.

DETECTED ORGANICS IN SEDIMENT
CONTRACT TASK ORDER – 0232

SCALE 1" = 300' DATE OCT. 1994

SHEET NO. 4-11

OHM (1997)



LEGEND

A1 28.38	SURVEYED POINT SHOWING ORIGINAL GROUND SURFACE AND/OR CUT ELEVATIONS
	INITIAL AOC BOUNDARY AS DEFINED BY ENGINEER
	ORIGINAL TOPOGRAPHIC SURVEY
	LIMITS OF SOIL EXCAVATION
MW-17	MONITORING WELL
MW-20	ABANDONED MONITORING WELL

AREAS A AND B			
POINT NUMBER	STATION	OFFSET	ELEV
A1	-0+10 5	3 0 R	16 37
A2	-0+04 5	10 5 R	10 33
A3	-0+15 5	115 6 R	13 14
A4	-0+15	115 0 R	9 34
A5	1+23 3	155 7 R	10 46
A6	1+23 3	155 5 R	9 1
A7	-0+7 5	85 3 R	10 41
A8	-0+7 5	85 8 R	9 05
A9	2+17 8	91 0 R	8 96
A10	2+17 8	91 6 R	9 90
A11	1+79	17 4 R	15 82
A12	1+79 8	23 8 R	10 41
A13	2+19 31	112 0 R	14 6
A14	2+10 5	113 4 R	9 34
B1	1+08 14	14 3 R	6 15
B2	1+08 0	14 3 R	5 08
B3	1+01 0	36 3 R	5 15
B4	0+92 5	6 70 R	5 38
B5	0+18 5	16 5 R	6 7
B6	0+00	81 0 R	7 5

AREA C			
POINT NUMBER	STATION	OFFSET	ELEV
C1	1+50	46 L	14 14
C2	1+60	57 L	14 26
C3	1+22 73	22 L	14 80
C4	1+22	47 25 L	14 13
C5	1+22	78 2 L	16 63
C6	1+21	124 L	17 11
C7	1+14 7	113 5 L	14 39
C8	1+12 48	31 3 L	10 46
C9	-0+35	16 L	13 91
C10	-0+23	9 6 L	15 27
C11	-0+13	13 6 L	15 17
C12	-0+13	24 73 L	8 56
C13	-0+23	20 5 L	8 36
C14	-0+35	27 L	8 03
C15	-0+35	39 L	14 65
C16	-0+27 5	44 15 L	16 14
C17	-0+27 5	115 L	14 87
C18	-0+ 5	81 5 L	8 23
C19	-0+ 5	29 L	8 33
C20	-0+16 5	42 6 L	8 35
C21	-0+16 5	86 2 L	8 28
C22	-0+16 5	105 L	4 73
C23	0+3	79 L	3 93
C24	0+3	32 L	5 43
C25	1+12	63 L	3 93

SCALE 1"=30'

D:\OHM\LANTDIV\LEJEUNE\16487\RECORD\FIG2-1 DWG

OHM Remediation Services Corp.
Norcross, Georgia
A Subsidiary of OHM Corporation

SUBMITTED _____ PROJECT MANAGER DATE _____
APPROVED _____ SR PROJECT ENGINEER DATE _____
APPROVED _____ DEPT MANAGER DATE _____

AT FULL SCALE (IF NOT 2"-SCALE ACCORDINGLY)
CADD FILE FIGA-A DWG
DRAWN J LANGE
DESIGNED —
CHECKED G GILLES
CHECKED J DUNN

REVISIONS

ZONE	REV	DESCRIPTION	BY	DATE	APP
	1	ISSUE FOR REVIEW & APPROVAL	OHM	3\1\95	
	2	AS BUILT	OHM	2\21\96	
	3	RECORD DRAWING	OHM	6\20\96	

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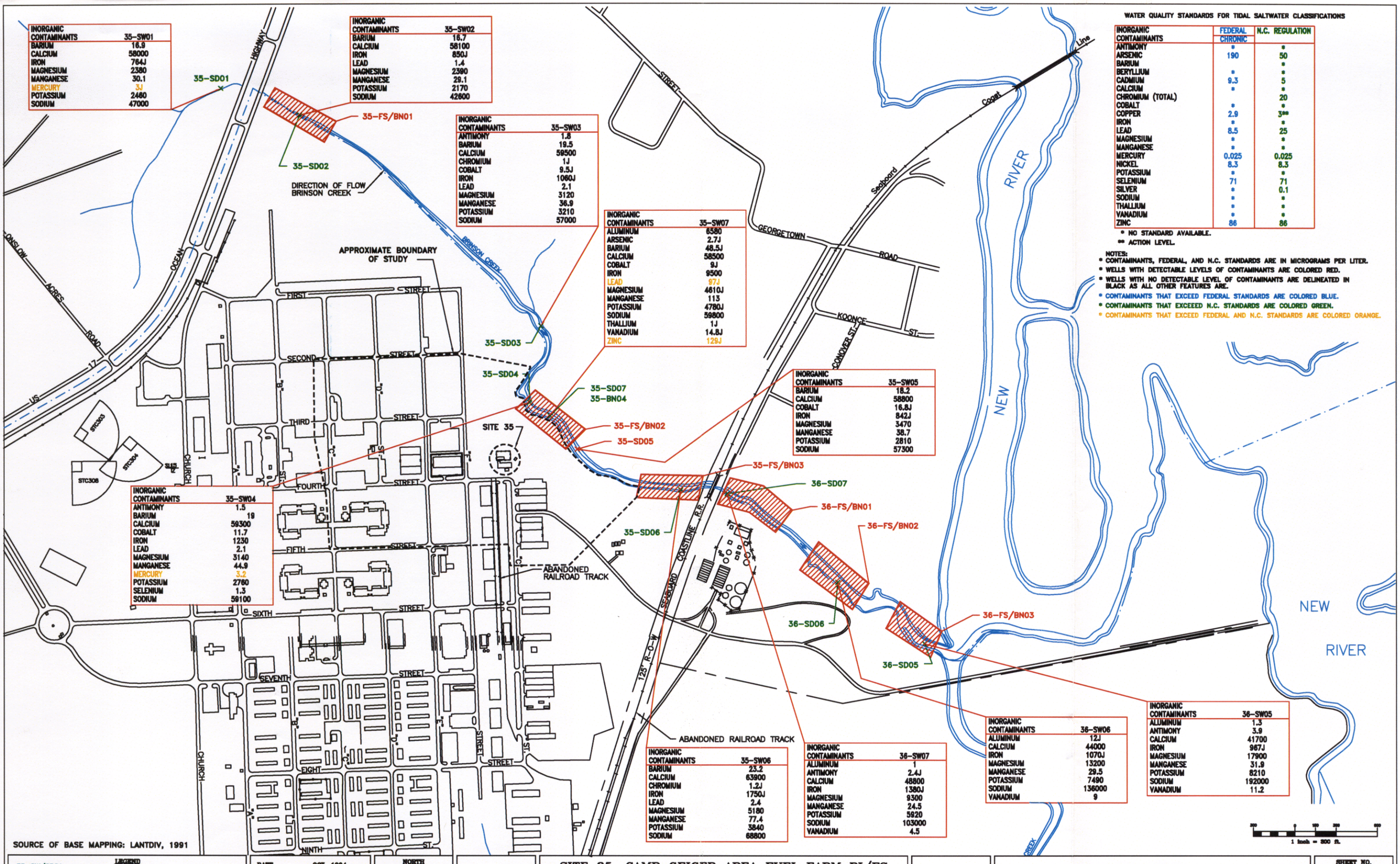
DEPARTMENT OF THE NAVY — NAVAL FACILITIES ENGINEERING COMMAND
ATLANTIC DIVISION
NAVAL STATION — NORFOLK, VIRGINA
LANTDIV RAC CONTRACT N62470-93-D-3032 — DELIVERY ORDER NO. 0044
OPERABLE UNIT NO. 1 — MARINE CORPS BASE, CAMP LEJEUNE, N.C.

FIGURE 2.1
TOPOGRAPHIC SURVEY SITE 35 AREAS A, B, AND C

CAMP GEIGER, NORTH CAROLINA

02281.T01X

Brinson Creek Surface Water and Sediment Inorganic Analytical Results Report (Baker 2002)



INORGANIC CONTAMINANTS	35-SW01
BARIUM	16.9
CALCIUM	58000
IRON	764J
MAGNESIUM	2380
MANGANESE	30.1
MERCURY	3J
POTASSIUM	2460
SODIUM	47000

INORGANIC CONTAMINANTS	35-SW02
BARIUM	16.7
CALCIUM	58100
IRON	850J
LEAD	1.4
MAGNESIUM	2390
MANGANESE	29.1
POTASSIUM	2170
SODIUM	42600

INORGANIC CONTAMINANTS	35-SW03
ANTIMONY	1.8
BARIUM	19.5
CALCIUM	59500
CHROMIUM	1J
COBALT	9.5J
IRON	1060J
LEAD	2.1
MAGNESIUM	3120
MANGANESE	36.9
POTASSIUM	3210
SODIUM	57000

INORGANIC CONTAMINANTS	35-SW07
ALUMINUM	6580
ARSENIC	2.7J
BARIUM	48.5J
CALCIUM	58500
COBALT	9J
IRON	9500
LEAD	97J
MAGNESIUM	4610J
MANGANESE	113
POTASSIUM	4780J
SODIUM	59800
THALLIUM	1J
VANADIUM	14.8J
ZINC	129J

INORGANIC CONTAMINANTS	35-SW05
BARIUM	18.2
CALCIUM	58800
COBALT	16.8J
IRON	842J
MAGNESIUM	3470
MANGANESE	38.7
POTASSIUM	2810
SODIUM	57300

INORGANIC CONTAMINANTS	35-SW04
ANTIMONY	1.5
BARIUM	19
CALCIUM	59300
COBALT	11.7
IRON	1230
LEAD	2.1
MAGNESIUM	3140
MANGANESE	44.9
MERCURY	3.2
POTASSIUM	2760
SELENIUM	1.3
SODIUM	59100

INORGANIC CONTAMINANTS	35-SW06
BARIUM	23.2
CALCIUM	63900
CHROMIUM	1.2J
IRON	1750J
LEAD	2.4
MAGNESIUM	5180
MANGANESE	77.4
POTASSIUM	3840
SODIUM	68800

INORGANIC CONTAMINANTS	36-SW07
ALUMINUM	1
ANTIMONY	2.4J
CALCIUM	48800
IRON	1380J
MAGNESIUM	9300
MANGANESE	24.5
POTASSIUM	5920
SODIUM	103000
VANADIUM	4.5

INORGANIC CONTAMINANTS	36-SW06
ALUMINUM	12J
CALCIUM	44000
IRON	1070J
MAGNESIUM	13200
MANGANESE	29.5
POTASSIUM	7490
SODIUM	136000
VANADIUM	9

INORGANIC CONTAMINANTS	36-SW05
ALUMINUM	1.3
ANTIMONY	3.9
CALCIUM	41700
IRON	967J
MAGNESIUM	17900
MANGANESE	31.9
POTASSIUM	8210
SODIUM	192000
VANADIUM	11.2

WATER QUALITY STANDARDS FOR TIDAL SALTWATER CLASSIFICATIONS

INORGANIC CONTAMINANTS	FEDERAL CHRONIC	N.C. REGULATION
ANTIMONY	*	*
ARSENIC	190	50
BARIUM		*
BERYLLIUM	*	*
CADMIUM	9.3	5
CALCIUM	*	*
CHROMIUM (TOTAL)		20
COBALT	*	*
COPPER	2.9	3**
IRON	*	*
LEAD	8.5	25
MAGNESIUM	*	*
MANGANESE	*	*
MERCURY	0.025	0.025
NICKEL	8.3	8.3
POTASSIUM	*	*
SELENIUM	71	71
SILVER	*	0.1
SODIUM	*	*
THALLIUM	*	*
VANADIUM	*	*
ZINC	86	86

* NO STANDARD AVAILABLE.
** ACTION LEVEL.

NOTES:
- CONTAMINANTS, FEDERAL, AND N.C. STANDARDS ARE IN MICROGRAMS PER LITER.
- WELLS WITH DETECTABLE LEVELS OF CONTAMINANTS ARE COLORED RED.
- WELLS WITH NO DETECTABLE LEVEL OF CONTAMINANTS ARE DELINEATED IN BLACK AS ALL OTHER FEATURES ARE.
- CONTAMINANTS THAT EXCEED FEDERAL STANDARDS ARE COLORED BLUE.
- CONTAMINANTS THAT EXCEEED N.C. STANDARDS ARE COLORED GREEN.
- CONTAMINANTS THAT EXCEED FEDERAL AND N.C. STANDARDS ARE COLORED ORANGE.

SOURCE OF BASE MAPPING: LANTDIV, 1991

LEGEND
- 35-SW/SD01 X 35-FS/BN01 – SAMPLE LOCATION FOR SURFACE WATER AND SEDIMENT
- COLLECTION AREA FOR FISH AND BENTHIC SAMPLES
- FENCE LINE
- EXISTING STRUCTURE

DATE	OCT. 1994
SCALE	1" = 300'
DRAWN	WJH
REVIEWED	JSC
S.O.#	62470-232-0000-07000
CADD#	2219567Z FROM 232910RI

NORTH

SITE 35, CAMP GEIGER AREA FUEL FARM RI/FS
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

BAKER ENVIRONMENTAL, Inc.
Coraopolis, Pennsylvania

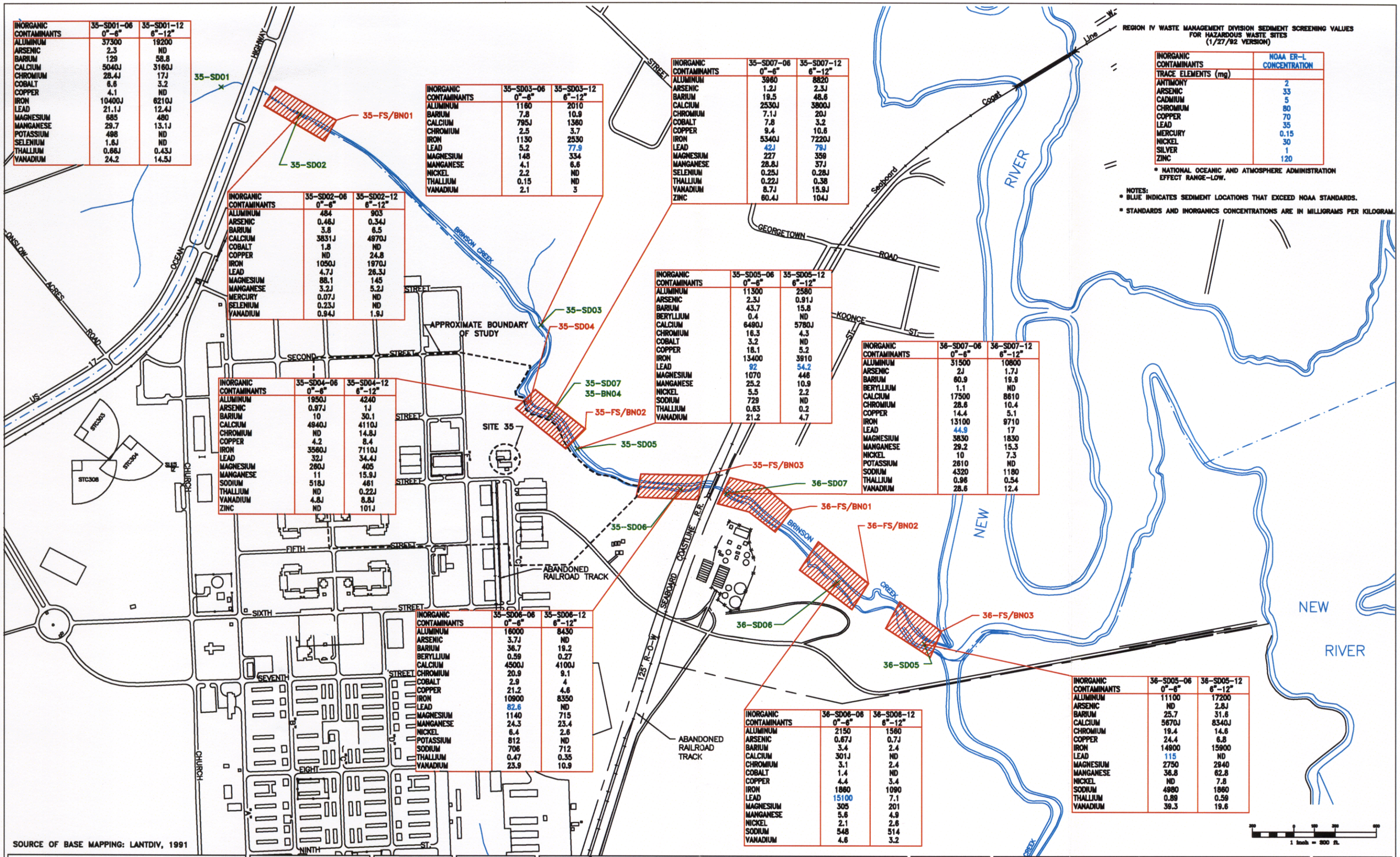
Baker
Baker Environmental, Inc.

DETECTED INORGANICS
IN SURFACE WATER
CONTRACT TASK ORDER – 0232

SCALE 1" = 300' DATE OCT. 1994

SHEET NO. 1 OF 5

Q3543 RRIV



INORGANIC CONTAMINANTS	35-SD01-06 0"-6"	35-SD01-12 6"-12"
ALUMINUM	37300	19200
ARSENIC	2.3	ND
BARIUM	129	58.8
CALCIUM	5040J	3160J
CHROMIUM	28.4J	17J
COBALT	6.6	3.2
COPPER	4.1	ND
IRON	10400J	6210J
LEAD	21.1J	12.4J
MAGNESIUM	685	480
MANGANESE	29.7	13.1J
POTASSIUM	498	ND
SELENIUM	1.6J	ND
THALLIUM	0.66J	0.43J
VANADIUM	24.2	14.5J

INORGANIC CONTAMINANTS	35-SD02-06 0"-6"	35-SD02-12 6"-12"
ALUMINUM	484	903
ARSENIC	0.46J	0.34J
BARIUM	3.8	6.5
CALCIUM	3831J	4970J
COBALT	1.8	ND
COPPER	ND	24.8
IRON	1050J	1970J
LEAD	4.7J	26.3J
MAGNESIUM	88.1	145
MANGANESE	3.2J	5.2J
MERCURY	0.07J	ND
SELENIUM	0.23J	ND
VANADIUM	0.94J	1.9J

INORGANIC CONTAMINANTS	35-SD03-06 0"-6"	35-SD03-12 6"-12"
ALUMINUM	1160	2010
BARIUM	7.8	10.9
CALCIUM	795J	1360
CHROMIUM	2.5	3.7
IRON	1130	2530
LEAD	5.2	77.9
MAGNESIUM	148	334
MANGANESE	4.1	6.6
NICKEL	2.2	ND
THALLIUM	0.15	ND
VANADIUM	2.1	3

INORGANIC CONTAMINANTS	35-SD04-06 0"-6"	35-SD04-12 6"-12"
ALUMINUM	1950J	4240
ARSENIC	0.97J	1J
BARIUM	10	30.1
CALCIUM	4940J	4110J
CHROMIUM	ND	14.8J
COPPER	4.2	8.4
IRON	3560J	7110J
LEAD	32J	34.4J
MAGNESIUM	260J	405
MANGANESE	11	15.9J
SODIUM	518J	461
THALLIUM	ND	0.22J
VANADIUM	4.8J	8.8J
ZINC	ND	101J

INORGANIC CONTAMINANTS	35-SD06-06 0"-6"	35-SD06-12 6"-12"
ALUMINUM	16000	8430
ARSENIC	3.7J	ND
BARIUM	36.7	19.2
BERYLLIUM	0.59	0.27
CALCIUM	4500J	4100J
CHROMIUM	20.9	9.1
COBALT	2.9	4
COPPER	21.2	4.6
IRON	10900	8350
LEAD	82.6	ND
MAGNESIUM	1140	715
MANGANESE	24.3	23.4
NICKEL	6.4	2.6
POTASSIUM	812	ND
SODIUM	706	712
THALLIUM	0.47	0.35
VANADIUM	23.9	10.9

INORGANIC CONTAMINANTS	35-SD07-06 0"-6"	35-SD07-12 6"-12"
ALUMINUM	3960	8820
ARSENIC	1.2J	2.3J
BARIUM	19.5	48.6
CALCIUM	2530J	3800J
CHROMIUM	7.1J	20J
COBALT	7.8	3.2
COPPER	9.4	10.6
IRON	5340J	7220J
LEAD	42J	79J
MAGNESIUM	227	359
MANGANESE	28.8J	37J
SELENIUM	0.25J	0.28J
THALLIUM	0.22J	0.38
VANADIUM	8.7J	15.9J
ZINC	60.4J	104J

INORGANIC CONTAMINANTS	35-SD05-06 0"-6"	35-SD05-12 6"-12"
ALUMINUM	11300	2580
ARSENIC	2.3J	0.91J
BARIUM	43.7	15.8
BERYLLIUM	0.4	ND
CALCIUM	6490J	5780J
CHROMIUM	16.3	4.3
COBALT	3.2	ND
COPPER	18.1	5.2
IRON	13400	3910
LEAD	92	54.2
MAGNESIUM	1070	446
MANGANESE	25.2	10.9
NICKEL	5.5	2.2
SODIUM	729	ND
THALLIUM	0.63	0.2
VANADIUM	21.2	4.7

INORGANIC CONTAMINANTS	36-SD07-06 0"-6"	36-SD07-12 6"-12"
ALUMINUM	31500	10800
ARSENIC	2J	1.7J
BARIUM	60.9	19.9
BERYLLIUM	1.1	ND
CALCIUM	17500	8610
CHROMIUM	28.6	10.4
COPPER	14.4	5.1
IRON	13100	9710
LEAD	44.9	17
MAGNESIUM	3830	1830
MANGANESE	29.2	15.3
NICKEL	10	7.3
POTASSIUM	2610	ND
SODIUM	4320	1180
THALLIUM	0.96	0.54
VANADIUM	28.6	12.4

INORGANIC CONTAMINANTS	36-SD06-06 0"-6"	36-SD06-12 6"-12"
ALUMINUM	2150	1560
ARSENIC	0.67J	0.7J
BARIUM	3.4	2.4
CALCIUM	301J	ND
CHROMIUM	3.1	2.4
COBALT	1.4	ND
COPPER	4.4	3.4
IRON	1860	1090
LEAD	15100	7.1
MAGNESIUM	305	201
MANGANESE	5.6	4.9
NICKEL	2.1	2.6
SODIUM	548	514
VANADIUM	4.6	3.2

INORGANIC CONTAMINANTS	36-SD05-06 0"-6"	36-SD05-12 6"-12"
ALUMINUM	11100	17200
ARSENIC	ND	2.8J
BARIUM	25.7	31.6
CALCIUM	5670J	8340J
CHROMIUM	19.4	14.6
COPPER	24.4	6.8
IRON	14900	15900
LEAD	115	ND
MAGNESIUM	2750	2940
MANGANESE	36.8	62.8
NICKEL	ND	7.8
SODIUM	4980	1860
THALLIUM	0.89	0.59
VANADIUM	39.3	19.6

REGION IV WASTE MANAGEMENT DIVISION SEDIMENT SCREENING VALUES FOR HAZARDOUS WASTE SITES (1/27/92 VERSION)

INORGANIC CONTAMINANTS	NOAA ER-L CONCENTRATION
TRACE ELEMENTS (mg)	
ANTIMONY	2
ARSENIC	33
CADMIUM	5
CHROMIUM	80
COPPER	70
LEAD	35
MERCURY	0.15
NICKEL	30
SILVER	1
ZINC	120

* NATIONAL OCEANIC AND ATMOSPHERE ADMINISTRATION EFFECT RANGE-LOW.

NOTES:
* BLUE INDICATES SEDIMENT LOCATIONS THAT EXCEED NOAA STANDARDS.
* STANDARDS AND INORGANICS CONCENTRATIONS ARE IN MILLIGRAMS PER KILOGRAM.

SOURCE OF BASE MAPPING: LANTDIV, 1991

LEGEND
35-SW/SD01 × – SAMPLE LOCATION FOR SURFACE WATER AND SEDIMENT
35-FS/BN01 – SAMPLE ZONE FOR FISH AND BENTHICS

DATE	OCT. 1994
SCALE	1" = 300'
DRAWN	WJH
REVIEWED	JSC
S.O.#	62470-232-0000-07000
CADD#	2219566Z FROM 232912RI

NORTH

SITE 35, CAMP GEIGER AREA FUEL FARM RI/FS
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

BAKER ENVIRONMENTAL, Inc.
Coraopolis, Pennsylvania

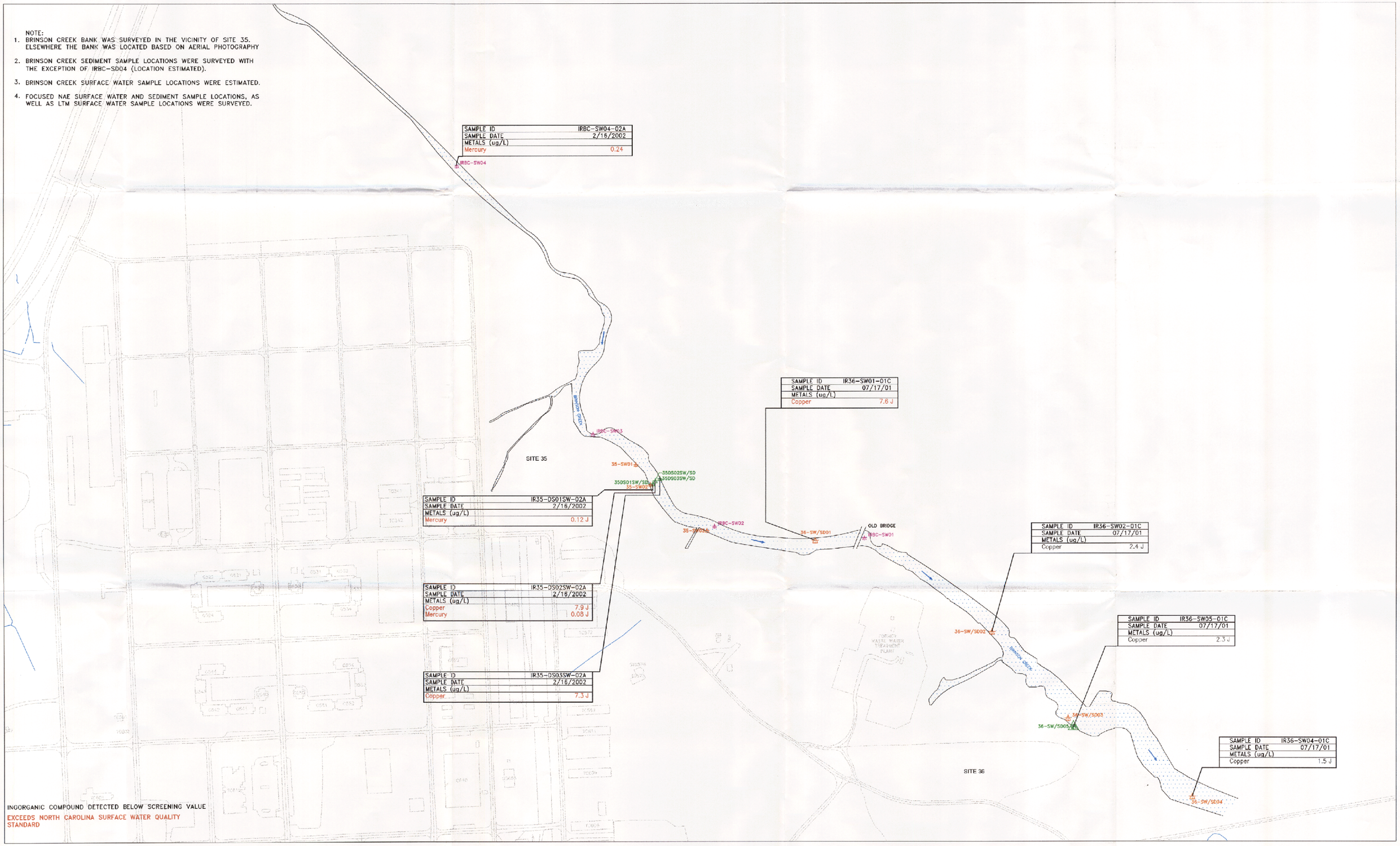
Baker
Baker Environmental, Inc.

DETECTED INORGANICS IN SEDIMENT
CONTRACT TASK ORDER – 0232

SCALE 1" = 300' | DATE OCT. 1994

SHEET NO. 2 OF 5

NOTE:
1. BRINSON CREEK BANK WAS SURVEYED IN THE VICINITY OF SITE 35. ELSEWHERE THE BANK WAS LOCATED BASED ON AERIAL PHOTOGRAPHY
2. BRINSON CREEK SEDIMENT SAMPLE LOCATIONS WERE SURVEYED WITH THE EXCEPTION OF IRBC-SD04 (LOCATION ESTIMATED).
3. BRINSON CREEK SURFACE WATER SAMPLE LOCATIONS WERE ESTIMATED.
4. FOCUSED NAE SURFACE WATER AND SEDIMENT SAMPLE LOCATIONS, AS WELL AS LTM SURFACE WATER SAMPLE LOCATIONS WERE SURVEYED.



INORGANIC COMPOUND DETECTED BELOW SCREENING VALUE

EXCEEDS NORTH CAROLINA SURFACE WATER QUALITY STANDARD

LEGEND

IRBC-SW01 - BRINSON CREEK SURFACE WATER SAMPLE LOCATION
35DS01SW/SD - FOCUSED NAE SURFACE WATER/SEDIMENT SAMPLE LOCATION
- CREEK FLOW DIRECTION
SW/SD05 - SURFACE WATER/SEDIMENT LOCATION FROM JANUARY 2001
36-SW/SD04 - LTM SURFACE WATER/SEDIMENT SAMPLE

DRAWN	RRR
REVIEWED	MKD
S.O.#	26007-219
CADD#	2219562z

k\26007\219Phase\Graphics\cad\zz\

NORTH

MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

BAKER ENVIRONMENTAL, Inc.
Coraopolis, Pennsylvania

Baker

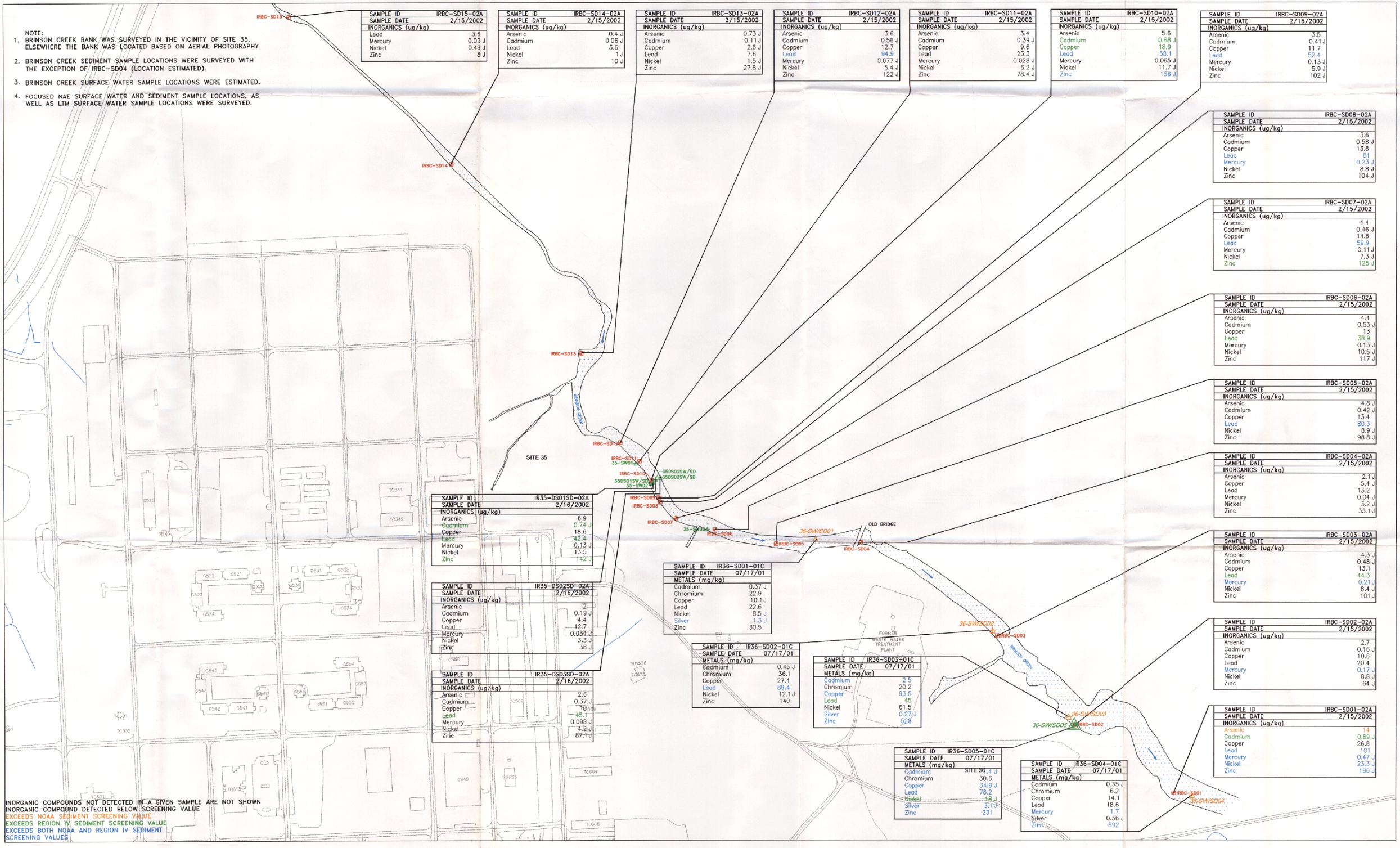
INORGANICS ABOVE SCREENING CRITERIA
IN SURFACE WATER - BRINSON CREEK
SITE 35, FORMER CAMP GEIGER FUEL FARM

SCALE 200 0 100 200 1 inch = 200 ft.

DATE SEPTEMBER 2002

SHEET NO. 3 OF 5

NOTE:
1. BRINSON CREEK BANK WAS SURVEYED IN THE VICINITY OF SITE 35. ELSEWHERE THE BANK WAS LOCATED BASED ON AERIAL PHOTOGRAPHY
2. BRINSON CREEK SEDIMENT SAMPLE LOCATIONS WERE SURVEYED WITH THE EXCEPTION OF IRBC-SD04 (LOCATION ESTIMATED).
3. BRINSON CREEK SURFACE WATER SAMPLE LOCATIONS WERE ESTIMATED.
4. FOCUSED NAE SURFACE WATER AND SEDIMENT SAMPLE LOCATIONS, AS WELL AS LTM SURFACE WATER SAMPLE LOCATIONS WERE SURVEYED.



SAMPLE ID	IRBC-SD15-02A
SAMPLE DATE	2/15/2002
INORGANICS (ug/kg)	
Lead	3.6
Mercury	0.03 J
Nickel	0.49 J
Zinc	8 J

SAMPLE ID	IRBC-SD14-02A
SAMPLE DATE	2/15/2002
INORGANICS (ug/kg)	
Arsenic	0.4 J
Cadmium	0.06 J
Lead	3.6
Nickel	1 J
Zinc	10 J

SAMPLE ID	IRBC-SD13-02A
SAMPLE DATE	2/15/2002
INORGANICS (ug/kg)	
Arsenic	0.73 J
Cadmium	0.11 J
Copper	2.6 J
Lead	7.6
Nickel	1.5 J
Zinc	27.8 J

SAMPLE ID	IRBC-SD12-02A
SAMPLE DATE	2/15/2002
INORGANICS (ug/kg)	
Arsenic	3.8
Cadmium	0.56 J
Copper	12.7
Lead	94.9
Mercury	0.077 J
Nickel	5.4 J
Zinc	122 J

SAMPLE ID	IRBC-SD11-02A
SAMPLE DATE	2/15/2002
INORGANICS (ug/kg)	
Arsenic	3.4
Cadmium	0.39 J
Copper	9.6
Lead	23.3
Mercury	0.028 J
Nickel	6.2 J
Zinc	78.4 J

SAMPLE ID	IRBC-SD10-02A
SAMPLE DATE	2/15/2002
INORGANICS (ug/kg)	
Arsenic	5.6
Cadmium	0.68 J
Copper	18.9
Lead	58.1
Mercury	0.065 J
Nickel	11.7 J
Zinc	156 J

SAMPLE ID	IRBC-SD09-02A
SAMPLE DATE	2/15/2002
INORGANICS (ug/kg)	
Arsenic	3.5
Cadmium	0.41 J
Copper	11.7
Lead	52.4
Mercury	0.13 J
Nickel	5.9 J
Zinc	102 J

SAMPLE ID	IRBC-SD08-02A
SAMPLE DATE	2/15/2002
INORGANICS (ug/kg)	
Arsenic	3.6
Cadmium	0.58 J
Copper	13.8
Lead	81
Mercury	0.23 J
Nickel	8.8 J
Zinc	104 J

SAMPLE ID	IRBC-SD07-02A
SAMPLE DATE	2/15/2002
INORGANICS (ug/kg)	
Arsenic	4.4
Cadmium	0.46 J
Copper	14.8
Lead	59.9
Mercury	0.11 J
Nickel	7.3 J
Zinc	125 J

SAMPLE ID	IRBC-SD06-02A
SAMPLE DATE	2/15/2002
INORGANICS (ug/kg)	
Arsenic	4.4
Cadmium	0.53 J
Copper	15
Lead	38.9
Mercury	0.13 J
Nickel	10.5 J
Zinc	117 J

SAMPLE ID	IRBC-SD05-02A
SAMPLE DATE	2/15/2002
INORGANICS (ug/kg)	
Arsenic	4.8 J
Cadmium	0.42 J
Copper	13.4
Lead	80.3
Nickel	8.9 J
Zinc	98.8 J

SAMPLE ID	IRBC-SD04-02A
SAMPLE DATE	2/15/2002
INORGANICS (ug/kg)	
Arsenic	2.1 J
Copper	5.4 J
Lead	13.2
Mercury	0.04 J
Nickel	3.2 J
Zinc	33.1 J

SAMPLE ID	IRBC-SD03-02A
SAMPLE DATE	2/15/2002
INORGANICS (ug/kg)	
Arsenic	4.3 J
Cadmium	0.48 J
Copper	13.1
Lead	44.3
Mercury	0.21 J
Nickel	8.4 J
Zinc	101 J

SAMPLE ID	IRBC-SD02-02A
SAMPLE DATE	2/15/2002
INORGANICS (ug/kg)	
Arsenic	2.7
Cadmium	0.16 J
Copper	10.6
Lead	20.4
Mercury	0.17 J
Nickel	8.8 J
Zinc	64 J

SAMPLE ID	IRBC-SD01-02A
SAMPLE DATE	2/15/2002
INORGANICS (ug/kg)	
Arsenic	14
Cadmium	0.89 J
Copper	26.8
Lead	101
Mercury	0.47 J
Nickel	23.3 J
Zinc	190 J

SAMPLE ID	IR35-DS01SD-02A
SAMPLE DATE	2/16/2002
INORGANICS (ug/kg)	
Arsenic	6.9
Cadmium	0.74 J
Copper	18.6
Lead	42.4
Mercury	0.13 J
Nickel	13.5
Zinc	142 J

SAMPLE ID	IR35-DS02SD-02A
SAMPLE DATE	2/16/2002
INORGANICS (ug/kg)	
Arsenic	2
Cadmium	0.19 J
Copper	4.4
Lead	12.7
Mercury	0.034 J
Nickel	3.3 J
Zinc	38 J

SAMPLE ID	IR35-DS03SD-02A
SAMPLE DATE	2/16/2002
INORGANICS (ug/kg)	
Arsenic	2.6
Cadmium	0.37 J
Copper	10
Lead	45.1
Mercury	0.098 J
Nickel	4.2 J
Zinc	87.1 J

SAMPLE ID	IR36-SD01-01C
SAMPLE DATE	07/17/01
METALS (mg/kg)	
Cadmium	0.37 J
Chromium	22.9
Copper	10.1 J
Lead	22.6
Nickel	8.5 J
Silver	1.3 J
Zinc	30.5

SAMPLE ID	IR36-SD02-01C
SAMPLE DATE	07/17/01
METALS (mg/kg)	
Cadmium	0.45 J
Chromium	36.1
Copper	27.4
Lead	89.4
Nickel	12.1 J
Zinc	140

SAMPLE ID	IR36-SD03-01C
SAMPLE DATE	07/17/01
METALS (mg/kg)	
Cadmium	2.5
Chromium	20.2
Copper	93.5
Lead	45
Nickel	61.5
Silver	0.27 J
Zinc	528

SAMPLE ID	IR36-SD05-01C
SAMPLE DATE	07/17/01
METALS (mg/kg)	
Cadmium	3.4 J
Chromium	30.8
Copper	34.9 J
Lead	78.2
Nickel	18 J
Silver	3.1 J
Zinc	231

SAMPLE ID	IR36-SD04-01C
SAMPLE DATE	07/17/01
METALS (mg/kg)	
Cadmium	0.35 J
Chromium	6.2
Copper	14.1
Lead	18.6
Mercury	1.7
Silver	0.36 J
Zinc	692

INORGANIC COMPOUNDS NOT DETECTED IN A GIVEN SAMPLE ARE NOT SHOWN
INORGANIC COMPOUND DETECTED BELOW SCREENING VALUE
EXCEEDS NOAA SEDIMENT SCREENING VALUE
EXCEEDS REGION IV SEDIMENT SCREENING VALUE
EXCEEDS BOTH NOAA AND REGION IV SEDIMENT SCREENING VALUES

LEGEND

IRBC-SD01 – BRINSON CREEK SEDIMENT SAMPLE LOCATION
35DS01SW/SD – FOCUSED NAE SURFACE WATER/SEDIMENT SAMPLE LOCATION
SW/SD05 – CREEK FLOW DIRECTION
– SURFACE WATER/SEDIMENT LOCATION FROM JANUARY 2001
36-SW/SD04 – SURFACE WATER/SEDIMENT SAMPLE
35-SW01 – LTM SURFACE WATER SAMPLE LOCATIONS

DRAWN	RRR
REVIEWED	MKD
S.O.#	26007-219
CADD#	2219561z

k\26007\219Phase1\Graphics\cad\zz\

NORTH

MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

BAKER ENVIRONMENTAL, Inc.
Coraopolis, Pennsylvania

Baker

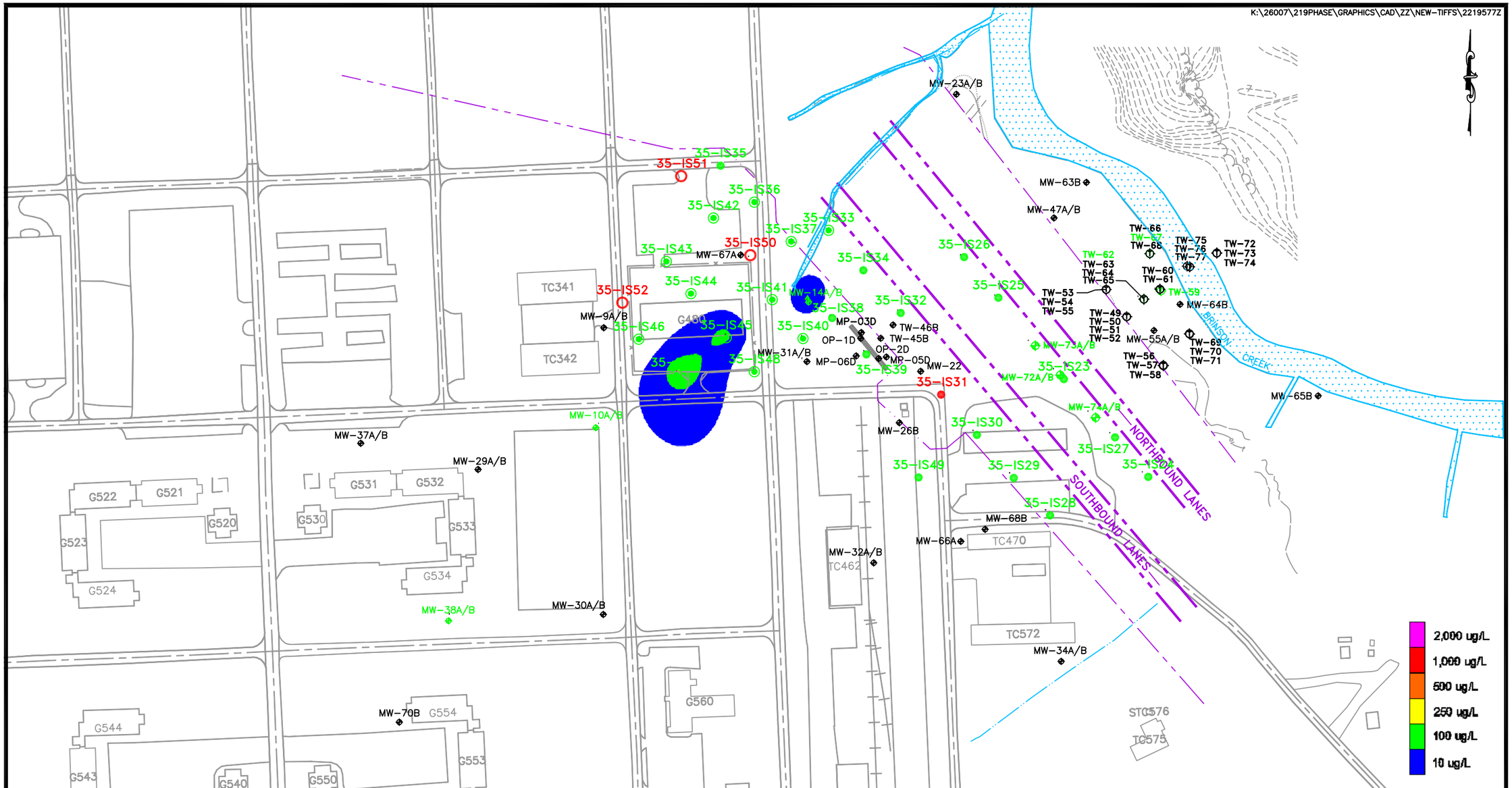
INORGANICS ABOVE SCREENING CRITERIA IN SEDIMENT - BRINSON CREEK SITE 35, FORMER CAMP GEIGER FUEL FARM

SCALE 200 0 100 200 — 1 inch = 200 ft.

DATE SEPTEMBER 2002

SHEET NO. 4 OF 5

Hot Spot Characterization Report (Baker 2002)



NOTE:
LOCATIONS IN GREEN USED TO GENERATE PLUME MAP.

Baker
Baker Environmental, Inc.

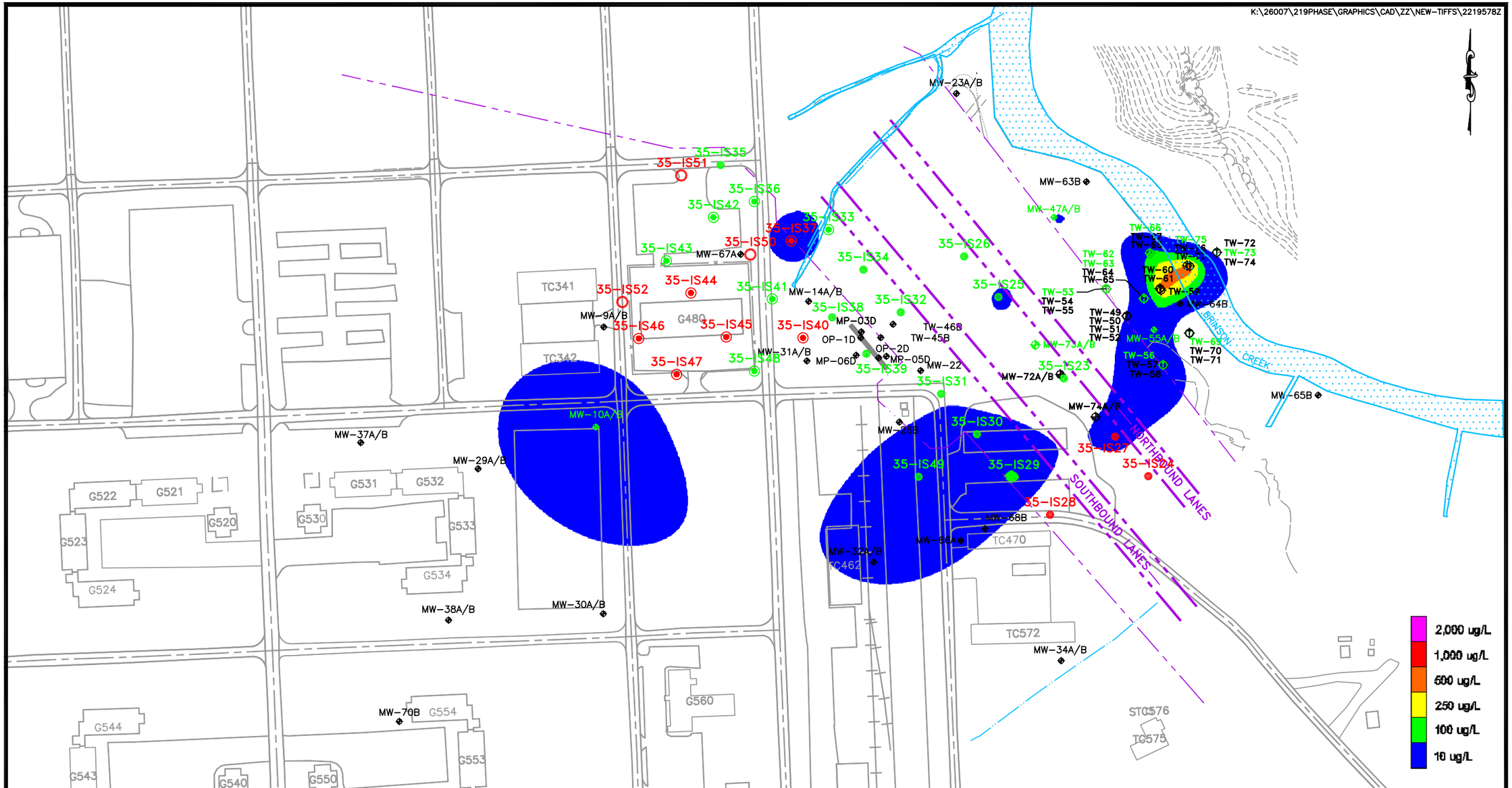
LEGEND

- US 17 JACKSONVILLE BYPASS RIGHT-OF-WAY LIMITS
- US 17 JACKSONVILLE BYPASS EASEMENT LIMITS (APPROXIMATE FENCE LINE)
- MW-14B MONITORING WELL
- TW-49 TEMPORARY WELL FROM FOCUSED NAE STUDY
- GROUNDWATER SAMPLING BORING LOCATION
- GROUNDWATER AND SOIL SAMPLING BORING LOCATION
- SOIL SAMPLING BORING LOCATION
- IAS TRENCH

SOURCE: MCB CAMP LEJEUNE, 2000.

FIGURE 3
TCE IN GROUNDWATER 5-FT ABOVE MSL TO 5-FT BELOW MSL
SITE 35, FORMER CAMP GEIGER FUEL FARM

HOT SPOT CHARACTERIZATION REPORT
CTO - 0219, FEBRUARY 2003
MARINE CORPS BASE, CAMP LEJEUNE,
NORTH CAROLINA



NOTE:
LOCATIONS IN GREEN USED TO GENERATE PLUME MAP.

200 0 100 200
1 inch = 200 ft.

Baker
Baker Environmental, Inc.

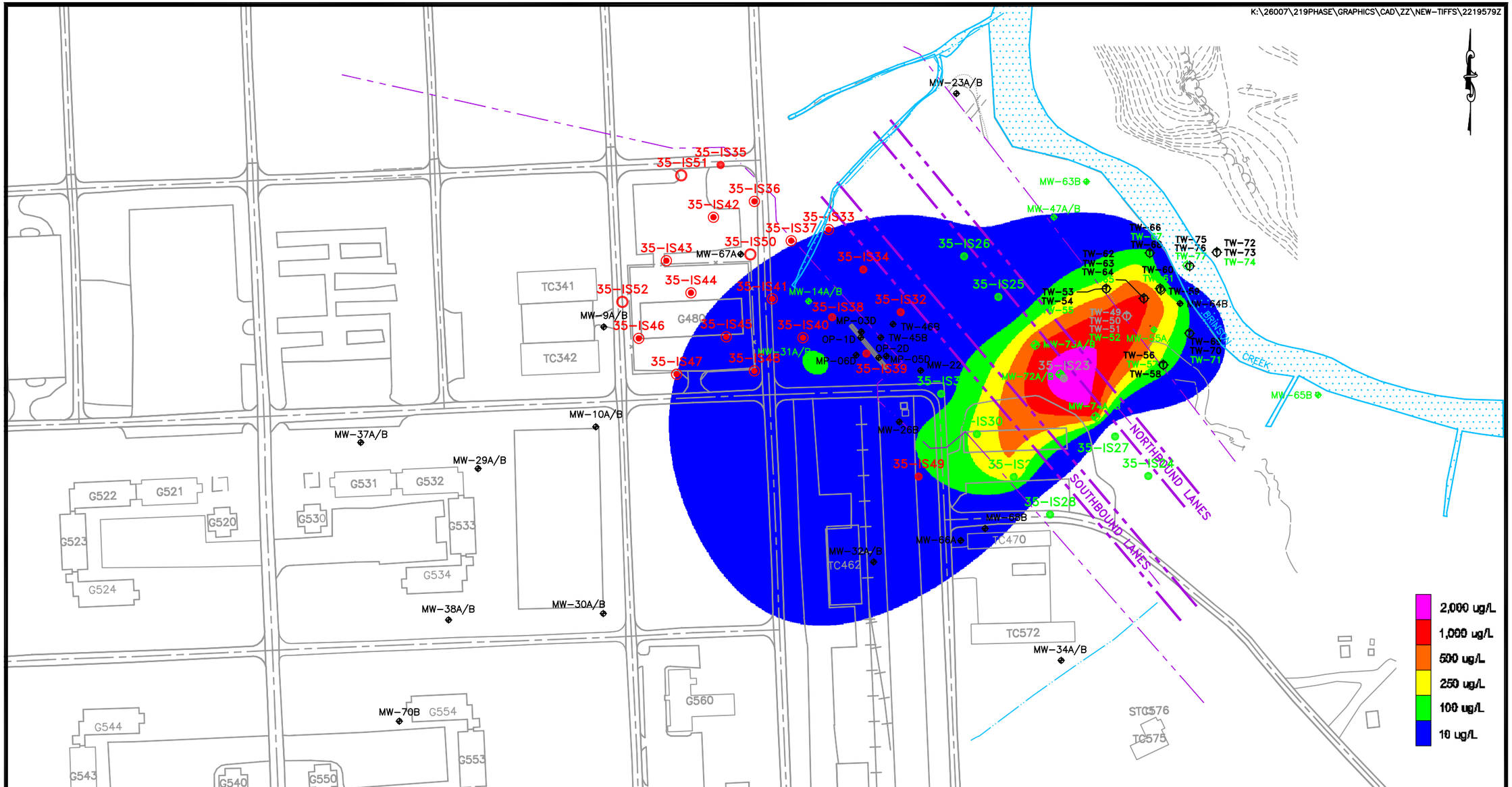
LEGEND

- US 17 JACKSONVILLE BYPASS RIGHT-OF-WAY LIMITS
- US 17 JACKSONVILLE BYPASS EASEMENT LIMITS (APPROXIMATE FENCE LINE)
- MW-14B — MONITORING WELL
- TW-49 — TEMPORARY WELL FROM FOCUSED NAE STUDY
- GROUNDWATER SAMPLING BORING LOCATION
- GROUNDWATER AND SOIL SAMPLING BORING LOCATION
- SOIL SAMPLING BORING LOCATION
- IAS TRENCH

SOURCE: MCB CAMP LEJEUNE, 2000.

FIGURE 4
TCE IN GROUNDWATER 5-FT TO 15-BELOW MSL
SITE 35, FORMER CAMP GEIGER FUEL FARM

HOT SPOT CHARACTERIZATION REPORT
CTO – 0219, FEBRUARY 2003
MARINE CORPS BASE, CAMP LEJEUNE,
NORTH CAROLINA



NOTE:
LOCATIONS IN GREEN USED TO GENERATE PLUME MAP.

Baker
Baker Environmental, Inc.

LEGEND

- US 17 JACKSONVILLE BYPASS RIGHT-OF-WAY LIMITS
- US 17 JACKSONVILLE BYPASS EASEMENT LIMITS (APPROXIMATE FENCE LINE)
- MW-14B — MONITORING WELL
- TW-49 — TEMPORARY WELL FROM FOCUSED NAE STUDY
- GROUNDWATER SAMPLING BORING LOCATION
- GROUNDWATER AND SOIL SAMPLING BORING LOCATION
- SOIL SAMPLING BORING LOCATION
- IAS TRENCH

SOURCE: MCB CAMP LEJEUNE, 2000.

FIGURE 5
TCE IN GROUNDWATER 15-FT TO 25-FT BELOW MSL
SITE 35, FORMER CAMP GEIGER FUEL FARM

HOT SPOT CHARACTERIZATION REPORT
CTO – 0219, FEBRUARY 2003
MARINE CORPS BASE, CAMP LEJEUNE,
NORTH CAROLINA

TABLE 2

MOBILE LABORATORY ANALYTICAL RESULTS
SITE 35 HOT SPOT CHARACTERIZATION, CTO-0219
MCB, CAMP LEJEUNE, NORTH CAROLINA

Sample ID	Depth Interval (ft. bgs)	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	VC	1,1,2,2-TCA	Benzene	Toluene	Ethylbenzene	M&P Xylene	O Xylene	Comments
IR35-IS23-01	10-14	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS23-02	20-24	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	3	2 U	2 U	2 U	
IR35-IS23-03	28-32	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS23-04	40-44	1.4	1151	1162	197	10	24	4	1 U	3	2 U	2 U	2 U	
IR35-IS24-01	10-14	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS24-03	30-34	0.5 U	1 U	1 U	1 U	2	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS24-04	40-44	0.5 U	1 U	2	1 U	1	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-ER01-02D	--	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	Equipment Rinsate
IR35-IS25-02	20-24	0.5 U	8	61	3	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS25-03	30-34	0.5 U	16	97	5	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS25-04	40-44	0.5 U	13	182	6	1 U	1	1 U	1 U	2	2 U	2 U	2 U	Chromatogram shows diesel-range organics
IR35-IS26-02	20-24	0.5 U	1 U	14	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS26-03	30-34	0.5 U	1 U	14	1 U	1 U	3	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS26-04	40-44	0.5 U	13	169	4	1 U	3	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-ER02-02D	--	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	Equipment Rinsate
IR35-IS27-01	10-14	0.5 U	1 U	1	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS27-02	20-24	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS27-03	30-34	0.5 U	26	79	5	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS27-04	40-44	0.5 U	1 U	28	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS28-01	10-14	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS28-02	20-24	0.5 U	1 U	2	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS28-03	30-34	0.5 U	1 U	2	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS28-04	40-44	0.5 U	1	21	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS29-01	10-14	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS29-02	20-24	0.5 U	144	300	31	1	2	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS29-03	30-34	0.5 U	452	830	75	2	10	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS29-04	40-44	0.5 U	58	50	5	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS30-01	10-14	0.5 U	1	1	1 U	1	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS30-02	20-24	0.5 U	17	71	20	1 U	1 U	42	1 U	2 U	2 U	2 U	2 U	
IR35-IS30-03	30-34	0.5 U	324	760	81	3	13	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS30-04	40-44	0.5 U	164	341	36	1	4	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS31-02	20-24	0.5 U	8	60	4	1 U	1 U	1	1 U	2 U	2 U	2 U	2 U	
IR35-IS31-03	30-34	0.5 U	34	217	12	1 U	2	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS31-03 DUP	30-34	0.5 U	33	215	12	1 U	2	1 U	1 U	2 U	2 U	2 U	2 U	Duplicate Sample
IR35-IS31-04	40-44	0.5 U	68	509	35	1	4	1 U	1 U	2 U	2 U	2 U	2 U	

TABLE 2

MOBILE LABORATORY ANALYTICAL RESULTS
SITE 35 HOT SPOT CHARACTERIZATION, CTO-0219
MCB, CAMP LEJEUNE, NORTH CAROLINA

Sample ID	Depth Interval (ft. bgs)	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	VC	1,1,2,2-TCA	Benzene	Toluene	Ethylbenzene	M&P Xylene	O Xylene	Comments
IR35-IS32-02	20-22	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	7	2 U	2 U(1)	2 U(1)	2 U(1)	Chromatogram shows diesel-range organics
IR35-IS32-03	25-27	0.5 U	1 U	2	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS33-02	20-22	0.5 U	2	161	8	1	8	1 U	3	2 U	2 U	2 U	2 U	
IR35-IS33-03	25-27	0.5 U	2	394	24	2	2	1 U	2	2 U	2 U	2 U	2 U	
IR35-IS33-04	30-32	0.5 U	6	349	21	2	2	1 U	2	2 U	2 U	2 U	2 U	
IR35-IS34-02	20-22	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS34-03	25-27	0.5 U	1 U	2	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS34-04	30-32	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-ER04-02D	--	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	Equipment Rinsate
IR35-IS35-01	10-12	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	12	2 U	78	7	2 U	Chromatogram shows diesel-range organics
IR35-IS35-02	15-17	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	Chromatogram shows diesel-range organics
IR35-IS35-03	20-22	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	Chromatogram shows diesel-range organics
IR35-IS36-01	10-12	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	165	2	170	138	2 U(1)	Chromatogram shows diesel-range organics
IR35-IS36-02	15-17	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	6	2 U	25	10	2 U	Chromatogram shows diesel-range organics
IR35-IS36-03	20-22	0.5 U	1	2	1 U	1 U	1 U	1 U	12	2 U	3	2	2 U	Chromatogram shows diesel-range organics
IR35-IS37-01	10-12	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	124	2	250	137	2 U(1)	Chromatogram shows diesel-range organics
IR35-IS37-02	15-17	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	4	2 U	2 U	2 U	2 U	Chromatogram shows diesel-range organics
IR35-IS37-03	20-22	0.5 U	70	126	12	1 U	1	1 U	13	2 U	27	14	2 U	Chromatogram shows diesel-range organics
IR35-IS38-01	10-12	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	6	3	2 U(1)	Chromatogram shows diesel-range organics
IR35-IS38-02	15-17	0.5 U	1	19	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	Chromatogram shows diesel-range organics
IR35-IS38-03	20-22	0.5 U	1 U	9	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	Chromatogram shows diesel-range organics
IR35-IS39-01	10-12	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U(1)	16	2 U(1)	Chromatogram shows diesel-range organics
IR35-IS39-02	15-17	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS39-03	20-22	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	Chromatogram shows diesel-range organics
IR35-IS40-01	10-12	0.5 U	1 U	1	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	Chromatogram shows diesel-range organics
IR35-IS40-02	15-17	0.5 U	1 U	7	1 U	1 U	1 U	1 U	1	2 U	2 U	2 U	2 U	Chromatogram shows diesel-range organics
IR35-IS40-03	20-22	0.5 U	1 U	11	1 U	1 U	1 U	1 U	3	2 U	2 U	2 U	2 U	
IR35-IS41-01	10-12	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	40	2 U	599	455	2 U(1)	Chromatogram shows diesel-range organics
IR35-IS41-02	15-17	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	78	2 U	201	160	2 U(1)	Chromatogram shows diesel-range organics
IR35-IS41-03	20-22	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	35	2 U	20	6	2 U	Chromatogram shows diesel-range organics
IR35-IS41-03 DUP	20-22	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	35	2 U	23	8	2 U	Duplicate Sample
IR35-ER05-02B	--	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	Equipment Rinsate
IR35-IS42-01	10-12	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	64	17	368	167	2 U(1)	Chromatogram shows diesel-range organics

TABLE 2

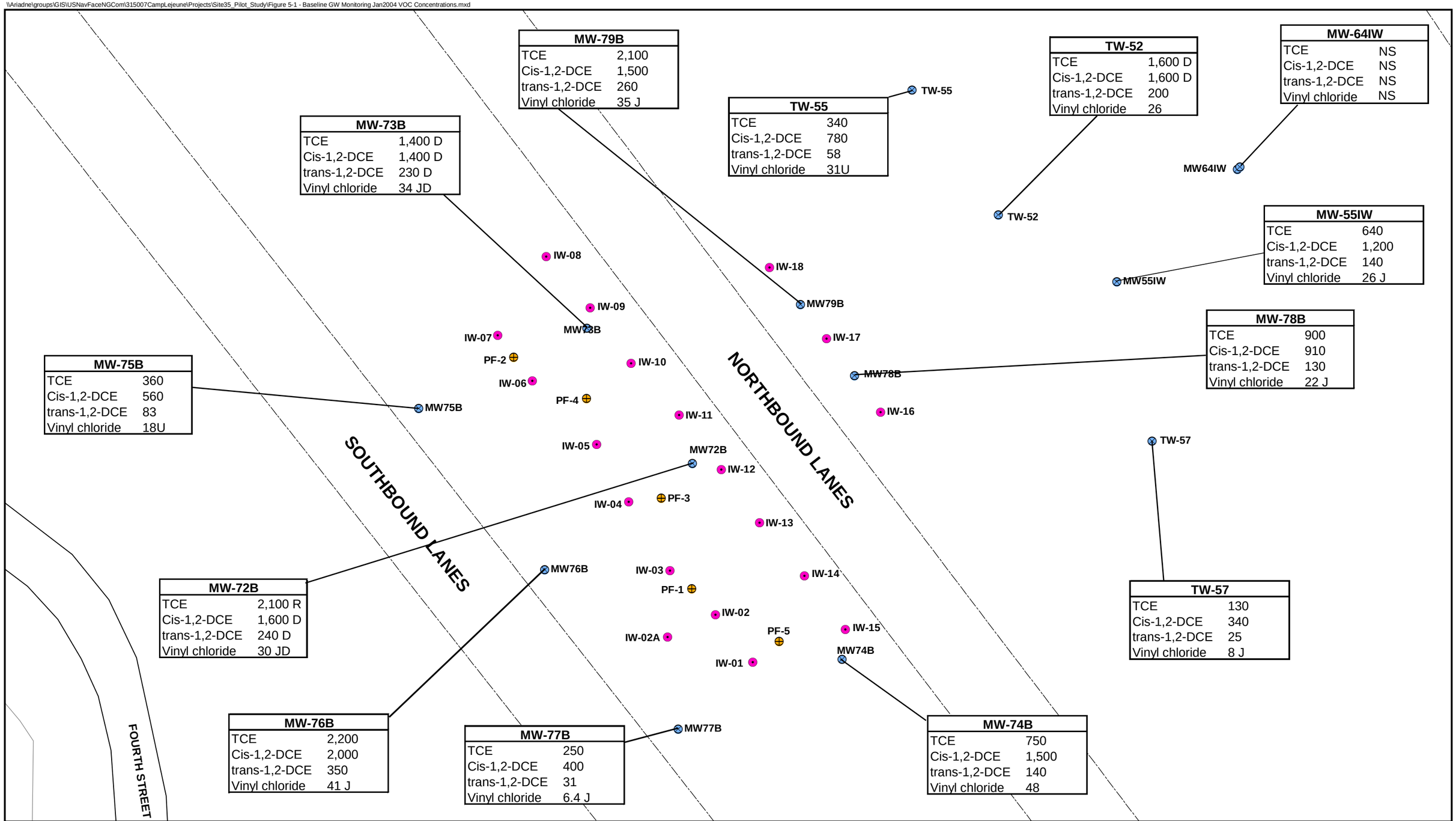
MOBILE LABORATORY ANALYTICAL RESULTS
SITE 35 HOT SPOT CHARACTERIZATION, CTO-0219
MCB, CAMP LEJEUNE, NORTH CAROLINA

Sample ID	Depth Interval (ft. bgs)	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	VC	1,1,2,2-TCA	Benzene	Toluene	Ethylbenzene	M&P Xylene	O Xylene	Comments
IR35-IS42-02	15-17	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	46	2 U	62	16	2 U	Chromatogram shows diesel-range organics
IR35-IS42-03	20-22	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1	2 U	2	2 U	2 U	Chromatogram shows diesel-range organics
IR35-IS43-01	10-12	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	93	2 U	443	218	2 U(1)	Chromatogram shows diesel-range organics
IR35-IS43-02	15-17	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	16	2 U	452	357	2 U(1)	Chromatogram shows diesel-range organics
IR35-IS43-03	20-22	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	3	2 U	2 U	Chromatogram shows diesel-range organics
IR35-IS44-01	10-12	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	104	18	451	362	328	Chromatogram shows diesel-range organics
IR35-IS44-02	15-17	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	97	20	446	376	343	Chromatogram shows diesel-range organics
IR35-IS44-03	20-22	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2	3	2	Chromatogram shows diesel-range organics
IR35-IS45-01	10-12	0.5 U	20	22	2	1 U	1 U	1 U	13	2 U	35	9	2 U	Chromatogram shows diesel-range organics
IR35-IS45-02	15-17	0.5 U	129	344	49	6	4	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS45-03	20-22	0.5 U	202	756	93	5	10	1 U	4	2 U	4	4	4	Chromatogram shows diesel-range organics
IR35-IS46-01	10-12	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS46-02	15-17	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	Chromatogram shows diesel-range organics
IR35-IS46-03	20-22	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS47-01	10-12	0.5 U	52	96	8	1 U	1 U	1 U	1 U	2	2 U	2 U	2 U	Chromatogram shows diesel-range organics
IR35-IS47-02	15-17	0.5 U	310	698	60	7	6	1 U	5	2 U	2 U	2 U	2 U	Chromatogram shows diesel-range organics
IR35-IS47-03	20-22	0.5 U	21	199	7	1 U	1	1 U	6	2 U	2 U	2 U	2 U	
IR35-ER06-02D	--	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	Equipment Rinsate
IR35-IS48-01	10-12	0.5 U	1 U	3	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS48-02	15-17	0.5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U	2 U	
IR35-IS48-03	20-22	0.5 U	1 U	15	1 U	1 U	1 U	1 U	1	2 U	2 U	2 U	2 U	
IR35-IS49-01	10-12	0.5 U	1	1 U	1 U	1 U	1 U	1 U	1 U	2	2 U	2 U	2 U	
IR35-IS49-02	15-17	0.5 U	3	13	4	1 U	1 U	14	1 U	2 U	2 U	2 U	2 U	
IR35-IS49-03	20-22	0.5 U	52	262	65	1 U	1	30	1 U	2 U	2 U	2 U	2 U	

Notes:
Units are in ug/L
(1) Interfering compound coeludes with analyte
U = Compound not detected

Pilot Study Report (CH2M HILL 2005)

\\Ariadne\groups\GIS\USNavFaceNGCom\315007CampLejeune\Projects\Site35_Pilot_Study\Figure 5-1 - Baseline GW Monitoring Jan2004 VOC Concentrations.mxd



Legend

- Injection Well
- Pneumatic Fracture
- Groundwater Station Location
- Installation Area
- Road Area
- Structure Area
- Surface Water Course Centerline
- Surface Water Body Area

NS - Not Sampled
TCE - Trichloroethene
DCE - Dichloroethene
U - Not detected
J - Estimated Value
D - Diluted sample
R - Unreliable Results
NS - Not Sampled

2L Groundwater Standards

TCE = 2.8 µg/L
Cis & Trans-1,2-DCE = 70 µg/L
Vinyl chloride = 0.015 µg/L

40 0 40 Feet

1 inch equals 40 feet

Figure 5-1
Baseline Groundwater Monitoring (January 2004) VOC Concentrations
Operable Unit No. 10 - Site 35
Pilot Study Report
Marine Corps Base, Camp Lejeune
North Carolina

AGVIQ AGVIQ ENVIRONMENTAL SERVICES
CH2M HILL JOINT VENTURE

Appendix B
Laboratory Reports and Chain of Custody Forms for the October 2005 and January/February 2006 DPT Assessments

PARADIGM ANALYTICAL LABORATORIES, INC.
5500 Business Drive
Wilmington, North Carolina 28405
(910) 350-1903
Fax (910) 350-1557

Mr. Teg Williams
CH2M HILL
4824 Parkway Plaza
Suite 200
Charlotte NC 28217
Report Number: G189-61

Client Project: Site 35 DPT

Dear Mr. Williams:

Enclosed are the results of the analytical services performed under the referenced project. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or the services performed during this project, please call Paradigm at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using Paradigm Analytical Labs for your analytical services. We look forward to working with you again on any additional analytical needs which you may have.

Sincerely,
Paradigm Analytical Laboratories, Inc.

11/2/05

Laboratory Director Date
J. Patrick Weaver

N.C. Certification #481 S.C. Certification #99029

CASE NARRATIVE

CH2M Hill Project ID: Site 35 DPT
Paradigm Analytical ID: G189-61

Fifty-two water samples were received at the laboratory October 19 for analysis of volatile organic compounds by method 8260B. The samples were received in good condition, within temperature and holding time limits.

Some of the samples required dilution to place the most concentrated target compound within linear measurement range. When a sample was diluted, it was analyzed a second time either undiluted or as low a dilution as possible. The enclosed summary reports show the lowest available detection limits for each target compound.

All surrogate spike recoveries were within acceptance limits.

The samples were analyzed in six analytical batches. The blanks, MS/MSD, and LCS summary reports for each batch are included.

Method blanks VBLK4102405B and VBLK4102505B contained a detection of 1,2,4-trichlorobenzene just above the MDL. This detection was carry-over from preceding check standards. The compound was not detected in any sample.

The MS/MSD set from batch 4102505 failed recovery and RPD limits for trichloroethene due to an elevated concentration of the compound in the sample. The batch was validated with the passing LCS recovery.

There were no other quality control exceptions.

Enclosed please find the data summary reports.

PARADIGM ANALYTICAL LABORATORIES, INC.
5500 Business Drive, Wilmington, NC 28405
Phone: (910)-350-1903 FAX: (910)-350-1557

Chain-of Custody Record & Analytical Request

COC# 51372

Page 4 of 6

Client: CH2M HILL
Address: 4824 PARKWAY PLAZA BLVD STE 200
Address: CHARLOTTE NC 28217
Quote #:

Project ID: SITE 35 DPT
Contact: R. POWELL
Phone: 704-329-0073 x 217
Fax:

Date: 10-18-05
Turnaround: STAT
Job Number:
P.O. Number:

Report To: RICK POWELL
Invoice To:

Sample ID	Date	Time	Matrix	Preservatives: HCl				Analyses: VOC 8260										Comments: Please specify any special reporting requirements
IR35-WT-ER0018005B	10-18-2005	1340	WT	3				3										G189-61
IR35-GW-IS108-20-24-05D	↓	1440	GW	3				3										
IR35-GW-IS108-40-44-05D		1500	GW	3				3										
IR35-GW-IS107-20-24-05D		1530	GW	3				3										
IR35-GW-IS107-40-44-05D		1550	GW	3				3										
IR35-GW-IS112-20-24-05D		1615	GW	9				9										* TRIPLICATE FOR MS/MSD
IR35-GW-IS112-40-44-05D	↓	1645	GW	3				3										
IR35-GW-IS113-20-24-05D	10-19-2005	0735	GW	3				3										
IR35-GW-IS113-40-44-05D	↓	0755	GW	3				3										
IR35-GW-IS113-40-44-05D DUP		0755	GW	3				3										

Relinquished By	Date	Time	Received By	Date	Time	Temperature
James E Frank	10-19-05	1300	[illegible signature]	10/19/05	1700	0.2°C

State Certification Requested

NC ____ SC ____ Other ____

SEE REVERSE FOR TERMS AND CONDITIONS

ORIGINAL

PARADIGM ANALYTICAL LABORATORIES, INC.

N.C. Certification #481 S.C. Certification #99029

PARADIGM ANALYTICAL LABORATORIES, INC.
5500 Business Drive, Wilmington, NC 28405
Phone: (910)-350-1903 FAX: (910)-350-1557

Chain-of Custody Record & Analytical Request

COC# 51366

Client: CH2M HILL
Address: 4824 Parkway Plaza Blvd Ste 200
Address: Charlotte NC 28217
Quote #:
Project ID: Site 35 DPT
Contact: R. Powell
Phone: 704-329-0073 x247
Fax:
Date: 10-19-05
Turnaround: STAT
Job Number:
P.O. Number:
Report To: Rick Powell
Invoice To:

Sample ID	Date	Time	Matrix	Preservatives: HCl				Analyses: VOC 8260									Comments: Please specify any special reporting requirements
IR35-GW-IS114-20-24-050	10-19-2005	0820	GW	3				3									
IR35-GW-IS114-40-44-050		0845	GW	3				3									G189-61
IR35-WT-FB101905		0830	WT	3				3									
IR35-GW-IS119-20-24-050		0910	GW	3				3									
IR35-WT-TB101905		0925	WT	3				3									
IR35-GW-IS119-40-44-050		0935	GW	3				3									
IR35-GW-IS118-20-24-050		1000	GW	3				3									
IR35-GW-IS118-40-44-050		1020	GW	3				3									
IR35-GW-IS117-20-24-050		1050	GW	3				3									
IR35-GW-IS117-40-44-050		1110	GW	3				3									

Relinquished By	Date	Time	Received By	Date	Time	Temperature
James E Frank	10-19-05	1300	[illegible]	10/19/05	1700	0.2°C

State Certification Requested
NC ____ SC ____ Other ____

SEE REVERSE FOR TERMS AND CONDITIONS

ORIGINAL

PARADIGM ANALYTICAL LABORATORIES, INC.

N.C. Certification #481 S.C. Certification #99029

PARADIGM ANALYTICAL LABORATORIES, INC.
5500 Business Drive, Wilmington, NC 28405
Phone: (910)-350-1903 FAX: (910)-350-1557

Chain-of Custody Record & Analytical Request

COC# 51367

Page 6 of 6

Client: CH2MHILL
Address: 4821 PARKWAY PLAZA BLVD STE200
Address: CHARLOTTE NC 28217
Project ID: SITE 35 DPT
Contact: R. POWELL
Phone: 704.329.0073 x247
Fax:
Quote #:
Date: 10-19-2005
Turnaround: STAT
Job Number:
P.O. Number:
Report To: RICK POWELL
Invoice To:

Sample ID	Date	Time	Matrix	Preservatives: J I				Analyses: VOC 8260										Comments: Please specify any special reporting requirements
SB35-GW-IS117 46-44-050 DUP	10-19-05	1110	GW	3				3										G189-61
SB35-WT-EB101905	↓	1130	WT	3				3										

Relinquished By	Date	Time	Received By	Date	Time	Temperature
James E Frank	10-19-05	1300	[signature]	10/19/05	1700	0.2°C

State Certification Requested
NC ____ SC ____ Other ____

SEE REVERSE FOR TERMS AND CONDITIONS

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PARADIGM ANALYTICAL LABORATORIES, INC.

N.C. Certification #481 S.C. Certification #99029

List of Reporting Abbreviations and Data Qualifiers

B = Compound also detected in batch blank

BQL = Below Quantitation Limit

DF = Dilution Factor

Dup = Duplicate

D = Detected, but RPD is > 40% between results in dual column method.

E = Estimated concentration, exceeds calibration range.

J = Estimated concentration, below calibration range and above MDL

LCS(D) = Laboratory Control Spike (Duplicate)

MDL = Method Detection Limit

MS(D) = Matrix Spike (Duplicate)

PQL = Practical Quantitation Limit

RL = Reporting Limit

RPD = Relative Percent Difference

mg/kg = milligram per kilogram, ppm, parts per million

ug/kg = micrograms per kilogram, ppb, parts per billion

mg/L = milligram per liter, ppm, parts per million

ug/L = micrograms per liter, ppb, parts per billion

% Rec = Percent Recovery

% soilds = Percent Solids

Special Notes:

1) Metals and mercury samples are digested with a hot block, see the standard operating procedure document for details.

2) Uncertainty for all reported data is less than or equal to 30 percent.

PARADIGM ANALYTICAL LABORATORIES, INC.
5500 Business Drive, Wilmington, NC 28405
Phone: (910)-350-1903 FAX: (910)-350-1557

Chain-of Custody Record & Analytical Request

COC# 51369

Page 1 of 6

3 of 137

Client: CH2MHILL
Project ID: SITE 35 DPT
Date: 10-17-2005
Report To: RICK POWELL
Address: 4824 PARKWAY PLAZA BLVD STE 200
Contact: R. POWELL
Turnaround: STAT
Address: CHARLOTTE NC 28217
Phone: 704-329-0073 x247
Job Number:
Quote #:
Fax:
P.O. Number:
Invoice To:

Sample ID	Date	Time	Matrix	Preservatives: HCl				Analyses: VOC 8260										Comments: Please specify any special reporting requirements
																		G189-61
IR35-GW-IS100-20-24-050	10-17-05	1320	GW	3				3										
IR35-GW-IS100-45-49-050		1340		3				3										
IR35-WT-FB101705		1330	WT	3				3										
IR35-GW-IS101-20-24-050		1415	GW	3				3										
IR35-GW-IS101-45-49-050		1430	GW	3				3										
IR35-GW-IS106-20-24-050		1500	GW	3				3										
IR35-GW-IS106-20-24-050 DUP		1500	GW	3				3										
IR35-GW-IS106-45-49-050		1530	GW	3				3										
IR35-GW-IS105-20-24-050		1600	GW	3				3										
IR35-GW-IS109-45-49-050		1625	GW	3				3										

Relinquished By	Date	Time	Received By	Date	Time	Temperature	State Certification Requested
James E Frank	10-19-05	1300	[illegible]	10/19/05	1700	0.2°C	NC ____ SC ____ Other ____
							SEE REVERSE FOR TERMS AND CONDITIONS

ORIGINAL

PARADIGM ANALYTICAL LABORATORIES, INC.
N.C. Certification #481 S.C. Certification #99029

PARADIGM ANALYTICAL LABORATORIES, INC.
5500 Business Drive, Wilmington, NC 28405
Phone: (910)-350-1903 FAX: (910)-350-1557

Chain-of Custody Record & Analytical Request

COC# 51370

Page 2 of 6

Client: CH2M HILL
Address: 4824 PARKWAY PLAZA BLVD STE 200
Address: CHARLOTTE NC 28217
Quote #:

Project ID: SITE 35 DPT
Contact: R. POWELL
Phone: 704-329-0073 x 247
Fax:

Date: 10-17-05
Turnaround: STAT
Job Number:
P.O. Number:

Report To: RICK POWELL
Invoice To:

Sample ID	Date	Time	Matrix	Preservatives: HCl				Analyses: VOC 8260										Comments: Please specify any special reporting requirements
IR35-GW-IS 110-20-24-05D	10-17-2005	1650	GW	3				3										G189-61
IR35-GW-IS 110-45-49-05D	↓	1720	GW	3				3										
IR35-GW-IS 111-20-24-05D	↓	1740	GW	3				3										
IR35-GW-IS 111-45-49-05D	↓	1800	GW	3				3										
IR35-WT-EB 101705	↓	1810	WT	3				3										
IR35-WT-TB 101705	↓	1820	WT	~~3~~ 02				~~3~~ 2										
IR35-GW-IS115-20-24-05D	10-18-2005	0750	GW	3				3										
IR35-GW-IS115-45-49-05D	↓	0815	GW	3				3										
IR35-GW-IS116-20-24-05D	↓	0840	GW	3				3										
IR35-GW-IS116-40-44-05D	↓	0900	GW	3				3										

Relinquished By	Date	Time	Received By	Date	Time	Temperature
James E Frank	10-19-05	1300	[illegible]	10/19/05	1700	0.2°C

State Certification Requested

NC ____ SC ____ Other ____

SEE REVERSE FOR TERMS AND CONDITIONS

ORIGINAL

PARADIGM ANALYTICAL LABORATORIES, INC.

N.C. Certification #481 S.C. Certification #99029

PARADIGM ANALYTICAL LABORATORIES, INC.
5500 Business Drive, Wilmington, NC 28405
Phone: (910)-350-1903 FAX: (910)-350-1557

Chain-of Custody Record & Analytical Request

COC# 51371

Client: CH2M HILL
Project ID: SITE 35 DPT
Date: 10-18-2005
Report To: RICK POWELL
Address: 4824 PARKWAY PLAZA BLD. STE 200
Contact: R. POWELL
Turnaround: STAT
Address: CHARLOTTE NC 28217
Phone: 704-329-0073 x247
Job Number:
Quote #:
Fax:
P.O. Number:
Invoice To:

Sample ID	Date	Time	Matrix	Preservatives: HCl				Analyses: VOC 8260										Comments: Please specify any special reporting requirements
IR35-GW-IS102-20-24-050	10-18-2005	1000	GW	3				3										G189-61
IR35-GW-IS102-40-44-050		1030	GW	3				3										
IR35-GW-IS103-20-24-050		1105	GW	3				3										
IR35-GW-IS103-40-44-050		1135	GW	3				3										
IR35-GW-IS104-20-24-050		1245	GW	9				9										* TRIPLICATE FOR MS/MSD
IR35-GW-IS104-40-44-050		1310	GW	3				3										
IR35-GW-IS109-20-24-050		1335	GW	3				3										
IR35-GW-IS109-20-24-050 DUP		1335	GW	3				3										
IR35-GW-IS108-40-44-050		1400	GW	3				3										
IR35-GW-EB10182005A		1330	WT	3				3										

Relinquished By	Date	Time	Received By	Date	Time	Temperature
James E Frank	10-19-05	1300	[illegible]	10/19/05	1700	0.2°C

State Certification Requested
NC ____ SC ____ Other ____

SEE REVERSE FOR TERMS AND CONDITIONS

ORIGINAL

PARADIGM ANALYTICAL LABORATORIES, INC.

N.C. Certification #481 S.C. Certification #99029

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS100-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-1C
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 13:20
Date Received: 10/19/05
Matrix: Water

AOD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/26/05	
Benzene	**1.01**	1.00	0.162	1	10/26/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/26/05	
Bromoform	BQL	1.00	0.0960	1	10/26/05	
Bromomethane	BQL	1.00	0.104	1	10/26/05	
2-Butanone	BQL	25.0	1.09	1	10/26/05	
Carbon disulfide	**0.380**	1.00	0.206	1	10/26/05	J
Carbon tetrachloride	BQL	1.00	0.181	1	10/26/05	
Chlorobenzene	BQL	1.00	0.177	1	10/26/05	
Chloroethane	BQL	1.00	0.416	1	10/26/05	
Chloroform	BQL	1.00	0.220	1	10/26/05	
Chloromethane	BQL	1.00	0.282	1	10/26/05	
Cyclohexane	BQL	1.00	1.00	1	10/26/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/26/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/26/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/26/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/26/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/26/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/26/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/26/05	
1,1-Dichloroethene	**0.420**	1.00	0.164	1	10/26/05	J
1,2-Dichloroethane	BQL	1.00	0.244	1	10/26/05	
cis-1,2-Dichloroethene	**805**	50.0	8.80	50	10/24/05	
trans-1,2-dichloroethene	**134**	50.0	11.5	50	10/24/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/26/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/26/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/26/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/26/05	
Ethylbenzene	**0.290**	1.00	0.206	1	10/26/05	J
2-Hexanone	BQL	5.00	0.874	1	10/26/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/26/05	
Methyl Acetate	BQL	1.00	1.00	1	10/26/05	
Methylene chloride	BQL	5.00	0.188	1	10/26/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/26/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/26/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/26/05	
Styrene	BQL	1.00	0.239	1	10/26/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/26/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/26/05	
Toluene	**1.01**	1.00	0.175	1	10/26/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/26/05	
Trichloroethene	**129**	50.0	10.5	50	10/24/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS100-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-1C
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 13:20
Date Received: 10/19/05
Matrix: Water

ACD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/26/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/26/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/26/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/26/05	
Vinyl chloride	**3.70**	1.00	0.400	1	10/26/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/26/05	
o-Xylene	BQL	1.00	0.167	1	10/26/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.2	102
1,2-Dichloroethane-d4	10	10.7	107
Toluene-d8	10	9.89	99

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: _____

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS100-45-49-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-2C
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 13:40
Date Received: 10/19/05
Matrix: Water

ADD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	**13.0**	25.0	3.37	1	10/26/05	J
Benzene	**1.02**	1.00	0.162	1	10/26/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/26/05	
Bromoform	BQL	1.00	0.0960	1	10/26/05	
Bromomethane	BQL	1.00	0.104	1	10/26/05	
2-Butanone	BQL	25.0	1.09	1	10/26/05	
Carbon disulfide	BQL	1.00	0.206	1	10/26/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/26/05	
Chlorobenzene	BQL	1.00	0.177	1	10/26/05	
Chloroethane	BQL	1.00	0.416	1	10/26/05	
Chloroform	BQL	1.00	0.220	1	10/26/05	
Chloromethane	BQL	1.00	0.282	1	10/26/05	
Cyclohexane	BQL	1.00	1.00	1	10/26/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/26/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/26/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/26/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/26/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/26/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/26/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/26/05	
1,1-Dichloroethene	**1.77**	1.00	0.164	1	10/26/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/26/05	
cis-1,2-Dichloroethene	**121**	25.0	4.40	25	10/24/05	
trans-1,2-dichloroethene	**19.1**	1.00	0.230	1	10/26/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/26/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/26/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/26/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/26/05	
Ethylbenzene	**1.02**	1.00	0.206	1	10/26/05	
2-Hexanone	BQL	5.00	0.874	1	10/26/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/26/05	
Methyl Acetate	BQL	1.00	1.00	1	10/26/05	
Methylene chloride	~~**0.820**~~	5.00	0.188	1	10/26/05	~~J~~ 5U, BL
methyl Cyclohexane	BQL	1.00	1.00	1	10/26/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/26/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/26/05	
Styrene	BQL	1.00	0.239	1	10/26/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/26/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/26/05	
Toluene	**1.86**	1.00	0.175	1	10/26/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/26/05	
Trichloroethene	**291**	25.0	5.23	25	10/24/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS100-45-49-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-2C
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 13:40
Date Received: 10/19/05
Matrix: Water

✓ ACD 7/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/26/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/26/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/26/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/26/05	
Vinyl chloride	**3.55**	1.00	0.400	1	10/26/05	
m-,p-Xylene	**0.870**	2.00	0.386	1	10/26/05	J
o-Xylene	**0.330**	1.00	0.167	1	10/26/05	J

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	9.98	100
1,2-Dichloroethane-d4	10	11.1	111
Toluene-d8	10	10	100

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: [signature]

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-WT-FB101705
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-3B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 13:30
Date Received: 10/19/05
Matrix: Water

✓ A-2nd 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/25/05	
Benzene	BQL	1.00	0.162	1	10/25/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	BQL	25.0	1.09	1	10/25/05	
Carbon disulfide	BQL	1.00	0.206	1	10/25/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	BQL	1.00	0.176	1	10/25/05	
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/25/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	BQL	1.00	0.206	1	10/25/05	
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	**1.00**	5.00	0.188	1	10/25/05	J, BRL
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/25/05	
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	BQL	1.00	0.175	1	10/25/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/25/05	
Trichloroethene	BQL	1.00	0.209	1	10/25/05	

Results for Volatiles
by GCMS 8260B

ACD 9/22/06

Client Sample ID: IR35-WT-FB101705
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-3B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 13:30
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/25/05	
o-Xylene	BQL	1.00	0.167	1	10/25/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.6	106
1,2-Dichloroethane-d4	10	10.9	109
Toluene-d8	10	10.2	102

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By:

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS101-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-4C
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 14:15
Date Received: 10/19/05
Matrix: Water

✓ ASM 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	50.0	6.74	2	10/26/05	
Benzene	**9.52**	2.00	0.324	2	10/26/05	
Bromodichloromethane	BQL	2.00	0.370	2	10/26/05	
Bromoform	BQL	2.00	0.192	2	10/26/05	
Bromomethane	BQL	2.00	0.208	2	10/26/05	
2-Butanone	BQL	50.0	2.18	2	10/26/05	
Carbon disulfide	BQL	2.00	0.412	2	10/26/05	
Carbon tetrachloride	BQL	2.00	0.362	2	10/26/05	
Chlorobenzene	BQL	2.00	0.354	2	10/26/05	
Chloroethane	BQL	2.00	0.832	2	10/26/05	
Chloroform	BQL	2.00	0.440	2	10/26/05	
Chloromethane	BQL	2.00	0.564	2	10/26/05	
Cyclohexane	BQL	2.00	2.00	2	10/26/05	
Dibromochloromethane	BQL	2.00	0.416	2	10/26/05	
1,2-Dibromo-3-chloropropane	BQL	10.0	3.90	2	10/26/05	
1,2-Dibromoethane (EDB)	BQL	2.00	0.528	2	10/26/05	
1,2-Dichlorobenzene	BQL	2.00	0.380	2	10/26/05	
1,3-Dichlorobenzene	BQL	2.00	0.468	2	10/26/05	
1,4-Dichlorobenzene	BQL	2.00	0.364	2	10/26/05	
1,1-Dichloroethane	BQL	2.00	0.430	2	10/26/05	
1,1-Dichloroethene	**3.52**	2.00	0.328	2	10/26/05	
1,2-Dichloroethane	BQL	2.00	0.488	2	10/26/05	
cis-1,2-Dichloroethene	**1150**	100	17.6	100	10/24/05	
trans-1,2-dichloroethene	**335**	100	23.0	100	10/24/05	
1,2-Dichloropropane	BQL	2.00	0.332	2	10/26/05	
cis-1,3-Dichloropropene	BQL	2.00	0.404	2	10/26/05	
trans-1,3-Dichloropropene	BQL	2.00	0.238	2	10/26/05	
Dichlorodifluoromethane	BQL	10.0	0.770	2	10/26/05	
Ethylbenzene	**3.74**	2.00	0.412	2	10/26/05	
2-Hexanone	BQL	10.0	1.75	2	10/26/05	
Isopropylbenzene	**2.16**	2.00	0.346	2	10/26/05	
Methyl Acetate	BQL	2.00	2.00	2	10/26/05	
Methylene chloride	~~**0.400**~~	10.0	0.376	2	10/26/05	~~J~~ 10, U, BL
methyl Cyclohexane	BQL	2.00	2.00	2	10/26/05	
4-Methyl-2-pentanone	BQL	10.0	0.990	2	10/26/05	
Methyl-tert-butyl ether (MTBE)	BQL	2.00	0.428	2	10/26/05	
Styrene	BQL	2.00	0.478	2	10/26/05	
1,1,2,2-Tetrachloroethane	BQL	2.00	0.512	2	10/26/05	
Tetrachloroethene	BQL	2.00	0.608	2	10/26/05	
Toluene	**6.08**	2.00	0.350	2	10/26/05	
1,2,4-Trichlorobenzene	BQL	2.00	0.488	2	10/26/05	
Trichloroethene	**183**	100	20.9	100	10/24/05	

Results for Volatiles
by GCMS 8260B

ACD 9/22/06

Client Sample ID: IR35-GW-IS101-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-4C
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 14:15
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	2.00	0.394	2	10/26/05	
1,1,2-Trichloroethane	BQL	2.00	0.534	2	10/26/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	2.00	2.00	2	10/26/05	
Trichlorofluoromethane	BQL	2.00	0.856	2	10/26/05	
Vinyl chloride	**15.9**	2.00	0.800	2	10/26/05	
m-,p-Xylene	**2.02**	4.00	0.772	2	10/26/05	J
o-Xylene	**1.54**	2.00	0.334	2	10/26/05	J

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.4	104
1,2-Dichloroethane-d4	10	10.4	104
Toluene-d8	10	10	100

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: _____

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS101-45-49-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-5C
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 14:30
Date Received: 10/19/05
Matrix: Water

ACD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	**20.9**	25.0	3.37	1	10/26/05	J
Benzene	**1.53**	1.00	0.162	1	10/26/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/26/05	
Bromoform	BQL	1.00	0.0960	1	10/26/05	
Bromomethane	BQL	1.00	0.104	1	10/26/05	
2-Butanone	BQL	25.0	1.09	1	10/26/05	
Carbon disulfide	BQL	1.00	0.206	1	10/26/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/26/05	
Chlorobenzene	BQL	1.00	0.177	1	10/26/05	
Chloroethane	BQL	1.00	0.416	1	10/26/05	
Chloroform	BQL	1.00	0.220	1	10/26/05	
Chloromethane	BQL	1.00	0.282	1	10/26/05	
Cyclohexane	BQL	1.00	1.00	1	10/26/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/26/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/26/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/26/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/26/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/26/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/26/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/26/05	
1,1-Dichloroethene	**0.390**	1.00	0.164	1	10/26/05	J
1,2-Dichloroethane	BQL	1.00	0.244	1	10/26/05	
cis-1,2-Dichloroethene	**216**	20.0	3.52	20	10/24/05	
trans-1,2-dichloroethene	**18.4**	1.00	0.230	1	10/26/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/26/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/26/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/26/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/26/05	
Ethylbenzene	**1.28**	1.00	0.206	1	10/26/05	
2-Hexanone	BQL	5.00	0.874	1	10/26/05	
Isopropylbenzene	**0.210**	1.00	0.173	1	10/26/05	J
Methyl Acetate	BQL	1.00	1.00	1	10/26/05	
Methylene chloride	~~**0.600**~~	5.00	0.188	1	10/26/05	~~J~~ 5, U, BC
methyl Cyclohexane	BQL	1.00	1.00	1	10/26/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/26/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/26/05	
Styrene	BQL	1.00	0.239	1	10/26/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/26/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/26/05	
Toluene	**2.87**	1.00	0.175	1	10/26/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/26/05	
Trichloroethene	**208**	20.0	4.18	20	10/24/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS101-45-49-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-5C
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 14:30
Date Received: 10/19/05
Matrix: Water

✓ AW 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/26/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/26/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/26/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/26/05	
Vinyl chloride	**3.26**	1.00	0.400	1	10/26/05	
m-,p-Xylene	**0.900**	2.00	0.386	1	10/26/05	J
o-Xylene	**0.380**	1.00	0.167	1	10/26/05	J

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	11.2	112
1,2-Dichloroethane-d4	10	10.7	107
Toluene-d8	10	10	100

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: [signature]

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS106-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-6B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 15:00
Date Received: 10/19/05
Matrix: Water

✓ ACD 11/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	**4.64**	25.0	3.37	1	10/24/05	J
Benzene	**19.2**	1.00	0.162	1	10/24/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/24/05	
Bromoform	BQL	1.00	0.0960	1	10/24/05	
Bromomethane	BQL	1.00	0.104	1	10/24/05	
2-Butanone	BQL	25.0	1.09	1	10/24/05	
Carbon disulfide	BQL	1.00	0.206	1	10/24/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/24/05	
Chlorobenzene	BQL	1.00	0.177	1	10/24/05	
Chloroethane	BQL	1.00	0.416	1	10/24/05	
Chloroform	BQL	1.00	0.220	1	10/24/05	
Chloromethane	BQL	1.00	0.282	1	10/24/05	
Cyclohexane	BQL	1.00	1.00	1	10/24/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/24/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/24/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/24/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/24/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/24/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/24/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/24/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/24/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/24/05	
cis-1,2-Dichloroethene	**7.70**	1.00	0.176	1	10/24/05	
trans-1,2-dichloroethene	**1.37**	1.00	0.230	1	10/24/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/24/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/24/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/24/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/24/05	
Ethylbenzene	**7.50**	1.00	0.206	1	10/24/05	
2-Hexanone	BQL	5.00	0.874	1	10/24/05	
Isopropylbenzene	**1.64**	1.00	0.173	1	10/24/05	
Methyl Acetate	BQL	1.00	1.00	1	10/24/05	
Methylene chloride	BQL	5.00	0.188	1	10/24/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/24/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/24/05	
Methyl-tert-butyl ether (MTBE)	**0.470**	1.00	0.214	1	10/24/05	J
Styrene	BQL	1.00	0.239	1	10/24/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/24/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/24/05	
Toluene	**2.46**	1.00	0.175	1	10/24/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/24/05	
Trichloroethene	**0.820**	1.00	0.209	1	10/24/05	J

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS106-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-6B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 15:00
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/24/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/24/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/24/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/24/05	
Vinyl chloride	BQL	1.00	0.400	1	10/24/05	
m-,p-Xylene	**1.30**	2.00	0.386	1	10/24/05	J
o-Xylene	**1.41**	1.00	0.167	1	10/24/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.5	105
1,2-Dichloroethane-d4	10	11.1	111
Toluene-d8	10	10.3	103

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By:

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS106-20-24-05D DUP
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-7B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 15:00
Date Received: 10/19/05
Matrix: Water

✓ RCD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	**5.93**	25.0	3.37	1	10/24/05	J
Benzene	**10.4**	1.00	0.162	1	10/24/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/24/05	
Bromoform	BQL	1.00	0.0960	1	10/24/05	
Bromomethane	BQL	1.00	0.104	1	10/24/05	
2-Butanone	BQL	25.0	1.09	1	10/24/05	
Carbon disulfide	BQL	1.00	0.206	1	10/24/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/24/05	
Chlorobenzene	BQL	1.00	0.177	1	10/24/05	
Chloroethane	BQL	1.00	0.416	1	10/24/05	
Chloroform	BQL	1.00	0.220	1	10/24/05	
Chloromethane	BQL	1.00	0.282	1	10/24/05	
Cyclohexane	BQL	1.00	1.00	1	10/24/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/24/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/24/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/24/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/24/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/24/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/24/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/24/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/24/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/24/05	
cis-1,2-Dichloroethene	**4.03**	1.00	0.176	1	10/24/05	
trans-1,2-dichloroethene	**0.590**	1.00	0.230	1	10/24/05	J
1,2-Dichloropropane	BQL	1.00	0.166	1	10/24/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/24/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/24/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/24/05	
Ethylbenzene	**3.79**	1.00	0.206	1	10/24/05	
2-Hexanone	BQL	5.00	0.874	1	10/24/05	
Isopropylbenzene	**1.20**	1.00	0.173	1	10/24/05	
Methyl Acetate	BQL	1.00	1.00	1	10/24/05	
Methylene chloride	BQL	5.00	0.188	1	10/24/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/24/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/24/05	
Methyl-tert-butyl ether (MTBE)	**0.330**	1.00	0.214	1	10/24/05	J
Styrene	BQL	1.00	0.239	1	10/24/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/24/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/24/05	
Toluene	**1.57**	1.00	0.175	1	10/24/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/24/05	
Trichloroethene	**0.340**	1.00	0.209	1	10/24/05	J

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS106-20-24-05D DUP
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-7B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 15:00
Date Received: 10/19/05
Matrix: Water

✓ KCD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/24/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/24/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/24/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/24/05	
Vinyl chloride	BQL	1.00	0.400	1	10/24/05	
m-,p-Xylene	**0.840**	2.00	0.386	1	10/24/05	J
o-Xylene	**0.850**	1.00	0.167	1	10/24/05	J

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.4	104
1,2-Dichloroethane-d4	10	11	110
Toluene-d8	10	10.3	103

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: _____

✓ 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS106-45-49-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-8B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 15:30
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	**17.1**	25.0	3.37	1	10/24/05	J
Benzene	**2.21**	1.00	0.162	1	10/24/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/24/05	
Bromoform	BQL	1.00	0.0960	1	10/24/05	
Bromomethane	BQL	1.00	0.104	1	10/24/05	
2-Butanone	**5.75**	25.0	1.09	1	10/24/05	J
Carbon disulfide	BQL	1.00	0.206	1	10/24/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/24/05	
Chlorobenzene	BQL	1.00	0.177	1	10/24/05	
Chloroethane	BQL	1.00	0.416	1	10/24/05	
Chloroform	**0.240**	1.00	0.220	1	10/24/05	J
Chloromethane	BQL	1.00	0.282	1	10/24/05	
Cyclohexane	BQL	1.00	1.00	1	10/24/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/24/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/24/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/24/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/24/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/24/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/24/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/24/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/24/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/24/05	
cis-1,2-Dichloroethene	**3.40**	1.00	0.176	1	10/24/05	
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/24/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/24/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/24/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/24/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/24/05	
Ethylbenzene	**2.13**	1.00	0.206	1	10/24/05	
2-Hexanone	BQL	5.00	0.874	1	10/24/05	
Isopropylbenzene	**0.310**	1.00	0.173	1	10/24/05	J
Methyl Acetate	BQL	1.00	1.00	1	10/24/05	
Methylene chloride	~~**0.390**~~	5.00	0.188	1	10/24/05	~~J~~ 5.U, BL
methyl Cyclohexane	BQL	1.00	1.00	1	10/24/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/24/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/24/05	
Styrene	BQL	1.00	0.239	1	10/24/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/24/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/24/05	
Toluene	**1.84**	1.00	0.175	1	10/24/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/24/05	
Trichloroethene	**0.610**	1.00	0.209	1	10/24/05	J

✓ ACD 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS106-45-49-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-8B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 15:30
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/24/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/24/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/24/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/24/05	
Vinyl chloride	BQL	1.00	0.400	1	10/24/05	
m-,p-Xylene	**0.600**	2.00	0.386	1	10/24/05	J
o-Xylene	**0.380**	1.00	0.167	1	10/24/05	J

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.5	105
1,2-Dichloroethane-d4	10	11.2	112
Toluene-d8	10	10.3	103

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: JW

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS105-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-9C
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 16:00
Date Received: 10/19/05
Matrix: Water

✓ #407 9/25/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	**3.57**	25.0	3.37	1	10/26/05	J
Benzene	**4.85**	1.00	0.162	1	10/26/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/26/05	
Bromoform	BQL	1.00	0.0960	1	10/26/05	
Bromomethane	BQL	1.00	0.104	1	10/26/05	
2-Butanone	BQL	25.0	1.09	1	10/26/05	
Carbon disulfide	**1.53**	1.00	0.206	1	10/26/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/26/05	
Chlorobenzene	BQL	1.00	0.177	1	10/26/05	
Chloroethane	BQL	1.00	0.416	1	10/26/05	
Chloroform	BQL	1.00	0.220	1	10/26/05	
Chloromethane	BQL	1.00	0.282	1	10/26/05	
Cyclohexane	BQL	1.00	1.00	1	10/26/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/26/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/26/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/26/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/26/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/26/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/26/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/26/05	
1,1-Dichloroethene	**1.68**	1.00	0.164	1	10/26/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/26/05	
cis-1,2-Dichloroethene	**876**	50.0	8.80	50	10/21/05	
trans-1,2-dichloroethene	**177**	50.0	11.5	50	10/21/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/26/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/26/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/26/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/26/05	
Ethylbenzene	**1.26**	1.00	0.206	1	10/26/05	
2-Hexanone	BQL	5.00	0.874	1	10/26/05	
Isopropylbenzene	**1.11**	1.00	0.173	1	10/26/05	
Methyl Acetate	BQL	1.00	1.00	1	10/26/05	
Methylene chloride	BQL	5.00	0.188	1	10/26/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/26/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/26/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/26/05	
Styrene	BQL	1.00	0.239	1	10/26/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/26/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/26/05	
Toluene	**2.73**	1.00	0.175	1	10/26/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/26/05	
Trichloroethene	**294**	50.0	10.5	50	10/21/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS105-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-9C
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 16:00
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/26/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/26/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/26/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/26/05	
Vinyl chloride	**9.55**	1.00	0.400	1	10/26/05	
m-,p-Xylene	**0.660**	2.00	0.386	1	10/26/05	J
o-Xylene	**0.460**	1.00	0.167	1	10/26/05	J

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.4	104
1,2-Dichloroethane-d4	10	10.4	104
Toluene-d8	10	10	100

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By:

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS105-45-49-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-10B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 16:25
Date Received: 10/19/05
Matrix: Water

✓ ATD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	**17.5**	25.0	3.37	1	10/24/05	J
Benzene	**1.20**	1.00	0.162	1	10/24/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/24/05	
Bromoform	BQL	1.00	0.0960	1	10/24/05	
Bromomethane	BQL	1.00	0.104	1	10/24/05	
2-Butanone	**4.36**	25.0	1.09	1	10/24/05	J
Carbon disulfide	BQL	1.00	0.206	1	10/24/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/24/05	
Chlorobenzene	BQL	1.00	0.177	1	10/24/05	
Chloroethane	BQL	1.00	0.416	1	10/24/05	
Chloroform	BQL	1.00	0.220	1	10/24/05	
Chloromethane	BQL	1.00	0.282	1	10/24/05	
Cyclohexane	BQL	1.00	1.00	1	10/24/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/24/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/24/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/24/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/24/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/24/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/24/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/24/05	
1,1-Dichloroethene	**0.440**	1.00	0.164	1	10/24/05	J
1,2-Dichloroethane	BQL	1.00	0.244	1	10/24/05	
cis-1,2-Dichloroethene	**82.4**	10.0	1.76	10	10/24/05	
trans-1,2-dichloroethene	**12.2**	1.00	0.230	1	10/24/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/24/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/24/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/24/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/24/05	
Ethylbenzene	**1.21**	1.00	0.206	1	10/24/05	
2-Hexanone	BQL	5.00	0.874	1	10/24/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/24/05	
Methyl Acetate	BQL	1.00	1.00	1	10/24/05	
Methylene chloride	~~**0.700**~~	5.00	0.188	1	10/24/05	J-5,U,BL
methyl Cyclohexane	BQL	1.00	1.00	1	10/24/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/24/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/24/05	
Styrene	BQL	1.00	0.239	1	10/24/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/24/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/24/05	
Toluene	**1.90**	1.00	0.175	1	10/24/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/24/05	
Trichloroethene	**58.9**	10.0	2.09	10	10/24/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS105-45-49-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-10B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 16:25
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/24/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/24/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/24/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/24/05	
Vinyl chloride	**2.05**	1.00	0.400	1	10/24/05	
m-,p-Xylene	**0.460**	2.00	0.386	1	10/24/05	J
o-Xylene	**0.200**	1.00	0.167	1	10/24/05	J

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.5	105
1,2-Dichloroethane-d4	10	11.3	113
Toluene-d8	10	10.3	103

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By:

✓ ADD 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS110-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-11A
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 16:50
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	100	13.5	4	10/26/05	
Benzene	**23.0**	4.00	0.648	4	10/26/05	
Bromodichloromethane	BQL	4.00	0.740	4	10/26/05	
Bromoform	BQL	4.00	0.384	4	10/26/05	
Bromomethane	BQL	4.00	0.416	4	10/26/05	
2-Butanone	BQL	100	4.36	4	10/26/05	
Carbon disulfide	BQL	4.00	0.824	4	10/26/05	
Carbon tetrachloride	BQL	4.00	0.724	4	10/26/05	
Chlorobenzene	BQL	4.00	0.708	4	10/26/05	
Chloroethane	BQL	4.00	1.66	4	10/26/05	
Chloroform	BQL	4.00	0.880	4	10/26/05	
Chloromethane	BQL	4.00	1.13	4	10/26/05	
Cyclohexane	BQL	4.00	4.00	4	10/26/05	
Dibromochloromethane	BQL	4.00	0.832	4	10/26/05	
1,2-Dibromo-3-chloropropane	BQL	20.0	7.80	4	10/26/05	
1,2-Dibromoethane (EDB)	BQL	4.00	1.06	4	10/26/05	
1,2-Dichlorobenzene	BQL	4.00	0.760	4	10/26/05	
1,3-Dichlorobenzene	BQL	4.00	0.936	4	10/26/05	
1,4-Dichlorobenzene	BQL	4.00	0.728	4	10/26/05	
1,1-Dichloroethane	BQL	4.00	0.860	4	10/26/05	
1,1-Dichloroethene	BQL	4.00	0.656	4	10/26/05	
1,2-Dichloroethane	BQL	4.00	0.976	4	10/26/05	
cis-1,2-Dichloroethene	**4.80**	4.00	0.704	4	10/26/05	
trans-1,2-dichloroethene	BQL	4.00	0.920	4	10/26/05	
1,2-Dichloropropane	BQL	4.00	0.664	4	10/26/05	
cis-1,3-Dichloropropene	BQL	4.00	0.808	4	10/26/05	
trans-1,3-Dichloropropene	BQL	4.00	0.476	4	10/26/05	
Dichlorodifluoromethane	BQL	20.0	1.54	4	10/26/05	
Ethylbenzene	**19.7**	4.00	0.824	4	10/26/05	
2-Hexanone	BQL	20.0	3.50	4	10/26/05	
Isopropylbenzene	**9.24**	4.00	0.692	4	10/26/05	
Methyl Acetate	BQL	4.00	4.00	4	10/26/05	
Methylene chloride	BQL	20.0	0.752	4	10/26/05	
methyl Cyclohexane	BQL	4.00	4.00	4	10/26/05	
4-Methyl-2-pentanone	BQL	20.0	1.98	4	10/26/05	
Methyl-tert-butyl ether (MTBE)	BQL	4.00	0.856	4	10/26/05	
Styrene	BQL	4.00	0.956	4	10/26/05	
1,1,2,2-Tetrachloroethane	BQL	4.00	1.02	4	10/26/05	
Tetrachloroethene	BQL	4.00	1.22	4	10/26/05	
Toluene	**22.4**	4.00	0.700	4	10/26/05	
1,2,4-Trichlorobenzene	BQL	4.00	0.976	4	10/26/05	
Trichloroethene	BQL	4.00	0.836	4	10/26/05	

✓ BCD 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS110-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-11A
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 16:50
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	4.00	0.788	4	10/26/05	
1,1,2-Trichloroethane	BQL	4.00	1.07	4	10/26/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	4.00	4.00	4	10/26/05	
Trichlorofluoromethane	BQL	4.00	1.71	4	10/26/05	
Vinyl chloride	BQL	4.00	1.60	4	10/26/05	
m-,p-Xylene	**12.9**	8.00	1.54	4	10/26/05	
o-Xylene	**7.48**	4.00	0.668	4	10/26/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.4	104
1,2-Dichloroethane-d4	10	10.5	105
Toluene-d8	10	10.1	101

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: [signature]

✓ ACD 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS110-45-49-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-12B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 17:20
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	**18.4**	25.0	3.37	1	10/25/05	J
Benzene	**4.99**	1.00	0.162	1	10/25/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	**4.69**	25.0	1.09	1	10/25/05	J
Carbon disulfide	**0.290**	1.00	0.206	1	10/25/05	J
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	**1.99**	1.00	0.176	1	10/25/05	
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/25/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	**3.17**	1.00	0.206	1	10/25/05	
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	**1.31**	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	**0.560**	5.00	0.188	1	10/25/05	J
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/25/05	
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	**5.23**	1.00	0.175	1	10/25/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/25/05	
Trichloroethene	BQL	1.00	0.209	1	10/25/05	

✓ ACD 9/22/06

Results for Volatiles by GCMS 8260B

Client Sample ID: IR35-GW-IS110-45-49-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-12B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 17:20
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	**1.62**	2.00	0.386	1	10/25/05	J
o-Xylene	**1.10**	1.00	0.167	1	10/25/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.2	102
1,2-Dichloroethane-d4	10	11.2	112
Toluene-d8	10	10.1	101

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: [signature]

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS111-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-13B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 17:40
Date Received: 10/19/05
Matrix: Water

✓ 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/25/05	
Benzene	**0.190**	1.00	0.162	1	10/25/05	J
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	BQL	25.0	1.09	1	10/25/05	
Carbon disulfide	**0.290**	1.00	0.206	1	10/25/05	J
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	BQL	1.00	0.176	1	10/25/05	
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/25/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	BQL	1.00	0.206	1	10/25/05	
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	~~**0.190**~~	5.00	0.188	1	10/25/05	~~J~~ 5, U, BL
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/25/05	
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	**1.02**	1.00	0.175	1	10/25/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/25/05	
Trichloroethene	BQL	1.00	0.209	1	10/25/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS111-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-13B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 17:40
Date Received: 10/19/05
Matrix: Water

✓ ACD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/25/05	
o-Xylene	BQL	1.00	0.167	1	10/25/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.8	108
1,2-Dichloroethane-d4	10	10.6	106
Toluene-d8	10	10.1	101

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: _____

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS111-45-49-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-14B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 18:00
Date Received: 10/19/05
Matrix: Water

✓ ACD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	**12.9**	25.0	3.37	1	10/24/05	J
Benzene	**0.600**	1.00	0.162	1	10/24/05	J
Bromodichloromethane	BQL	1.00	0.185	1	10/24/05	
Bromoform	BQL	1.00	0.0960	1	10/24/05	
Bromomethane	BQL	1.00	0.104	1	10/24/05	
2-Butanone	**3.43**	25.0	1.09	1	10/24/05	J
Carbon disulfide	BQL	1.00	0.206	1	10/24/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/24/05	
Chlorobenzene	BQL	1.00	0.177	1	10/24/05	
Chloroethane	BQL	1.00	0.416	1	10/24/05	
Chloroform	BQL	1.00	0.220	1	10/24/05	
Chloromethane	BQL	1.00	0.282	1	10/24/05	
Cyclohexane	BQL	1.00	1.00	1	10/24/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/24/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/24/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/24/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/24/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/24/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/24/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/24/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/24/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/24/05	
cis-1,2-Dichloroethene	**5.74**	1.00	0.176	1	10/24/05	
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/24/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/24/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/24/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/24/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/24/05	
Ethylbenzene	**1.06**	1.00	0.206	1	10/24/05	
2-Hexanone	BQL	5.00	0.874	1	10/24/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/24/05	
Methyl Acetate	BQL	1.00	1.00	1	10/24/05	
Methylene chloride	BQL	5.00	0.188	1	10/24/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/24/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/24/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/24/05	
Styrene	BQL	1.00	0.239	1	10/24/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/24/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/24/05	
Toluene	**1.45**	1.00	0.175	1	10/24/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/24/05	
Trichloroethene	BQL	1.00	0.209	1	10/24/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS111-45-49-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-14B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 18:00
Date Received: 10/19/05
Matrix: Water

✓ ACD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/24/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/24/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/24/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/24/05	
Vinyl chloride	BQL	1.00	0.400	1	10/24/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/24/05	
o-Xylene	BQL	1.00	0.167	1	10/24/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.2	102
1,2-Dichloroethane-d4	10	11.4	114
Toluene-d8	10	10.2	102

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: _____

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-WT-EB101705
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-15A
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 18:10
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/25/05	
Benzene	BQL	1.00	0.162	1	10/25/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	BQL	25.0	1.09	1	10/25/05	
Carbon disulfide	BQL	1.00	0.206	1	10/25/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	BQL	1.00	0.176	1	10/25/05	
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/25/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	BQL	1.00	0.206	1	10/25/05	
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	**0.620**	5.00	0.188	1	10/25/05	J
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/25/05	
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	BQL	1.00	0.175	1	10/25/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/25/05	
Trichloroethene	BQL	1.00	0.209	1	10/25/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-WT-EB101705
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-15A
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 18:10
Date Received: 10/19/05
Matrix: Water

✓ ASD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/25/05	
o-Xylene	BQL	1.00	0.167	1	10/25/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.7	107
1,2-Dichloroethane-d4	10	10.8	108
Toluene-d8	10	10.3	103

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: [signature]

✓ AZP 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-WT-TB101705
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-16A
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 18:20
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/25/05	
Benzene	BQL	1.00	0.162	1	10/25/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	BQL	25.0	1.09	1	10/25/05	
Carbon disulfide	BQL	1.00	0.206	1	10/25/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	BQL	1.00	0.176	1	10/25/05	
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/25/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	BQL	1.00	0.206	1	10/25/05	
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	**0.260**	5.00	0.188	1	10/25/05	J
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/25/05	
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	BQL	1.00	0.175	1	10/25/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/25/05	
Trichloroethene	BQL	1.00	0.209	1	10/25/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-WT-TB101705
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-16A
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/17/05 18:20
Date Received: 10/19/05
Matrix: Water

AED 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/25/05	
o-Xylene	BQL	1.00	0.167	1	10/25/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.4	104
1,2-Dichloroethane-d4	10	10.7	107
Toluene-d8	10	10.2	102

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: _____

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS115-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-17B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 7:50
Date Received: 10/19/05
Matrix: Water

✓ HED 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/25/05	
Benzene	BQL	1.00	0.162	1	10/25/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	BQL	25.0	1.09	1	10/25/05	
Carbon disulfide	BQL	1.00	0.206	1	10/25/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	BQL	1.00	0.176	1	10/25/05	
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/25/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	BQL	1.00	0.206	1	10/25/05	
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	BQL	5.00	0.188	1	10/25/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/25/05	
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	~~0.930~~	1.00	0.175	1	10/25/05	~~J~~ 1, U, BL
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/25/05	
Trichloroethene	BQL	1.00	0.209	1	10/25/05	

✓ ACD 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS115-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-17B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 7:50
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/25/05	
o-Xylene	BQL	1.00	0.167	1	10/25/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.2	102
1,2-Dichloroethane-d4	10	10.6	106
Toluene-d8	10	10.3	103

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: _____

✓ AW 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS115-45-49-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-18B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 8:15
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	**14.8**	25.0	3.37	1	10/25/05	J
Benzene	**0.560**	1.00	0.162	1	10/25/05	J
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	**3.84**	25.0	1.09	1	10/25/05	J
Carbon disulfide	BQL	1.00	0.206	1	10/25/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	**4.21**	1.00	0.176	1	10/25/05	
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/25/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	**0.820**	1.00	0.206	1	10/25/05	J
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	BQL	5.00	0.188	1	10/25/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/25/05	
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	**1.62**	1.00	0.175	1	10/25/05	— 1.62, U, BL
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/25/05	
Trichloroethene	**0.710**	1.00	0.209	1	10/25/05	J

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS115-45-49-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-18B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 8:15
Date Received: 10/19/05
Matrix: Water

ACD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	~~0.580~~	2.00	0.386	1	10/25/05	~~J~~ 2, U, BL
o-Xylene	~~0.220~~	1.00	0.167	1	10/25/05	~~J~~ 1, U, BL

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.5	105
1,2-Dichloroethane-d4	10	11.1	111
Toluene-d8	10	10.2	102

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: [signature]

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS116-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-19B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 8:40
Date Received: 10/19/05
Matrix: Water

ACM 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/25/05	
Benzene	BQL	1.00	0.162	1	10/25/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	BQL	25.0	1.09	1	10/25/05	
Carbon disulfide	BQL	1.00	0.206	1	10/25/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	BQL	1.00	0.176	1	10/25/05	
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/25/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	BQL	1.00	0.206	1	10/25/05	
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	~~0.370~~	5.00	0.188	1	10/25/05	~~J~~ 5, U, BL
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/25/05	
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	~~0.330~~	1.00	0.175	1	10/25/05	~~J~~ 1, U, BL
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/25/05	
Trichloroethene	BQL	1.00	0.209	1	10/25/05	

✓ ACD 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS116-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-19B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 8:40
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/25/05	
o-Xylene	BQL	1.00	0.167	1	10/25/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.5	105
1,2-Dichloroethane-d4	10	10.3	103
Toluene-d8	10	10.2	102

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: [signature]

✓ AJD 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS116-40-44-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-20B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 9:00
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/25/05	
Benzene	**0.650**	1.00	0.162	1	10/25/05	J
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	BQL	25.0	1.09	1	10/25/05	
Carbon disulfide	BQL	1.00	0.206	1	10/25/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	**5.68**	1.00	0.176	1	10/25/05	
trans-1,2-dichloroethene	**0.520**	1.00	0.230	1	10/25/05	J
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	**1.27**	1.00	0.206	1	10/25/05	
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	BQL	5.00	0.188	1	10/25/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/25/05	
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	~~**0.870**~~	1.00	0.175	1	10/25/05	~~J~~ I, U, BL
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/25/05	
Trichloroethene	**5.03**	1.00	0.209	1	10/25/05	

✓ ACD 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS116-40-44-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-20B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 9:00
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/25/05	
o-Xylene	BQL	1.00	0.167	1	10/25/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.3	103
1,2-Dichloroethane-d4	10	10.6	106
Toluene-d8	10	10.1	101

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: _____

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS102-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-21B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 10:00
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/25/05	
Benzene	**7.64**	1.00	0.162	1	10/25/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	BQL	25.0	1.09	1	10/25/05	
Carbon disulfide	BQL	1.00	0.206	1	10/25/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	**7.98**	1.00	0.176	1	10/25/05	
trans-1,2-dichloroethene	**0.820**	1.00	0.230	1	10/25/05	J
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	**1.46**	1.00	0.206	1	10/25/05	
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	BQL	5.00	0.188	1	10/25/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	**0.570**	1.00	0.214	1	10/25/05	J
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	**1.37**	1.00	0.175	1	10/25/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/25/05	
Trichloroethene	**0.830**	1.00	0.209	1	10/25/05	J

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS102-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-21B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 10:00
Date Received: 10/19/05
Matrix: Water

✓ ACP 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/25/05	
o-Xylene	**0.180**	1.00	0.167	1	10/25/05	J

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.4	104
1,2-Dichloroethane-d4	10	10.8	108
Toluene-d8	10	10.1	101

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: [signature]

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS102-40-44-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-22B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 10:30
Date Received: 10/19/05
Matrix: Water

✓ ACD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/25/05	
Benzene	**3.86**	1.00	0.162	1	10/25/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	BQL	25.0	1.09	1	10/25/05	
Carbon disulfide	BQL	1.00	0.206	1	10/25/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	**7.18**	1.00	0.176	1	10/25/05	
trans-1,2-dichloroethene	**0.330**	1.00	0.230	1	10/25/05	J
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	**1.02**	1.00	0.206	1	10/25/05	
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	~~**0.250**~~	5.00	0.188	1	10/25/05	~~J~~ 5.4, BL
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/25/05	
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	**1.38**	1.00	0.175	1	10/25/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/25/05	
Trichloroethene	**0.310**	1.00	0.209	1	10/25/05	J

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS102-40-44-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-22B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 10:30
Date Received: 10/19/05
Matrix: Water

✓ ACD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/25/05	
o-Xylene	BQL	1.00	0.167	1	10/25/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.2	102
1,2-Dichloroethane-d4	10	10.8	108
Toluene-d8	10	10.2	102

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: _____

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS103-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-23B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 11:05
Date Received: 10/19/05
Matrix: Water

✓ 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/25/05	
Benzene	**0.340**	1.00	0.162	1	10/25/05	J
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	BQL	25.0	1.09	1	10/25/05	
Carbon disulfide	BQL	1.00	0.206	1	10/25/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	**0.380**	1.00	0.176	1	10/25/05	J
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/25/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	**0.650**	1.00	0.206	1	10/25/05	J
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	BQL	5.00	0.188	1	10/25/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/25/05	
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	**0.230**	1.00	0.175	1	10/25/05	J
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/25/05	
Trichloroethene	BQL	1.00	0.209	1	10/25/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS103-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-23B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 11:05
Date Received: 10/19/05
Matrix: Water

V ACD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/25/05	
o-Xylene	**0.230**	1.00	0.167	1	10/25/05	J

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.6	105
1,2-Dichloroethane-d4	10	11	110
Toluene-d8	10	10.2	102

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: [signature]

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS103-40-44-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-24B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 11:35
Date Received: 10/19/05
Matrix: Water

✓ ACM 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	**5.42**	25.0	3.37	1	10/25/05	J
Benzene	**0.740**	1.00	0.162	1	10/25/05	J
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	BQL	25.0	1.09	1	10/25/05	
Carbon disulfide	BQL	1.00	0.206	1	10/25/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	**10.9**	1.00	0.176	1	10/25/05	
trans-1,2-dichloroethene	**0.430**	1.00	0.230	1	10/25/05	J
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	**1.04**	1.00	0.206	1	10/25/05	
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	~~**0.240**~~	5.00	0.188	1	10/25/05	~~J~~ 5, U, BL
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/25/05	
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	**1.40**	1.00	0.175	1	10/25/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/25/05	
Trichloroethene	**7.53**	1.00	0.209	1	10/25/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS103-40-44-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-24B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 11:35
Date Received: 10/19/05
Matrix: Water

ACD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/25/05	
o-Xylene	BQL	1.00	0.167	1	10/25/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.2	102
1,2-Dichloroethane-d4	10	10.6	106
Toluene-d8	10	10	100

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: _____

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS104-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-25A
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 12:45
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/26/05	
Benzene	BQL	1.00	0.162	1	10/26/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/26/05	
Bromoform	BQL	1.00	0.0960	1	10/26/05	
Bromomethane	BQL	1.00	0.104	1	10/26/05	
2-Butanone	BQL	25.0	1.09	1	10/26/05	
Carbon disulfide	BQL	1.00	0.206	1	10/26/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/26/05	
Chlorobenzene	BQL	1.00	0.177	1	10/26/05	
Chloroethane	BQL	1.00	0.416	1	10/26/05	
Chloroform	BQL	1.00	0.220	1	10/26/05	
Chloromethane	BQL	1.00	0.282	1	10/26/05	
Cyclohexane	BQL	1.00	1.00	1	10/26/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/26/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/26/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/26/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/26/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/26/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/26/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/26/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/26/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/26/05	
cis-1,2-Dichloroethene	**0.770**	1.00	0.176	1	10/26/05	J
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/26/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/26/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/26/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/26/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/26/05	
Ethylbenzene	**0.620**	1.00	0.206	1	10/26/05	J
2-Hexanone	BQL	5.00	0.874	1	10/26/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/26/05	
Methyl Acetate	BQL	1.00	1.00	1	10/26/05	
Methylene chloride	BQL	5.00	0.188	1	10/26/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/26/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/26/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/26/05	
Styrene	BQL	1.00	0.239	1	10/26/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/26/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/26/05	
Toluene	**0.640**	1.00	0.175	1	10/26/05	J
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/26/05	
Trichloroethene	**0.290**	1.00	0.209	1	10/26/05	J

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS104-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-25A
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 12:45
Date Received: 10/19/05
Matrix: Water

✓ AED 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/26/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/26/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/26/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/26/05	
Vinyl chloride	BQL	1.00	0.400	1	10/26/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/26/05	
o-Xylene	BQL	1.00	0.167	1	10/26/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.4	104
1,2-Dichloroethane-d4	10	10.5	105
Toluene-d8	10	10.1	101

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: _____

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS104-40-44-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-26B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 13:10
Date Received: 10/19/05
Matrix: Water

✓ ACD 01/23/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/26/05	
Benzene	**0.640**	1.00	0.162	1	10/26/05	J
Bromodichloromethane	BQL	1.00	0.185	1	10/26/05	
Bromoform	BQL	1.00	0.0960	1	10/26/05	
Bromomethane	BQL	1.00	0.104	1	10/26/05	
2-Butanone	BQL	25.0	1.09	1	10/26/05	
Carbon disulfide	BQL	1.00	0.206	1	10/26/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/26/05	
Chlorobenzene	BQL	1.00	0.177	1	10/26/05	
Chloroethane	BQL	1.00	0.416	1	10/26/05	
Chloroform	BQL	1.00	0.220	1	10/26/05	
Chloromethane	BQL	1.00	0.282	1	10/26/05	
Cyclohexane	BQL	1.00	1.00	1	10/26/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/26/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/26/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/26/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/26/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/26/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/26/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/26/05	
1,1-Dichloroethene	**0.280**	1.00	0.164	1	10/26/05	J
1,2-Dichloroethane	BQL	1.00	0.244	1	10/26/05	
cis-1,2-Dichloroethene	**105**	10.0	1.76	10	10/26/05	
trans-1,2-dichloroethene	**11.1**	1.00	0.230	1	10/26/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/26/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/26/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/26/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/26/05	
Ethylbenzene	**0.960**	1.00	0.206	1	10/26/05	J
2-Hexanone	BQL	5.00	0.874	1	10/26/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/26/05	
Methyl Acetate	BQL	1.00	1.00	1	10/26/05	
Methylene chloride	BQL	5.00	0.188	1	10/26/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/26/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/26/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/26/05	
Styrene	BQL	1.00	0.239	1	10/26/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/26/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/26/05	
Toluene	**1.09**	1.00	0.175	1	10/26/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/26/05	
Trichloroethene	**68.4**	10.0	2.09	10	10/26/05	

Results for Volatiles
by GCMS 8260B

✓ AED 9/22/06

Client Sample ID: IR35-GW-IS104-40-44-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-26B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 13:10
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/26/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/26/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/26/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/26/05	
Vinyl chloride	**1.58**	1.00	0.400	1	10/26/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/26/05	
o-Xylene	BQL	1.00	0.167	1	10/26/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.6	106
1,2-Dichloroethane-d4	10	11	110
Toluene-d8	10	10	100

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: _____

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS109-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-27B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 13:35
Date Received: 10/19/05
Matrix: Water

✓ AND 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/25/05	
o-Xylene	BQL	1.00	0.167	1	10/25/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.2	102
1,2-Dichloroethane-d4	10	11.1	111
Toluene-d8	10	10.1	101

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: [signature]

✓ ATD 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS109-20-24-05D DUP
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-28B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 13:35
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/25/05	
Benzene	BQL	1.00	0.162	1	10/25/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	BQL	25.0	1.09	1	10/25/05	
Carbon disulfide	BQL	1.00	0.206	1	10/25/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	**5.18**	1.00	0.176	1	10/25/05	
trans-1,2-dichloroethene	**0.370**	1.00	0.230	1	10/25/05	J
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	**0.490**	1.00	0.206	1	10/25/05	J
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	BQL	5.00	0.188	1	10/25/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/25/05	
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	**0.440**	1.00	0.175	1	10/25/05	J
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/25/05	
Trichloroethene	**0.880**	1.00	0.209	1	10/25/05	J

V
ACD
9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS109-20-24-05D DUP
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-28B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 13:35
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/25/05	
o-Xylene	BQL	1.00	0.167	1	10/25/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.2	102
1,2-Dichloroethane-d4	10	10.7	107
Toluene-d8	10	10.1	101

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: [signature]

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS109-40-44-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-29B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 14:00
Date Received: 10/19/05
Matrix: Water

✓ ADD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/26/05	
Benzene	**0.880**	1.00	0.162	1	10/26/05	J
Bromodichloromethane	BQL	1.00	0.185	1	10/26/05	
Bromoform	BQL	1.00	0.0960	1	10/26/05	
Bromomethane	BQL	1.00	0.104	1	10/26/05	
2-Butanone	BQL	25.0	1.09	1	10/26/05	
Carbon disulfide	BQL	1.00	0.206	1	10/26/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/26/05	
Chlorobenzene	BQL	1.00	0.177	1	10/26/05	
Chloroethane	BQL	1.00	0.416	1	10/26/05	
Chloroform	BQL	1.00	0.220	1	10/26/05	
Chloromethane	BQL	1.00	0.282	1	10/26/05	
Cyclohexane	BQL	1.00	1.00	1	10/26/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/26/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/26/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/26/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/26/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/26/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/26/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/26/05	
1,1-Dichloroethene	**0.210**	1.00	0.164	1	10/26/05	J
1,2-Dichloroethane	BQL	1.00	0.244	1	10/26/05	
cis-1,2-Dichloroethene	**97.4**	10.0	1.76	10	10/26/05	
trans-1,2-dichloroethene	**12.8**	1.00	0.230	1	10/26/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/26/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/26/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/26/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/26/05	
Ethylbenzene	**0.890**	1.00	0.206	1	10/26/05	J
2-Hexanone	BQL	5.00	0.874	1	10/26/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/26/05	
Methyl Acetate	BQL	1.00	1.00	1	10/26/05	
Methylene chloride	BQL	5.00	0.188	1	10/26/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/26/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/26/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/26/05	
Styrene	BQL	1.00	0.239	1	10/26/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/26/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/26/05	
Toluene	**1.13**	1.00	0.175	1	10/26/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/26/05	
Trichloroethene	**69.1**	10.0	2.09	10	10/26/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS109-40-44-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-29B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 14:00
Date Received: 10/19/05
Matrix: Water

✓ ACD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/26/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/26/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/26/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/26/05	
Vinyl chloride	**1.13**	1.00	0.400	1	10/26/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/26/05	
o-Xylene	BQL	1.00	0.167	1	10/26/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.2	102
1,2-Dichloroethane-d4	10	10.7	107
Toluene-d8	10	10	100

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: _____

V
ACD
9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-WT-EB101805A
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-30B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 13:30
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/25/05	
Benzene	BQL	1.00	0.162	1	10/25/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	BQL	25.0	1.09	1	10/25/05	
Carbon disulfide	BQL	1.00	0.206	1	10/25/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	BQL	1.00	0.176	1	10/25/05	
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/25/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	BQL	1.00	0.206	1	10/25/05	
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	**0.480**	5.00	0.188	1	10/25/05	J
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/25/05	
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	BQL	1.00	0.175	1	10/25/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/25/05	
Trichloroethene	BQL	1.00	0.209	1	10/25/05	

✓ AND 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-WT-EB101805A
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-30B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 13:30
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/25/05	
o-Xylene	BQL	1.00	0.167	1	10/25/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.3	103
1,2-Dichloroethane-d4	10	10.5	105
Toluene-d8	10	10.1	101

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: _____

✓ RND 09/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-WT-EB101805B
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-31B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 13:40
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/25/05	
Benzene	BQL	1.00	0.162	1	10/25/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	BQL	25.0	1.09	1	10/25/05	
Carbon disulfide	BQL	1.00	0.206	1	10/25/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	BQL	1.00	0.176	1	10/25/05	
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/25/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	BQL	1.00	0.206	1	10/25/05	
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	**0.500**	5.00	0.188	1	10/25/05	J
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/25/05	
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	BQL	1.00	0.175	1	10/25/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/25/05	
Trichloroethene	BQL	1.00	0.209	1	10/25/05	

✓ ASD 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-WT-EB101805B
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-31B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 13:40
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/25/05	
o-Xylene	BQL	1.00	0.167	1	10/25/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.5	105
1,2-Dichloroethane-d4	10	10.6	106
Toluene-d8	10	10.1	101

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: _____

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS107-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-34B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 15:30
Date Received: 10/19/05
Matrix: Water

✓ ADD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/27/05	
Benzene	BQL	1.00	0.162	1	10/27/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/27/05	
Bromoform	BQL	1.00	0.0960	1	10/27/05	
Bromomethane	BQL	1.00	0.104	1	10/27/05	
2-Butanone	BQL	25.0	1.09	1	10/27/05	
Carbon disulfide	**0.810**	1.00	0.206	1	10/27/05	J
Carbon tetrachloride	BQL	1.00	0.181	1	10/27/05	
Chlorobenzene	BQL	1.00	0.177	1	10/27/05	
Chloroethane	BQL	1.00	0.416	1	10/27/05	
Chloroform	BQL	1.00	0.220	1	10/27/05	
Chloromethane	BQL	1.00	0.282	1	10/27/05	
Cyclohexane	BQL	1.00	1.00	1	10/27/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/27/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/27/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/27/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/27/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/27/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/27/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/27/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/27/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/27/05	
cis-1,2-Dichloroethene	**0.270**	1.00	0.176	1	10/27/05	J
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/27/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/27/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/27/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/27/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/27/05	
Ethylbenzene	**2.81**	1.00	0.206	1	10/27/05	
2-Hexanone	BQL	5.00	0.874	1	10/27/05	
Isopropylbenzene	**4.53**	1.00	0.173	1	10/27/05	
Methyl Acetate	BQL	1.00	1.00	1	10/27/05	
Methylene chloride	BQL	5.00	0.188	1	10/27/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/27/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/27/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/27/05	
Styrene	BQL	1.00	0.239	1	10/27/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/27/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/27/05	
Toluene	**0.400**	1.00	0.175	1	10/27/05	J
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/27/05	
Trichloroethene	BQL	1.00	0.209	1	10/27/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS107-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-34B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 15:30
Date Received: 10/19/05
Matrix: Water

✓ ACD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/27/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/27/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/27/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/27/05	
Vinyl chloride	BQL	1.00	0.400	1	10/27/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/27/05	
o-Xylene	BQL	1.00	0.167	1	10/27/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.5	105
1,2-Dichloroethane-d4	10	10.2	102
Toluene-d8	10	9.97	100

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: _____

AOD 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS107-40-44-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-35B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 15:50
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/27/05	
Benzene	**0.390**	1.00	0.162	1	10/27/05	J
Bromodichloromethane	BQL	1.00	0.185	1	10/27/05	
Bromoform	BQL	1.00	0.0960	1	10/27/05	
Bromomethane	BQL	1.00	0.104	1	10/27/05	
2-Butanone	BQL	25.0	1.09	1	10/27/05	
Carbon disulfide	BQL	1.00	0.206	1	10/27/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/27/05	
Chlorobenzene	BQL	1.00	0.177	1	10/27/05	
Chloroethane	BQL	1.00	0.416	1	10/27/05	
Chloroform	BQL	1.00	0.220	1	10/27/05	
Chloromethane	BQL	1.00	0.282	1	10/27/05	
Cyclohexane	BQL	1.00	1.00	1	10/27/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/27/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/27/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/27/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/27/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/27/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/27/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/27/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/27/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/27/05	
cis-1,2-Dichloroethene	**2.87**	1.00	0.176	1	10/27/05	
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/27/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/27/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/27/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/27/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/27/05	
Ethylbenzene	**1.14**	1.00	0.206	1	10/27/05	
2-Hexanone	BQL	5.00	0.874	1	10/27/05	
Isopropylbenzene	**0.230**	1.00	0.173	1	10/27/05	J
Methyl Acetate	BQL	1.00	1.00	1	10/27/05	
Methylene chloride	BQL	5.00	0.188	1	10/27/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/27/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/27/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/27/05	
Styrene	BQL	1.00	0.239	1	10/27/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/27/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/27/05	
Toluene	**1.22**	1.00	0.175	1	10/27/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/27/05	
Trichloroethene	**2.92**	1.00	0.209	1	10/27/05	

✓ ACD 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS107-40-44-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-35B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 15:50
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/27/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/27/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/27/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/27/05	
Vinyl chloride	BQL	1.00	0.400	1	10/27/05	
m-,p-Xylene	**0.450**	2.00	0.386	1	10/27/05	J
o-Xylene	**0.180**	1.00	0.167	1	10/27/05	J

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.3	103
1,2-Dichloroethane-d4	10	10.3	103
Toluene-d8	10	10.1	101

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: _____

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS108-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-32B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 14:40
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/25/05	
Benzene	BQL	1.00	0.162	1	10/25/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	BQL	25.0	1.09	1	10/25/05	
Carbon disulfide	BQL	1.00	0.206	1	10/25/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	BQL	1.00	0.176	1	10/25/05	
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/25/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	**0.250**	1.00	0.206	1	10/25/05	J
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	BQL	5.00	0.188	1	10/25/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/25/05	
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	**0.370**	1.00	0.175	1	10/25/05	J
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/25/05	
Trichloroethene	BQL	1.00	0.209	1	10/25/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS108-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-32B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 14:40
Date Received: 10/19/05
Matrix: Water

✓ ACM 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/25/05	
o-Xylene	BQL	1.00	0.167	1	10/25/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.6	106
1,2-Dichloroethane-d4	10	10.5	105
Toluene-d8	10	10.1	101

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: [signature]

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS108-40-44-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-33B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 15:00
Date Received: 10/19/05
Matrix: Water

✓ ADP 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	**4.45**	25.0	3.37	1	10/26/05	J
Benzene	**0.990**	1.00	0.162	1	10/26/05	J
Bromodichloromethane	BQL	1.00	0.185	1	10/26/05	
Bromoform	BQL	1.00	0.0960	1	10/26/05	
Bromomethane	BQL	1.00	0.104	1	10/26/05	
2-Butanone	BQL	25.0	1.09	1	10/26/05	
Carbon disulfide	BQL	1.00	0.206	1	10/26/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/26/05	
Chlorobenzene	BQL	1.00	0.177	1	10/26/05	
Chloroethane	BQL	1.00	0.416	1	10/26/05	
Chloroform	BQL	1.00	0.220	1	10/26/05	
Chloromethane	BQL	1.00	0.282	1	10/26/05	
Cyclohexane	BQL	1.00	1.00	1	10/26/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/26/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/26/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/26/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/26/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/26/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/26/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/26/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/26/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/26/05	
cis-1,2-Dichloroethene	**57.5**	4.00	0.704	4	10/26/05	
trans-1,2-dichloroethene	**6.94**	1.00	0.230	1	10/26/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/26/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/26/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/26/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/26/05	
Ethylbenzene	**0.990**	1.00	0.206	1	10/26/05	J
2-Hexanone	BQL	5.00	0.874	1	10/26/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/26/05	
Methyl Acetate	BQL	1.00	1.00	1	10/26/05	
Methylene chloride	BQL	5.00	0.188	1	10/26/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/26/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/26/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/26/05	
Styrene	BQL	1.00	0.239	1	10/26/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/26/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/26/05	
Toluene	**1.39**	1.00	0.175	1	10/26/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/26/05	
Trichloroethene	**53.4**	4.00	0.836	4	10/26/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS108-40-44-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-33B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 15:00
Date Received: 10/19/05
Matrix: Water

✓ ACD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/26/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/26/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/26/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/26/05	
Vinyl chloride	**0.850**	1.00	0.400	1	10/26/05	J
m-,p-Xylene	BQL	2.00	0.386	1	10/26/05	
o-Xylene	BQL	1.00	0.167	1	10/26/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.5	105
1,2-Dichloroethane-d4	10	10.6	106
Toluene-d8	10	9.97	100

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: _____

✓ ACM 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS109-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-27B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 13:35
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/25/05	
Benzene	BQL	1.00	0.162	1	10/25/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	BQL	25.0	1.09	1	10/25/05	
Carbon disulfide	BQL	1.00	0.206	1	10/25/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	**4.99**	1.00	0.176	1	10/25/05	
trans-1,2-dichloroethene	**0.410**	1.00	0.230	1	10/25/05	J
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	**0.510**	1.00	0.206	1	10/25/05	J
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	BQL	5.00	0.188	1	10/25/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/25/05	
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	**0.400**	1.00	0.175	1	10/25/05	J
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/25/05	
Trichloroethene	**0.830**	1.00	0.209	1	10/25/05	J

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS112-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-36I
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 16:15
Date Received: 10/19/05
Matrix: Water

✓ RED 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/25/05	
Benzene	**0.510**	1.00	0.162	1	10/25/05	J
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	BQL	25.0	1.09	1	10/25/05	
Carbon disulfide	BQL	1.00	0.206	1	10/25/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	**16.7**	1.00	0.176	1	10/25/05	
trans-1,2-dichloroethene	**1.56**	1.00	0.230	1	10/25/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	**0.880**	1.00	0.206	1	10/25/05	J
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	~~**0.280**~~	5.00	0.188	1	10/25/05	~~J~~ 5, U, BL
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/25/05	
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	**1.47**	1.00	0.175	1	10/25/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/25/05	
Trichloroethene	**23.5**	1.00	0.209	1	10/25/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS112-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-36I
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 16:15
Date Received: 10/19/05
Matrix: Water

✓ ACP 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	**0.500**	2.00	0.386	1	10/25/05	J
o-Xylene	**0.210**	1.00	0.167	1	10/25/05	J

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.2	102
1,2-Dichloroethane-d4	10	10.5	105
Toluene-d8	10	9.89	99

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: JW

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS112-40-44-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-37B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 16:45
Date Received: 10/19/05
Matrix: Water

✓ ADD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/25/05	
Benzene	**0.810**	1.00	0.162	1	10/25/05	J
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	BQL	25.0	1.09	1	10/25/05	
Carbon disulfide	BQL	1.00	0.206	1	10/25/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	**27.6**	1.00	0.176	1	10/25/05	
trans-1,2-dichloroethene	**2.31**	1.00	0.230	1	10/25/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	**0.570**	1.00	0.206	1	10/25/05	J
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	BQL	5.00	0.188	1	10/25/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/25/05	
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	**0.870**	1.00	0.175	1	10/25/05	J
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/25/05	
Trichloroethene	**12.8**	1.00	0.209	1	10/25/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS112-40-44-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-37B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/18/05 16:45
Date Received: 10/19/05
Matrix: Water

HED 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/25/05	
o-Xylene	BQL	1.00	0.167	1	10/25/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.1	101
1,2-Dichloroethane-d4	10	10.6	106
Toluene-d8	10	9.9	99

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By:

✓ ACD 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS113-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-38B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 7:35
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/25/05	
Benzene	BQL	1.00	0.162	1	10/25/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	BQL	25.0	1.09	1	10/25/05	
Carbon disulfide	BQL	1.00	0.206	1	10/25/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	**11.6**	1.00	0.176	1	10/25/05	
trans-1,2-dichloroethene	**1.47**	1.00	0.230	1	10/25/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	BQL	1.00	0.206	1	10/25/05	
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	BQL	5.00	0.188	1	10/25/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/25/05	
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	~~**0.620**~~	1.00	0.175	1	10/25/05	J 1,4,BC
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/25/05	
Trichloroethene	**2.43**	1.00	0.209	1	10/25/05	

✓ ACD 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS113-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-38B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 7:35
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/25/05	
o-Xylene	BQL	1.00	0.167	1	10/25/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.2	102
1,2-Dichloroethane-d4	10	10.5	105
Toluene-d8	10	10	100

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: _____

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS113-40-44-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-39A
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 7:55
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	**6.25**	25.0	3.37	1	10/26/05	J
Benzene	**1.29**	1.00	0.162	1	10/26/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/26/05	
Bromoform	BQL	1.00	0.0960	1	10/26/05	
Bromomethane	BQL	1.00	0.104	1	10/26/05	
2-Butanone	BQL	25.0	1.09	1	10/26/05	
Carbon disulfide	BQL	1.00	0.206	1	10/26/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/26/05	
Chlorobenzene	BQL	1.00	0.177	1	10/26/05	
Chloroethane	BQL	1.00	0.416	1	10/26/05	
Chloroform	BQL	1.00	0.220	1	10/26/05	
Chloromethane	BQL	1.00	0.282	1	10/26/05	
Cyclohexane	BQL	1.00	1.00	1	10/26/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/26/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/26/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/26/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/26/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/26/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/26/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/26/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/26/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/26/05	
cis-1,2-Dichloroethene	**40.6**	1.00	0.176	1	10/26/05	
trans-1,2-dichloroethene	**2.75**	1.00	0.230	1	10/26/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/26/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/26/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/26/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/26/05	
Ethylbenzene	**0.990**	1.00	0.206	1	10/26/05	J
2-Hexanone	BQL	5.00	0.874	1	10/26/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/26/05	
Methyl Acetate	BQL	1.00	1.00	1	10/26/05	
Methylene chloride	~~**0.290**~~	5.00	0.188	1	10/26/05	~~J~~ 5, U, BL
methyl Cyclohexane	BQL	1.00	1.00	1	10/26/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/26/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/26/05	
Styrene	BQL	1.00	0.239	1	10/26/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/26/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/26/05	
Toluene	~~**2.02**~~	1.00	0.175	1	10/26/05	~~2.75, BL~~ 2.02, U, BL
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/26/05	
Trichloroethene	**28.7**	1.00	0.209	1	10/26/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS113-40-44-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-39A
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 7:55
Date Received: 10/19/05
Matrix: Water

AED 11/2/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/26/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/26/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/26/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/26/05	
Vinyl chloride	**0.730**	1.00	0.400	1	10/26/05	J
m-,p-Xylene	~~**0.510**~~	2.00	0.386	1	10/26/05	~~J~~ 2, U, BC
o-Xylene	~~**0.200**~~	1.00	0.167	1	10/26/05	J 1, U, BC

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.3	103
1,2-Dichloroethane-d4	10	11.1	111
Toluene-d8	10	10.2	102

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: [signature]

V
ASD
9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS113-40-44-05D DUP
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-40A
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 7:55
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/26/05	
Benzene	**1.50**	1.00	0.162	1	10/26/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/26/05	
Bromoform	BQL	1.00	0.0960	1	10/26/05	
Bromomethane	BQL	1.00	0.104	1	10/26/05	
2-Butanone	BQL	25.0	1.09	1	10/26/05	
Carbon disulfide	BQL	1.00	0.206	1	10/26/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/26/05	
Chlorobenzene	BQL	1.00	0.177	1	10/26/05	
Chloroethane	BQL	1.00	0.416	1	10/26/05	
Chloroform	BQL	1.00	0.220	1	10/26/05	
Chloromethane	BQL	1.00	0.282	1	10/26/05	
Cyclohexane	BQL	1.00	1.00	1	10/26/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/26/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/26/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/26/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/26/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/26/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/26/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/26/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/26/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/26/05	
cis-1,2-Dichloroethene	**48.8**	4.00	0.704	4	10/26/05	
trans-1,2-dichloroethene	**6.17**	1.00	0.230	1	10/26/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/26/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/26/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/26/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/26/05	
Ethylbenzene	**1.26**	1.00	0.206	1	10/26/05	
2-Hexanone	BQL	5.00	0.874	1	10/26/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/26/05	
Methyl Acetate	BQL	1.00	1.00	1	10/26/05	
Methylene chloride	~~**0.530**~~	5.00	0.188	1	10/26/05	J-5, U, BL
methyl Cyclohexane	BQL	1.00	1.00	1	10/26/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/26/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/26/05	
Styrene	BQL	1.00	0.239	1	10/26/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/26/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/26/05	
Toluene	**1.84**	1.00	0.175	1	10/26/05	U, BL
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/26/05	
Trichloroethene	**55.6**	4.00	0.836	4	10/26/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS113-40-44-05D DUP
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-40A
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 7:55
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/26/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/26/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/26/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/26/05	
Vinyl chloride	**0.650**	1.00	0.400	1	10/26/05	J
m-,p-Xylene	~~**0.550**~~	2.00	0.386	1	10/26/05	~~J~~ 2, U, BL
o-Xylene	~~**0.230**~~	1.00	0.167	1	10/26/05	~~J~~ 1, U, BL

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	9.91	99
1,2-Dichloroethane-d4	10	10.4	104
Toluene-d8	10	9.93	99

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: [signature]

✓ ACP 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS114-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-41B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 8:20
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/25/05	
Benzene	**1.54**	1.00	0.162	1	10/25/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	BQL	25.0	1.09	1	10/25/05	
Carbon disulfide	BQL	1.00	0.206	1	10/25/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	**8.69**	1.00	0.176	1	10/25/05	
trans-1,2-dichloroethene	**0.240**	1.00	0.230	1	10/25/05	J
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	BQL	1.00	0.206	1	10/25/05	
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	~~**0.290**~~	5.00	0.188	1	10/25/05	~~J~~ 5, U, BL
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/25/05	
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	~~**0.590**~~	1.00	0.175	1	10/25/05	~~J~~ 1, U, BL
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/25/05	
Trichloroethene	BQL	1.00	0.209	1	10/25/05	

✓ AUD 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS114-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-41B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 8:20
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/25/05	
o-Xylene	BQL	1.00	0.167	1	10/25/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.3	103
1,2-Dichloroethane-d4	10	10.6	106
Toluene-d8	10	10	100

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By:

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS114-40-44-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-42B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 8:45
Date Received: 10/19/05
Matrix: Water

✓ ACD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	**4.46**	25.0	3.37	1	10/26/05	J
Benzene	**3.14**	1.00	0.162	1	10/26/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/26/05	
Bromoform	BQL	1.00	0.0960	1	10/26/05	
Bromomethane	BQL	1.00	0.104	1	10/26/05	
2-Butanone	BQL	25.0	1.09	1	10/26/05	
Carbon disulfide	BQL	1.00	0.206	1	10/26/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/26/05	
Chlorobenzene	BQL	1.00	0.177	1	10/26/05	
Chloroethane	BQL	1.00	0.416	1	10/26/05	
Chloroform	BQL	1.00	0.220	1	10/26/05	
Chloromethane	BQL	1.00	0.282	1	10/26/05	
Cyclohexane	BQL	1.00	1.00	1	10/26/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/26/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/26/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/26/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/26/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/26/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/26/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/26/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/26/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/26/05	
cis-1,2-Dichloroethene	**165**	10.0	1.76	10	10/26/05	
trans-1,2-dichloroethene	**19.6**	1.00	0.230	1	10/26/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/26/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/26/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/26/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/26/05	
Ethylbenzene	**1.01**	1.00	0.206	1	10/26/05	
2-Hexanone	BQL	5.00	0.874	1	10/26/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/26/05	
Methyl Acetate	BQL	1.00	1.00	1	10/26/05	
Methylene chloride	BQL	5.00	0.188	1	10/26/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/26/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/26/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/26/05	
Styrene	BQL	1.00	0.239	1	10/26/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/26/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/26/05	
Toluene	**2.82**	1.00	0.175	1	10/26/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/26/05	
Trichloroethene	**47.1**	1.00	0.209	1	10/26/05	

✓ AOD 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS114-40-44-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-42B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 8:45
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/26/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/26/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/26/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/26/05	
Vinyl chloride	**2.31**	1.00	0.400	1	10/26/05	
m-,p-Xylene	~~**0.530**~~	2.00	0.386	1	10/26/05	~~J~~ 2, U, BL
o-Xylene	~~**0.250**~~	1.00	0.167	1	10/26/05	~~J~~ 1, U, BL

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.5	105
1,2-Dichloroethane-d4	10	10.8	108
Toluene-d8	10	10.1	101

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: _____

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-WT-FB101905
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-43B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 8:30
Date Received: 10/19/05
Matrix: Water

ACD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/26/05	
Benzene	BQL	1.00	0.162	1	10/26/05	
Bromodichloromethane	**15.9**	1.00	0.185	1	10/26/05	
Bromoform	**0.380**	1.00	0.0960	1	10/26/05	J
Bromomethane	BQL	1.00	0.104	1	10/26/05	
2-Butanone	BQL	25.0	1.09	1	10/26/05	
Carbon disulfide	**0.310**	1.00	0.206	1	10/26/05	J
Carbon tetrachloride	BQL	1.00	0.181	1	10/26/05	
Chlorobenzene	BQL	1.00	0.177	1	10/26/05	
Chloroethane	BQL	1.00	0.416	1	10/26/05	
Chloroform	**40.9**	10.0	2.20	10	10/26/05	
Chloromethane	BQL	1.00	0.282	1	10/26/05	
Cyclohexane	BQL	1.00	1.00	1	10/26/05	
Dibromochloromethane	**6.47**	1.00	0.208	1	10/26/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/26/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/26/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/26/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/26/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/26/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/26/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/26/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/26/05	
cis-1,2-Dichloroethene	BQL	1.00	0.176	1	10/26/05	
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/26/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/26/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/26/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/26/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/26/05	
Ethylbenzene	BQL	1.00	0.206	1	10/26/05	
2-Hexanone	BQL	5.00	0.874	1	10/26/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/26/05	
Methyl Acetate	BQL	1.00	1.00	1	10/26/05	
Methylene chloride	BQL	5.00	0.188	1	10/26/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/26/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/26/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/26/05	
Styrene	BQL	1.00	0.239	1	10/26/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/26/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/26/05	
Toluene	**0.550**	1.00	0.175	1	10/26/05	J
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/26/05	
Trichloroethene	BQL	1.00	0.209	1	10/26/05	

ACD 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-WT-FB101905
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-43B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 8:30
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/26/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/26/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/26/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/26/05	
Vinyl chloride	BQL	1.00	0.400	1	10/26/05	
m-,p-Xylene	**0.640**	2.00	0.386	1	10/26/05	J
o-Xylene	**0.300**	1.00	0.167	1	10/26/05	J

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.4	104
1,2-Dichloroethane-d4	10	10.4	104
Toluene-d8	10	10	100

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: JW

✓ #CD 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-WT-TB101905
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-45A
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 9:25
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/27/05	
Benzene	BQL	1.00	0.162	1	10/27/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/27/05	
Bromoform	BQL	1.00	0.0960	1	10/27/05	
Bromomethane	BQL	1.00	0.104	1	10/27/05	
2-Butanone	BQL	25.0	1.09	1	10/27/05	
Carbon disulfide	BQL	1.00	0.206	1	10/27/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/27/05	
Chlorobenzene	BQL	1.00	0.177	1	10/27/05	
Chloroethane	BQL	1.00	0.416	1	10/27/05	
Chloroform	BQL	1.00	0.220	1	10/27/05	
Chloromethane	BQL	1.00	0.282	1	10/27/05	
Cyclohexane	BQL	1.00	1.00	1	10/27/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/27/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/27/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/27/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/27/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/27/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/27/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/27/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/27/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/27/05	
cis-1,2-Dichloroethene	BQL	1.00	0.176	1	10/27/05	
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/27/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/27/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/27/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/27/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/27/05	
Ethylbenzene	BQL	1.00	0.206	1	10/27/05	
2-Hexanone	BQL	5.00	0.874	1	10/27/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/27/05	
Methyl Acetate	BQL	1.00	1.00	1	10/27/05	
Methylene chloride	**0.820**	5.00	0.188	1	10/27/05	J
methyl Cyclohexane	BQL	1.00	1.00	1	10/27/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/27/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/27/05	
Styrene	BQL	1.00	0.239	1	10/27/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/27/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/27/05	
Toluene	BQL	1.00	0.175	1	10/27/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/27/05	
Trichloroethene	BQL	1.00	0.209	1	10/27/05	

✓ ASM 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-WT-TB101905
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-45A
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 9:25
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/27/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/27/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/27/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/27/05	
Vinyl chloride	BQL	1.00	0.400	1	10/27/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/27/05	
o-Xylene	BQL	1.00	0.167	1	10/27/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.4	104
1,2-Dichloroethane-d4	10	10.3	103
Toluene-d8	10	10	100

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: _____

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS119-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-44B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 9:10
Date Received: 10/19/05
Matrix: Water

✓ ACD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/25/05	
Benzene	**1.06**	1.00	0.162	1	10/25/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	BQL	25.0	1.09	1	10/25/05	
Carbon disulfide	BQL	1.00	0.206	1	10/25/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	**0.910**	1.00	0.176	1	10/25/05	J
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/25/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	BQL	1.00	0.206	1	10/25/05	
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	~~**0.350**~~	5.00	0.188	1	10/25/05	~~J~~ 5, U, BL
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/25/05	
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	**1.43**	1.00	0.175	1	10/25/05	— 1.43, U, BL
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/25/05	
Trichloroethene	BQL	1.00	0.209	1	10/25/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS119-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-44B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 9:10
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/25/05	
o-Xylene	BQL	1.00	0.167	1	10/25/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.4	104
1,2-Dichloroethane-d4	10	10.9	109
Toluene-d8	10	10.2	102

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By:

✓ ACD 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS119-40-44-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-46B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 9:35
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/26/05	
Benzene	**4.78**	1.00	0.162	1	10/26/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/26/05	
Bromoform	BQL	1.00	0.0960	1	10/26/05	
Bromomethane	BQL	1.00	0.104	1	10/26/05	
2-Butanone	BQL	25.0	1.09	1	10/26/05	
Carbon disulfide	BQL	1.00	0.206	1	10/26/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/26/05	
Chlorobenzene	BQL	1.00	0.177	1	10/26/05	
Chloroethane	BQL	1.00	0.416	1	10/26/05	
Chloroform	BQL	1.00	0.220	1	10/26/05	
Chloromethane	BQL	1.00	0.282	1	10/26/05	
Cyclohexane	BQL	1.00	1.00	1	10/26/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/26/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/26/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/26/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/26/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/26/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/26/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/26/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/26/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/26/05	
cis-1,2-Dichloroethene	**81.8**	10.0	1.76	10	10/26/05	
trans-1,2-dichloroethene	**8.85**	1.00	0.230	1	10/26/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/26/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/26/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/26/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/26/05	
Ethylbenzene	**1.06**	1.00	0.206	1	10/26/05	
2-Hexanone	BQL	5.00	0.874	1	10/26/05	
Isopropylbenzene	**0.490**	1.00	0.173	1	10/26/05	J
Methyl Acetate	BQL	1.00	1.00	1	10/26/05	
Methylene chloride	BQL	5.00	0.188	1	10/26/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/26/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/26/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/26/05	
Styrene	BQL	1.00	0.239	1	10/26/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/26/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/26/05	
Toluene	**1.91**	1.00	0.175	1	10/26/05	— 1.91, U, BL
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/26/05	
Trichloroethene	**10.4**	1.00	0.209	1	10/26/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS119-40-44-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-46B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 9:35
Date Received: 10/19/05
Matrix: Water

Acn 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/26/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/26/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/26/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/26/05	
Vinyl chloride	**1.07**	1.00	0.400	1	10/26/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/26/05	
o-Xylene	BQL	1.00	0.167	1	10/26/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.6	105
1,2-Dichloroethane-d4	10	10.7	107
Toluene-d8	10	10.1	101

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By:

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS118-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-47B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 10:00
Date Received: 10/19/05
Matrix: Water

✓ AOD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/25/05	
Benzene	**7.32**	1.00	0.162	1	10/25/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	BQL	25.0	1.09	1	10/25/05	
Carbon disulfide	BQL	1.00	0.206	1	10/25/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	**0.700**	1.00	0.176	1	10/25/05	J
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/25/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	BQL	1.00	0.206	1	10/25/05	
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	~~**0.390**~~	5.00	0.188	1	10/25/05	~~J~~ 5, U, BC
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/25/05	
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	~~**0.910**~~	1.00	0.175	1	10/25/05	~~J~~ 1, U, BC
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/25/05	
Trichloroethene	BQL	1.00	0.209	1	10/25/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS118-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-47B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 10:00
Date Received: 10/19/05
Matrix: Water

ACM 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/25/05	
o-Xylene	BQL	1.00	0.167	1	10/25/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.5	105
1,2-Dichloroethane-d4	10	11	110
Toluene-d8	10	10.3	103

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By:

✓ ACD 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS118-40-44-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-48B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 10:20
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/27/05	
Benzene	**2.76**	1.00	0.162	1	10/27/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/27/05	
Bromoform	BQL	1.00	0.0960	1	10/27/05	
Bromomethane	BQL	1.00	0.104	1	10/27/05	
2-Butanone	BQL	25.0	1.09	1	10/27/05	
Carbon disulfide	BQL	1.00	0.206	1	10/27/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/27/05	
Chlorobenzene	BQL	1.00	0.177	1	10/27/05	
Chloroethane	BQL	1.00	0.416	1	10/27/05	
Chloroform	BQL	1.00	0.220	1	10/27/05	
Chloromethane	BQL	1.00	0.282	1	10/27/05	
Cyclohexane	BQL	1.00	1.00	1	10/27/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/27/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/27/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/27/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/27/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/27/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/27/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/27/05	
1,1-Dichloroethene	**0.510**	1.00	0.164	1	10/27/05	J
1,2-Dichloroethane	BQL	1.00	0.244	1	10/27/05	
cis-1,2-Dichloroethene	**291**	20.0	3.52	20	10/26/05	
trans-1,2-dichloroethene	**46.6**	20.0	4.60	20	10/26/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/27/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/27/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/27/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/27/05	
Ethylbenzene	**0.860**	1.00	0.206	1	10/27/05	J
2-Hexanone	BQL	5.00	0.874	1	10/27/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/27/05	
Methyl Acetate	BQL	1.00	1.00	1	10/27/05	
Methylene chloride	~~**0.190**~~	5.00	0.188	1	10/27/05	~~J~~ 5.4, BL
methyl Cyclohexane	BQL	1.00	1.00	1	10/27/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/27/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/27/05	
Styrene	BQL	1.00	0.239	1	10/27/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/27/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/27/05	
Toluene	**2.67**	1.00	0.175	1	10/27/05	– 2.67, U, BL
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/27/05	
Trichloroethene	**132**	20.0	4.18	20	10/26/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS118-40-44-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-48B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 10:20
Date Received: 10/19/05
Matrix: Water

BCD 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/27/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/27/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/27/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/27/05	
Vinyl chloride	**2.69**	1.00	0.400	1	10/27/05	
m-,p-Xylene	~~**0.510**~~	2.00	0.386	1	10/27/05	~~J~~ 2, U, BL
o-Xylene	~~**0.200**~~	1.00	0.167	1	10/27/05	~~J~~ 1, U, BL

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.1	101
1,2-Dichloroethane-d4	10	10.1	101
Toluene-d8	10	10.1	101

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: JW

✓ ACD 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS117-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-49B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 10:50
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/25/05	
Benzene	**0.510**	1.00	0.162	1	10/25/05	J
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	BQL	25.0	1.09	1	10/25/05	
Carbon disulfide	~~**0.980**~~	1.00	0.206	1	10/25/05	~~J~~ 1, U, BC
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	**4.72**	1.00	0.176	1	10/25/05	
trans-1,2-dichloroethene	**0.310**	1.00	0.230	1	10/25/05	J
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	BQL	1.00	0.206	1	10/25/05	
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	~~**0.550**~~	5.00	0.188	1	10/25/05	~~J~~ 5, U, BC
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/25/05	
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	~~**0.570**~~	1.00	0.175	1	10/25/05	~~J~~ 1, U, BC
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/25/05	
Trichloroethene	**0.250**	1.00	0.209	1	10/25/05	J

✓ ACD 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS117-20-24-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-49B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 10:50
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/25/05	
o-Xylene	BQL	1.00	0.167	1	10/25/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.7	106
1,2-Dichloroethane-d4	10	10.7	106
Toluene-d8	10	10.3	103

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: _____

✓ AGD 9/27/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS117-40-44-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-50B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 11:10
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	**3.89**	25.0	3.37	1	10/27/05	J
Benzene	**0.710**	1.00	0.162	1	10/27/05	J
Bromodichloromethane	BQL	1.00	0.185	1	10/27/05	
Bromoform	BQL	1.00	0.0960	1	10/27/05	
Bromomethane	BQL	1.00	0.104	1	10/27/05	
2-Butanone	BQL	25.0	1.09	1	10/27/05	
Carbon disulfide	BQL	1.00	0.206	1	10/27/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/27/05	
Chlorobenzene	BQL	1.00	0.177	1	10/27/05	
Chloroethane	BQL	1.00	0.416	1	10/27/05	
Chloroform	BQL	1.00	0.220	1	10/27/05	
Chloromethane	BQL	1.00	0.282	1	10/27/05	
Cyclohexane	BQL	1.00	1.00	1	10/27/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/27/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/27/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/27/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/27/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/27/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/27/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/27/05	
1,1-Dichloroethene	**0.210**	1.00	0.164	1	10/27/05	J
1,2-Dichloroethane	BQL	1.00	0.244	1	10/27/05	
cis-1,2-Dichloroethene	**106**	10.0	1.76	10	10/26/05	
trans-1,2-dichloroethene	**11.8**	1.00	0.230	1	10/27/05	
1,2-Dichloropropane	**0.210**	1.00	0.166	1	10/27/05	J
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/27/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/27/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/27/05	
Ethylbenzene	**0.800**	1.00	0.206	1	10/27/05	J
2-Hexanone	BQL	5.00	0.874	1	10/27/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/27/05	
Methyl Acetate	BQL	1.00	1.00	1	10/27/05	
Methylene chloride	BQL	5.00	0.188	1	10/27/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/27/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/27/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/27/05	
Styrene	BQL	1.00	0.239	1	10/27/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/27/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/27/05	
Toluene	**2.54**	1.00	0.175	1	10/27/05	– 2.54, U, BL
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/27/05	
Trichloroethene	**88.6**	10.0	2.09	10	10/26/05	

✓ ACD 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS117-40-44-05D
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-50B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 11:10
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/27/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/27/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/27/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/27/05	
Vinyl chloride	**1.17**	1.00	0.400	1	10/27/05	
m-,p-Xylene	~~**0.630**~~	2.00	0.386	1	10/27/05	~~J~~ 2,U,BL
o-Xylene	~~**0.270**~~	1.00	0.167	1	10/27/05	~~J~~ 1,U,BL

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.2	102
1,2-Dichloroethane-d4	10	10.5	105
Toluene-d8	10	10	100

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: [signature]

✓ ACD 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS117-40-44-05D DUP
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-51B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 11:10
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	**5.43**	25.0	3.37	1	10/26/05	J
Benzene	**0.770**	1.00	0.162	1	10/26/05	J
Bromodichloromethane	BQL	1.00	0.185	1	10/26/05	
Bromoform	BQL	1.00	0.0960	1	10/26/05	
Bromomethane	BQL	1.00	0.104	1	10/26/05	
2-Butanone	BQL	25.0	1.09	1	10/26/05	
Carbon disulfide	BQL	1.00	0.206	1	10/26/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/26/05	
Chlorobenzene	BQL	1.00	0.177	1	10/26/05	
Chloroethane	BQL	1.00	0.416	1	10/26/05	
Chloroform	BQL	1.00	0.220	1	10/26/05	
Chloromethane	BQL	1.00	0.282	1	10/26/05	
Cyclohexane	BQL	1.00	1.00	1	10/26/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/26/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/26/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/26/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/26/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/26/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/26/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/26/05	
1,1-Dichloroethene	**0.240**	1.00	0.164	1	10/26/05	J
1,2-Dichloroethane	BQL	1.00	0.244	1	10/26/05	
cis-1,2-Dichloroethene	**107**	10.0	1.76	10	10/26/05	
trans-1,2-dichloroethene	**11.1**	1.00	0.230	1	10/26/05	
1,2-Dichloropropane	**0.220**	1.00	0.166	1	10/26/05	J
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/26/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/26/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/26/05	
Ethylbenzene	**0.810**	1.00	0.206	1	10/26/05	J
2-Hexanone	BQL	5.00	0.874	1	10/26/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/26/05	
Methyl Acetate	BQL	1.00	1.00	1	10/26/05	
Methylene chloride	~~**0.260**~~	5.00	0.188	1	10/26/05	~~J~~ 5, U, BL
methyl Cyclohexane	BQL	1.00	1.00	1	10/26/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/26/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/26/05	
Styrene	BQL	1.00	0.239	1	10/26/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/26/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/26/05	
Toluene	**2.55**	1.00	0.175	1	10/26/05	– 2.55, U, BL
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/26/05	
Trichloroethene	**61.6**	10.0	2.09	10	10/26/05	

AOD 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-GW-IS117-40-44-05D DUP
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-51B
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 11:10
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/26/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/26/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/26/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/26/05	
Vinyl chloride	**1.72**	1.00	0.400	1	10/26/05	
m-,p-Xylene	~~**0.640**~~	2.00	0.386	1	10/26/05	~~J~~ 2, U, BL
o-Xylene	~~**0.280**~~	1.00	0.167	1	10/26/05	~~J~~ 1, U, BL

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.4	104
1,2-Dichloroethane-d4	10	10.8	108
Toluene-d8	10	10	100

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By:

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-WT-EB101905
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-52A
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 11:30
Date Received: 10/19/05
Matrix: Water

✓ DCN 9/22/06

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/27/05	
Benzene	BQL	1.00	0.162	1	10/27/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/27/05	
Bromoform	BQL	1.00	0.0960	1	10/27/05	
Bromomethane	BQL	1.00	0.104	1	10/27/05	
2-Butanone	BQL	25.0	1.09	1	10/27/05	
Carbon disulfide	BQL	1.00	0.206	1	10/27/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/27/05	
Chlorobenzene	BQL	1.00	0.177	1	10/27/05	
Chloroethane	BQL	1.00	0.416	1	10/27/05	
Chloroform	BQL	1.00	0.220	1	10/27/05	
Chloromethane	BQL	1.00	0.282	1	10/27/05	
Cyclohexane	BQL	1.00	1.00	1	10/27/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/27/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/27/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/27/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/27/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/27/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/27/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/27/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/27/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/27/05	
cis-1,2-Dichloroethene	BQL	1.00	0.176	1	10/27/05	
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/27/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/27/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/27/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/27/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/27/05	
Ethylbenzene	BQL	1.00	0.206	1	10/27/05	
2-Hexanone	BQL	5.00	0.874	1	10/27/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/27/05	
Methyl Acetate	BQL	1.00	1.00	1	10/27/05	
Methylene chloride	**0.200**	5.00	0.188	1	10/27/05	J
methyl Cyclohexane	BQL	1.00	1.00	1	10/27/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/27/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/27/05	
Styrene	BQL	1.00	0.239	1	10/27/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/27/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/27/05	
Toluene	BQL	1.00	0.175	1	10/27/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/27/05	
Trichloroethene	BQL	1.00	0.209	1	10/27/05	

✓ ACD 9/22/06

Results for Volatiles
by GCMS 8260B

Client Sample ID: IR35-WT-EB101905
Client Project ID: Site 35 DPT
Lab Sample ID: G189-61-52A
Lab Project ID: G189-61

Analyzed By: JTF
Date Collected: 10/19/05 11:30
Date Received: 10/19/05
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/27/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/27/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/27/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/27/05	
Vinyl chloride	BQL	1.00	0.400	1	10/27/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/27/05	
o-Xylene	BQL	1.00	0.167	1	10/27/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.3	103
1,2-Dichloroethane-d4	10	10.1	101
Toluene-d8	10	9.99	100

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: _____

Results for Volatiles
by GCMS 8260B

Client Sample ID: Method Blank
Client Project ID:
Lab Sample ID: VBLK4102405B
Lab Project ID:

Analyzed By: JTF
Date Collected:
Date Received:
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/24/05	
Benzene	BQL	1.00	0.162	1	10/24/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/24/05	
Bromoform	BQL	1.00	0.0960	1	10/24/05	
Bromomethane	BQL	1.00	0.104	1	10/24/05	
2-Butanone	BQL	25.0	1.09	1	10/24/05	
Carbon disulfide	BQL	1.00	0.206	1	10/24/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/24/05	
Chlorobenzene	BQL	1.00	0.177	1	10/24/05	
Chloroethane	BQL	1.00	0.416	1	10/24/05	
Chloroform	BQL	1.00	0.220	1	10/24/05	
Chloromethane	BQL	1.00	0.282	1	10/24/05	
Cyclohexane	BQL	1.00	1.00	1	10/24/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/24/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/24/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/24/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/24/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/24/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/24/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/24/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/24/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/24/05	
cis-1,2-Dichloroethene	BQL	1.00	0.176	1	10/24/05	
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/24/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/24/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/24/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/24/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/24/05	
Ethylbenzene	BQL	1.00	0.206	1	10/24/05	
2-Hexanone	BQL	5.00	0.874	1	10/24/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/24/05	
Methyl Acetate	BQL	1.00	1.00	1	10/24/05	
Methylene chloride	BQL	5.00	0.188	1	10/24/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/24/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/24/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/24/05	
Styrene	BQL	1.00	0.239	1	10/24/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/24/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/24/05	
Toluene	BQL	1.00	0.175	1	10/24/05	
1,2,4-Trichlorobenzene	**0.260**	1.00	0.244	1	10/24/05	J
Trichloroethene	BQL	1.00	0.209	1	10/24/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: Method Blank
Client Project ID:
Lab Sample ID: VBLK4102405B
Lab Project ID:

Analyzed By: JTF
Date Collected:
Date Received:
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/24/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/24/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/24/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/24/05	
Vinyl chloride	BQL	1.00	0.400	1	10/24/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/24/05	
o-Xylene	BQL	1.00	0.167	1	10/24/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.5	105
1,2-Dichloroethane-d4	10	10.9	109
Toluene-d8	10	10.1	101

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: _____

Results for Laboratory Control Spike (LCS)
by GC/MS

Lab Sample ID: lcs4102405a
Analyst: JTF
Batch ID: 4102405

Date Analyzed: 24 Oct 2005 12:16 pm
Matrix: Water

Compound	Spiked ug/L	Amount recovered	LCS (%)	Limits Lower (%)	Limits Upper (%)
benzene	5.0	5.10	101.9	77.4	123
chlorobenzene	5.0	4.69	93.8	72.5	128
1,1-dichloroethene	5.0	5.13	102.5	71.7	128
toluene	5.0	5.00	100.0	75.9	124
trichloroethene	5.0	4.99	99.9	77.9	122

Comments:
Concentration values are on column amount.

Flags:
* = Out of limits.
NA = Not applicable

Reviewed By:

VO42.072303.1

Results for MS/MSD
by GC/MS

Client Project ID: Batch QC
Lab Sample ID: g189-61-5b x20
Batch ID: 4102405

Date Analyzed: 24 Oct 2005 9:49 pm
Matrix: water
Analyzed By: JTF

Compound	Unspiked Sample ug/L	Spike conc. ug/L	Recovered MS %	Recovered MSD %	Limits Lower %	Limits Upper %	RPD %	RPD Limit %
benzene	BQL	5	102.1	105.5	61.6	135	3.2	30
chlorobenzene	BQL	5	90.0	98.5	77.2	118	9.0	30
1,1-dichloroethene	BQL	5	100.4	106.1	64.4	130	5.5	30
toluene	BQL	5	101.0	104.8	66.4	128	3.7	30
trichloroethene	10.4	5	102.3	86.0	84.9	136	17.3	30

Comments:

Concentrations are on column amounts.
Concentration Units: ug/L

Flags:

* = Out of limits.
NA = Not applicable
BQL = Below quantitation limit.

Reviewed By: _____

VO43.072303.1

Results for Volatiles
by GCMS 8260B

Client Sample ID: Method Blank
Client Project ID:
Lab Sample ID: VBLK4102405D
Lab Project ID:

Analyzed By: JTF
Date Collected:
Date Received:
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/25/05	
Benzene	BQL	1.00	0.162	1	10/25/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	BQL	25.0	1.09	1	10/25/05	
Carbon disulfide	BQL	1.00	0.206	1	10/25/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	BQL	1.00	0.176	1	10/25/05	
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/25/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	BQL	1.00	0.206	1	10/25/05	
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	BQL	5.00	0.188	1	10/25/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/25/05	
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	BQL	1.00	0.175	1	10/25/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/25/05	
Trichloroethene	BQL	1.00	0.209	1	10/25/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: Method Blank
Client Project ID:
Lab Sample ID: VBLK4102405D
Lab Project ID:

Analyzed By: JTF
Date Collected:
Date Received:
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/25/05	
o-Xylene	BQL	1.00	0.167	1	10/25/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.4	104
1,2-Dichloroethane-d4	10	10.7	107
Toluene-d8	10	10.1	101

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By:

Results for Laboratory Control Spike (LCS)
by GC/MS

Lab Sample ID: lcs4102405b
Analyst: JTF
Batch ID: 4102405

Date Analyzed: 25 Oct 2005 12:59 am
Matrix: Water

Compound	Spiked ug/L	Amount recovered	LCS (%)	Limits Lower (%)	Limits Upper (%)
benzene	5.0	5.26	105.2	77.4	123
chlorobenzene	5.0	4.63	92.6	72.5	128
1,1-dichloroethene	5.0	5.24	104.8	71.7	128
toluene	5.0	5.06	101.2	75.9	124
trichloroethene	5.0	5.33	106.7	77.9	122

Comments:
Concentration values are on column amount.

Flags:
* = Out of limits.
NA = Not applicable

Reviewed By: [signature]

VO42.072303.1

Results for MS/MSD
by GC/MS

Client Project ID: Batch QC
Lab Sample ID. g189-61-13b
Batch ID: 4102405

Date Analyzed: 25 Oct 2005 9:25 am
Matrix: water
Analyzed By: JTF

Compound	Unspiked Sample ug/L	Spike conc. ug/L	Recovered MS %	Recovered MSD %	Limits Lower %	Limits Upper %	RPD %	RPD Limit %
benzene	BQL	5	102.8	104.0	61.6	135	1.1	30
chlorobenzene	BQL	5	91.8	97.2	77.2	118	5.7	30
1,1-dichloroethene	BQL	5	103.0	104.3	64.4	130	1.3	30
toluene	1.0	5	79.6	83.0	66.4	128	4.2	30
trichloroethene	BQL	5	108.1	110.5	84.9	136	2.3	30

Comments:

Concentrations are on column amounts.
Concentration Units: ug/L

Flags:

* = Out of limits.
NA = Not applicable
BQL = Below quantitation limit.

Reviewed By: _____

VO43.072303.1

Results for Volatiles
by GCMS 8260B

Client Sample ID: Method Blank
Client Project ID:
Lab Sample ID: VBLK4102505B
Lab Project ID:

Analyzed By: JTF
Date Collected:
Date Received:
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/25/05	
Benzene	BQL	1.00	0.162	1	10/25/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/25/05	
Bromoform	BQL	1.00	0.0960	1	10/25/05	
Bromomethane	BQL	1.00	0.104	1	10/25/05	
2-Butanone	BQL	25.0	1.09	1	10/25/05	
Carbon disulfide	BQL	1.00	0.206	1	10/25/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/25/05	
Chlorobenzene	BQL	1.00	0.177	1	10/25/05	
Chloroethane	BQL	1.00	0.416	1	10/25/05	
Chloroform	BQL	1.00	0.220	1	10/25/05	
Chloromethane	BQL	1.00	0.282	1	10/25/05	
Cyclohexane	BQL	1.00	1.00	1	10/25/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/25/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/25/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/25/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/25/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/25/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/25/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/25/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/25/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/25/05	
cis-1,2-Dichloroethene	BQL	1.00	0.176	1	10/25/05	
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/25/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/25/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/25/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/25/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/25/05	
Ethylbenzene	BQL	1.00	0.206	1	10/25/05	
2-Hexanone	BQL	5.00	0.874	1	10/25/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/25/05	
Methyl Acetate	BQL	1.00	1.00	1	10/25/05	
Methylene chloride	BQL	5.00	0.188	1	10/25/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/25/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/25/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/25/05	
Styrene	BQL	1.00	0.239	1	10/25/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/25/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/25/05	
Toluene	BQL	1.00	0.175	1	10/25/05	
1,2,4-Trichlorobenzene	**0.290**	1.00	0.244	1	10/25/05	J
Trichloroethene	BQL	1.00	0.209	1	10/25/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: Method Blank
Client Project ID:
Lab Sample ID: VBLK4102505B
Lab Project ID:

Analyzed By: JTF
Date Collected:
Date Received:
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/25/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/25/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/25/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/25/05	
Vinyl chloride	BQL	1.00	0.400	1	10/25/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/25/05	
o-Xylene	BQL	1.00	0.167	1	10/25/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.4	104
1,2-Dichloroethane-d4	10	10.6	106
Toluene-d8	10	10.2	102

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: [illegible]

Results for Laboratory Control Spike (LCS)
by GC/MS

Lab Sample ID: lcs4102505a
Analyst: JTF
Batch ID: 4102505

Date Analyzed: 25 Oct 2005 1:13 pm
Matrix: Water

Compound	Spiked ug/L	Amount recovered	LCS (%)	Limits Lower (%)	Limits Upper (%)
benzene	5.0	4.93	98.6	77.4	123
chlorobenzene	5.0	4.55	91.0	72.5	128
1,1-dichloroethene	5.0	4.93	98.6	71.7	128
toluene	5.0	4.84	96.9	75.9	124
trichloroethene	5.0	4.93	98.5	77.9	122

Comments:
Concentration values are on column amount.

Flags:
* = Out of limits.
NA = Not applicable

Reviewed By:

VO42.072303.1

Results for MS/MSD
by GC/MS

Client Project ID: Batch QC
Lab Sample ID: g189-61-36i
Batch ID: 4102505

Date Analyzed: 25 Oct 2005 10:43 pm
Matrix: water
Analyzed By: JTF

Compound	Unspiked Sample ug/L	Spike conc. ug/L	Recovered MS %	Recovered MSD %	Limits Lower %	Limits Upper %	RPD %	RPD Limit %
benzene	0.5	5	127.5	114.9	61.6	135	10.4	30
chlorobenzene	BQL	5	112.5	104.2	77.2	118	7.7	30
1,1-dichloroethene	BQL	5	127.4	117.3	64.4	130	8.2	30
toluene	1.5	5	122.0	118.3	66.4	128	3.1	30
trichloroethene	23.5	5	450.8 *	235.2 *	84.9	136	62.8 *	30

Comments:

Concentrations are on column amounts.
Concentration Units: ug/L

Flags:

* = Out of limits.
NA = Not applicable
BQL = Below quantitation limit.

Reviewed By: _____

VO43.072303.1

Results for Volatiles
by GCMS 8260B

Client Sample ID: Method Blank
Client Project ID:
Lab Sample ID: VBLK4102505D
Lab Project ID:

Analyzed By: JTF
Date Collected:
Date Received:
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/26/05	
Benzene	BQL	1.00	0.162	1	10/26/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/26/05	
Bromoform	BQL	1.00	0.0960	1	10/26/05	
Bromomethane	BQL	1.00	0.104	1	10/26/05	
2-Butanone	BQL	25.0	1.09	1	10/26/05	
Carbon disulfide	BQL	1.00	0.206	1	10/26/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/26/05	
Chlorobenzene	BQL	1.00	0.177	1	10/26/05	
Chloroethane	BQL	1.00	0.416	1	10/26/05	
Chloroform	BQL	1.00	0.220	1	10/26/05	
Chloromethane	BQL	1.00	0.282	1	10/26/05	
Cyclohexane	BQL	1.00	1.00	1	10/26/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/26/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/26/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/26/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/26/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/26/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/26/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/26/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/26/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/26/05	
cis-1,2-Dichloroethene	BQL	1.00	0.176	1	10/26/05	
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/26/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/26/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/26/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/26/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/26/05	
Ethylbenzene	BQL	1.00	0.206	1	10/26/05	
2-Hexanone	BQL	5.00	0.874	1	10/26/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/26/05	
Methyl Acetate	BQL	1.00	1.00	1	10/26/05	
Methylene chloride	BQL	5.00	0.188	1	10/26/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/26/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/26/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/26/05	
Styrene	BQL	1.00	0.239	1	10/26/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/26/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/26/05	
Toluene	BQL	1.00	0.175	1	10/26/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/26/05	
Trichloroethene	BQL	1.00	0.209	1	10/26/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: Method Blank
Client Project ID:
Lab Sample ID: VBLK4102505D
Lab Project ID:

Analyzed By: JTF
Date Collected:
Date Received:
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/26/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/26/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/26/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/26/05	
Vinyl chloride	BQL	1.00	0.400	1	10/26/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/26/05	
o-Xylene	BQL	1.00	0.167	1	10/26/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.5	105
1,2-Dichloroethane-d4	10	10.3	103
Toluene-d8	10	9.96	100

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By:

Results for Laboratory Control Spike (LCS)
by GC/MS

Lab Sample ID: lcs4102505b
Analyst: JTF
Batch ID: 4102505

Date Analyzed: 26 Oct 2005 1:53 am
Matrix: Water

Compound	Spiked ug/L	Amount recovered	LCS (%)	Limits Lower (%)	Limits Upper (%)
benzene	5.0	5.07	101.3	77.4	123
chlorobenzene	5.0	4.66	93.1	72.5	128
1,1-dichloroethene	5.0	5.03	100.6	71.7	128
toluene	5.0	4.91	98.1	75.9	124
trichloroethene	5.0	5.23	104.6	77.9	122

Comments:
Concentration values are on column amount.

Flags:
* = Out of limits.
NA = Not applicable

Reviewed By: [signature]

VO42.072303.1

Results for MS/MSD
by GC/MS

Client Project ID: Batch QC
Lab Sample ID: g189-61-25a
Batch ID: 4102505

Date Analyzed: 26 Oct 2005 11:23 am
Matrix: water
Analyzed By: JTF

Compound	Unspiked Sample ug/L	Spike conc. ug/L	Recovered MS %	Recovered MSD %	Limits Lower %	Limits Upper %	RPD %	RPD Limit %
benzene	BQL	5	106.6	106.8	61.6	135	0.2	30
chlorobenzene	BQL	5	93.3	92.3	77.2	118	1.2	30
1,1-dichloroethene	BQL	5	105.2	105.5	64.4	130	0.3	30
toluene	0.6	5	100.7	103.3	66.4	128	2.5	30
trichloroethene	BQL	5	111.6	111.7	84.9	136	0.1	30

Comments:

Concentrations are on column amounts.
Concentration Units: ug/L

Flags:

* = Out of limits.
NA = Not applicable
BQL = Below quantitation limit.

Reviewed By:

VO43.072303.1

Results for Volatiles
by GCMS 8260B

Client Sample ID: Method Blank
Client Project ID:
Lab Sample ID: VBLK4102605B
Lab Project ID:

Analyzed By: JTF
Date Collected:
Date Received:
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/26/05	
Benzene	BQL	1.00	0.162	1	10/26/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/26/05	
Bromoform	BQL	1.00	0.0960	1	10/26/05	
Bromomethane	BQL	1.00	0.104	1	10/26/05	
2-Butanone	BQL	25.0	1.09	1	10/26/05	
Carbon disulfide	BQL	1.00	0.206	1	10/26/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/26/05	
Chlorobenzene	BQL	1.00	0.177	1	10/26/05	
Chloroethane	BQL	1.00	0.416	1	10/26/05	
Chloroform	BQL	1.00	0.220	1	10/26/05	
Chloromethane	BQL	1.00	0.282	1	10/26/05	
Cyclohexane	BQL	1.00	1.00	1	10/26/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/26/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/26/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/26/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/26/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/26/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/26/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/26/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/26/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/26/05	
cis-1,2-Dichloroethene	BQL	1.00	0.176	1	10/26/05	
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/26/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/26/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/26/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/26/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/26/05	
Ethylbenzene	BQL	1.00	0.206	1	10/26/05	
2-Hexanone	BQL	5.00	0.874	1	10/26/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/26/05	
Methyl Acetate	BQL	1.00	1.00	1	10/26/05	
Methylene chloride	BQL	5.00	0.188	1	10/26/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/26/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/26/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/26/05	
Styrene	BQL	1.00	0.239	1	10/26/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/26/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/26/05	
Toluene	BQL	1.00	0.175	1	10/26/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/26/05	
Trichloroethene	BQL	1.00	0.209	1	10/26/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: Method Blank
Client Project ID:
Lab Sample ID: VBLK4102605B
Lab Project ID:

Analyzed By: JTF
Date Collected:
Date Received:
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/26/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/26/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/26/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/26/05	
Vinyl chloride	BQL	1.00	0.400	1	10/26/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/26/05	
o-Xylene	BQL	1.00	0.167	1	10/26/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.4	104
1,2-Dichloroethane-d4	10	10.4	104
Toluene-d8	10	9.97	100

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By:

Results for Laboratory Control Spike (LCS)
by GC/MS

Lab Sample ID: lcs4102605a
Analyst: JTF
Batch ID: 4102605

Date Analyzed: 26 Oct 2005 2:32 pm
Matrix: Water

Compound	Spiked ug/L	Amount recovered	LCS (%)	Limits Lower (%)	Limits Upper (%)
benzene	5.0	5.02	100.4	77.4	123
chlorobenzene	5.0	4.62	92.4	72.5	128
1,1-dichloroethene	5.0	4.98	99.6	71.7	128
toluene	5.0	4.92	98.3	75.9	124
trichloroethene	5.0	4.91	98.2	77.9	122

Comments:
Concentration values are on column amount.

Flags:
* = Out of limits.
NA = Not applicable

Reviewed By: _____

VO42.072303.1

Results for MS/MSD
by GC/MS

Client Project ID: Batch QC
Lab Sample ID: g189-61-48a x20
Batch ID: 4102605

Date Analyzed: 27 Oct 2005 12:00 am
Matrix: water
Analyzed By: JTF

Compound	Unspiked Sample ug/L	Spike conc. ug/L	Recovered MS %	Recovered MSD %	Limits Lower %	Limits Upper %	RPD %	RPD Limit %
benzene	BQL	5	106.4	104.3	61.6	135	2.1	30
chlorobenzene	BQL	5	97.0	94.5	77.2	118	2.6	30
1,1-dichloroethene	BQL	5	103.1	103.4	64.4	130	0.3	30
toluene	BQL	5	103.5	101.3	66.4	128	2.2	30
trichloroethene	6.6	5	105.2	93.7	84.9	136	11.6	30

Comments:

Concentrations are on column amounts.
Concentration Units: ug/L

Flags:

* = Out of limits.
NA = Not applicable
BQL = Below quantitation limit.

Reviewed By:

VO43.072303.1

Results for Volatiles
by GCMS 8260B

Client Sample ID: Method Blank
Client Project ID:
Lab Sample ID: VBLK4102605D
Lab Project ID:

Analyzed By: JTF
Date Collected:
Date Received:
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
Acetone	BQL	25.0	3.37	1	10/27/05	
Benzene	BQL	1.00	0.162	1	10/27/05	
Bromodichloromethane	BQL	1.00	0.185	1	10/27/05	
Bromoform	BQL	1.00	0.0960	1	10/27/05	
Bromomethane	BQL	1.00	0.104	1	10/27/05	
2-Butanone	BQL	25.0	1.09	1	10/27/05	
Carbon disulfide	BQL	1.00	0.206	1	10/27/05	
Carbon tetrachloride	BQL	1.00	0.181	1	10/27/05	
Chlorobenzene	BQL	1.00	0.177	1	10/27/05	
Chloroethane	BQL	1.00	0.416	1	10/27/05	
Chloroform	BQL	1.00	0.220	1	10/27/05	
Chloromethane	BQL	1.00	0.282	1	10/27/05	
Cyclohexane	BQL	1.00	1.00	1	10/27/05	
Dibromochloromethane	BQL	1.00	0.208	1	10/27/05	
1,2-Dibromo-3-chloropropane	BQL	5.00	1.95	1	10/27/05	
1,2-Dibromoethane (EDB)	BQL	1.00	0.264	1	10/27/05	
1,2-Dichlorobenzene	BQL	1.00	0.190	1	10/27/05	
1,3-Dichlorobenzene	BQL	1.00	0.234	1	10/27/05	
1,4-Dichlorobenzene	BQL	1.00	0.182	1	10/27/05	
1,1-Dichloroethane	BQL	1.00	0.215	1	10/27/05	
1,1-Dichloroethene	BQL	1.00	0.164	1	10/27/05	
1,2-Dichloroethane	BQL	1.00	0.244	1	10/27/05	
cis-1,2-Dichloroethene	BQL	1.00	0.176	1	10/27/05	
trans-1,2-dichloroethene	BQL	1.00	0.230	1	10/27/05	
1,2-Dichloropropane	BQL	1.00	0.166	1	10/27/05	
cis-1,3-Dichloropropene	BQL	1.00	0.202	1	10/27/05	
trans-1,3-Dichloropropene	BQL	1.00	0.119	1	10/27/05	
Dichlorodifluoromethane	BQL	5.00	0.385	1	10/27/05	
Ethylbenzene	BQL	1.00	0.206	1	10/27/05	
2-Hexanone	BQL	5.00	0.874	1	10/27/05	
Isopropylbenzene	BQL	1.00	0.173	1	10/27/05	
Methyl Acetate	BQL	1.00	1.00	1	10/27/05	
Methylene chloride	BQL	5.00	0.188	1	10/27/05	
methyl Cyclohexane	BQL	1.00	1.00	1	10/27/05	
4-Methyl-2-pentanone	BQL	5.00	0.495	1	10/27/05	
Methyl-tert-butyl ether (MTBE)	BQL	1.00	0.214	1	10/27/05	
Styrene	BQL	1.00	0.239	1	10/27/05	
1,1,2,2-Tetrachloroethane	BQL	1.00	0.256	1	10/27/05	
Tetrachloroethene	BQL	1.00	0.304	1	10/27/05	
Toluene	BQL	1.00	0.175	1	10/27/05	
1,2,4-Trichlorobenzene	BQL	1.00	0.244	1	10/27/05	
Trichloroethene	BQL	1.00	0.209	1	10/27/05	

Results for Volatiles
by GCMS 8260B

Client Sample ID: Method Blank
Client Project ID:
Lab Sample ID: VBLK4102605D
Lab Project ID:

Analyzed By: JTF
Date Collected:
Date Received:
Matrix: Water

Compound	Result UG/L	Quantitation Limit UG/L	MDL UG/L	Dilution Factor	Date Analyzed	Flag
1,1,1-Trichloroethane	BQL	1.00	0.197	1	10/27/05	
1,1,2-Trichloroethane	BQL	1.00	0.267	1	10/27/05	
1,1,2-Trichloro-1,2,2-trifluoroethane	BQL	1.00	1.00	1	10/27/05	
Trichlorofluoromethane	BQL	1.00	0.428	1	10/27/05	
Vinyl chloride	BQL	1.00	0.400	1	10/27/05	
m-,p-Xylene	BQL	2.00	0.386	1	10/27/05	
o-Xylene	BQL	1.00	0.167	1	10/27/05	

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	10	10.5	105
1,2-Dichloroethane-d4	10	10.5	105
Toluene-d8	10	9.96	100

Comments:

Flags:
BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By:

Results for Laboratory Control Spike (LCS)
by GC/MS

Lab Sample ID: lcs4102605b
Analyst: JTF
Batch ID: 4102605

Date Analyzed: 27 Oct 2005 3:09 am
Matrix: Water

Compound	Spiked ug/L	Amount recovered	LCS (%)	Limits Lower (%)	Limits Upper (%)
benzene	5.0	5.02	100.3	77.4	123
chlorobenzene	5.0	4.69	93.9	72.5	128
1,1-dichloroethene	5.0	4.95	99.0	71.7	128
toluene	5.0	4.91	98.2	75.9	124
trichloroethene	5.0	5.08	101.6	77.9	122

Comments:
Concentration values are on column amount.

Flags:
* = Out of limits.
NA = Not applicable

Reviewed By: _____

VO42.072303.1

Results for MS/MSD
by GC/MS

Client Project ID: Batch QC
Lab Sample ID: g145-1122-1b x200
Batch ID: 4102605

Date Analyzed: 27 Oct 2005 10:32 am
Matrix: water
Analyzed By: JTF

Compound	Unspiked Sample ug/L	Spike conc. ug/L	Recovered MS %	Recovered MSD %	Limits Lower %	Limits Upper %	RPD %	RPD Limit %
benzene	BQL	5	107.7	103.3	61.6	135	4.1	30
chlorobenzene	BQL	5	102.1	100.8	77.2	118	1.2	30
1,1-dichloroethene	BQL	5	107.9	104.1	64.4	130	3.5	30
toluene	BQL	5	105.1	102.7	66.4	128	2.4	30
trichloroethene	BQL	5	107.2	101.4	84.9	136	5.5	30

Comments:

Concentrations are on column amounts.
Concentration Units: ug/L

Flags:

* = Out of limits.
NA = Not applicable
BQL = Below quantitation limit.

Reviewed By:

VO43.072303.1

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: EB013106-06A

Lab Sample ID: 904123
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Soil Extract Volume: _____(uL)
Method Blank: 93324

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Date Received: 02/06/06
Lab File ID: 904123A71
Analyst: 2423

Date Analyzed: 02/07/06
Dilution Factor: 1.0

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	2	JB
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	0.13	J
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	ND	U
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	ND	U
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	ND	U
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: EB013106-06A

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Lab Sample ID: 904123
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904123A71
Analyst: 2423

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/07/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93324

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	ND	U
108-38-3	m,p-Xylene	0.20	1	ND	U
95-47-6	o-Xylene	0.10	0.5	ND	U
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	ND	U
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: FB013106-06A

Lab Sample ID: 904122
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Soil Extract Volume: _____(uL)
Method Blank: 93324

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Date Received: 02/06/06
Lab File ID: 904122A71
Analyst: 2423

Date Analyzed: 02/07/06
Dilution Factor: 1.0

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	1.7	JB
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	0.14	J
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	ND	U
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	ND	U
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	ND	U
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: FB013106-06A

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Lab Sample ID: 904122
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904122A71
Analyst: 2423

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/07/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93324

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	ND	U
108-38-3	m,p-Xylene	0.20	1	0.28	J
95-47-6	o-Xylene	0.10	0.5	ND	U
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	0.3	J
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS200-20-24-06A

Lab Sample ID: 904101
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Soil Extract Volume:_____(uL)
Method Blank: 93326

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Date Received: 02/06/06
Lab File ID: 904101RB71
Analyst: 2481

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	3	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	1	J
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.16	J
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	1	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS200-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Lab Sample ID: 904101
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904101RB71
Analyst: 2481

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93326

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	0.2	J
108-38-3	m,p-Xylene	0.20	1	0.38	J
95-47-6	o-Xylene	0.10	0.5	0.17	J
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	0.56	
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS200-40-44-06A

Lab Sample ID: 904102
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Soil Extract Volume:_____(uL)
Method Blank: 93326

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Date Received: 02/06/06
Lab File ID: 904102RB71
Analyst: 2481

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	4	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	1.5	J
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.35	J
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	1.2	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS200-40-44-06A

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Lab Sample ID: 904102
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904102RB71
Analyst: 2481

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93326

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	0.7	
108-38-3	m,p-Xylene	0.20	1	0.51	J
95-47-6	o-Xylene	0.10	0.5	0.22	J
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	0.75	
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS201-20-24-06A

Lab Sample ID: 904103
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Soil Extract Volume:_____(uL)
Method Blank: 93326

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Date Received: 02/06/06
Lab File ID: 904103RB71
Analyst: 2481

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	0.13	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	1.8	JB
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	ND	U
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.13	J
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	1.2	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS201-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Lab Sample ID: 904103
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904103RB71
Analyst: 2481

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93326

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	0.16	J
108-38-3	m,p-Xylene	0.20	1	0.44	J
95-47-6	o-Xylene	0.10	0.5	0.17	J
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	0.64	
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS201-40-44-06A

Lab Sample ID: 904104
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Soil Extract Volume: _____(uL)
Method Blank: 93326

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Date Received: 02/06/06
Lab File ID: 904104RB71
Analyst: 2481

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	5.3	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	0.24	J
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	1.8	J
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.36	J
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	1.3	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS201-40-44-06A

Lab Sample ID: 904104
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Soil Extract Volume:_____(uL)
Method Blank: 93326

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Date Received: 02/06/06
Lab File ID: 904104RB71
Analyst: 2481

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	0.63	
108-38-3	m,p-Xylene	0.20	1	0.52	J
95-47-6	o-Xylene	0.10	0.5	0.21	J
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	0.75	
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS202-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Lab Sample ID: 904105
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904105RB71
Analyst: 2481

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93326

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	1.8	JB
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	ND	U
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.1	J
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	0.56	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS202-20-24-06A

Lab Sample ID: 904105
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Soil Extract Volume:_____(uL)
Method Blank: 93326

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Date Received: 02/06/06
Lab File ID: 904105RB71
Analyst: 2481

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Aliquot Volume: _____(uL)

CAS NO. COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4--1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7--Chlorobenzene	0.10	0.5	ND	U
100-41-4--Ethylbenzene	0.10	0.5	0.21	J
108-38-3--m,p-Xylene	0.20	1	ND	U
95-47-6---o-Xylene	0.10	0.5	ND	U
100-42-5--Styrene	0.10	0.5	ND	U
75-25-2---Bromoform	0.10	0.5	ND	U
98-82-8---Isopropyl Benzene	0.10	0.5	ND	U
79-34-5---1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1--1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7--1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1---1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8---1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1--1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7-Xylene (total)	0.10	0.5	ND	U
110-82-7--Cyclohexane	0.12	0.5	ND	U
108-87-2--Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS202-40-44-06A

Lab Sample ID: 904106
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Soil Extract Volume: _____ (uL)
Method Blank: 93326

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Date Received: 02/06/06
Lab File ID: 904106RB71
Analyst: 2481

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	4.1	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	1.4	J
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.2	J
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	1.1	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS202-40-44-06A

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Lab Sample ID: 904106
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904106RB71
Analyst: 2481

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93326

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	0.61	
108-38-3	m,p-Xylene	0.20	1	0.51	J
95-47-6	o-Xylene	0.10	0.5	0.21	J
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	0.74	
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS203-20-24-06A

Lab Sample ID: 904107
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Soil Extract Volume:_____(uL)
Method Blank: 93326

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Date Received: 02/06/06
Lab File ID: 904107RB71
Analyst: 2481

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	2.3	JB
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	ND	U
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.11	J
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	1	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS203-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Lab Sample ID: 904107
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904107RB71
Analyst: 2481

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93326

Soil Aliquot Volume: _____(uL)

CAS NO. COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4--1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7--Chlorobenzene	0.10	0.5	ND	U
100-41-4--Ethylbenzene	0.10	0.5	0.11	J
108-38-3--m,p-Xylene	0.20	1	0.34	J
95-47-6---o-Xylene	0.10	0.5	0.13	J
100-42-5--Styrene	0.10	0.5	ND	U
75-25-2---Bromoform	0.10	0.5	ND	U
98-82-8---Isopropyl Benzene	0.10	0.5	ND	U
79-34-5---1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1--1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7--1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1---1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8---1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1--1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7-Xylene (total)	0.10	0.5	0.49	J
110-82-7--Cyclohexane	0.12	0.5	ND	U
108-87-2--Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS203-40-44-06A

Lab Sample ID: 904108
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Soil Extract Volume: _____ (uL)
Method Blank: 93326

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Date Received: 02/06/06
Lab File ID: 904108RB71
Analyst: 2481

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	3.8	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	0.17	J
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	1.4	J
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.18	J
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	0.95	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS203-40-44-06A

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Lab Sample ID: 904108
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904108RB71
Analyst: 2481

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93326

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	0.49	J
108-38-3	m,p-Xylene	0.20	1	0.36	J
95-47-6	o-Xylene	0.10	0.5	0.13	J
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	0.5	
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS204-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Lab Sample ID: 904109
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904109RB71
Analyst: 2481

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93326

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	0.76	
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	5.6	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	0.22	J
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	1.9	J
67-66-3	Chloroform	0.10	0.5	2.5	
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.15	J
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	1	
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	0.89	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	0.6	

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS204-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Lab Sample ID: 904109
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904109RB71
Analyst: 2481

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93326

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	0.18	J
108-38-3	m,p-Xylene	0.20	1	0.24	J
95-47-6	o-Xylene	0.10	0.5	0.11	J
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	0.36	J
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS204-40-44-06A

Lab Sample ID: 904110
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Soil Extract Volume: _____ (uL)
Method Blank: 93326

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Date Received: 02/06/06
Lab File ID: 904110RB71
Analyst: 2481

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	3.9	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	1.4	J
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.2	J
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	1.2	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS204-40-44-06A

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Lab Sample ID: 904110
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904110RB71
Analyst: 2481

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93326

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	0.63	
108-38-3	m,p-Xylene	0.20	1	0.44	J
95-47-6	o-Xylene	0.10	0.5	0.17	J
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	0.63	
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS205-20-24-06A

Lab Sample ID: 904111
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Soil Extract Volume: _____ (uL)
Method Blank: 93326

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Date Received: 02/06/06
Lab File ID: 904111RB71
Analyst: 2481

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	0.12	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	2.8	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	ND	U
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.22	J
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	1.5	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS205-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Lab Sample ID: 904111
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904111RB71
Analyst: 2481

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93326

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	1.1	
108-38-3	m,p-Xylene	0.20	1	0.54	J
95-47-6	o-Xylene	0.10	0.5	0.22	J
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	0.78	
110-82-7	Cyclohexane	0.12	0.5	0.44	J
108-87-2	Methylcyclohexane	0.11	0.5	0.11	J

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS205-40-44-06A

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Lab Sample ID: 904112
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904112RB71
Analyst: 2481

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume: _____(uL)
Method Blank: 93326

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	3.6	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	1.7	J
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.4	J
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	1.7	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS205-40-44-06A

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Lab Sample ID: 904112
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904112RB71
Analyst: 2481

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93326

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	0.84	
108-38-3	m,p-Xylene	0.20	1	0.7	J
95-47-6	o-Xylene	0.10	0.5	0.3	J
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	1	
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	0.32	J

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS206-20-24-06A

Lab Sample ID: 904113
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Soil Extract Volume:_____(uL)
Method Blank: 93326

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Date Received: 02/06/06
Lab File ID: 904113RB71
Analyst: 2481

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	2	JB
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	ND	U
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.14	J
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	0.37	J
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS206-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Lab Sample ID: 904113
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904113RB71
Analyst: 2481

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93326

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	0.17	J
108-38-3	m,p-Xylene	0.20	1	ND	U
95-47-6	o-Xylene	0.10	0.5	ND	U
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	ND	U
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS206-40-44-06A

Lab Sample ID: 904114
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Soil Extract Volume: _____ (uL)
Method Blank: 93326

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Date Received: 02/06/06
Lab File ID: 904114RB71
Analyst: 2481

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	1.8	JB
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	0.14	J
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	ND	U
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.13	J
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	0.6	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS206-40-44-06A

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Lab Sample ID: 904114
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904114RB71
Analyst: 2481

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93326

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	0.54	
108-38-3	m,p-Xylene	0.20	1	ND	U
95-47-6	o-Xylene	0.10	0.5	ND	U
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	ND	U
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS207-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Lab Sample ID: 904115
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904115RB71
Analyst: 2481

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume: _____(uL)
Method Blank: 93326

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	2.5	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	ND	U
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	ND	U
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	0.42	J
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS207-20-24-06A

Lab Sample ID: 904115
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Soil Extract Volume:_____(uL)
Method Blank: 93326

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Date Received: 02/06/06
Lab File ID: 904115RB71
Analyst: 2481

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	0.17	J
108-38-3	m,p-Xylene	0.20	1	ND	U
95-47-6	o-Xylene	0.10	0.5	ND	U
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	ND	U
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS210-20-24-06A

Lab Sample ID: 904116
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Soil Extract Volume:_____(uL)
Method Blank: 93326

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Date Received: 02/06/06
Lab File ID: 904116RB71
Analyst: 2481

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	1.6	JB
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	ND	U
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.12	J
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	0.68	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS210-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Lab Sample ID: 904116
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904116RB71
Analyst: 2481

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93326

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	0.24	J
108-38-3	m,p-Xylene	0.20	1	0.21	J
95-47-6	o-Xylene	0.10	0.5	ND	U
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	0.22	J
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS210-40-44-06A

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Lab Sample ID: 904117
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904117RB71
Analyst: 2481

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93326

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	3.9	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	0.42	J
78-93-3	2-butanone	0.79	2.5	1.4	J
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.58	
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	0.74	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS210-40-44-06A

Lab Sample ID: 904117
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Soil Extract Volume: _____ (uL)
Method Blank: 93326

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Date Received: 02/06/06
Lab File ID: 904117RB71
Analyst: 2481

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	0.96	
108-38-3	m,p-Xylene	0.20	1	0.47	J
95-47-6	o-Xylene	0.10	0.5	0.13	J
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	0.63	
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS211-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Lab Sample ID: 904118
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904118RB71
Analyst: 2481

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93326

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	0.13	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	3	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	ND	U
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	ND	U
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	0.53	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS211-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Lab Sample ID: 904118
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904118RB71
Analyst: 2481

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93326

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	0.14	J
108-38-3	m,p-Xylene	0.20	1	0.41	J
95-47-6	o-Xylene	0.10	0.5	0.14	J
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	0.56	
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS211-40-44-06A

Lab Sample ID: 904119
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Soil Extract Volume:_____(uL)
Method Blank: 93357

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Date Received: 02/06/06
Lab File ID: 904119A71
Analyst: 2423

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	0.24	J
75-15-0	Carbon disulfide	0.10	0.5	0.11	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	3.1	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	0.25	J
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	0.49	J
78-93-3	2-butanone	0.79	2.5	ND	U
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	6.1	
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	0.15	J
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	2.3	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS211-40-44-06A

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Lab Sample ID: 904119
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904119A71
Analyst: 2423

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93357

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	0.83	
108-38-3	m,p-Xylene	0.20	1	0.64	J
95-47-6	o-Xylene	0.10	0.5	0.4	J
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	1.1	
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS211-40-44P-06A

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Lab Sample ID: 904120
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904120A71
Analyst: 2423

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93357

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	0.16	J
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	4.7	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	0.13	J
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	0.45	J
78-93-3	2-butanone	0.79	2.5	1.6	J
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	6.5	
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	0.1	J
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	2.5	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: IS211-40-44P-06A

Lab Sample ID: 904120
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Soil Extract Volume:_____(uL)
Method Blank: 93357

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Date Received: 02/06/06
Lab File ID: 904120A71
Analyst: 2423

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	1.2	
108-38-3	m,p-Xylene	0.20	1	0.49	J
95-47-6	o-Xylene	0.10	0.5	0.51	
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	1	
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: TB013106-06A

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Lab Sample ID: 904121
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904121RA71
Analyst: 2423

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93357

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	1.8	JB
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	ND	U
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	ND	U
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	ND	U
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9041
Client Sample ID: TB013106-06A

Lab Project Number:
Method: 8260B
Date Collected: 01/31/06

Lab Sample ID: 904121
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904121RA71
Analyst: 2423

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93357

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	ND	U
108-38-3	m,p-Xylene	0.20	1	ND	U
95-47-6	o-Xylene	0.10	0.5	ND	U
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	ND	U
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: EB020106-06A

Lab Sample ID: 904416
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Soil Extract Volume:_____(uL)
Method Blank: 93356

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Date Received: 02/06/06
Lab File ID: 904416B73
Analyst: 2481

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	2.6	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	0.15	J
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	0.18	J
78-93-3	2-butanone	0.79	2.5	ND	U
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	ND	U
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	0.1	J
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: EB020106-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904416
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904416B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	ND	U
108-38-3	m,p-Xylene	0.20	1	ND	U
95-47-6	o-Xylene	0.10	0.5	ND	U
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	ND	U
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS-219-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904413
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904413B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	6.8	
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	0.61	
75-15-0	Carbon disulfide	0.10	0.5	0.37	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	3.4	B
79-20-9	Methyl acetate	0.15	0.5	0.69	
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	280	E
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	460	E
78-93-3	2-butanone	0.79	2.5	ND	U
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.36	J
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	4	
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	1.4	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS-219-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904413
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904413B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	0.46	J
108-38-3	m,p-Xylene	0.20	1	0.33	J
95-47-6	o-Xylene	0.10	0.5	ND	U
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	0.37	J
110-82-7	Cyclohexane	0.12	0.5	0.16	J
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS-219-20-24-06ADL

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904413
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904413DA71
Analyst: 2423

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 41.7

Soil Extract Volume: _____(uL)
Method Blank: 93357

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	21	ND	U
74-87-3	Chloromethane	0.10	21	ND	U
75-01-4	Vinyl Chloride	0.14	21	ND	U
74-83-9	Bromomethane	0.14	21	ND	U
75-00-3	Chloroethane	0.12	21	ND	U
75-69-4	Trichlorofluoromethane	0.13	21	ND	U
75-35-4	1,1-Dichloroethene	0.10	21	ND	U
75-15-0	Carbon disulfide	0.10	21	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	21	ND	U
67-64-1	Acetone	0.76	100	94	DJB
79-20-9	Methyl acetate	0.15	21	ND	U
75-09-2	Methylene Chloride	0.12	21	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	21	190	D
1634-04-4	Methyl-tert-butyl ether	0.10	21	ND	U
75-34-3	1,1-Dichloroethane	0.10	21	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	21	820	D
78-93-3	2-butanone	0.79	100	ND	U
67-66-3	Chloroform	0.10	21	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	21	ND	U
56-23-5	Carbon Tetrachloride	0.10	21	ND	U
71-43-2	Benzene	0.10	21	ND	U
107-06-2	1,2-Dichloroethane	0.10	21	ND	U
79-01-6	Trichloroethene	0.10	21	ND	U
78-87-5	1,2-Dichloropropane	0.10	21	ND	U
75-27-4	Bromodichloromethane	0.10	21	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	21	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	100	ND	U
108-88-3	Toluene	0.10	21	ND	U
10061-02-6	trans-1,3-Dichloropropene	0.10	21	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	21	ND	U
127-18-4	Tetrachloroethene	0.16	21	ND	U
591-78-6	2-hexanone	0.50	100	ND	U
124-48-1	Dibromochloromethane	0.10	21	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS-219-20-24-06ADL

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904413
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904413DA71
Analyst: 2423

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 41.7

Soil Extract Volume:_____(uL)
Method Blank: 93357

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	21	ND	U
108-90-7	Chlorobenzene	0.10	21	ND	U
100-41-4	Ethylbenzene	0.10	21	ND	U
108-38-3	m,p-Xylene	0.20	42	ND	U
95-47-6	o-Xylene	0.10	21	ND	U
100-42-5	Styrene	0.10	21	ND	U
75-25-2	Bromoform	0.10	21	ND	U
98-82-8	Isopropyl Benzene	0.10	21	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	21	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	21	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	21	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	21	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	21	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	21	ND	U
1330-20-7	Xylene (total)	0.10	21	ND	U
110-82-7	Cyclohexane	0.12	21	ND	U
108-87-2	Methylcyclohexane	0.11	21	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS-219-20-24P-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904414
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904414B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume: _____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	6.9	
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	0.59	
75-15-0	Carbon disulfide	0.10	0.5	0.3	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	3.7	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	270	E
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	460	E
78-93-3	2-butanone	0.79	2.5	ND	U
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.34	J
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	3.7	
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	1.6	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS-219-20-24P-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904414
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904414B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	0.54	
108-38-3	m,p-Xylene	0.20	1	0.33	J
95-47-6	o-Xylene	0.10	0.5	0.1	J
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	0.47	J
110-82-7	Cyclohexane	0.12	0.5	0.15	J
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS-219-20-24P-06ADL

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904414
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904414DA71
Analyst: 2423

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 41.7

Soil Extract Volume:_____(uL)
Method Blank: 93357

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	21	ND	U
74-87-3	Chloromethane	0.10	21	ND	U
75-01-4	Vinyl Chloride	0.14	21	ND	U
74-83-9	Bromomethane	0.14	21	ND	U
75-00-3	Chloroethane	0.12	21	ND	U
75-69-4	Trichlorofluoromethane	0.13	21	ND	U
75-35-4	1,1-Dichloroethene	0.10	21	ND	U
75-15-0	Carbon disulfide	0.10	21	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	21	ND	U
67-64-1	Acetone	0.76	100	97	DJB
79-20-9	Methyl acetate	0.15	21	ND	U
75-09-2	Methylene Chloride	0.12	21	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	21	190	D
1634-04-4	Methyl-tert-butyl ether	0.10	21	ND	U
75-34-3	1,1-Dichloroethane	0.10	21	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	21	830	D
78-93-3	2-butanone	0.79	100	ND	U
67-66-3	Chloroform	0.10	21	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	21	ND	U
56-23-5	Carbon Tetrachloride	0.10	21	ND	U
71-43-2	Benzene	0.10	21	ND	U
107-06-2	1,2-Dichloroethane	0.10	21	ND	U
79-01-6	Trichloroethene	0.10	21	ND	U
78-87-5	1,2-Dichloropropane	0.10	21	ND	U
75-27-4	Bromodichloromethane	0.10	21	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	21	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	100	ND	U
108-88-3	Toluene	0.10	21	ND	U
10061-02-6	trans-1,3-Dichloropropene	0.10	21	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	21	ND	U
127-18-4	Tetrachloroethene	0.16	21	ND	U
591-78-6	2-hexanone	0.50	100	ND	U
124-48-1	Dibromochloromethane	0.10	21	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS-219-20-24P-06ADL

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904414
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904414DA71
Analyst: 2423

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 41.7

Soil Extract Volume:_____(uL)
Method Blank: 93357

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	21	ND	U
108-90-7	Chlorobenzene	0.10	21	ND	U
100-41-4	Ethylbenzene	0.10	21	ND	U
108-38-3	m,p-Xylene	0.20	42	ND	U
95-47-6	o-Xylene	0.10	21	ND	U
100-42-5	Styrene	0.10	21	ND	U
75-25-2	Bromoform	0.10	21	ND	U
98-82-8	Isopropyl Benzene	0.10	21	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	21	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	21	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	21	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	21	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	21	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	21	ND	U
1330-20-7	Xylene (total)	0.10	21	ND	U
110-82-7	Cyclohexane	0.12	21	ND	U
108-87-2	Methylcyclohexane	0.11	21	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS-219-40-44-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904415
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904415RA71
Analyst: 2423

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93357

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	0.22	J
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	2.5	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	0.17	J
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	2.3	
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	11	
78-93-3	2-butanone	0.79	2.5	1	J
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	1.5	
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	4.1	
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	1.8	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	0.5	
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS-219-40-44-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904415
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904415RA71
Analyst: 2423

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93357

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	0.71	
108-38-3	m,p-Xylene	0.20	1	0.33	J
95-47-6	o-Xylene	0.10	0.5	0.11	J
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	0.46	J
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS208-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904401
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904401B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	3.5	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	0.1	J
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	ND	U
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.2	J
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	1.4	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS208-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904401
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904401B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	1.5	
108-38-3	m,p-Xylene	0.20	1	0.3	J
95-47-6	o-Xylene	0.10	0.5	ND	U
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	0.33	J
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS209-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904402
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904402B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	0.14	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	4.4	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	ND	U
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	ND	U
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	0.68	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS209-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904402
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904402B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	0.21	J
108-38-3	m,p-Xylene	0.20	1	ND	U
95-47-6	o-Xylene	0.10	0.5	ND	U
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	ND	U
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS209-40-44-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904403
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904403B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)
Method Blank: 93356

Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	7.8	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	0.19	J
78-93-3	2-butanone	0.79	2.5	1.7	J
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.38	J
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	1.3	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS209-40-44-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904403
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904403B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	0.95	
108-38-3	m,p-Xylene	0.20	1	0.21	J
95-47-6	o-Xylene	0.10	0.5	ND	U
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	0.24	J
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS212-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904410
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904410B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	4.4	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	ND	U
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.4	J
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	1.4	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS212-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904410
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904410B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	0.48	J
108-38-3	m,p-Xylene	0.20	1	0.37	J
95-47-6	o-Xylene	0.10	0.5	0.11	J
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	0.53	
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS212-40-44-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904411
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904411B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume: _____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	13	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	2.5	
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.45	J
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	1.4	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS212-40-44-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904411
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904411B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume: _____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	1.6	
108-38-3	m,p-Xylene	0.20	1	0.37	J
95-47-6	o-Xylene	0.10	0.5	0.17	J
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	2.5	
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	0.59	
110-82-7	Cyclohexane	0.12	0.5	0.16	J
108-87-2	Methylcyclohexane	0.11	0.5	1.1	

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS213-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904407
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904407B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	5.4	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	ND	U
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	21	
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	8.5	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS213-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904407
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904407B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	3	
108-38-3	m,p-Xylene	0.20	1	0.96	J
95-47-6	o-Xylene	0.10	0.5	1.6	
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	0.82	
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	2.7	
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS213-20-24P-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904408
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904408B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	5.8	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	1.3	J
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	19	
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	8	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS213-20-24P-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904408
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904408B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	2.9	
108-38-3	m,p-Xylene	0.20	1	0.95	J
95-47-6	o-Xylene	0.10	0.5	1.5	
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	0.72	
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	2.6	
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS213-40-44-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904409
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904409B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	6.7	B
79-20-9	Methyl acetate	0.15	0.5	2.6	
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	0.92	J
67-66-3	Chloroform	0.10	0.5	0.12	J
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.46	J
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	1.4	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS213-40-44-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904409
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904409B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	1.1	
108-38-3	m,p-Xylene	0.20	1	0.23	J
95-47-6	o-Xylene	0.10	0.5	0.14	J
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	0.39	J
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS214-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904406
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904406B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	5	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	ND	U
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	21	
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	11	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS214-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904406
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904406B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	3.7	
108-38-3	m,p-Xylene	0.20	1	1.4	
95-47-6	o-Xylene	0.10	0.5	1.8	
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	1.3	
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	3.4	
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS215-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904404
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904404B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	0.14	J
75-15-0	Carbon disulfide	0.10	0.5	0.12	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	6.5	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	0.12	J
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	0.18	J
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	ND	U
67-66-3	Chloroform	0.10	0.5	0.5	
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.29	J
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	0.5	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS215-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904404
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904404B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	0.15	J
108-38-3	m,p-Xylene	0.20	1	ND	U
95-47-6	o-Xylene	0.10	0.5	ND	U
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	ND	U
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS215-40-44-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904405
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904405B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	6.5	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	0.21	J
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	0.14	J
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	0.31	J
78-93-3	2-butanone	0.79	2.5	0.86	J
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	9.5	
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	0.23	J
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	2.4	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS215-40-44-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904405
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904405B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	1.5	
108-38-3	m,p-Xylene	0.20	1	0.46	J
95-47-6	o-Xylene	0.10	0.5	0.76	
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	1.3	
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS216-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904417
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904417B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	0.63	
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	5.1	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	ND	U
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	7.3	
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	36	E
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS216-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904417
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904417B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	9.6	
108-38-3	m,p-Xylene	0.20	1	6.4	
95-47-6	o-Xylene	0.10	0.5	3.1	
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	6.2	
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	10	
110-82-7	Cyclohexane	0.12	0.5	0.14	J
108-87-2	Methylcyclohexane	0.11	0.5	0.25	J

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS216-20-24-06ADL

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904417
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904417DA71
Analyst: 2423

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 2.5

Soil Extract Volume:_____(uL)
Method Blank: 93357

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	1.3	ND	U
74-87-3	Chloromethane	0.10	1.3	ND	U
75-01-4	Vinyl Chloride	0.14	1.3	ND	U
74-83-9	Bromomethane	0.14	1.3	ND	U
75-00-3	Chloroethane	0.12	1.3	ND	U
75-69-4	Trichlorofluoromethane	0.13	1.3	ND	U
75-35-4	1,1-Dichloroethene	0.10	1.3	ND	U
75-15-0	Carbon disulfide	0.10	1.3	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	1.3	ND	U
67-64-1	Acetone	0.76	6.3	4.7	DJB
79-20-9	Methyl acetate	0.15	1.3	ND	U
75-09-2	Methylene Chloride	0.12	1.3	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	1.3	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	1.3	ND	U
75-34-3	1,1-Dichloroethane	0.10	1.3	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	1.3	ND	U
78-93-3	2-butanone	0.79	6.3	ND	U
67-66-3	Chloroform	0.10	1.3	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	1.3	ND	U
56-23-5	Carbon Tetrachloride	0.10	1.3	ND	U
71-43-2	Benzene	0.10	1.3	6.3	D
107-06-2	1,2-Dichloroethane	0.10	1.3	ND	U
79-01-6	Trichloroethene	0.10	1.3	ND	U
78-87-5	1,2-Dichloropropane	0.10	1.3	ND	U
75-27-4	Bromodichloromethane	0.10	1.3	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	1.3	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	6.3	ND	U
108-88-3	Toluene	0.10	1.3	28	D
10061-02-6	trans-1,3-Dichloropropene	0.10	1.3	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	1.3	ND	U
127-18-4	Tetrachloroethene	0.16	1.3	ND	U
591-78-6	2-hexanone	0.50	6.3	ND	U
124-48-1	Dibromochloromethane	0.10	1.3	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS216-20-24-06ADL

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904417
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904417DA71
Analyst: 2423

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 2.5

Soil Extract Volume:_____(uL)
Method Blank: 93357

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	1.3	ND	U
108-90-7	Chlorobenzene	0.10	1.3	ND	U
100-41-4	Ethylbenzene	0.10	1.3	14	D
108-38-3	m,p-Xylene	0.20	2.5	8.3	D
95-47-6	o-Xylene	0.10	1.3	3.8	D
100-42-5	Styrene	0.10	1.3	ND	U
75-25-2	Bromoform	0.10	1.3	ND	U
98-82-8	Isopropyl Benzene	0.10	1.3	6.9	D
79-34-5	1,1,2,2-Tetrachloroethane	0.11	1.3	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	1.3	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	1.3	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	1.3	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	1.3	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	1.3	ND	U
1330-20-7	Xylene (total)	0.10	1.3	12	D
110-82-7	Cyclohexane	0.12	1.3	ND	U
108-87-2	Methylcyclohexane	0.11	1.3	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS216-20-24P-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904418
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904418D2B71
Analyst: 2481

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/09/06
Dilution Factor: 2.5

Soil Extract Volume:_____(uL)
Method Blank: 93588

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	1.3	ND	U
74-87-3	Chloromethane	0.10	1.3	ND	U
75-01-4	Vinyl Chloride	0.14	1.3	ND	U
74-83-9	Bromomethane	0.14	1.3	ND	U
75-00-3	Chloroethane	0.12	1.3	ND	U
75-69-4	Trichlorofluoromethane	0.13	1.3	ND	U
75-35-4	1,1-Dichloroethene	0.10	1.3	ND	U
75-15-0	Carbon disulfide	0.10	1.3	0.32	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	1.3	ND	U
67-64-1	Acetone	0.76	6.3	6.9	B
79-20-9	Methyl acetate	0.15	1.3	ND	U
75-09-2	Methylene Chloride	0.12	1.3	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	1.3	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	1.3	ND	U
75-34-3	1,1-Dichloroethane	0.10	1.3	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	1.3	ND	U
78-93-3	2-butanone	0.79	6.3	ND	U
67-66-3	Chloroform	0.10	1.3	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	1.3	ND	U
56-23-5	Carbon Tetrachloride	0.10	1.3	ND	U
71-43-2	Benzene	0.10	1.3	5.9	
107-06-2	1,2-Dichloroethane	0.10	1.3	ND	U
79-01-6	Trichloroethene	0.10	1.3	ND	U
78-87-5	1,2-Dichloropropane	0.10	1.3	ND	U
75-27-4	Bromodichloromethane	0.10	1.3	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	1.3	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	6.3	ND	U
108-88-3	Toluene	0.10	1.3	34	
10061-02-6	trans-1,3-Dichloropropene	0.10	1.3	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	1.3	ND	U
127-18-4	Tetrachloroethene	0.16	1.3	ND	U
591-78-6	2-hexanone	0.50	6.3	ND	U
124-48-1	Dibromochloromethane	0.10	1.3	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS216-20-24P-06A

Lab Sample ID: 904418
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Soil Extract Volume:_____(uL)
Method Blank: 93588

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Date Received: 02/06/06
Lab File ID: 904418D2B71
Analyst: 2481

Date Analyzed: 02/09/06
Dilution Factor: 2.5

Soil Aliquot Volume: _____(uL)

CAS NO. COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4--1,2-Dibromoethane	0.10	1.3	ND	U
108-90-7--Chlorobenzene	0.10	1.3	ND	U
100-41-4--Ethylbenzene	0.10	1.3	8.7	
108-38-3--m,p-Xylene	0.20	2.5	6.1	
95-47-6---o-Xylene	0.10	1.3	2.7	
100-42-5--Styrene	0.10	1.3	ND	U
75-25-2---Bromoform	0.10	1.3	ND	U
98-82-8---Isopropyl Benzene	0.10	1.3	6.1	
79-34-5---1,1,2,2-Tetrachloroethane	0.11	1.3	ND	U
541-73-1--1,3-Dichlorobenzene	0.10	1.3	ND	U
106-46-7--1,4-Dichlorobenzene	0.10	1.3	ND	U
95-50-1---1,2-Dichlorobenzene	0.10	1.3	ND	U
96-12-8---1,2-Dibromo-3-Chloropropane	0.10	1.3	ND	U
120-82-1--1,2,4-Trichlorobenzene	0.10	1.3	0.25	J
1330-20-7-Xylene (total)	0.10	1.3	9.1	
110-82-7--Cyclohexane	0.12	1.3	ND	U
108-87-2--Methylcyclohexane	0.11	1.3	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS216-40-44-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904419
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904419RA71
Analyst: 2423

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93357

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	4.1	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	1.7	J
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.34	J
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	1.9	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS216-40-44-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904419
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904419RA71
Analyst: 2423

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93357

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	1.1	
108-38-3	m,p-Xylene	0.20	1	0.38	J
95-47-6	o-Xylene	0.10	0.5	0.16	J
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	0.23	J
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	0.56	
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS216-40-44P-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904420
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904420A71
Analyst: 2423

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93357

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	3.9	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	0.2	J
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	1.2	J
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.28	J
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	1.8	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: IS216-40-44P-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904420
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904420A71
Analyst: 2423

% Moisture: not dec. _____
GC Column: SPB-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93357

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	1.2	
108-38-3	m,p-Xylene	0.20	1	0.39	J
95-47-6	o-Xylene	0.10	0.5	0.16	J
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	0.17	J
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	0.57	
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: TB020106-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904412
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904412B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	0.12	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	4.8	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	0.12	J
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	ND	U
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	ND	U
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	ND	U
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9044
Client Sample ID: TB020106-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904412
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904412B73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93356

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	ND	U
108-38-3	m,p-Xylene	0.20	1	ND	U
95-47-6	o-Xylene	0.10	0.5	ND	U
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	ND	U
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9046
Client Sample ID: IS217-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904601
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904601A73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93378

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	4.6	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	1.2	J
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.11	J
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	0.48	J
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9046
Client Sample ID: IS217-20-24-06A

Lab Sample ID: 904601
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Soil Extract Volume:_____(uL)
Method Blank: 93378

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Date Received: 02/06/06
Lab File ID: 904601A73
Analyst: 2481

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	ND	U
108-38-3	m,p-Xylene	0.20	1	ND	U
95-47-6	o-Xylene	0.10	0.5	ND	U
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	ND	U
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9046
Client Sample ID: IS217-40-44-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904602
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904602A73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93378

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	ND	U
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	9.9	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	2.1	J
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	0.56	
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	1.8	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9046
Client Sample ID: IS217-40-44-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904602
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904602A73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93378

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	1	
108-38-3	m,p-Xylene	0.20	1	0.39	J
95-47-6	o-Xylene	0.10	0.5	0.15	J
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	ND	U
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	0.58	
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9046
Client Sample ID: IS218-20-24-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904603
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904603A73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93378

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	0.4	J
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	0.89	
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	3.4	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	ND	U
67-66-3	Chloroform	0.10	0.5	0.13	J
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	17	
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	13	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9046
Client Sample ID: IS218-20-24-06A

Lab Sample ID: 904603
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Soil Extract Volume:_____(uL)
Method Blank: 93378

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Date Received: 02/06/06
Lab File ID: 904603A73
Analyst: 2481

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	19	
108-38-3	m,p-Xylene	0.20	1	5.2	
95-47-6	o-Xylene	0.10	0.5	4.8	
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	3	
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	11	
110-82-7	Cyclohexane	0.12	0.5	0.25	J
108-87-2	Methylcyclohexane	0.11	0.5	1.7	

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9046
Client Sample ID: IS218-40-44-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904604
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904604A73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93378

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
75-71-8	Dichlorodifluoromethane	0.10	0.5	ND	U
74-87-3	Chloromethane	0.10	0.5	ND	U
75-01-4	Vinyl Chloride	0.14	0.5	ND	U
74-83-9	Bromomethane	0.14	0.5	ND	U
75-00-3	Chloroethane	0.12	0.5	ND	U
75-69-4	Trichlorofluoromethane	0.13	0.5	ND	U
75-35-4	1,1-Dichloroethene	0.10	0.5	ND	U
75-15-0	Carbon disulfide	0.10	0.5	0.11	J
76-13-1	1,1,2-trichloro-1,2,2-triflu	0.10	0.5	ND	U
67-64-1	Acetone	0.76	2.5	4.2	B
79-20-9	Methyl acetate	0.15	0.5	ND	U
75-09-2	Methylene Chloride	0.12	0.5	ND	U
156-60-5	trans-1,2-Dichloroethene	0.10	0.5	ND	U
1634-04-4	Methyl-tert-butyl ether	0.10	0.5	ND	U
75-34-3	1,1-Dichloroethane	0.10	0.5	ND	U
156-59-2	cis-1,2-Dichloroethene	0.15	0.5	ND	U
78-93-3	2-butanone	0.79	2.5	0.95	J
67-66-3	Chloroform	0.10	0.5	ND	U
71-55-6	1,1,1-Trichloroethane	0.12	0.5	ND	U
56-23-5	Carbon Tetrachloride	0.10	0.5	ND	U
71-43-2	Benzene	0.10	0.5	4.5	
107-06-2	1,2-Dichloroethane	0.10	0.5	ND	U
79-01-6	Trichloroethene	0.10	0.5	ND	U
78-87-5	1,2-Dichloropropane	0.10	0.5	ND	U
75-27-4	Bromodichloromethane	0.10	0.5	ND	U
10061-01-5	cis-1,3-Dichloropropene	0.11	0.5	ND	U
108-10-1	4-Methyl-2-pentanone	0.57	2.5	ND	U
108-88-3	Toluene	0.10	0.5	4.9	
10061-02-6	trans-1,3-Dichloropropene	0.10	0.5	ND	U
79-00-5	1,1,2-Trichloroethane	0.15	0.5	ND	U
127-18-4	Tetrachloroethene	0.16	0.5	ND	U
591-78-6	2-hexanone	0.50	2.5	ND	U
124-48-1	Dibromochloromethane	0.10	0.5	ND	U

ND = Not Detected
Q = Qualifier

FORM I VOA

1AWC
VOLATILE ORGANICS ANALYSIS DATA SHEET

Client Project ID:
Client SDG No: 9046
Client Sample ID: IS218-40-44-06A

Lab Project Number:
Method: 8260B
Date Collected: 02/01/06

Lab Sample ID: 904604
Sample wt/vol: 25 (g/ml) ML
Level: (low/med) LOW

Date Received: 02/06/06
Lab File ID: 904604A73
Analyst: 2481

% Moisture: not dec. _____
GC Column: RTX-624 ID: 0.32 (mm)

Date Analyzed: 02/08/06
Dilution Factor: 1.0

Soil Extract Volume:_____(uL)
Method Blank: 93378

Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	MDL	Reporting Limit UG/L	Results UG/L	Q
106-93-4	1,2-Dibromoethane	0.10	0.5	ND	U
108-90-7	Chlorobenzene	0.10	0.5	ND	U
100-41-4	Ethylbenzene	0.10	0.5	1.5	
108-38-3	m,p-Xylene	0.20	1	0.55	J
95-47-6	o-Xylene	0.10	0.5	0.62	
100-42-5	Styrene	0.10	0.5	ND	U
75-25-2	Bromoform	0.10	0.5	ND	U
98-82-8	Isopropyl Benzene	0.10	0.5	0.17	J
79-34-5	1,1,2,2-Tetrachloroethane	0.11	0.5	ND	U
541-73-1	1,3-Dichlorobenzene	0.10	0.5	ND	U
106-46-7	1,4-Dichlorobenzene	0.10	0.5	ND	U
95-50-1	1,2-Dichlorobenzene	0.10	0.5	ND	U
96-12-8	1,2-Dibromo-3-Chloropropane	0.10	0.5	ND	U
120-82-1	1,2,4-Trichlorobenzene	0.10	0.5	ND	U
1330-20-7	Xylene (total)	0.10	0.5	1.2	
110-82-7	Cyclohexane	0.12	0.5	ND	U
108-87-2	Methylcyclohexane	0.11	0.5	0.12	J

ND = Not Detected
Q = Qualifier

FORM I VOA

№ 006615

Page 1 of 5

CompuChem
a division of Liberty Analytical Corp.

CHAIN OF CUSTODY

501 Madison Ave.
Cary, NC 27513
Phone: 919-379-4100 Fax 919-379-4040

Courier
Airbill No.
Sampling Complete? Y or N

Client/Reporting Information	Project Information
Company Name: CH2MHill	Project Name: OU 10 Site 35
Address: 4824 Parkway Plaza Blvd Suite 200	Sampling Location: Site 35
City: Charlotte State: NC Zip: 28217	Turnaround time: std
Project Contact: Rick Powell / David Dry	Batch QC or Project Specific? If Specific, which Sample ID?
Phone #: 704-329-0072	Are aqueous samples field filtered for metals? Y or N
Sampler's Name: David Dry	Are high concentrations expected? Y or N? If yes, which ID(s)?

Requested Analysis (include method and bottle type): 8260B

Matrices: GW - Ground water; WW - Waste water; SW - Surface water; SO - Soil/Sediment; TB - Trip Blank; RI - Rinsate; WP - Wipe; O - Other

CompuChem No (Lab Use)	Field ID	Collection Date	Collection Time	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	MEOH	Other	8260B	pH / Sample Info (Lab Use)
	IR35-GW-IS200 20-24-06A	1/31	0850	W	3	✓						✓	
	IR35-GW-IS200 40-44-06A	1/31	9:05	W	3	✓						✓	
	IR35-GW-IS201 20-24-06A	1/31	9:25	W	3	✓						✓	
	IR35-GW-IS201 40-44-06A	1/31	9:45	W	3	✓						✓	
	IR35-GW-IS202 20-24-06A	1/31	10:25	W	3	✓						✓	
	IR35-GW-IS202 40-44-06A	1/31	10:40	W	3	✓						✓	
	IR35-GW-IS203 20-24-06A	1/31	11:00	W	3	✓						✓	
40-44-06A	IR35-GW-IS203 ~~[illegible]~~	1/31	11:20	W	3	✓						✓	
	IR35-GW-IS204 20-24-06A	1/31	12:50	W	3	✓						✓	
	IR35-GW-IS204 40-44-06A	1/31	1305	W	3	✓						✓	

Lab Use Only

Sample Unpacked By:
Sample Order Entry By:
Samples Received in Good Condition? Y or N
If no, explain:

Cyanide samples checked for sulfide & chlorine? Y or NA
625 & Phenol samples checked for chlorine? Y or NA
608 samples checked for pH between 5.0-9.0? Y or NA

Comments

Sample Custody

Relinquished by: David V. Dry	Date/Time: 2/3/06/1030	Received by: FedEx	Date/Time: 2/3/06/1030
Relinquished by:	Date/Time:	Received by:	Date/Time:

Subcontact? Y or N If yes, where?
Custody Seal(s) intact? Y or N
On Ice? Y or N
Cooler Temp: °C

Samples stored 60 days after date report mailed at no extra charge.

White & Yellow copy to lab • Pink copy for customer

№ 006614

CompuChem
a division of Liberty Analytical Corp.

CHAIN OF CUSTODY

501 Madison Ave.
Cary, NC 27513
Phone: 919-379-4100 Fax 919-379-4040

Courier
Airbill No.
Sampling Complete? Y or N

Client/Reporting Information

Company Name: CH2M Hill
Address: 4824 Parkway Plaza Blvd
City: Charlotte State: NC Zip: 28217
Project Contact: Rick Powell / David Dry
Phone #: 704-329-0072
Sampler's Name: David Dry

Project Information

Project Name: OU 10 site 35
Sampling Location: site 35
Turnaround time: std
Batch QC or Project Specific? If Specific, which Sample ID?
Are aqueous samples field filtered for metals? Y or N
Are high concentrations expected? Y or N? If yes, which ID(s)?

Requested Analysis (include method and bottle type): 8260B

Matrices: GW - Ground water; WW - Waste water; SW - Surface water; SO - Soil/Sediment; TB - Trip Blank; RI - Rinsate; WP - Wipe; O - Other

CompuChem No (Lab Use)	Field ID	Collection Date	Collection Time	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	MEOH	Other	8260B								pH / Sample Info (Lab Use)
	IR35-GW-IS 205 20-24-06A	1/31	1330	GW	3	✓						✓								
	IR35-GW-IS 205 40-44-06A	1/31	1350	GW	~~3~~ 9	✓						✓					MS/MSD			
	IR35-GW-IS 206 20-24-06A	1/31	1700	GW	3	✓						✓								
	IR35-GW-IS 206 40-44-06A	1/31	1715	GW	3	✓						✓								
	IR35-GW-IS 207 20-24-06A	1/31	1635	GW	3	✓						✓								
DND	~~IR35-GW-IS 207 40-44-06A~~	~~1/31~~		~~GW~~	~~3~~	~~✓~~	Unable to collect this sample													
	IR35-GW-IS 208 20-24-06A	2/1	840	GW	3	✓						✓								
DND	~~IR35-GW-IS 208 40-44-06A~~	~~2/1~~		~~GW~~	~~3~~	~~✓~~	Unable to collect this sample													
	IR35-GW-IS 209 20-24-06A	2/1	9:15	GW	3	✓						✓								
	IR35-GW-IS 209 40-44-06A	2/1	9:35	GW	3	✓						✓								

Lab Use Only

Sample Unpacked By:
Sample Order Entry By:
Samples Received in Good Condition? Y or N
If no, explain:
Cyanide samples checked for sulfide & chlorine? Y or NA
625 & Phenol samples checked for chlorine? Y or NA
608 samples checked for pH between 5.0-9.0? Y or NA

Comments

Sample Custody

Relinquished by: David Dry — Date/Time: 2/3/06/1030 — Received by: FedEx — Date/Time: 2/3/06/1030
Relinquished by: — Date/Time: — Received by: — Date/Time:
Subcontact? Y or N If yes, where? — Custody Seal(s) intact? Y or N — On Ice? Y or N — Cooler Temp: °C

Samples stored 60 days after date report mailed at no extra charge.

White & Yellow copy to lab • Pink copy for customer

№ 006613

CompuChem
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CHAIN OF CUSTODY

501 Madison Ave.
Cary, NC 27513
Phone: 919-379-4100 Fax 919-379-4040

Courier
Airbill No.
Sampling Complete? Y or N

Client/Reporting Information

Company Name: CH2M Hill
Address: 4824 Phy Plaza Blvd.
City: Charlotte State: NC Zip: 28217
Project Contact: Rick Powell/David Dry
Phone #: 704-329-0073 ext 247
Sampler's Name: David Dry

Project Information

Project Name: Site 35
Sampling Location: Site 35
Turnaround time: std
Batch QC or Project Specific? If Specific, which Sample ID?
Are aqueous samples field filtered for metals? Y or N
Are high concentrations expected? Y or N If yes, which ID(s)?

Requested Analysis (include method and bottle type): 8260 B

Matrices: GW - Ground water; WW - Waste water; SW - Surface water; SO - Soil/Sediment; TB - Trip Blank; RI - Rinsate; WP - Wipe; O - Other

CompuChem No (Lab Use)	Field ID	Collection Date	Collection Time	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	MEOH	Other	8260 B		pH / Sample Info (Lab Use)
	IR35-GW-IS 210 20-24-06A	1/31	1520	GW	3	✓						✓		
	IR35-GW-IS 210 40-44-06A	1/31	1540	GW	3	✓						✓		
	IR35-GW-IS 211 20-24-06A	1/31	1435	GW	3	✓						✓		
	IR35-GW-IS 211 40-44-06A	1/31	1455	GW	~~3~~ 6	✓						✓	Field Dupl.	
	Trip Blank 1	1/31	—	W	3	✓						✓		
DVD	~~Field Duplicate~~	~~1/31~~		~~GW~~	~~3~~	~~✓~~								
	Field Blank	1/31	1505	W	3	✓						✓		
	Equipment Blank	1/31	1615	W	3	✓						✓		
	IR35-GW-IS 215 20-24-06A	2/1	1025	GW	3	✓						✓		
	IR35-GW-IS 215 40-44-06A	2/1	1025	GW	3	✓						✓		

Lab Use Only

Sample Unpacked By:
Sample Order Entry By:
Samples Received in Good Condition? Y or N
If no, explain:
Cyanide samples checked for sulfide & chlorine? Y or NA
625 & Phenol samples checked for chlorine? Y or NA
608 samples checked for pH between 5.0-9.0? Y or NA

Comments

Sample Custody

Relinquished by: David Dry	Date/Time: 2/3/06 1030	Received by: FedEx	Date/Time: 2/3/06 1030
Relinquished by:	Date/Time:	Received by:	Date/Time:
Subcontact? Y or N If yes, where?	Custody Seal(s) intact? Y or N	On Ice? Y or N	Cooler Temp: °C

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CHAIN OF CUSTODY

501 Madison Ave.
Cary, NC 27513
Phone: 919-379-4100 Fax 919-379-4040

Courier
Airbill No.
Sampling Complete? Y or N

Client/Reporting Information	Project Information
Company Name: CH2M Hill	Project Name: Site 35
Address: 4824 Parkway Plaza Blvd	Sampling Location: Site 35
City: Charlotte State: NC Zip: 28217	Turnaround time: Std
Project Contact: Rick Powell / David Dry	Batch QC or Project Specific? If Specific, which Sample ID?
Phone #: 704-329-0073 ext 247	Are aqueous samples field filtered for metals? Y or N
Sampler's Name: David Dry	Are high concentrations expected? Y or N? If yes, which ID(s)?

Requested Analysis (include method and bottle type): 8260 B

Matrices: GW - Ground water; WW - Waste water; SW - Surface water; SO - Soil/Sediment; TB - Trip Blank; RI - Rinsate; WP - Wipe; O - Other

CompuChem No (Lab Use)	Field ID	Collection Date	Collection Time	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	MEOH	Other	8260 B	pH / Sample Info (Lab Use)
	IR35-GW-IS214 20-24-06A	2/1	1050	GW	3	✓						✓	
DUP	~~IR35-GW-IS214 40-44-06A~~	~~2/1~~		~~GW~~	~~6~~	~~✓~~			~~Field Duplicate~~			~~Unable to collect~~	
	IR35-GW-IS213 20-24-06A	2/1	1225	GW	3	✓			Field Duplicate				
	IR35-GW-IS213 40-44-06A	2/1	1240	GW	3	✓						✓	
	IR35-GW-IS212 20-24-06A	2/1	1300	GW	3	✓						✓	
	IR35-GW-IS212 40-44-06A	2/1	1325	GW	9	✓			MS/MSD			✓ Sample	
	Trip Blank 2	2/1	—	W	3	✓						✓	
	IR35-GW-IS219 20-24-06A	2/1	1620	GW	6	✓			Field Duplicate				
	IR35-GW-IS219 40-44-06A	2/1	1645	GW	3	✓						✓	
	Equipment Blank 2	2/1	1415	W	3	✓						✓	

Lab Use Only

Sample Unpacked By:
Sample Order Entry By:
Samples Received in Good Condition? Y or N
If no, explain:

Cyanide samples checked for sulfide & chlorine? Y or NA
625 & Phenol samples checked for chlorine? Y or NA
608 samples checked for pH between 5.0-9.0? Y or NA

Comments

Sample Custody

Relinquished by: David V. Dry	Date/Time: 2/3/06/1030	Received by: FedEx	Date/Time: 2/3/06/1030
Relinquished by:	Date/Time:	Received by:	Date/Time:

Subcontact? Y or N If yes, where?
Custody Seal(s) intact? Y or N
On Ice? Y or N
Cooler Temp: °C

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CHAIN OF CUSTODY

501 Madison Ave.
Cary, NC 27513
Phone: 919-379-4100 Fax 919-379-4040

Courier
Airbill No.
Sampling Complete? Y or N

Client/Reporting Information

Company Name: CH2M Hill
Address: 4824 Parkway Plaza Blvd
City: Charlotte State: NC Zip: 28217
Project Contact: Rick Powell / David Dry
Phone #: 704-329-0073 ext 247
Sampler's Name: David Dry

Project Information

Project Name: Site 35
Sampling Location: Site 35
Turnaround time: Std
Batch QC or Project Specific? If Specific, which Sample ID?
Are aqueous samples field filtered for metals? Y or N
Are high concentrations expected? Y or N If yes, which ID(s)?

Requested Analysis (include method and bottle type): 8260B

Matrices: GW - Ground water; WW - Waste water; SW - Surface water; SO - Soil/Sediment; TB - Trip Blank; RI - Rinsate; WP - Wipe; O - Other

CompuChem No (Lab Use)	Field ID	Collection Date	Collection Time	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	MEOH	Other	8260B	pH / Sample Info (Lab Use)
	IR35-GW-IS216 20-24'-06A	2/1	1425	GW	6	Duplicate						✓	
	IR35-GW-IS 216 40-44-06A	2/1	1445	GW	6	Duplicate						✓	
	IR35-GW-IS 217 20-24-06A	2/1	1505	GW	3	✓						✓	
	IR35-GW-IS217 40-44-06A	2/1	1520	GW	3	✓						✓	
	IR35-GW-IS 218 20-24-06A	2/1	1545	GW	3	✓						✓	
	IR35-GW-IS 218 40-44-06A	2/1	1600	GW	3	✓						✓	

Lab Use Only

Sample Unpacked By:
Sample Order Entry By:
Samples Received in Good Condition? Y or N
If no, explain:
Cyanide samples checked for sulfide & chlorine? Y or NA
625 & Phenol samples checked for chlorine? Y or NA
608 samples checked for pH between 5.0-9.0? Y or NA

Comments

Sample Custody

Relinquished by: David V. Dry — Date/Time: 2/3/06 / 1030 — Received by: FedEx — Date/Time: 2/3/06 / 1030
Relinquished by: — Date/Time: — Received by: — Date/Time:
Subcontact? Y or N If yes, where? — Custody Seal(s) intact? Y or N — On Ice? Y or N — Cooler Temp: °C

Samples stored 60 days after date report mailed at no extra charge.

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Appendix C
Boring Logs and Well Construction Diagrams

Well Number: 35-MW30DW

Client: NAVFAC
Project: Camp Lejeune Site 35
Location: Jacksonville, NC
Project Number: 328432

Driller: Prosonic/ Probe Tech
Drilling Method: Rotosonic
Sampling Method:
Logged by: J Frank/RDU
Start/Finish Date: 4/6/06 1230 4/6/06 1500

Depth (ft)	Sample Info: Sample #	Sample Info: STP (6"-6"-6")	Soil Log	Soil Description	Depth / Elev	Well Drawing	Well Construction Notes
				Ground Surface	0		
0	1			**Sandy-Silt (SM)** Dark brown, sandy-silt; loose; damp; some roots	0 -4		2 ft Steel Stick up 4" x 4" 2' x 2' concrete pad
5				**Silty-Sand (SM)** Brown, silty-sand; loose; damp	4 -6		Schedule 40 PVC 2" ID
				Silty-Clay (CL) Brown, silty-clay; trace sand; stiff; damp	6 -9		
10	2			**Sand (SP)** Brown, f-m sand; trace silt; medium dense; wet	9 -12		Grout- Portland Type 1 95%/ Bentonite powder 5%
				Sand (SP) Lt tan- gray, f-m sand; trace silt; loose; wet	12 -15		
15				**Sand (SP)** Dk gray, f-m sand; trace silt; loose; wet	15 -19		
20	3			**Sand (SP)** Brown-gray, f-m sand; trace silt; loose; wet to saturated	19 -24		
25				**Silty-Sand (SM)** Lt tan-gray, f silty-sand; medium dense; some shell material; moist	24 -26		
				Sand (SP) Lt gray, f-m cemented sands "gravelly"; wet	26		
30							

Well Number: 35-MW30DW

Client: NAVFAC
Project: Camp Lejeune Site 35
Location: Jacksonville, NC
Project Number: 328432

Driller: Prosonic/ Probe Tech
Drilling Method: Rotosonic
Sampling Method:
Logged by: J Frank/RDU
Start/Finish Date: 4/6/06 1230 4/6/06 1500

Depth (ft)	Sample Info: Sample #	Sample Info: STP (6"-6"-6")	Soil Log	Soil Description	Depth / Elev	Well Drawing	Well Construction Notes
35	4						
40	5			**Silty-Sand (SM)** Green-gray, f silty-sand; medium dense; some shell frags; moist to wet	-40 40		
45							
50	6			**Silty-Sand (SM)** Lt green-gray, f-m silty-sand; little cementation; medium dense; some shell frags; moist	-50 50		
55				**Sand (SP)** Lt green-gray, f-m cemented sands "gravelly"; wet	-55 55		Temporary 7" steel casing Transition seal- 3/8" bentonite chips/ 2 50lb bags Filterpack- Type 1 sand/ 3 50lb bags
60							

Well Number: 35-MW30DW

Client: NAVFAC
Project: Camp Lejeune Site 35
Location: Jacksonville, NC
Project Number: 328432

Driller: Prosonic/ Probe Tech
Drilling Method: Rotosonic
Sampling Method:
Logged by: J Frank/RDU
Start/Finish Date: 4/6/06 1230 4/6/06 1500

Depth (ft)	Sample Info: Sample #	Sample Info: STP (6"-6"-6")	Soil Log	Soil Description	Depth / Elev	Well Drawing	Well Construction Notes
	7				-64		Screen- Johnson type/ O-rings removed/ 0.010" slot
65				**Silty-Sand (SM)** Lt green-gray, f silty-sand; little cementation; moist	64 -67		
	8			**Sandy-Silt (SM)** Green-gray, vf sandy-silt; dense; damp to moist	67 -77		Bentonite chips
70							
75							
				End of Log	77		
80							
85							
90							

Well Number: 35-MW72DW

Client: NAVFAC
Project: Camp Lejeune Site 35
Location: Jacksonville, NC
Project Number: 328432

Driller: Prosonic/ Probe Tech
Drilling Method: Rotosonic
Sampling Method:
Logged by: J Frank/RDU
Start/Finish Date: 8/5/06 0945 8/5/06 1600

Depth (ft)	Sample Info: Sample #	Sample Info: STP (6"-6"-6")	Soil Log	Soil Description	Depth / Elev	Well Drawing	Well Construction Notes
				Ground Surface	0		
0				**Topsoil** Dark brown, grass and some roots	0		Manhole- 8" diameter steel cover 2' x 2' concrete pad
	1			**Sand (SW)** White, vf-f clean sand; trace to no silt; v loose; moist	-3 3		
				Silty-Clay (CL) Tan-orange, sandy-silty-clay; stiff; plastic; moist	-5 5		Schedule 40 PVC 2" ID
5				**Silty-Sand (SM)** Lt gray-orange, mottled silty-sand; medium dense; wet			
10	2			**Sand (SP)** Dark orange, f-m send; loose; wet	-10 10		Grout- Portland Type 1 95%/ Bentonite powder 5%
				Mottled with gray	-13 13		
15				orange, f-m sand			
				Sand (SP) Orange-dk orange, f-m sand; loose to medium dense; moist to wet	-16 16 -18 18 -19 19		
20	3			coarse at bottom			
				Sand (SP) Orange-tan-lt gray, f-m sand; trace to little silt; loose; saturated; trace shells			
				Sand (SP) Tan, f-m cemented sands "gravelly"; loose to dense; saturated; shell frags			
25				**Sand (SP)** Lt gray, f-m cemented sands "gravelly"; wet; shell frags			
30							

Well Number: 35-MW72DW

Client: NAVFAC
Project: Camp Lejeune Site 35
Location: Jacksonville, NC
Project Number: 328432

Driller: Prosonic/ Probe Tech
Drilling Method: Rotosonic
Sampling Method:
Logged by: J Frank/RDU
Start/Finish Date: 8/5/06 0945 8/5/06 1600

Depth (ft)	Sample Info: Sample #	Sample Info: STP (6"-6"-6")	Soil Log	Soil Description	Depth / Elev	Well Drawing	Well Construction Notes
	4						
35					-36		
				Silty-Sand (SM) Gray-brown, f silty cemented sands; medium dense; wet	36		
				Silty-Sand (SM) Dark green-gray, f silty-sand; glauconitic; medium dense to stiff; trace clay; moist			
40	5						
45							Temporary 7" steel casing
					-48		
				Sand (SP) Lt gray, f-m cemented sands "gravelly"; loose to dense; 25% shell frags; wet	48		Transition seal- 3/8" bentonite chips/ 4 50lb bags
50	6						
55							Filterpack- Type 2 sand/ 2.5 50lb bags Screen- Johnson type/ O-rings removed/ 0.010" slot
					-57		
				Silty-Sand (SM) Dark green-gray, f silty-sand; glauconitic; medium dense to stiff; trace clay; moist	57		
60							

Well Number: 35-MW72DW

Client: NAVFAC
Project: Camp Lejeune Site 35
Location: Jacksonville, NC
Project Number: 328432

Driller: Prosonic/ Probe Tech
Drilling Method: Rotosonic
Sampling Method:
Logged by: J Frank/RDU
Start/Finish Date: 8/5/06 0945 8/5/06 1600

Depth (ft)	Sample Info: Sample #	Sample Info: STP (6"-6"-6")	Soil Log	Soil Description	Depth / Elev	Well Drawing	Well Construction Notes
	7						Bentonite chips
65					-66		
				End of Log	66		
70							
75							
80							
85							
90							

Well Number: 35-MW80IW

Client: NAVFAC
Project: Camp Lejeune Site 35
Location: Jacksonville, NC
Project Number: 328432

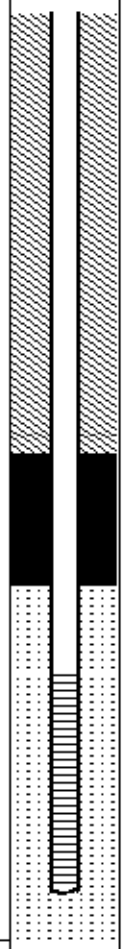
Driller: Parratt-Wolff
Drilling Method: HSA 4.25"
Sampling Method:
Logged by: J Vaughan/CLT
Start/Finish Date: 5/9/06 1000 5/9/06 1615

Depth (ft)	Sample Info: Sample #	Sample Info: STP (6"-6"-6")	Soil Log	Soil Description	Depth / Elev	Well Drawing	Well Construction Notes
				Ground Surface	0		
0				See schematic for 35-MW80DW for soil log information	0		Manhole- 8" diameter steel cover 2' x 2' concrete pad Schedule 40 PVC 2" ID Grout- Portland Type 1 95%/ Bentonite powder 5%
5							
10							
15							
20							
25							
30							

Well Number: 35-MW80IW

Client: NAVFAC
Project: Camp Lejeune Site 35
Location: Jacksonville, NC
Project Number: 328432

Driller: Parratt-Wolff
Drilling Method: HSA 4.25"
Sampling Method:
Logged by: J Vaughan/CLT
Start/Finish Date: 5/9/06 1000 5/9/06 1615

Depth (ft)	Sample Info: Sample #	Sample Info: STP (6"-6"-6")	Soil Log	Soil Description	Depth / Elev	Well Drawing	Well Construction Notes
35							
40							Transition seal- 3/8" bentonite chips
							Filterpack- Type 2 sand
45							Screen- Johnson type/ O-rings removed/ 0.010" slot
50					-51		
				End of Log	51		
55							
60							

Well Number: 35-MW80DW

Client: NAVFAC
Project: Camp Lejeune Site 35
Location: Jacksonville, NC
Project Number: 328432

Driller: Prosonic/ Probe Tech
Drilling Method: Rotosonic
Sampling Method:
Logged by: J Frank/RDU
Start/Finish Date: 4/7/06 0845 4/7/06 1300

Depth (ft)	Sample Info: Sample #	Sample Info: STP (6"-6"-6")	Soil Log	Soil Description	Depth / Elev	Well Drawing	Well Construction Notes
				Ground Surface	0		
0				**Topsoil** Dark brown, grass and some roots	0		Manhole- 8" diameter steel cover 2' x 2' concrete pad
	1			**Sand (SW)** White, vf-f clean sand; trace to no silt; v loose; moist			Schedule 40 PVC 2" ID
5							
10							Grout- Portland Type 1 95%/ Bentonite powder 5%
					-14		
	2			**Silty-Sand (SM)** Tan-orange-brown, f silty-sand; trace clay; medium stiff; moist	14 -16		
15				**Sand (SP)** Lt gray-gray, f-m sand; loose; wet	16		
				Sand (SP) Brown-lt gray, f-m sand; loose; trace shell frags and cementation; wet	-21		
20	3			**Silty-Sand (SM)** Lt green-gray, f silty-sand; some gravelly cementation; medium dense; moist to wet	21 -25		
25				**Sand (SP)** Lt green-gray, f-m cemented sands; trace shell frags; wet	25 -27		
				Sand (SP) Lt gray, f-m cemented sands "gravelly"; shell frags; wet	27		
30							

Well Number: 35-MW80DW

Client: NAVFAC
Project: Camp Lejeune Site 35
Location: Jacksonville, NC
Project Number: 328432

Driller: Prosonic/ Probe Tech
Drilling Method: Rotosonic
Sampling Method:
Logged by: J Frank/RDU
Start/Finish Date: 4/7/06 0845 4/7/06 1300

Depth (ft)	Sample Info: Sample #	Sample Info: STP (6"-6"-6")	Soil Log	Soil Description	Depth / Elev	Well Drawing	Well Construction Notes
35	4						
40	5			**Silty-Sand (SM)** Lt green-gray, f-silty-sand; some gravelly cementation; medium dense; moist to wet	-39 39 -41		
45				**Silty-Sand (SM)** Green-gray, vf silty sand; trace clay; dense; moist	41 -47		
50	6			**Sand (SP)** Green-gray, vf-f sand; glauconitic; little to some silt; medium dense; moist	47		Temporary 7" steel casing
55				**Sand (SP)** Lt green-gray, f-m cemented sands "gravelly"; shell frags; wet	-55 55		Transition seal- 3/8" bentonite chips/ 4 50lb bags
60							Filterpack- Type 2 sand/ 2.5 50lb bags

Well Number: 35-MW80DW

Client: NAVFAC
Project: Camp Lejeune Site 35
Location: Jacksonville, NC
Project Number: 328432

Driller: Prosonic/ Probe Tech
Drilling Method: Rotosonic
Sampling Method:
Logged by: J Frank/RDU
Start/Finish Date: 4/7/06 0845 4/7/06 1300

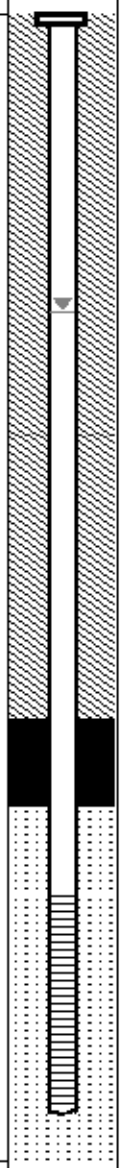
Depth (ft)	Sample Info: Sample #	Sample Info: STP (6"-6"-6")	Soil Log	Soil Description	Depth / Elev	Well Drawing	Well Construction Notes
	7				-65		Filterpack- Type 2 sand/ 2.5 50lb bags Screen- Johnson type/ O-rings removed/ 0.010" slot
65				**Silty-Sand (SM)** Green-gray, f silty-sand; glauconitic; medium dense; moist	65		
					-68		Bentonite chips
70	8			**Sandy-Silt (ML)** Green-gray, vf sandy-silt; dense; moist	68		
75					-77		
				End of Log	77		
80							
85							
90							

Well Number: 35-MW81

Client: NAVFAC
Project: Camp Lejeune Site 35
Location: Jacksonville, NC
Project Number: 328432

Driller: Parratt-Wolff
Drilling Method: HSA 4.25"
Sampling Method:
Logged by: J Frank/RDU
Start/Finish Date: 8/4/06 0900 8/4/06 1345

Depth (ft)	Sample Info: Sample #	Sample Info: STP (6"-6"-6")	Soil Log	Soil Description	Depth / Elev	Well Drawing	Well Construction Notes
				Ground Surface	0		
0				See schematic for 35-MW81IW for soil log information	0		Manhole- 8" diameter steel cover 2' x 2' concrete pad Schedule 40 PVC 2" ID Grout- Portland Type 1 95%/ Bentonite powder 5% Transition seal- 3/8" bentonite chips/ 1 50lb bag Filterpack- Type 1 sand/ 3.5 50lb bags Screen- Johnson type/ O-rings removed/ 0.010" slot
5							
10							
15							
20							
25					-26		
				End of Log	26		
30							



Well Number: 35-MW81IW

Client: NAVFAC
Project: Camp Lejeune Site 35
Location: Jacksonville, NC
Project Number: 328432

Driller: Parratt-Wolff
Drilling Method: HSA 4.25" ID
Sampling Method:
Logged by: J Frank/RDU
Start/Finish Date: 8/3/06 1200 8/3/06 8/4/06 1315

Depth (ft)	Sample Info: Sample #	Sample Info: STP (6"-6"-6")	Soil Log	Soil Description	Depth / Elev	Well Drawing	Well Construction Notes
				Ground Surface	0		
0				**Topsoil** Dark brown, grass and some roots	0		Manhole- 8" diameter steel cover 2' x 2' concrete pad
	1			**Silty-Sand (SM)** Yellow-orange, silty-vf sand; trace clay; medium stiff; slight plasticity; moist	-4		
5	2	2-3-5-7		**Sand (SW)** Yellow-tan-white, vf-f sand; soft; loose; moist	4 / -6		Schedule 40 PVC 2" ID
	3	3-5-5-7		**Sand (SW)** Yellow-tan-white, f-m sand clean quartz; medium dense; wet	6 / -9		
	4	3-2-6-6			9		
10	5	4-9-10-9		coarse sand **Silty-Sand (SM)** Orange-lt gray, mottled silty-vf sand; medium stiff; wet	-13		Grout- Portland Type 1 95%/ Bentonite powder 5%
	6	2-2		**Sand (SP)** Orange-dk orange, f-m sand; medium dense; wet to saturated	13		
15	7	2-2-1-2		**Sand (SP)** Medium brown, f sand; loose to med dense; saturated	-16		
	8	3-2-5-8		**Sand (SP)** Dark gray-brown, f sand; medium dense; saturated	16 / -18		
	9	4-8-10-8		**Silty-Sand (SM)** Brown-dk gray, f silty-sand; medium dense; saturated	18		
20	10	4-8-7-7		**Sand (SP)** Lt gray, clean sand; 10% shell frags; medium dense; wet	-22		
	11	4-6-7-8		**Silty-Sand (SM)** Tan-gray, f silty-sand; medium dense; moist	22 / -24		
25	12	7-17-33-46		**Sand (SP)** Lt green-gray, f-m cemented sands "gravelly"; shell frags; wet	24 / -28		
	13	8-41-47-54		**Sand (SP)** Lt brown and lt gray, f-m sand; loose-medium dense; wet	28 / -30		
	14	1-22-22-25			30		
30							

Well Number: 35-MW81IW

Client: NAVFAC
Project: Camp Lejeune Site 35
Location: Jacksonville, NC
Project Number: 328432

Driller: Parratt-Wolff
Drilling Method: HSA 4.25" ID
Sampling Method:
Logged by: J Frank/RDU
Start/Finish Date: 8/3/06 1200 8/3/06 8/4/06 1315

Depth (ft)	Sample Info: Sample #	Sample Info: STP (6"-6"-6")	Soil Log	Soil Description	Depth / Elev	Well Drawing	Well Construction Notes
	15	4-15-35-4		**Sand (SP)** Same as above with "gravelly" cemented sands			
	16	4-14-15-19			-34		
35	17	5-15-21-27		**Sand (SP)** Lt gray, f-m "gravelly" cemented sands; loose; 30% shell frags; wet	34 -36		
	18	5-12-5-7		No recovery	36 -38		Transition seal- 3/8" bentonite chips/ 1.5 50lb bags
	19	1-11-12-14		**Sand (SP)** Lt green-gray, f-m sand; trace cementation; loose to medium dense; wet	38		
40	20	6-10-20-31			-42		Filterpack- Type 2 sand/ 2.5 50lb bags
	21	6-8-8-10		**Sand (SP)** Lt gray, f-m cemented sand "gravelly"; 40% shell frags; wet	42		Screen- Johnson type/ O-rings removed/ 0.010" slot
45	22	3-5-17-23			-45		
				Silty-Sand (SM) Lt green-gray, f silty-sand; medium dense to dense; moist	45 -48		
				End of Log	48		
50							
55							
60							

Appendix D
Groundwater Sampling Sheets from the April, June, and August 2006 Monitoring Well Sampling Events

CH2M HILL Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: Camp Grizzly
Event: 06B
Date: 4/23/06
Weather: Clr 78°

Well ID: IR 35 MW01 DW
Sample ID: IR35 MW01 DW-06B
Sample Team: M. OST

Total Depth: 61 FT.(BTOC) Measuring Device: 300ml/min
Depth to water: (-) 12.40 FT.(BTOC) Date and Time:
Water Column: 48.60 FT.
(x) .163 GAL/FT. [(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
Well Volume: 8.0 GAL. (1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)
Total Purge Volume: 8.0 GAL.
Purge Device: peristaltic pump with new HDPE tubing

WELL DIAMETER

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	DTW ft BTC	Color / Odor / Comments
1155	0.25	19.7	0.46	1.46	7.18	-82	49.7	12.52	clr
1215	2.00	19.8	0.48	0.00	7.23	-113	10.9	12.52	clr
1235	3.00	20.1	0.48	0.00	7.18	-123	4.31	12.52	clr
1255	4.00	19.9	0.48	0.00	7.14	-127	1.84	12.52	clr
1315	6.50	20.0	0.48	0.00	7.12	-127	2.18	12.52	clr
1335	8.0	20.0	0.48	0.00	7.11	-132	1.49	12.52	clr

Sample information: method, container number, size, and type, preservative used.

Sample Time 1340
Sample Appearance

Notes:
Fe = 1.0 mg/L

Signed by: [signature] Date 4/23/06

CH2M HILL

Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVI
Location: CTO-35
Event: 2ND QTR
Date: 4-23-06
Weather: Cloudy, cool

Well ID: IR35MW02
Sample ID: IR35GW02 06B

Sample Team: R Deleon

Total Depth: 18.80 FT.(BTOC) Measuring Device:
Depth to water: (-) 5.60 FT.(BTOC) Date and Time:
Water Column: 13.20 FT.
.653 (x) ~~.163~~ GAL/FT. [(2" DIA.= 0.163 GAL/FT.) (4" DIA.= 0.653 GAL/FT.)]
Well Volume: 8.6 ~~2.1~~ GAL.
Total Purge Volume: ~~2.5~~ GAL.
Purge Device: peristaltic pump with new HDPE tubing

WELL DIAMETER
(1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)

200ML Purge Rate

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	Color / Odor / Comments	
0900	.5gal	17.19	.201	0.00	6.82	-61	10.0	Clear	5.81
0905	1gal	17.23	.201	0.00	6.83	-66	11.6	Clear	5.81
0910	1.5gal	17.23	.201	0.00	6.83	-68	7.33	Clear	5.81
0915	2.gal	17.26	.201	0.00	6.84	-67	8.25	Clear	5.81
0920	2.5gal	17.29	.201	0.00	6.84	-67	7.97	Clear	5.81
0925	Sample Time								
CONT. 1255	.2gal	18.93	.212	0.00	6.90	-65	9.24	Clear	5.78
1300	.5gal	18.39	.211	0.00	6.69	-66	7.11	Clear	5.79
1305	1gal	18.50	.210	0.00	6.75	-72	5.03	Clear	5.79
1310	1.5gal	18.38	.211	0.00	6.80	-76	5.24	Clear	5.79
1315	2gal	18.13	.211	0.00	6.81	-77	5.56	Clear	5.79
1320	2.5gal	18.56	.211	0.00	6.83	-79	6.14	Clear	5.79
1325	3gal	18.38	.212	0.00	6.85	-80	4.27	Clear	5.79
1330	3.5gal	18.45	.211	0.00	6.85	-80	6.81	Clear	5.79
1335	4.0gal	18.56	.210	0.00	6.85	-81	5.44	Clear	5.79
1340	4.2gal	18.79	.210	0.00	6.85	-80	5.39	Clear	5.79
1400	5gal	18.83	.213	0.00	6.86	-81	4.36	Clear	5.79
1430	6.5gal	18.89	.218	0.00	6.86	-83	4.78	Clear	5.79

Sample information: method, container number, size, and type, preservative used.

Sampled for - VOC, RSK175, TOC
Ferric Iron, ALKALITITY, SULFIDE

Sample Time ~~0925~~ 1435
Sample Appearance

Notes: Ferron Iron = 2 mg/L
Collected ALKALITITY = 0723 04-24-06

Signed by: R H Deleon 4-23-06
Date

CH2M HILL

Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVY
Location: IR35
Event: 2nd Quarter 2006
Date: 04/24/06
Weather: Sunny, B:0024, 60's

Well ID: IR35-MW03DW
Sample ID: IR35-GW03DW-06B

Sample Team: M Harris
B. Trebble

Total Depth: 67.55 FT.(BTOC) Measuring Device:
Depth to water: (-) 8.91 FT.(BTOC) Date and Time:
Water Column: 58.64 FT.
(x) 0.163 GAL/FT. [(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
Well Volume: 9.55 GAL. (1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)
Total Purge Volume: GAL.
Purge Device: peristaltic pump with new HDPE tubing Started pumping @ 0815

WELL DIAMETER

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	DTW	Color / Odor / Comments
0816	0	18.61	0.568	0.45	6.72	-3	137	9.15	cloudy
0906	3	18.72	0.436	0.0	7.13	-96	2.75	9.17	clear no odor
0956	6	18.81	0.440	0.0	7.31	-111	1.64	9.17	clear no odor
~~0801~~ 1046	9	19.05	~~0.436~~	0.0	7.35	-113	~~30~~ 2.25	9.14	clear
1051	9.3	18.84	0.434	0.0	7.39	-121	2.01	9.15	clear
1056	9.6	18.65	0.433	0.0	7.39	-123	0.87	9.16	clear
1101	9.9	18.82	0.432	0.0	7.40	-124	0.89	9.16	clear

Sample information: method, container number, size, and type, preservative used.
(2) VOC (2) RSK 175 (1) TOC (1) Alkalinity (1) Sulfide (1) Ferrous Iron

Sample Time 1110
Sample Appearance Clear

Notes:
Ferrous Iron 1.0
Flow Rate 0.06
OVM = 0ppm

Signed by: M Harris 04/24/06
Date

CH2M HILL Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVSAC
Location: Camp Geiger
Event: 06B
Date: 4/23/06
Weather: clr 80°

Well ID: IR35-MW04
Sample ID: IR35-GW04-06B
Sample Team: M OST

Total Depth: 14.00 FT.(BTOC) Measuring Device: 250 ML/min
Depth to water: (-) 11.96 FT.(BTOC) Date and Time:
Water Column: 2.04 FT.
(x) .163 GAL/FT. [(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
Well Volume: 0.33 GAL. (1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)
Total Purge Volume: 2.4 GAL.
Purge Device: peristaltic pump with new HDPE tubing

WELL DIAMETER

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	DTW	Color / Odor / Comments
1430	.1	17.9	0.17	6.09	6.38	117	24.0	12.39	clr
1440	1	18.6	0.16	6.20	6.02	131	106.0	13.52	clr
1445	1.2	18.8	0.17	6.09	5.87	129	125.0	13.83	clr
1450	2.0	18.6	0.17	~~6.53~~ 5.46	6.13	134	104.0	13.65	clr
1455	2.2	18.9	0.17	4.98	6.12	135	76.5	13.71	clr
1500	2.4	19.0	0.17	4.70	6.13	134	53.9	13.10	clr

Sample information: method, container number, size, and type, preservative used.

Sample Time 1520
Sample Appearance clear

Notes:
Fe = 0.4 mg/L Reduced Rate to 100 ml/min Due to Drawdown
Reduced from 100 to 50 ml/min

Signed by:

Date

CH2M HILL

Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVI
Location: C7035
Event: 2ND QTR
Date: 4-23-06
Weather:

Well ID: IR35 GW06
Sample ID: IR35 GW06 06B
Sample Team: R Deleon

Total Depth: 14.68 FT.(BTOC) Measuring Device:
Depth to water: (-) 8.38 FT.(BTOC) Date and Time:
Water Column: 6.30 FT.
(x) .163 GAL/FT.
Well Volume: 1 gal GAL.
Total Purge Volume: 2.5 GAL.
Purge Device: peristaltic pump with new HDPE tubing

WELL DIAMETER
[(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
(1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)

200 mL Purge Rate

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	Color / Odor / Comments	DTW
1510	.1 gal	18.21	.027	2.43	4.37	327	141	Cloudy	8.49
1520	.5 gal	18.01	.025	2.46	3.94	380	27.7	Cloudy	8.54
1525	1 gal	17.92	.024	2.90	4.08	384	13.1	Clear	8.57
1530	1.5 gal	17.80	.024	3.07	4.24	387	10.7	Clear	8.57
1535	2 gal	17.93	.024	2.85	4.41	384	10.5	Clear	8.58
1540	2.5 gal	17.88	.024	2.90	4.47	386	9.47	Clear	8.58
1545	Sample Time								

Sample information: method, container number, size, and type, preservative used.

Sampled for - VOC, RSK-175, TOC, HNO3, SULFIDE, ALKALITITY

Sample Time 1545
Sample Appearance

Notes: Ferrous Iron = 0 % Mg/L

Collected ALKALITITY at 0716 4-24-06

Signed by: RH Deleon 4-23-06
Date

CH2M HILL Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVSTA
Location: Camp Grieger
Event: 06B
Date: 4/24/06
Weather: clr 72°

Well ID: IR35-MW06DW
Sample ID: IR35-~~MW~~GW06DW-06B
Sample Team: M. OST

Total Depth: 69.0 FT.(BTOC) Measuring Device: Purge 250 mL/min
Depth to water: (-) 6.32 FT.(BTOC) Date and Time:
Water Column: 62.68 FT.
(x) .163 GAL/FT. [(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
Well Volume: 10.21 GAL. (1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)
Total Purge Volume: 10.5 GAL.
Purge Device: peristaltic pump with new HDPE tubing

WELL DIAMETER

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	DTW ft bTC	Color / Odor / Comments
0850	.1	20.6	0.51	2.46	7.04	102	19.4	10.90'	clr
0920	2.5	20.7	0.51	0.00	7.15	-65	9.56	11.15'	clr
0945	5.0	20.8	0.52	0.00	7.15	-75	3.22	11.15'	clr
1017	7.5	20.7	0.53	0.00	7.13	-83	2.26	11.15'	clr
1037	8.5	20.7	0.53	0.00	7.14	-85	1.83	11.15'	clr
1055	10.5	20.8	0.53	0.00	7.14	-88	1.31	11.15'	clr

Sample information: method, container number, size, and type, preservative used.

Sample Time 1059
Sample Appearance clear

Notes:
Fe = 0.0 mg/L
Collected MS/MSD at site
VOC x 4

Signed by: [signature] Date 4/24/06

CH2MHILL

PG 1 OF 1

GROUNDWATER SAMPLING DATA SHEET

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date: 6/22/06
Weather: 90°F, humid, clear

Project Number: 328432.FI.FQ.35
Well ID: TR-35-MW07DW2
Sample ID: TR35-GW07DW06B 1240
Sampling Team: B. Claus

Total Depth: 53.4 FT.(BTOC)
Depth to water: (-) 6.86 FT.(BTOC)
Water Column: 46.54 FT.
(x) 0.163 GAL/FT.
Well Volume: 7.49 GAL. 28.4 L
Total Purge Vol.: 28 L GAL.

Measuring Device: Electronic WL indicator
Date and Time: ~~60~~ 6/22/06

Purge Device: Peristaltic Pump, new HDPE tubing

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

SAMPLE DATA

Date: 6/22/06 Time: 1240	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: ____	Depth to water	Color / Odor / Comments
Method: Horiba U-22	20.62	.463	1.70	7.51	-109	6.6		6.63	

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: ____	Depth to water (ft)	Color / Odor / Comments
1125	2,000	20.60	.338	13.58	7.60	127	22.1		6.86	
1130	4,000	20.37	.338	11.7	7.93	120	14.9		6.66	
1135	6,000	20.26	.338	11.2	8.05	118	63		6.62	
1140	8,000	20.85	.337	10.25	8.13	113	20.5		6.62	
1145	10,000	20.24	.391	8.21	7.81	43	27.2		6.63	
1150	12,000	21.38	.446	6.42	7.61	-61	28.1		6.69	
1155	14,000	21.34	.456	3.88	7.62	-91	24.2		6.63	
1200	16,000	20.80	.460	1.76	7.51	-106	18.4		6.63	
1205	18,000	20.64	.461	1.73	7.51	-107	15.6		6.64	
1210	20,000	20.65	.462	1.69	7.50	-107	14.2		6.63	
1215	22,000	20.64	.460	1.70	7.51	-108	11.8		6.64	
1220	24,000	20.64	.464	1.71	7.50	-109	12.4		6.63	
1225	26,000	20.63	.464	1.70	7.50	-108	8.4		6.63	
1230	28,000	20.62	.463	1.70	7.51	-109	6.6		6.63	

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
VOCs	HCL		2
MEE	HCL		2
Alk, Anions, Ferrous Iron			1
Sulfide			1
TOC			1
Ferric Iron	HNO3		1

Observations/Notes:

Flow rate = 400 mL/m must purge 28,400 mL

Ferrous Iron = 0.00 mg/L

MS/MSD

Duplicate ID No.:

Signature(s):

CH2M HILL

Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVI
Location: CTO 35
Event: 2ND QTR
Date: 4-24-06
Weather: Cloudy, Cool

Well ID: IR35MW09
Sample ID: IR35GW0906B

Sample Team: R Deleon

Total Depth: 14.14 FT.(BTOC) Measuring Device:
Depth to water: (-) 8.33 FT.(BTOC) Date and Time:
Water Column: 5.81 FT.
(x) .163 GAL/FT. [~~(2" DIA.~~ = 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
Well Volume: 0.9 GAL.
Total Purge Volume: 1 gal GAL.
Purge Device: peristaltic pump with new HDPE tubing

WELL DIAMETER
(1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)

100 ML Purge Rate

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	Color / Odor / Comments	
0905	.1 gal	17.33	.316	0.93	7.45	75	7.28	Clear	8.88
0910	.3 gal	17.38	.334	0.00	7.30	82	12.20	Clear	9.10
0915	.5 gal	17.36	.335	0.00	7.32	86	11.70	Clear	9.30
0920	.6 gal	17.46	.328	0.00	7.36	87	8.18	Clear	9.48
0925	.7 gal	17.44	.328	0.00	7.38	85	7.85	Clear	9.60
0930	1 gal	17.41	.323	0.00	7.39	82	8.17	Clear	9.77
0935	Sample Time								

Sample information: method, container number, size, and type, preservative used.

Sampled for - VOC, RSK 175, TOC, ALK, HW3, sulfide

Sample Time 0935
Sample Appearance

Notes: Ferrous Iron = 0 mg/L

Signed by: RH Deleon 4-24-06
Date

CH2M HILL

Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVI
Location: CTO 35
Event: 2ND QTR
Date: 4-24-06
Weather: PRTLY Cloudy, Sunny

Well ID: IR35MW09IW
Sample ID: IR35GW09IW06B
Sample Team: R. Deleon

Total Depth: 31.73 FT.(BTOC) Measuring Device:
Depth to water: (-) 8.54 FT.(BTOC) Date and Time:
Water Column: 23.19 FT.
(x) .163 GAL/FT. [2" DIA. = 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
Well Volume: 3.7 GAL. (1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)
Total Purge Volume: 3.5 GAL.
Purge Device: peristaltic pump with new HDPE tubing

WELL DIAMETER

300 ML Purge Rate

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	Color / Odor / Comments	
0810	.5gal	17.49	.268	0.00	7.58	48	22.8	Clear	8.54
0820	1.5gal	17.75	.272	0.00	7.65	-78	32.6	Clear	8.54
0830	2.5gal	17.94	.277	0.00	7.62	-104	18.1	Clear	8.54
0835 ~~0835~~	3gal	17.98	.278	0.00	7.61	-110	11.5	Clear	8.54
0840	3.5	18.04	.279	0.00	7.61	-114	9.00	Clear	
0845	Sample	TIME							

Sample information: method, container number, size, and type, preservative used.

Sample Time 0845
Sample Appearance

Notes:
Sampled for VOC, TOC, RSK175, HNO3, ALKALITITY, SULFIDE
Ferrous IRON = 0% mg/L

Signed by: RH Deleon 04-24-06
Date

CH2M HILL

Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVY
Location: IR35
Event: 2nd Quarter 2006 (B)
Date: 04/24/06
Weather: Sunny, Breezy, 60's

Well ID: IR35-MW10
Sample ID: IR35-GW10-06B

Sample Team: M Harris
B. Trebble

Total Depth: 17.32 FT.(BTOC) Measuring Device:
Depth to water: (-) 8.08 FT.(BTOC) Date and Time:
Water Column: 9.24 FT.
(x) 0.163 GAL/FT.
Well Volume: 1.51 GAL.
Total Purge Volume: 1.6 GAL.
Purge Device: peristaltic pump with new HDPE tubing

WELL DIAMETER
[(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
(1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	DTW	Color / Odor / Comments
0953	0	17.01	0.722	0.92	6.6	-16	20.9	3.08	clear
1008	0.6	17.05	0.681	0.48	6.7	11	~~16~~ 7.3/3	3.68	clear
1018	1.0	17.22	0.625	0.39	6.4	4	20.10	8.72	clear
1023	1.2	17.14	0.621	0.67	6.6	-13	10.70	3.76	clear
1028	1.4	17.46	0.615	0.61	6.6	-20	7.00	3.82	clear
1033	1.6	17.40	0.627	0.70	6.7	-38	9.07	8.41	clear

Sample information: method, container number, size, and type, preservative used.
(2) VOC (1) RSK 175 (1) TOC (1) Alkalinity (1) Sulfide (1) Ferrous Iron

Sample Time 1040
Sample Appearance Clear

Notes:
Ferrous Iron: 1.60 mg
Flow Rate 0.04
OVM = 0ppm

Signed by: M Harris 04/24/06
Date

CH2M HILL

Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVY
Location: IR35
Event: 2nd Quarter 2006 (B)
Date: 04/24/06
Weather: Sunny, Breezy, 60's

Well ID: IR35-MW10IW
Sample ID: IR35-GW10IW-06B

Sample Team: M Harris
B. Trebler

Total Depth: 32.1 FT.(BTOC)
Depth to water: (-) 8.09 FT.(BTOC)
Water Column: 24.01 FT.
(x) 0.163 GAL/FT.
Well Volume: 3.91 GAL.
Total Purge Volume: 4.0 GAL.

Measuring Device:
Date and Time:

WELL DIAMETER
[(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
(1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)

Purge Device: peristaltic pump with new HDPE tubing Started pumping @ 0805

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	DTW Color	/ Odor / Comments
0808	0	17.92	0.741	0.37	6.30	-165	9.19	8.09	clear/slight odor
0828	1	18.14	0.704	0.33	6.6	-141	27.9	8.09	clear
0848	2	18.14	0.708	0.31	6.7	-155	3.77	8.1	clear
0908	3	18.18	0.719	0.29	6.8	-158	1.74	8.09	clear
0913	3.25	18.22	0.736	0.29	6.8	-159	0.91	8.09	clear
0918	3.50	18.22	0.732	0.28	6.8	-159	1.03	8.09	clear
0923	3.75	18.21	0.729	0.28	6.8	-159	1.16	8.09	clear
0928	4.00	18.24	0.733	0.28	6.8	-159	0.49	8.09	clear

Sample information: method, container number, size, and type, preservative used:
(2) VOC (2) RSK-175 (1) TOC (1) Alkalinity (1) Sulfide (1) Ferric Iron

Sample Time 0935
Sample Appearance

Notes:
Flow Rate: 0.05gpm
Ferrous Iron = 22mg
OVM: 0 ppm

Signed by: M Harris

04/24/06
Date

CH2M HILL

Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVI
Location: CTO-35
Event: 2ND QTR
Date: 4-25-06
Weather:

Well ID: JR35MW14
Sample ID: JR35GW1406B

Sample Team: R Deleon

Total Depth: 16.35 FT.(BTOC) Measuring Device:
Depth to water: (-)10.93 FT.(BTOC) Date and Time:
Water Column: 5.42 FT.
(x) .163 GAL/FT. [(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
Well Volume: .8 GAL. (1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)
Total Purge Volume: 4.0 GAL.
Purge Device: peristaltic pump with new HDPE tubing 300 mL Purge Rate

WELL DIAMETER

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	Color / Odor / Comments	DTW
0720	.5gal	17.10	.361	0.45	6.99	161	36.3	Clear	10.94
0725	1gal	17.13	.361	0.00	6.85	150	12.0	Clear	11.09
0730	1.5gal	17.18	.358	0.00	6.87	137	6.04	Clear	11.09
0735	2.0gal	17.22	.353	0.00	6.87	118	2.76	Clear	11.09
0740	2.5gal	17.23	.350	0.00	6.87	105	2.47	Clear	11.09
0745	3gal	17.27	.347	0.00	6.86	87	2.51	Clear	11.09
0750	3.5	17.49	.345	0.00	6.87	80	1.23	Clear	11.09
0755	4gal	17.52	.346	0.00	6.88	77	1.07	Clear	11.09
0800	Sample Time								

Sample information: method, container number, size, and type, preservative used.

SAMPLED FOR - VOC, TOC, RSK-175
SULFIDE, ALKALITITY, FERRIC IRON

Sample Time 0800
Sample Appearance

Notes: Ferrous Iron - 0 % Mg/L

Signed by: RH Deleon 4-25-06
Date

CH2M HILL

Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAV 1

Location: CTO-35

Event: 2ND QTR

Date: 4-25-06

Weather: PARTLY CLOUDY, Humid

Well ID: IR35MW14IW

Sample ID: IR35GW14IW06B

Sample Team: R Deleon

Total Depth: 30.80 FT.(BTOC) Measuring Device:

Depth to water: (-) 11.08 FT.(BTOC) Date and Time:

Water Column: 19.72 FT.

(x) .163 GAL/FT. [(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]

WELL DIAMETER

Well Volume: 3.2 GAL. (1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)

Total Purge Volume: 3.5 GAL.

Purge Device: peristaltic pump with new HDPE tubing 300 mL Purge Rate

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	Color / Odor / Comments	DTW
0818	.29gal	18.95	.313	1.45	7.53	-15	29.1	Clear	11.08
0838	2.5gal	19.22	.314	0.00	7.39	-97	5.34	Clear	11.08
0843	3gal	19.23	.313	0.00	7.39	-101	6.41	Clear	11.08
0848	3.5	19.23	.313	0.00	7.39	-102	3.46	Clear	11.08
0855	Sample Time								

Sample information: method, container number, size, and type, preservative used.

SAMPLED FOR - VOC, TOC, RSK-175
SULFID, FERRIC IRON, ALKALITY

Sample Time 0855

Sample Appearance

Notes: Ferrous Iron => 0% Mg/L

Signed by: R H Deleon 4-25-06

Date

CH2M HILL Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVY
Location: IR35
Event: 2nd Quarter 2006 (B)
Date: 07/24/06
Weather: Cloudy, 60's

Well ID: IR35-MW29
Sample ID: IR35-GW29-4613

Sample Team: M Harris
B Trebbe

Total Depth: 18.00 FT.(BTOC) Measuring Device:
Depth to water: (-) 8.55 FT.(BTOC) Date and Time:
Water Column: 9.45 FT.
(x) 0.163 GAL/FT.
Well Volume: 1.54 GAL.
Total Purge Volume: 1.60 GAL.
Purge Device: peristaltic pump with new HDPE tubing

WELL DIAMETER
[(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
(1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	DTW	Color / Odor / Comments
1155	0	17.78	1.04	3.09	6.38	-122	4.48	8.75	clear/odor
1210	0.6	17.56	0.237	0.0	5.47	-139	3.30	9.06	clear/odor
1220	1.0	17.68	0.219	0.0	5.54	-147	1.06	9.10	clear/odor
1225	1.2	17.79	0.213	0.0	5.52	-149	1.28	9.10	clear/odor
1230	1.4	17.84	0.213	0.0	5.53	-151	0.85	9.10	clear/odor
1235	1.6	17.84	0.212	0.00	5.56	-155	1.21	9.1	clear/odor

Sample information: method, container number, size, and type, preservative used.
(2) VOC (2) RSK-175 (1) TOC (1) Alkalinity (1) Sulfide (1) Ferrous Iron

Sample Time @ 1245 DUP @ 1255
Sample Appearance

Notes:
OVM: 3 ppm w/ medium odor
Nephelometer: 0.04
Ferrous Iron 0.8mg DUP 0.8mg Ferrous Iron

Signed by: Mandi C Harris 07/24/06
Date

CH2M HILL Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVY
Location: IR35
Event: 2nd Quarter 2006 (B)
Date: 04/24/06
Weather: Cloudy 60's

Well ID: IR35-MW29IW
Sample ID: IR35-GW29IW-06B

Sample Team: M Harris
B. Trebble

Total Depth: 47.10 FT.(BTOC) Measuring Device:
Depth to water: (-) 7.95 FT.(BTOC) Date and Time:
Water Column: 39.15 FT.
(x) 0.163 GAL/FT.
Well Volume: 6.38 GAL.
Total Purge Volume: GAL.
Purge Device: peristaltic pump with new HDPE tubing

WELL DIAMETER
[(**2**" DIA.= 0.163 GAL/FT.) (**4**" DIA. = 0.653 GAL/FT.)]
(**1**" DIA.= 0.041 GAL/FT.) (**1 1/4** " DIA.= 0.064 GAL/FT.)

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	DTW	Color / Odor / Comments
1157	0	19.38	0.565	1.92	7.0	-89	55.3	8.10	clear
1237	2	19.75	0.547	0.29	6.8	-124	0.55	8.18	clear
1317	4	19.88	0.549	0.23	6.9	-135	0.26	8.10	clear
1337	5	19.66	0.572	0.25	7.0	-144	0.70	8.10	clear
1357	6	19.84	0.575	0.24	7.0	-146	0.49	8.10	clear
1402	6.25	19.75	0.578	0.24	7.0	-147	0.41	8.10	clear
1407	6.50	19.93	0.579	0.24	7.0	-147	0.21	8.10	clear

Sample information: method, container number, size, and type, preservative used.
(2) VOC (2) RSK-175 (1) TOC (1) Alkalinity (1) Sulfide (1) Ferric Iron

Sample Time 1415
Sample Appearance

Notes:
OVM: 0ppm
Flow Rate: 0.05
Ferrous Iron: 1.2 mg

Signed by: M Harris 04/24/06
Date

CH2M HILL Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVY
Location: IR35
Event: 2nd Quarter 2006 B
Date: 04/23/06
Weather: Sunny clear 10's

Well ID: IR35-MW30
Sample ID: IR35-GW30-068

Sample Team: M. Harris
B. Trebble

Total Depth: 17.80 FT.(BTOC) Measuring Device:
Depth to water: (-) 6.15 FT.(BTOC) Date and Time:
Water Column: 11.65 FT.
(x) 0.163 GAL/FT. [(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
Well Volume: 1.90 GAL. (1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)
Total Purge Volume: 2.2 GAL.
Purge Device: peristaltic pump with new HDPE tubing Started @ 1425

WELL DIAMETER

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	DTW / Color / Odor / Comments
1426	0	18.60	0.219	1.48	5.07	146	18.3	6.78 clear no odor
1436	0.40	12.05	0.104	0.00	4.32	116	1.53	6.79 clear / " "
1446	0.60	17.91	0.099	0.00	4.30	73	0.21	6.79 clear
1456	0.80	17.88	0.097	0.00	4.31	36	3.26	6.79 clear slight odor
1506	1.00	18.05	0.095	0.00	4.36	17	2.33	6.79 clear slight odor
1511	1.30	17.85	0.095	0.00	4.39	13	1.58	6.79 clear slight odor
1516	2.00	17.90	0.095	0.00	4.40	7	1.51	6.79 clear slight odor
1520	2.2	17.98	0.095	0.00	4.40	5	1.54	6.79 slight odor clear

Sample information: method, container number, size, and type, preservative used.
(2) VOC (2) RSK-175 (1) TOC (1) Sulfide (1) Ferric Iron collected 04/23/06
(1) Alkalinity collected 04/24/06 @

Sample Time 1525
Sample Appearance clear

Alkalinity collected 04/24/06 @ ~~0750~~ 0745

Notes:
OVM - 0ppm
Flow Rate: 0.04 gpm
Ferrous Iron: 2.8 mg

Signed by: M Harris 04/24/06
Date

CH2M HILL Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVY
Location: IR35
Event: 2nd Quarter 2006 B
Date: 04/23/06
Weather: Sunny Clear 70's

Well ID: IR35-MW30IW
Sample ID: IR35-GW30IW-06B

Sample Team: M Harris
B. Trebble

Total Depth: 43.80 FT.(BTOC) Measuring Device:
Depth to water: (-) 6.53 FT.(BTOC) Date and Time:
Water Column: 37.27 FT.
(x) 0.163 GAL/FT.
Well Volume: 6.08 GAL.
Total Purge Volume: 6.25 GAL.
Purge Device: peristaltic pump with new HDPE tubing

WELL DIAMETER
[(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
(1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	DTW	Color / Odor / Comments
1207	0	19.45	0.602	1.09	7.03	-44	7.57	6.60	clear
1237	1.5	19.53	0.633	0.0	7.00	-121	2.50	6.65	Clear
1307	3.0	19.56	0.634	0.0	7.08	-135	4.50	6.64	clear slight odor
1337	4.5	19.86	0.631	0.0	7.15	-138	2.10	6.62	clear "
1347	5.0	19.90	0.641	0.00	7.12	-136	1.91	6.62	clear "
1357	5.5	19.88	0.637	0.00	7.14	-137	1.56	6.62	Clear "
1402	5.75	19.85	0.635	0.00	7.14	-138	0.73	6.62	clear Int odor
1407	6.00	19.34	0.637	0.00	7.06	-138	1.33	6.62	clear "
1412	6.25	19.96	0.637	0.00	7.05	-139	0.93	6.62	clear "

Sample information: method, container number, size, and type, preservative used.
(2) VOC (2) RSK 175 (1) TOC (1) Sulfide (1) Ferric Iron sampled 04/23/06
(1) Alkalinity 04/24/06

Sample Time 1415 4/23/06 04/24/06 @ 0740
Sample Appearance clear

Notes:
OVM: 0.20m
Flow Rate: 0.05
Ferrous Iron: 1.5mg

Signed by: Meredith C. Harris 04/24/06
Date

CH2M HILL Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVY
Location: IR35
Event: 2nd Quarter 2006
Date: 04/23/06
Weather: Sunny, Clear, 70's

Well ID: IR35-MW30DW
Sample ID: IR35-MW30DW-0603

Sample Team: M Harris
B Treble

Total Depth: 67.40 FT.(BTOC) Measuring Device:
Depth to water: (-) 6.60 FT.(BTOC) Date and Time:
Water Column: 60.80 FT.
(x) 0.163 GAL/FT.
Well Volume: 9.91 GAL.
Total Purge Volume: 10.0 GAL.

WELL DIAMETER
[(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
(1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)

1235

Purge Device: peristaltic pump with new HDPE tubing Started pumping @ 1202

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	DTW	Color / Odor / Comments
1204	0	19.97	1.20	1.45	7.3	29	70.1	7.20	cloudy no odor
1214	2	19.31	0.233	0.31	7.4	-105	29.0	8.75	clear
1324	4	19.90	0.696	0.26	7.4	-141	7.23	3.95	clear
1404	6	19.98	0.642	0.27	7.4	-145	3.95	4.00	clear
1444	8	20.02	0.607	0.25	7.2	-142	2.45	9.03	clear
1504	9	20.04	0.601	0.25	7.5	-151	2.17	9.06	clear slight odor
~~1509~~	9.25	19.91	0.597	0.25	7.5	-151	1.76	9.06	clear no odor
1514	9.50								
1519	9.75	20.02	0.588	0.25	7.5	-151	1.69	9.06	clear
1524	10.0	19.98	0.586	0.25	7.5	-151	1.59	9.06	clear

Sample information: method, container number, size, and type, preservative used.
(2) voc (2) RSK-175 (1) TOC (1) Sulfide (1) Nitrate collected 04/25/06
(1) Alkalinity collected 04/24/06

Sample Time 1530
Sample Appearance clear

Anions 04/24/06 @ 0750
collected

Notes:
O.M. 0 ppm
Flow Rate: 0.05 gpm
Ferrous Iron: 0.1 mg
Water has a sheen.

Signed by: M Harris

04/24/06
Date

CH2M HILL

Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVY
Location: CTO-35
Event: 2ND QTR
Date: 4-24-06
Weather: PRTLY CLOUDY, WARM

Well ID: IR35MW31
Sample ID: IR35GW3106B

Sample Team: R Deleon

Total Depth: 14.52 FT.(BTOC) Measuring Device:
Depth to water: (-) 10.22 FT.(BTOC) Date and Time:
Water Column: 4.30 FT.
(x) .163 GAL/FT. [(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
Well Volume: .7 GAL. (1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)
Total Purge Volume: .7 GAL.
Purge Device: peristaltic pump with new HDPE tubing

WELL DIAMETER

200 mL Purge Rate

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	Color / Odor / Comments	DTW
1425	.1991	19.53	.206	0.00	6.73	116	24.1	Clear	10.22
1430	.2991	19.38	.210	0.00	6.49	150	14.3	Clear	10.22
1435	.3991	19.62	.210	0.00	6.52	161	5.48	Clear	10.22
1440	.4991	19.27	.203	0.00	6.53	170	2.84	Clear	10.22
1445	.5991	18.53	.205	0.00	6.56	176	2.17	Clear	10.22
1450	.6991	19.20	.203	0.00	6.55	178	1.52	Clear	10.22
1455	.7	19.08	.204	0.00	6.60	180	1.38	Clear	10.22
1500	Sample Time								

Sample information: method, container number, size, and type, preservative used.

Sampled for - VOC, TOC, RSK-175, HNO3, SULFIDE, ALKALITY

Sample Time 1500
Sample Appearance

Notes:
Ferrous Iron - 0 % Mg/L

Signed by: RH. Deleon 4-24-06
Date

CH2M HILL

Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVI

Location: CTO-35

Event: 2ND QTR

Date: 4-24-06

Weather: Cloudy, Humid

Well ID: IR35MW31IW

Sample ID: IR35GW31IW06B

Sample Team: R. Deleon

Total Depth: 44.37 FT.(BTOC) Measuring Device:

Depth to water: (-) 10.75 FT.(BTOC) Date and Time:

Water Column: 33.62 FT.

(x) .163 GAL/FT. [(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]

Well Volume: 5.4 GAL. (1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)

Total Purge Volume: 5.5 GAL.

Purge Device: peristaltic pump with new HDPE tubing 300ML Purge Rate

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	Color / Odor / Comments	DTW
1307	.1gal	20.15	.284	6.32	8.08	85	2.29	Clear	10.75
1327	2gal	20.52	.282	1.98	7.83	-41	2.61	Clear	10.75
1347	4gal	20.56	.283	0.00	7.67	-69	3.12	Clear	10.75
1352	4.5gal	20.55	.283	0.00	7.67	-73	2.55	Clear	10.75
1357	5gal	20.62	.282	0.00	7.67	-73	2.12	Clear	10.75
1402	5.5gal	20.60	.282	0.00	7.66	-74	1.75	Clear	10.75
1410	Sample	Time							

Sample information: method, container number, size, and type, preservative used

SAMPLED FOR, VOC, TOC, RSK175, HNO3, ALKALITITY, SULFIDE

Sample Time 1410

Sample Appearance

Notes: Ferrous Iron = 0 % Mg/L

Signed by: RH Deleon 4-24-06

Date

CH2M HILL Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVY
Location: IR35
Event: 3rd Quarter 2006
Date: 04/23/06 B
Weather: cloudy, humid 57°F

Well ID: IR35-MW32
Sample ID: IR35-GW32-06B

Sample Team: M Harris
B. Trebble

Total Depth: 15.80 FT.(BTOC) Measuring Device:
Depth to water: (-) 8.44 FT.(BTOC) Date and Time:
Water Column: 7.36 FT.
(x) 0.163 GAL/FT.
Well Volume: 1.20 GAL.
Total Purge Volume: 2.0 GAL.
Purge Device: peristaltic pump with new HDPE tubing ✓ start pumping @ 0833

WELL DIAMETER
[(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
(1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	DTW Color /	Odor / Comments
0834	0	16.69	0.276	2.91	4.57 suspect	302	11.8	8.66	clear, no odor
0839	0.2	16.62	0.249	1.22		341	9.87	9.01	clear
0844	0.4	16.69	0.175	1.45	4.30	354	6.54	9.45	clear
0849	0.6	16.72	0.184	0.62	4.28	364	6.28	9.75	clear
0854	0.8	17.89	0.393	—	5.6	91	16.5	9.74	clear
0859	1.0	17.35	0.388	1.55	5.2	149	9.66	9.75	clear
0904	1.2	16.92	0.275	1.40	4.8	209	10.6	9.75	clear
0909	1.4	16.88	0.255	1.37	4.6	248	"	9.75	clear
0914	1.6	16.93	0.244	1.35	4.6	266	4.17	9.75	clear
0919	1.8	16.93	0.240	1.30	4.7	276	3.26	9.75	clear
0924	2.0	16.94	0.239	1.27	4.7	288	3.16	9.75	clear

Manual Horiba *

Sample information: method, container number, size, and type, preservative used.
(2) VOC (2) RSK-175 (1) Alkalinity (1) TOC (1) Sulfide (1) Ferric Iron
MS/MSD also collected @ 04/23/06
Acid Anions, Ferrous will be collected 4/24/06 AM IR35-GW32-06B2

Sample Time 4/23/06 @ 0925 / 4/24/06 @ 0720
Sample Appearance clear

Notes:
OVM = 0ppm
Flow Rate: 0.04gpm
Ferrous Iron: 0mg
original HORIBA showing suspect readings. we switched HORIBAS @ 0854

Signed by: B Trebble

Date 4/23/06 / 4/24/06

CH2M HILL

Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVY
Location: IR35
Event: 2nd Quarter 2006 B
Date: 04/23/06
Weather: cloudy humid 57°F

Well ID: IR35-MW32IW
Sample ID: IR35-GW32IW-06B
+ IR35-GW32IW-06BDUP
Sample Team: M Harris
Bob Trebble

Total Depth: 44.73 FT.(BTOC) Measuring Device:
Depth to water: (-) 9.25 FT.(BTOC) Date and Time:
Water Column: 35.48 FT.
(x) 0.163 GAL/FT.
Well Volume: 5.80 GAL.
Total Purge Volume: 5.80 GAL.

WELL DIAMETER
[(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
(1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)

Purge Device: peristaltic pump with new HDPE tubing ✓ start pumping @ 830

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	DTW Color /	Odor / Comments
0831	0	18.09	0.782	4.56	6.7	-1	267	9.40	cloudy: odor Mod. w
0851	1	18.44	0.729	0.43	6.5	-95	3.21	9.36	
0911	2	18.76	0.675	0.00	6.62	-66	0.69	9.38	clear: odor
0931	3	18.84	0.678	0.0	6.72	-96	0.86	9.36	
0951	4	18.71	0.675	1.65	6.86	-115	0.40	9.34	Clear/low odor
1011	5	18.81	0.675	0.78	6.93	-124	0.69	9.32	clear/odor
1016	5.25	19.55	0.690	0.00	6.94	-126	0.47	9.32	Clear/low odor
1021	5.50	18.55	0.690	0.57	6.95	-127	0.47	9.32	Clear/low odor
1030	5.80	18.91	0.680	0.46	6.96	-125	0.36	9.33	Clear/

Sample information: method, container number, size, and type, preservative used.

(2) VOC (2) RSK-175 (1) TOC (1) Alkalinity (1) Sulfide (1) Ferric Iron

Alk, Anions, Ferrous will be collected 4/24/06 AM - IR35-GW32IW-06B2
IR35-GW32IW-06B2DUP

Sample Time @ 1030
Sample Appearance Clear, low odor
ANIONS 04/24/06 @ 0735

IR35-GW32IW-06BDUP @ 1040
ANIONS 04/24/06 @ 0735

Notes:
OVM = 10 ppm
Flow Rate: 0.05 gpm
Ferrous Iron: 1.4 mg
Ferrous Iron Duplicate = 1.4 mg

Signed by: [signature]

Date 4/23/06

CH2M HILL

Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVI
Location: CTO-35
Event: 2ND QTR
Date: 4-24-06
Weather: cloudy, humid

Well ID: IR35MW34
Sample ID: IR35GW3406B

Sample Team: R Delem

Total Depth: 15.89 FT.(BTOC) Measuring Device:
Depth to water: (-) 7.30 FT.(BTOC) Date and Time:
Water Column: 8.59 FT.
(x) .163 GAL/FT. [(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
Well Volume: 1.4 GAL. (1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)
Total Purge Volume: 1.5 GAL.
Purge Device: peristaltic pump with new HDPE tubing 100 mL Purge Rate

WELL DIAMETER

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	Color / Odor / Comments	
1010	.1gal	18.01	.144	0.00	6.35	148	95.3	HAZY	7.77
.3gal 1020	~~.3gal~~	18.22	.139	0.00	6.28	164	44.6	HAZY	7.90
1030	.75gal	18.15	.137	0.00	6.24	194	10.7	Clear	8.05
1040	1gal	18.24	.137	0.00	6.24	203	6.15	Clear	8.16
1050	1.5gal	18.28	.137	0.00	6.23	209	5.63	Clear	8.28
1055	sample Time								

Sample information: method, container number, size, and type, preservative used.

Sampled FOR - VOC, TOC, RSK-175, Halos, ALKALINITY, NAOH SULFIDE

Sample Time 1055
Sample Appearance

Notes:
Ferrous Iron = 0 % Mg/L

Signed by: R H Delem 4-24-06
Date

CH2M HILL

Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVI
Location: CT035
Event: 2ND QTR
Date: 4-24-06
Weather: Cloudy, Cool

Well ID: IR35GW34TW
Sample ID: IR35GW34TW06B
Sample Team: R Deleon

Total Depth: 43.00 FT.(BTOC) Measuring Device:
Depth to water: (-) 8.38 FT.(BTOC) Date and Time:
Water Column: 34.62 FT.
(x) .163 GAL/FT.
Well Volume: 5.6 GAL.
Total Purge Volume: 5.5 GAL.
Purge Device: peristaltic pump with new HDPE tubing

WELL DIAMETER
[(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
(1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)

300 mL Purgerate

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	Color / Odor / Comments	DTW
1115	.5gal	19.96	.266	7.53	8.21	127	10.1	Clear	8.38
1135	2gal	20.59	.275	6.56	8.54	111	17.4	Clear	8.38
1155	4gal	20.93	.541	0.00	7.52	-81	6.84	Clear	8.38
1200	4.5gal	21.08	.542	0.00	7.51	-84	5.95	Clear	8.38
1205	5gal	20.98	.540	0.00	7.51	-86	4.89	Clear	8.35
1210	5.5gal	20.98	.537	0.00	7.50	-86	5.31	Clear	8.35
1215	Sample Time								

Sample information: method, container number, size, and type, preservative used.

Sampled FOR - VOC TOC RSK-175, SULFIDE, NO3, ALKALITY

Sample Time 1215
Sample Appearance

Notes:
Ferrous Iron => 0% Mg/L

Signed by: RA Deleon 4-24-06
Date

CH2M HILL Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVSAC
Location: Camp Geiger
Event: OCB
Date: 4/25/06
Weather: Sunny 69

Well ID: IR35-MW37IW
Sample ID: IR35-GW37IW-06B
Sample Team: M. Ost

Total Depth: 45.0 FT.(BTOC) Measuring Device: 250 ml/min
Depth to water: (-) 7.45 FT.(BTOC) Date and Time:
Water Column: 37.55 FT.
(x) .163 GAL/FT. [(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
Well Volume: 6.12 GAL. (1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)
Total Purge Volume: 6.2 GAL.
Purge Device: peristaltic pump with new HDPE tubing

WELL DIAMETER

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	BTW Color / Odor / Comments	
0900	.2	18.8	0.60	2.62	6.97	-41	7.87	7.55'	clr
0910	2.0	18.9	0.62	0.22	6.90	-95	7.86	7.55'	clr
0920	3.5	19.0	0.62	0.01	6.90	-104	7.13	7.55'	clr
0930	4.5	19.1	0.63	0.00	6.90	-109	5.20	7.55'	clr
0940	5.5	19.1	0.63	0.00	6.89	-111	3.94	7.55'	clr
0945	6.2	19.2	0.63	0.00	6.90	-113	2.87	7.55'	clr

Sample information: method, container number, size, and type, preservative used.

Sample Time 0950
Sample Appearance clr

Notes:
Fe = 1.0 mg/L

Signed by: [signature] Date 4/25/06

CH2M HILL Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: Camp Geiger
Event: 06B
Date: 4/25/06
Weather: Sunny 59°

Well ID: ER35 MW37
Sample ID: ER35MW37-06B
Sample Team: M. OST

Total Depth: 15.0 FT.(BTOC) Measuring Device: 100 mL/min
Depth to water: (-) 11.2 FT.(BTOC) Date and Time:
Water Column: 3.8 FT.
(x) .163 GAL/FT. [(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
Well Volume: 0.6 GAL. (1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)
Total Purge Volume: 1.3 GAL.
Purge Device: peristaltic pump with new HDPE tubing

WELL DIAMETER

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	DTW feet BTC	Color / Odor / Comments
0730	.1	17.3	0.16	6.07	4.55	282	36.5	11.2'	clr
0738	.5	16.6	0.10	0.74	4.36	318	8.56	11.2'	clr
0745	.75	16.7	0.09	0.32	4.35	327	5.72	11.2'	clr
0750	.90	16.7	0.09	0.21	4.36	332	4.71	11.2'	clr
0755	1.1	16.8	0.09	0.13	4.36	336	4.25	11.2'	clr
0800	1.3	16.8	0.09	0.12	4.37	341	3.73	11.2'	clr

Sample information: method, container number, size, and type, preservative used.

Sample Time 0810
Sample Appearance clr

Notes:
Fe = 0.0 mg/L
Collected QA/QC Duplicate

Signed by: [signature] Date 4/25/06

37

DWF Eng

CH2MHILL

PG 1 OF 1

GROUNDWATER SAMPLING DATA SHEET

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date: 6/22/06
Weather: 80° F, clear,

Project Number: 328432.FI.FQ.35
Well ID: IR35-MW38
Sample ID: IR35-GW3806B time: 850
Sampling Team: B. claus MS/MSD

Total Depth: 15 FT.(BTOC)
Depth to water: (-) 6.51 FT.(BTOC)
Water Column: 8.49 FT.
(x) 0.163 GAL/FT.
Well Volume: 1.36 GAL. 5.13 L
Total Purge Vol.: GAL. 8.8L

Measuring Device: Electronic WL indicator
Date and Time: 6/22/06 800

Purge Device: Peristaltic Pump, new HDPE tubing

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

SAMPLE DATA

Date: 6/22/06 Time: 850	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: ____	Depth to water	Color / Odor / Comments
Method: Horiba U-22	20.60	.241	2.10	6.05	8	0.0		6.83	

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: ____	Depth to water (ft)	Color / Odor / Comments
820	50	19.89	.437	5.23	6.65	-42	75		6.84	
825	1800	20.02	.360	3.54	6.46	-30	2		6.83	
830	3,550	20.12	.269	2.77	6.24	-6	5.1		6.83	
835	5,300	20.50	.238	2.21	6.08	9	4.5		6.83	
840	7,050	20.54	.241	2.13	6.06	8	0.0		6.84	
845	8,800	20.56	.240	2.09	6.06	9	0.0		6.83	
850		20.60	.241	2.10	6.05	8	0.0		6.83	

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes:
Flow rate = 350 ml/m must purge at least 5,130
Ferrous Iron = 0.00 mg/L

MS/MSD YES. Duplicate ID No.:

Signature(s):

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date: 6/22/06
Weather: 70, Clear

Project Number: 328432.FI.FQ.35
Well ID: IR35-MW38IW
Sample ID: IR35-GW38IW06B
Sampling Team:

Total Depth: 44 FT.(BTOC)
Depth to water: (-) 6.87 FT.(BTOC)
Water Column: 37.13 FT.
(x) 0.163 GAL/FT.
Well Volume: 5.94 GAL. 22.5L
Total Purge Vol.: 22 L GAL.

Measuring Device: Electronic WL indicator
Date and Time: 6/22/06 1:810

Purge Device: Peristaltic Pump, new HDPE tubing

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

SAMPLE DATA

Date: 6/22/06 Time: 910	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: _____	Depth to water	Color / Odor / Comments
Method: Horiba U-22	20.00	2.73	7.06	7.07	-135	5.0		7.1	

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: _____	Depth to water (ft)	Color / Odor / Comments
815	0	19.70	0.418	9.54	7.35	119	5.8		7.1	
820	2,000	19.72	0.416	9.41	7.33	115	7.2		7.1	
825	4,000	19.79	0.418	9.31	7.32	40	6.0		7.1	
830	6,000	19.84	0.440	9.04	7.20	-77	3.1		7.1	
835	8,000	19.85	0.430	8.19	7.15	-108	5.0		7.1	
840	10,000	19.88	0.434	7.95	7.12	-120	4.8		7.1	
845	12,000	19.95	0.436	7.87	7.10	-126	2.4		7.1	
850	14,000	19.96	0.437	7.86	7.09	-129	0.8		7.1	
855	16,000	19.95	0.438	7.91	7.08	-131	3.7		7.1	
900	18,000	19.97	0.437	7.84	7.08	-133	8.8		7.1	
905	20,000	20.00	0.439	7.73	7.07	-135	5.1		7.1	
910	22,000									

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes:

Flow rate = 400 mL/m must purge 22,500 mL

Ferrous Iron = 0.2 mg/L

MS/MSD

Duplicate ID No.: IR35-GW38IW-06B (P) 910

Signature(s):

CH2M HILL

Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVY
Location: CTO-35
Event: 2ND QTR
Date: 4-23-06
Weather: Cloudy, Humid

Well ID: IR35MW39IW
Sample ID: IR35GW39IW06B
Sample Team: R. Deleon

Total Depth: 44.45 FT.(BTOC) Measuring Device:
Depth to water: (-) 5.22 FT.(BTOC) Date and Time:
Water Column: 39.23 FT.
(x) .163 GAL/FT.
Well Volume: 6.3 GAL.
Total Purge Volume: 6.5 GAL.
Purge Device: peristaltic pump with new HDPE tubing

WELL DIAMETER
[(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
(1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)

300 ML Purge Rate

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	Color / Odor / Comments	
1000	.5 gal	20.18	.240	0.00	7.61	-179	3.82	Clear	5.35
1005	1 gal	20.33	.240	0.00	7.61	-186	3.33	Clear	5.35
1010	1.5 gal	20.43	.241	0.00	7.61	-193	3.34	Clear	5.35
1015	2 gal	20.46	.240	0.00	7.60	-196	3.13	Clear	5.35
1020	2.5 gal	20.59	.240	0.00	7.60	-198	2.58	Clear	5.35
1025	3 gal	20.65	.238	0.00	7.60	-200	2.33	Clear	5.35
1030	3.5 gal	20.63	.239	0.00	7.59	-200	2.47	Clear	5.35
1035	4 gal	20.65	.239	0.00	7.59	-201	3.24	Clear	5.35
1040	4.5 gal	20.77	.241	0.00	7.59	-201	1.95	Clear	5.35
1045	5.0 gal	20.88	.241	0.00	7.59	-200	2.01	Clear	5.35
1050	5.5 gal	20.90	.238	0.00	7.56	-200	2.14	Clear	5.35
1055	6 gal	21.00	.239	0.00	7.56	-198	1.68	Clear	5.35
1100	6.5	21.01	.241	0.00	7.56	-197	2.18	Clear	5.35
1105	Sample Time								

Sample information: method, container number, size, and type, preservative used.

Sampled for - VOC, RSK175, TOC
SULFIDE, ALKALITY, NaOH, Zinc, Acetate
HNO_3

Sample Time 1105
Sample Appearance

Notes: Ferrous Iron => 1.4 Mg/L
Collected ALKALITY at - ~~0730~~ 0730 4-24-06

Signed by: RH Deleon 4-23-06
Date

CH2M HILL Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: Navfac
Location: Camp Geiger
Event: OLB
Date: 4/24/06
Weather: clr 78

Well ID: MW40IW
Sample ID: IR35-GW40IW-06B
Sample Team: M. OST

Total Depth: 47.0 FT.(BTOC) Measuring Device: 250 mL/min
Depth to water: (-) 9.83 FT.(BTOC) Date and Time:
Water Column: 37.17 FT.
(x) .163 GAL/FT.
Well Volume: 6.05 GAL.
Total Purge Volume: 6.10 GAL.
Purge Device: peristaltic pump with new HDPE tubing

WELL DIAMETER
[(**2**" DIA.= 0.163 GAL/FT.) (**4**" DIA. = 0.653 GAL/FT.)]
(**1**" DIA.= 0.041 GAL/FT.) (**1 1/4** " DIA.= 0.064 GAL/FT.)

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	DTW	Color / Odor / Comments
1145	.1	21.2	0.53	4.30	7.01	37	6.07	9.90'	clr
1158	1.0	21.4	0.69	0.81	6.92	-90	4.66	9.90'	clr
1210	2.5	21.5	0.71	0.04	6.95	-117	3.84	9.90'	clr
1220	3.2	21.5	0.71	0.00	6.98	-126	3.62	9.90'	clr
1230	4.2	21.6	0.72	0.00	6.99	-130	3.65	9.90	clr
1235	4.7	21.6	0.72	0.00	7.00	-131	2.40	9.90	clr
1240	5.5	21.5	0.72	0.00	7.00	-131	2.70	9.90	clr
1245	6.1	21.5	0.72	0.00	7.00	-132	2.30	9.90	clr

Sample information: method, container number, size, and type, preservative used.

Sample Time 1250
Sample Appearance clear

Notes:
Fe = 0.4 mg/L

Signed by: [signature] Date 4/24/06

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date: 6/21/06
Weather: HOT, 90° CLOUDY

Project Number: 328432.FI.FQ.35
Well ID: IR35-MW47
Sample ID: IR35-GW47060B
Sampling Team: D. DRY

Total Depth: 15.5' FT.(BTOC)
Depth to water: (-) 2.80 FT.(BTOC)
Water Column: 12.70 FT.
(x) 0.163 GAL/FT.
Well Volume: 2.07 GAL.
Total Purge Vol.: 3.0 GAL.

Measuring Device: Electronic WL indicator
Date and Time: 6/20

Purge Device: Peristaltic Pump, new HDPE tubing

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

SAMPLE DATA

Date: 6/21/06 Time: 1450	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: Salinity	Depth to water	Color / Odor / Comments TDS
Method: Horiba U-22	20.10	0.554	0.00	7.50	-12	160.0	0.02	3.18	0.34

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: Sal	Depth to water (ft)	Color / Odor / Comments TDS
1400	0	21.60	35.4	2.99	7.27	22	119.6	1.14	3.08	10 clear
1405	0.3	20.70	39.9	0.60	7.41	-27	176.0	3.27	3.15	30 clear
1410	0.6	20.58	61.4	0.20	7.42	-20	110.0	3.90	3.17	35 clear
1415	0.9	20.46	29.0	0.41	7.46	-19	195.0	1.61	3.18	16 clear
1420	1.2	20.47	3.22	0.00	7.48	-15	226.0	0.15	3.18	1.7 clear
1425	1.5	20.58	1.80	0.00	7.49	-14	128.0	0.08	3.18	1.1 clear
1430	1.8	20.60	1.38	0.0	7.50	-14	174.0	0.06	3.18	0.9 clear
1435	2.1	20.32	1.20	0.00	7.50	-14	141.0	0.05	3.18	0.7 clear
1440	2.4	20.27	0.605	0.00	7.49	-13	239.0	0.02	3.18	0.38 clear
1445	2.7	20.17	0.573	0.00	7.50	-13	240.0	0.02	3.18	0.36 clear
1450	3.0	20.10	0.554	0.00	7.50	-12	160.0	0.02	3.18	0.34 clear

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes:
Flow rate = 250 mL/min = 0.25 L/min
Ferrous Iron = 0.0 mg/L
~~Flow Test~~ DW PID = 0.0 ppm

MS/MSD | Duplicate ID No.:

Signature(s): David V. Dry

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Pg 1 of 1

GROUNDWATER SAMPLING DATA SHEET

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date: 6/21/06
Weather: 90° SUNNY

Project Number: 328432.FI.FQ.35
Well ID: IR35 - MW 471W
Sample ID: IR35 - GW 471W06B
Sampling Team: DAVID DRY
MONICA TIBURZI

Total Depth: 32.25 FT.(BTOC)
Depth to water: (-) 2.30 FT.(BTOC)
Water Column: 29.95 FT.
(x) 0.163 GAL/FT.
Well Volume: 4.74 GAL.
Total Purge Vol.: 5.25 GAL.

Measuring Device: Electronic WL indicator
Date and Time:

Purge Device: Peristaltic Pump, new HDPE tubing

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

PID = 0.0 ppm

SAMPLE DATA

Date: 6/21/06 Time: 1440	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: Fe	Depth to water	Color / Odor / Comments
Method: Horiba U-22	20.48	0.410	4.27	7.34	-143	3.6	0.0 mg/L	2.51	

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: ____	Depth to water (ft)	Color / Odor / Comments
1345	0	20.45	0.332	16.43	8.45	~~0.332~~ mV	67.2		2.30	ORP: 48
1350	0.05	20.50	0.339	12.85	8.32	65	50.3		2.52	
1355	0.2	20.85	0.358	8.91	7.72	-125	30.4		2.50	
1400	0.5	20.89	0.376	7.34	7.43	-141	16.9		2.51	
1405	1.0	20.85	0.388	6.27	7.39	-140	10.5		2.51	
1410	1.5	20.57	0.401	5.46	7.36	-140	4.4		2.51	
1415	2.25	20.63	0.403	5.13	7.34	-140	5.7		2.51	
1420	3.00	20.59	0.406	4.83	7.31	-139	4.7		2.50	
1425	3.75	20.52	0.408	4.73	7.30	-140	4.2		2.51	
1430	4.50	20.45	0.409	4.52	7.30	-141	3.8		2.51	
1435	5.25	20.48	0.410	4.27	7.34	-143	3.6		2.51	

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes:
Flow rate = .3 l/min

Ferrous Iron = 0.0 mg/L

MS/MSD N/A
Duplicate ID No.: N/A

Signature(s): Monica Tiburzi

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Pg 1 of 1

GROUNDWATER SAMPLING DATA SHEET

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date: 6/21/06
Weather: 90+, humid.

Project Number: 328432.FI.FQ.35
Well ID: IR35-MW 49A
Sample ID: IR35-GW4906B
Sampling Team: S. Claus

Time 1340

Total Depth: 14.90 FT.(BTOC)
Depth to water: (-) 3.15 FT.(BTOC)
Water Column: 11.75 FT.
(x) 0.163 GAL/FT.
Well Volume: 1.88 GAL. ≈ 7.14 L
Total Purge Vol.: 2.36 GAL. ≈ 9.0 L

Measuring Device: Electronic WL indicator
Date and Time: 6/21/06 1300

Purge Device: Peristaltic Pump, new HDPE tubing

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

SAMPLE DATA

Date: 6/21/06 Time: 1330-1340	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: _____	Depth to water	Color / Odor / Comments
Method: Horiba U-22	18.39	.498	10.13	7.08	-121	0.0			

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: _____	Depth to water (ft)	Color / Odor / Comments
1300	0	18.76	0.498	10.69	7.11	~103	12.4		3.41	Clear
1305	~~3001~~ 1,500	18.58	0.497	10.36	7.10	-106	4.1		3.20	
1310	~~603~~ 3,000	18.42	0.498	9.91	7.08	-115	0.0		3.18	
1315	4,500	18.38	0.497	10.09	7.08	-120	0.00		3.18	
1320	6,000	18.41	0.497	10.11	7.08	-121	1.2		3.18	
1325	7,500	18.38	0.497	10.09	7.09	-120	0.0		3.19	
1330	9,000	18.39	0.498	10.13	7.08	-121	0.0		3.18	

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes:
Flow rate = 300 mL/m must purge at least 7,140 mL

Ferrous Iron = 0.00 mg/L

MS/MSD | Duplicate ID No.:

Signature(s):

CH2MHILL

Pg 1 of 1

GROUNDWATER SAMPLING DATA SHEET

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date: 6/21/06
Weather: humid, hot 89°.

Project Number: 328432.FI.FQ.35
Well ID: IR35-MW49IW
Sample ID: IR35-GW49IW06B time: 1445
Sampling Team: B. Claus.

Total Depth: 33.00 FT.(BTOC)
Depth to water: (-) 1.6 FT.(BTOC)
Water Column: 32.4 FT.
(x) 0.163 GAL/FT.
Well Volume: 4.56 GAL. ≈17.0L
Total Purge Vol.: GAL. 18.05L

Measuring Device: Electronic WL indicator
Date and Time: 6/21/0, 1350

Purge Device: Peristaltic Pump, new HDPE tubing

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

So

SAMPLE DATA

Date: 6/21/06 Time: 1445	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: ____	Depth to water	Color / Odor / Comments
Method: Horiba U-22	20.19	.419	12.14	7.21	-137	2.4			

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: ____	Depth to water (ft)	Color / Odor / Comments
1350	500	19.94	.375	13.49	7.46	31	1.9		1.90	
1355	~~1450~~ 2,800	19.84	.388	11.93	7.37	~~2~~ -37	1.4		1.90	
1400	~~3~~ 4,550	19.77	.405	11.69	7.27	~~0.0~~ -110	2.3		1.87	
1405	6,800	20.13	.417	11.99	7.21	-132	2.0		1.88	
1410	9,050	20.19	.418	12.15	7.21	-135	2.2		1.87	
1415	11,300	20.18	.417	12.00	7.21	-134	2.0		1.88	
1420	13,550	20.19	.419	12.14	7.21	-137	2.4		1.88	
1425	15,800									
1430	18,050									
1435										

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes:

Flow rate = 450 mL/m must pump — 17,000 mL

Ferrous Iron = 0.00 mg/L

MS/MSD

Duplicate ID No.:

Signature(s):

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GROUNDWATER SAMPLING DATA SHEET

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date: 6/21/06
Weather: 70 sunny

Project Number: 328432.FI.FQ.35
Well ID: MW-55 IR35-MW55
Sample ID: IR3R-GW55-06B
Sampling Team: D. Seed / RDV

Total Depth: 14.30 FT.(BTOC)
Depth to water: (-) 2.35 FT.(BTOC)
Water Column: 11.95 FT.
(x) 0.163 GAL/FT.
Well Volume: 2.00 GAL.
Total Purge Vol.: 5.00 GAL.

Measuring Device: Electronic WL indicator
Date and Time: 6/21/06

Purge Device: Peristaltic Pump, new HDPE tubing

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

SAMPLE DATA

Date: 6/21/06 Time: 1435	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: DTW	Depth to water	Color / Odor / Comments
Method: Horiba U-22	18.13	0.488	0.79	6.47	-101	62	2.38		

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity* NTU	Other: DTW	Depth to water (ft)	Color / Odor / Comments
1345		19.29	0.524	3.42	6.68	-77	305.0	2.38		Brownish/orange a tint
1355		20.29	0.505	1.53	6.51	-89	542.	2.38		
1400		18.41	0.504	1.57	6.51	-91	>999	2.38		
1405		18.33	0.502	1.34	6.49	-93	>999	2.38		
1410		18.06	0.499	1.19	6.49	-95	257	2.38		
1415		18.33	0.496	1.07	6.48	-97	215.00	2.38		
1420		18.21	0.494	0.98	6.48	-98	130.00	2.38		
1425		18.22	0.492	0.89	6.48	-99	88.1	2.38		
1430		18.11	0.491	0.83	6.47	-100	66	2.38		
1435	5.00	18.13	0.488	0.79	6.47	-101	62	2.38		

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes:
Flow rate = 0.1 gal/min
Ferrous Iron = 5.2

* Readings off due to sediment stuck in the flow through cell

MS/MSD
Duplicate ID No.:

Signature(s):

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PG 1 OF 1

GROUNDWATER SAMPLING DATA SHEET

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date: 6/21/06
Weather: 75 Sunny

Project Number: 328432.FI.FQ.35
Well ID: MW55IW
Sample ID: IR35-GW55IW06B
Sampling Team: D. Seed / RDU

Total Depth: 29.52 FT.(BTOC)
Depth to water: (-) 3.25 FT.(BTOC)
Water Column: 24.27 FT.
(x) 0.163 GAL/FT.
Well Volume: 4.00 GAL.
Total Purge Vol.: 5.00 GAL.

Measuring Device: Electronic WL indicator
Date and Time: 6/21/06

Purge Device: Peristaltic Pump, new HDPE tubing

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

SAMPLE DATA

Date: 6/21/06 Time: 1240	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: DTW	Depth to water	Color / Odor / Comments
Method: Horiba U-22	19.26	0.624	1.44	6.78	43	55	3.30		

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: DTW	Depth to water (ft)	Color / Odor / Comments
1150		19.02	0.669	8.86	7.06	136	25.6	3.30		
1155		18.99	0.652	3.00	6.79	96	44.1	3.30		
1200		19.99	0.646	2.36	6.78	80	48.3	3.30		
1205		18.95	0.643	2.13	6.78	68	53.2	3.30		
1210		18.93	0.640	1.87	6.78	61	59.6	3.30		
1215		19.10	0.637	1.70	6.78	55	49.3	3.30		
1220		19.02	0.630	1.62	6.78	50	49.6	3.30		
1225		18.91	0.626	1.53	6.78	45	53.1	3.30		
1230		19.29	0.624	1.44	6.78	44	55.9	3.30		
1235		19.74	0.623	1.44	6.78	44	55.9	3.30		
1240	5.00	19.26	0.624	1.44	6.78	43	55.0	3.30		

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes:

Flow rate = 0.1 gal/min

Ferrous Iron = 0.0

MS/MSD

Duplicate ID No.:

Signature(s):

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GROUNDWATER SAMPLING DATA SHEET

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date: 6/22/
Weather: 90°, clear, humid

Project Number: 328432.FI.FQ.35
Well ID: IR35MW60
Sample ID: IR35-GW060006B time 1155
Sampling Team:

Total Depth: 22.44 FT.(BTOC)
Depth to water: (-) 8.06 FT.(BTOC)
Water Column: 14.38 FT.
(x) 0.163 GAL/FT.
Well Volume: 2.3 GAL.
Total Purge Vol.: 4.0 GAL.

Measuring Device: Electronic WL indicator
Date and Time: 6/21/06

Purge Device: Peristaltic Pump, new HDPE tubing

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

SAMPLE DATA

Date: 6/22 Time: 1155	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: ____	Depth to water	Color / Odor / Comments
Method: Horiba U-22	18.00	.121	10.03	5.29	219	2.0		8.15	

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: ____	Depth to water (ft)	Color / Odor / Comments
1125	.5	17.89	0.132	9.45	5.52	195	3.5		8.06	
1130	1.3	17.85	0.125	9.08	5.38	205	2.8		8.11	
1135	2.5	17.97	0.123	9.64	5.33	212	2.3		8.13	
1140	3.0	17.99	0.121	9.62	5.31	214	2.1		8.16	
1145	3.3	18.01	.122	10.02	5.30	218	2.6		8.13	
1150	4.0	18.00	.121	10.03	5.29	219	2.0		8.13	
					[illegible]					

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes:
Flow rate = ~ 0.11 gal/min

Ferrous Iron =

MS/MSD | Duplicate ID No.:

Signature(s):

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PG 1 OF 1

GROUNDWATER SAMPLING DATA SHEET

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date: 6/22/06
Weather: 75° Sunny

Project Number: 328432.FI.FQ.35
Well ID: IR35-MW60IW-~~068~~
Sample ID: IR35-GW60IW-068
Sampling Team: D. Seed / RBU

Total Depth: 37.9 FT.(BTOC)
Depth to water: (-) 7.55 FT.(BTOC)
Water Column: 30.35 FT.
(x) 0.163 GAL/FT.
Well Volume: 4.9 GAL.
Total Purge Vol.: 6.00 GAL.

Measuring Device: Electronic WL indicator
Date and Time: 6/22/06 1130

Purge Device: Peristaltic Pump, new HDPE tubing

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

SAMPLE DATA

Date: 6/22/06 Time: 1240	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: DTW	Depth to water	Color / Odor / Comments
Method: Horiba U-22	18.65	/	0	7.65	-89	105	8.16		

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond.* mS/cm	DO* mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: DTW	Depth to water (ft)	Color / Odor / Comments
1130		19.26	N/A	0	7.16	-9	101	7.71		
1135		18.08	N/A	0	7.38	-9	114	8.12		
1140		18.43	N/A	0	7.51	-73	110	8.15		
1200		18.54	86.8	0	7.58	-81	142	8.15		
1220		19.58	NA	0	7.67	-98	98.4	8.16		
1225		18.67	NA	0	7.65	-90	88			
1230		18.65	N/A	0	7.66	-90	103			
1240	6.00	18.65	N/A	0	7.65	-89	105			

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes:

Flow rate = 0.12 gal/min

Ferrous Iron =

* Pump shut down because of low battery; Cond. + DO may be inaccurate due to equipment damage

Duplicate Taken: IR35-GW-60IW068(P) → time: 1245

MS/MSD | Duplicate ID No.:

Signature(s):

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Pg 1 of 1

GROUNDWATER SAMPLING DATA SHEET

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date: 6/21/06
Weather: humid, 80°F, clear

Project Number: 328432.FI.FQ.35
Well ID: IR35-MW62A
Sample ID: IR35-GW6206B time: 1040
Sampling Team: B. Claus

Total Depth: 16.70 FT.(BTOC)
Depth to water: (-) 4.18 FT.(BTOC)
Water Column: 12.6 FT.
(x) 0.163 GAL/FT.
Well Volume: 2.01 GAL. ≈ 7.8 L
Total Purge Vol.: 2.55 GAL. ≈ 9.7 L

Purge Device: Peristaltic Pump, new HDPE tubing

Measuring Device: Electronic WL indicator
Date and Time: 945, 6/21/06

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

SAMPLE DATA

Date: / Time:	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: _____	Depth to water	Color / Odor / Comments
Method: Horiba U-22	18.55	.547	7.52	6.92	-162	14.2			

FIELD PARAMETERS

Time	Purge Vol. (~~gals~~) mL	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: _____	Depth to water (ft)	Color / Odor / Comments
1000	800 mL	18.06	0.556	7.84	6.70	-125	856.4		4.68	brown
1005	1,600 mL	18.3	0.550	7.16	6.79	-151	306.1		4.24	Slight brown
1010	3,200	18.52	0.550	7.40	6.88	-159	48.1		4.22	Clear
1015	4,200	18.66	0.549	7.47	6.89	-160	32.4		4.24	Clear
1020	6,200	18.65	0.548	7.48	6.89	-161	26.4		4.825	clear
1025	7,700	18.55	0.548	7.50	6.90	-162	17.4			
1030	8,200		0.547	7.55	6.91	-163	16.7			
1035	9,300		0.547	7.52	6.92	-162	14.2			
1040										

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes:
Flow rate = 300 mL/m, must purge at least 7.8 L, or 7,800 mL

Ferrous Iron = 0.00 mg/L

MS/MSD | Duplicate ID No.:

Signature(s):

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Pg 1 of 1

GROUNDWATER SAMPLING DATA SHEET

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date: 6/21/06
Weather: humid, 89°F, clear

Project Number: 328432.FI.FQ.35
Well ID: IR35-MW63IW
Sample ID: IR35-GW63063B t = 1205
Sampling Team: B. Claus

Total Depth: 32.13 FT.(BTOC)
Depth to water: (-) 2.45 FT.(BTOC)
Water Column: 29.68 FT.
(x) 0.163 GAL/FT.
Well Volume: 4.74 GAL. = 18.0 L
Total Purge Vol.: 4.75 GAL. = 18.05 L

Measuring Device: Electronic WL indicator
Date and Time: 1100 6/21/06

Purge Device: Peristaltic Pump, new HDPE tubing

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

SAMPLE DATA

Date: 6/21/06 Time:	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: _____	Depth to water	Color / Odor / Comments
Method: Horiba U-22	17.95	.384	8.72	7.28	-151	1.4			

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: _____	Depth to water (ft)	Color / Odor / Comments
1115	500	18.34	0.382	10.11	7.25	-90	212.4		3.01	Slight brown
1120	2,300	18.00	0.381	8.93	7.26	-124	64.		2.80	
1125	4,550	17.92	0.384	8.48	7.27	-140	22.4		2.81	Clear
1130	6,800	17.95	0.384	8.56	7.28	-148	8.8		2.79	
1135	9,050	17.95	0.384	8.60	7.28	-150	6.7		2.80	
1140	11,300	17.96	0.385	8.70	7.29	-152	2.4		2.8	
1145	13,550	17.95	0.384	8.71	7.28	-153	2.8		2.80	
1150	15,800	17.95	0385	8.70	7.29	-152	1.6		2.79	
1155	18,050	17.95	3.84	8.72	7.28	-151	1.4		2.76	

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes:
Flow rate = ~~500 ml/min~~ 450 ml/min, need to purge 18,000 mL,
Ferrous Iron = 0.00 mg/L

MS/MSD | Duplicate ID No.:

Signature(s):

CH2MHILL

PG 1 OF 1

GROUNDWATER SAMPLING DATA SHEET

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date: 6/21/06
Weather: 70° Sunny

Project Number: 328432.FI.FQ.35
Well ID: MW64IW
Sample ID: ~~JR35-MW64IW~~ JR35-GW64IW06B
Sampling Team: D. Seed / RDU

Total Depth: 32.8 FT.(BTOC)
Depth to water: (-) 2.55 FT.(BTOC)
Water Column: 30.25 FT.
(x) 0.163 GAL/FT.
Well Volume: 4.9 GAL.
Total Purge Vol.: 5.80 GAL.

Measuring Device: Electronic WL indicator
Date and Time: 6/21/06 9:50

Purge Device: Peristaltic Pump, new HDPE tubing

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

SAMPLE DATA

Date: 6/21/06 Time: 1035	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: DTW	Depth to water	Color / Odor / Comments
Method: Horiba U-22	19.10	0.376	1.74	7.07	-142	1.4	2.59		

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: ____	Depth to water (ft)	Color / Odor / Comments
950		18.67	0.356	7.21	6.68	-99	4.7	2.6		
955		18.69	0.367	5.27	6.78	-108	2.6	2.59		
1000		18.42	0.371	3.09	6.89	-123	-0.6	2.59		
1005		18.81	0.371	2.68	6.94	-130	-0.5	2.59		
1010		18.85	0.376	2.33	6.98	-133	0.0	2.59		
1015		18.95	0.375	2.07	7.00	-137	0.6	2.59		
1020		19.09	0.376	1.85	7.02	-139	0.8	2.59		
1025		19.09	0.376	1.79	7.04	-141	1.2	2.59		
1030		19.09	0.376	1.74	7.04	-140	1.3	2.59		
1035	5.80	19.10	0.376	1.74	7.07	-142	1.4	2.59		

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes:
Flow rate = 0.13 gal/min

Ferrous Iron = 2.4 mg/L

MS/MSD | Duplicate ID No.:

Signature(s):

CH2M HILL Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: Navy
Location: Camp Geiger
Event: 2Q8
Date: 4/23/06
Weather: Clear 70°

Well ID: LF 35 MW 66
Sample ID: LF35 MW 66 - 0608

Sample Team: M. OST

Total Depth: 15.62 FT.(BTOC) Measuring Device:
Depth to water: (-) 11.02 FT.(BTOC) Date and Time: 300 mL/min
Water Column: 4.6 FT.
(x) .163 GAL/FT. [(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
Well Volume: .75 GAL. (1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)
Total Purge Volume: 4.0 GAL.
Purge Device: peristaltic pump with new HDPE tubing

WELL DIAMETER

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	DTW ft BTC	Color / Odor / Comments
0725	.2	17.6	0.26	4.16	5.19	216	90.5	11.5	clr
0730	1.5	17.8	0.25	4.04	5.28	152	40.0	11.5	clr
0735	2.0	17.8	0.24	~~5.29~~ 3.89	5.21	94	24.4	11.5	clr
0740	2.5	17.8	0.23	3.12	5.22	64	17.7	11.5	clr
0745	3.0	17.8	0.23	3.19	5.20	37	11.0	11.5	clr
0750	3.5	17.9	0.21	2.82	5.20	34	6.88	11.5	clr
0755	4.0	17.9	0.20	2.60	5.18	34	6.39	11.5	clr

Sample information: method, container number, size, and type, preservative used.

Sample Time 0810
Sample Appearance clr

Notes:
Fe 0.6 mg/L

Signed by: 4/23/06
Date

CH2M HILL

Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAV 1
Location: CTU 35
Event: 2ND QTR
Date: 4-23-06
Weather:

Well ID: IR35-MW68IW
Sample ID: IR35MW68IW06B
Sample Team: R Delon

Total Depth: 42.39 FT.(BTOC)
Depth to water: (-) 7.80 FT.(BTOC)
Water Column: 34.59 FT.
(x) .163 GAL/FT.
Well Volume: 5.6 GAL.
Total Purge Volume: 6.0 GAL.
Purge Device: peristaltic pump with new HDPE tubing

Measuring Device:
Date and Time:

WELL DIAMETER
[(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
(1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)

300 ML Purge Rate

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	Color / Odor / Comments	DTW
0730	.5gal	18.74	.083	6.10	10.60	178	8.15	Clear	7.80
0735	1gal	18.96	.076	6.00	10.68	166	6.83	Clear	7.80
0740	1.5gal	19.12	.075	5.88	10.68	159	6.22	Clear	7.80
0745	2gal	19.22	.075	5.76	10.64	155	6.40	Clear	7.80
0750	2.5gal	19.27	.076	5.62	10.57	152	6.92	Clear	7.80
0755	3gal	19.32	.082	5.23	10.37	152	4.55	Clear	7.80
0800	3.5gal	19.27	.099	4.32	9.86	159	5.03	Clear	7.80
0805	4gal	19.47	.211	0.00	8.22	57	3.21	Clear	7.80
0810	4.5gal	19.59	.258	0.00	7.79	-1	1.89	Clear	7.80
0815	5gal	19.56	.265	0.00	7.71	-15	1.92	Clear	7.80
0820	5.5gal	19.58	.266	0.00	7.70	-19	1.44	Clear	7.80
0825	6gal	19.63	.272	0.00	7.66	-31	0.93	Clear	7.80
0830	Sampled	Time							

Sample information: method, container number, size, and type, preservative used.

Sampled for VOC, RSK 175 TOC
HNO_3, ZINC, ACETATE, ALKALITITY, NaOH

Sample Time 0830
Sample Appearance

Notes:
Ferrous Iron = 0.0 mg/L
Collected ALKALITITY = 0710 04-24-06

Signed by: R.H. Deleon 4-23-06
Date

CH2M HILL Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVSAL
Location: Camp Geiger
Event: 08
Date: 4/24/06
Weather: Clr 77

Well ID: IR35 MW 69 IW
Sample ID: IR35-GW69IW-060
Sample Team: M. Osk

Total Depth: 43.00 FT.(BTOC) Measuring Device:
Depth to water: (-) 10.14 FT.(BTOC) Date and Time:
Water Column: 32.86 FT.
(x) .163 GAL/FT. [(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
Well Volume: 5.3 GAL. (1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)
Total Purge Volume: 5.3 GAL.
Purge Device: peristaltic pump with new HDPE tubing

WELL DIAMETER

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	DTW Color / Odor / Comments	
1333	.5	20.0	0.74	8.30	6.85	-35	15.3	10.29'	clr
1343	1.0	20.1	0.77	6.90	6.72	-75	7.04	10.29'	clr
1355	2.0	20.2	0.77	6.28	6.79	-87	4.83	10.30'	clr
1400	2.8	20.1	0.77	5.73	6.85	-95	4.87	10.30'	clr
1405	3.5	20.1	0.77	4.53	6.88	-98	4.30	10.30'	clr
1410	4.0	20.2	0.77	3.78	6.89	-100	3.70	10.20'	clr
1415	4.8	20.3	0.77	3.16	6.90	-103	3.40	10.30'	clr
1420	5.3	20.5	0.76	2.53	6.91	-104	2.80	10.30'	clr

Sample information: method, container number, size, and type, preservative used.

Sample Time 1425
Sample Appearance clr

Notes:
Fe = 1.0 mg/L

Signed by: [signature] Date 4/24/06

CH2M HILL Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVSEC
Location: Camp Gilger
Event: 06B
Date: 4/23/06
Weather: Cdy 70

Well ID: IR 35 MW 29 IW
Sample ID: IR 35 GW 70-06B
Sample Team: M. Ost

Total Depth: 46.00 FT.(BTOC) Measuring Device:
Depth to water: (-) 9.84 FT.(BTOC) Date and Time: 300 ml/min
Water Column: 36.16 FT.
(x) .163 GAL/FT. [(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
Well Volume: 5.90 GAL. (1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)
Total Purge Volume: 7.25 GAL.
Purge Device: peristaltic pump with new HDPE tubing

WELL DIAMETER

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	DTW ft BR	Color / Odor / Comments
0857	.1	19.6	0.58	3.06	6.70	121	12.0	9.98'	clr
0914	1.25	19.9	0.58	1.93	6.86	102	7.38	9.98'	clr
0926	2.50	19.9	0.57	0.98	6.89	-55	5.88	9.98'	clr
0937	3.50	20.0	0.58	0.76	6.91	-88	4.20	9.98'	clr
0951	5.00	20.0	0.57	0.22	6.93	-95	3.86	9.98'	clr
1001	5.75	20.1	0.57	0.13	6.94	-105	2.57	9.98'	clr
1011	6.50	20.1	0.58	0.00	6.94	-104	2.31	9.98'	clr
1021	7.25	20.2	0.58	0.00	6.94	-106	1.88	9.98'	clr

Sample information: method, container number, size, and type, preservative used.

Sample Time 1025
Sample Appearance clr

Notes:
Fe = 0.41 mg/L

Signed by: [signature] Date 4/23/06

CH2M HILL

Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVY
Location: CTO-35
Event: 2ND QTR
Date: 4-23-06
Weather: Cloudy, Humid

Well ID: IR35MW71IW
Sample ID: IR35GW71IW06B
Sample Team: R. Deleon

Total Depth: 42.89 FT.(BTOC) Measuring Device:
Depth to water: (-) 2.00 FT.(BTOC) Date and Time:
Water Column: 40.89 FT.
(x) .163 GAL/FT. [~~(2" DIA.=~~ 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
Well Volume: 6.6 GAL. (1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)
Total Purge Volume: 6.5 GAL.
Purge Device: peristaltic pump with new HDPE tubing

WELL DIAMETER

300 mL Purge Rate

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	Color / Odor / Comments	DTW
1140	1.5gal	19.40	.232	.94	7.62	20	23.8	Clear	2.00
1145	2gal	19.51	.232	0.00	7.63	-98	29.7	Clear	2.00
1150	2.5gal	19.53	.237	0.00	7.68	-124	24.0	Clear	2.00
1155	3gal	19.65	.242	0.00	7.70	-132	20.1	Clear	2.00
1200	3.5gal	19.65	.244	0.00	7.70	-132	18.1	Clear	2.00
1205	4gal	19.63	.244	0.00	7.70	-127	14.5	Clear	2.00
1210	4.5gal	19.73	.244	0.00	7.70	-131	9.08	Clear	2.00
1215	5gal	19.71	.245	0.00	7.71	-128	8.96	Clear	2.00
1220	5.5gal	19.91	.243	0.00	7.72	-134	6.88	Clear	2.00
1225	6gal	19.84	.244	0.00	7.71	-132	6.02	Clear	2.00
1230	6.5gal	19.82	.245	0.00	7.72	-135	4.45	Clear	2.00
1235	Sample Time								

Sample information: method, container number, size, and type, preservative used.

sampled for - VOC, RSK175, HNO3 Ferric Iron
NH3, SULFIDE, ALKALITY
TOC

Sample Time 1235
Sample Appearance

Notes: Ferrous Iron => 0 mg/L
COLLECTED ALKALITY = 0740 04-24-06

Signed by: RH Deleon 4-23-06
Date

CH2MHILL

Pg 1 of 1

GROUNDWATER SAMPLING DATA SHEET

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date: ~~40~~ MLT 6/21/06
Weather: 90° HOT, SUNNY

Project Number: 328432.FI.FQ.35
Well ID: IR35-MW72
Sample ID: IR35-GW7206B
Sampling Team: DAVID DRY
MONICA TIBURZI

Total Depth: 19.00 FT.(BTOC)
Depth to water: (-) 9.80 FT.(BTOC)
Water Column: 9.20 FT.
(x) 0.163 GAL/FT.
Well Volume: 1.50 GAL.
Total Purge Vol.: 2.0 GAL.

Measuring Device: Electronic WL indicator
Date and Time: 6/20/06 11:30

Purge Device: Peristaltic Pump, new HDPE tubing

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

PID = 0.0 ppm

SAMPLE DATA

Date: 6/21/06 Time: 1230	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: Fe	Depth to water	Color / Odor / Comments
Method: Horiba U-22	20.36	1.82*	0.00	6.95	-149	596*	7.0		

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: ____	Depth to water (ft)	Color / Odor / Comments
1140	0	20.89	99.9*	0.35	6.47	-117	206		9.87	CLEAR
1145	0.1	20.45	99.9*	0.46	6.66	-122	152		10.15	CLEAR
1150	0.2	20.49	20.5	0.49	6.80	-131	142		10.33	CLEAR
1155	0.3	20.38	12.4	0.04	6.84	-136	135		10.35	CLEAR
1200	0.4	20.58	3.88	0.00	6.88	-142	684		10.43	CLEAR
1205	0.75	20.26	3.20	0.00	6.90	-144	556		10.49	CLEAR
1210	1.0	20.14	2.75	0.00	6.91	-145	293		10.50	CLEAR
1215	1.25	20.56	2.46	0.00	6.93	-146	252		10.52	CLEAR
1220	1.50	20.62	2.12	0.00	6.95	-148	648		10.56	CLEAR
1225	2	20.36	1.82	0.00	6.95	-149	596*		10.56	CLEAR

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes:
Flow rate = 0.15 L/min
Ferrous Iron = 7.0 mg/L
* TURBIDITY / CONDUCTIVITY READINGS ARE QUESTIONABLE.

MS/MSD
Duplicate ID No.:

Signature(s): Monica Tiburzi

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Pg 1 of 2

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date: 6/20/06
Weather: Sunny Low 90s breezy

Project Number: 328432.FI.FQ.35
Well ID: 72IW
Sample ID: IR35-GW72IW06B
Sampling Team: David Dry

Total Depth: 44.94 FT.(BTOC)
Depth to water: (-) 10.64 FT.(BTOC)
Water Column: 34.30 FT.
(x) 0.163 GAL/FT.
Well Volume: 5.59 GAL.
Total Purge Vol.: 6.8 GAL.

Measuring Device: Electronic WL indicator
Date and Time: 6/20/06 1440

Purge Device: Peristaltic Pump, new HDPE tubing

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

SAMPLE DATA

Date: 6/20/06 Time: 1440	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: Salinity	Depth to water	Color / Odor / Comments TDS
Method: Horiba U-22	20.55	0.539	1.73	7.14	-88	78.4	0.02	10.90	0.344 clear

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: Sal	Depth to water (ft)	Color / Odor / Comments TDS
1315	0	21.16	0.533	8.90	6.86	197	4.6	0.02	10.70	0.342 clear
1320	0.4	20.96	0.534	8.30	6.92	198	4.6	0.02	10.78	0.341 clear
1325	0.8	21.05	0.537	6.71	7.08	193	7.5	0.02	10.84	0.347 clear
1330	1.2	21.42	0.560	4.60	7.02	119	20.9	0.02	10.87	0.358 clear
1335	1.6	20.72	0.558	3.60	7.02	71	22.8	0.02	10.87	0.358 clear
1340	2.0	20.62	0.555	3.04	7.04	49	26.5	0.02	10.87	0.356 clear
1345	2.4	20.72	0.562	2.33	7.04	-24	46.8	0.02	10.88	0.360 clear
1350	2.8	20.60	0.562	2.34	7.04	-25	47.2	0.02	10.89	0.360 clear
1355	3.2	21.16	0.556	2.14	7.06	-46	47.6	0.02	10.89	0.356 clear
1400	3.6	20.98	0.564	2.11	7.07	-61	53.9	0.02	10.89	0.360 clear
1405	4.0	20.70	0.559	2.05	7.08	-72	60.1	0.02	10.90	0.358 clear

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes:
Flow rate = 0.25 L/min 250 mL/min
Ferrous Iron = 0.0 ppm
PID 0.0 ppm

MS/MSD
Duplicate ID No.:

Signature(s): David V. Dry

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Pg 2 of 2

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date:
Weather:

Project Number: 328432.FI.FQ.35
Well ID: 72IW
Sample ID: IR35-GW72IW06B
Sampling Team: David Dry

Total Depth: FT.(BTOC)
Depth to water: (-) FT.(BTOC)
Water Column: FT.
(x) 0.163 GAL/FT.
Well Volume: GAL.
Total Purge Vol.: GAL.

Purge Device: Peristaltic Pump, new HDPE tubing

Measuring Device: Electronic WL indicator
Date and Time:

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

SAMPLE DATA

Date: / Time:	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: ____	Depth to water	Color / Odor / Comments TDS
Method: Horiba U-22	20.55	0.539	1.73	7.14	-88	78.4	0.02	10.90	0.344

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: Sal	Depth to water (ft)	Color / Odor / Comments TDS
1410	4.4	20.81	0.552	1.95	7.10	-79	63.4	0.02	10.90	0.353 clear
1415	4.8	20.84	0.551	1.94	7.10	-80	63.5	0.02	10.90	0.353 clear
1420	5.2	20.90	0.550	1.92	7.11	-81	64.4	0.02	10.90	0.352 clear
1425	5.6	20.80	0.545	1.87	7.12	-81	66.0	0.02	10.90	0.348 clear
1430	6.0	20.47	0.541	1.77	7.15	-87	75.3	0.02	10.90	0.346 clear
1435	6.4	20.44	0.541	1.75	7.14	-88	76.8	0.02	10.90	0.346 clear
1440	6.8	20.55	0.539	1.73	7.14	-88	78.4	0.02	10.90	0.344 clear

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes:
Flow rate =

Ferrous Iron =

MS/MSD | Duplicate ID No.:

Signature(s): David V. Dry

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC CTO-105
Location: SITE 35 / 24/17 BY PASS
Event: GW SAMPLING
Date: 8-6-06
Weather: SUNNY 90's

Project Number: 328M32.FI.FQ.35
Well ID: 35-MW72DW
Sample ID: I235-GW72DW-06C
Sampling Team: J FRANK

Total Depth: 58 FT.(BTOC)
Depth to water: (-) 5.15 FT.(BTOC)
Water Column: 52.85 FT.
(x) 0.163 GAL/FT.
Well Volume: 8.61 GAL.
Total Purge Vol.: 25.84 GAL.

Purge Device: PERISTALTIC

Measuring Device: HORIBA U-22 / HERON
Date and Time: 8-6-06 0800

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

SAMPLE DATA

Date: 8-6-06 Time: 0930	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
Method: low flow	26.23	0.445	1.51	8.36	-31	160	5.31	CLOUDY → CLEAR

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
0800	0	30.19	1.36	3.25	11.58	-71	180	5.27	CLEAR
0810	1	29.78	1.21	3.21	11.62	-74	72	5.31	CLEAR
0820	2	29.35	1.12	3.18	11.59	-72	69	5.31	CLEAR
0830	3	—	—	—	—	—	—	—	CLOUDY
0840	4	26.94	0.272	2.57	9.87	-40	500	5.30	CLOUDY
0850	5	26.91	~~0.306~~ 0.272	1.81	~~9.54~~ 9.36	-30	182	5.30	CLOUDY
0900	6	26.66	0.392	1.96	9.02	-2	160	5.29	CLOUDY
0910	7	26.58	0.414	1.64	8.95	-13	158	5.29	CLOUDY
0920	8	26.51	0.433	1.49	8.84	-26	155	5.30	CLOUDY
0930	9	26.23	0.445	1.51	8.36	-31	160	5.31	CLOUDY → CLEAR

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
VOC	HCl	40 mL	2
MEE	HCl	40 mL	2
TOC	HCl	40 mL	1
Fe^{3+} / ~~METALS~~ (SS)	HNO_3	250 mL	1
ALK / ANIONS / Fe^{2+}	—	500 mL	1
SULFIDE	ZN AC NaOH	250 mL	1

Observations/Notes:

HACH NTU 19.5
HACH Fe^{2+} 0.0 mg/L
TUBING 2 ft ABOVE BOTTOM

MS/MSD
Duplicate ID No.:
Signature(s): Jamel E Frank 8-6-06

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date: 6/21/06
Weather: 80° SUNNY

Project Number: 328432.FI.FQ.35
Well ID: IR35-MW73
Sample ID: IR35-GW7306B
Sampling Team: DAVID DRY
MONICA TIBURZI

Total Depth: 20.70 FT.(BTOC)
Depth to water: (-) 11.65 FT.(BTOC)
Water Column: 9.05 FT.
(x) 0.163 GAL/FT.
Well Volume: 1.48 GAL.
Total Purge Vol.: 3.5 GAL.

Purge Device: Peristaltic Pump, new HDPE tubing

Measuring Device: Electronic WL indicator
Date and Time: 6/20 11:30

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

PID = 0.0 ppm

SAMPLE DATA

Date: 6/21/06 Time: 1050	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: Fe	Depth to water	Color / Odor / Comments
Method: Horiba U-22	20.04	13.0	0.00	5.81	-6	135	3.8 mg/L	12.02	CLEAR

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: ____	Depth to water (ft)	Color / Odor / Comments
935	0	21.31	99.9*	0.68	6.15	66	85.4		11.71	CLEAR
940	0.1	20.45	99.9*	0.21	5.65	76	66.1		11.89	CLEAR
945	0.2	19.83	99.9*	0.08	5.64	69	20.60		11.96	CLEAR
950	0.5	19.80	99.9*	0.00	5.68	51	308		12.00	CLEAR
955	0.75	19.79	99.9*	0.00	5.74	36	220		12.02	CLEAR
MS/MSD 1000	1.00	19.87	99.9*	0.00	5.77	20	611		12.02	CLEAR
1005	1.25	19.78	99.9*	0.00	5.79	9	642		12.03	CLEAR
1010	1.50	20.00	99.9*	0.00	5.81	4	746**		12.02	CLEAR
1015	1.75	19.88	99.9*	0.00	5.80	0	161		12.02	CLEAR
1020	2.00	20.00	99.9*	0.00	5.81	-3	42		12.02	CLEAR
1025	2.50	20.03	66.4	0.00	5.80	-4	110		12.01	CLEAR

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes: * blinking INDICATES ERROR. WILL RECALIBRATE AFTER SAMPLE IS COLLECTED → MAY RESULT FROM IMPROPER EQUIPMENT SHIPPED, RIGGED TO WORK.

Flow rate = 0.225 L/min

Ferrous Iron = 3.8 mg/L

** TURBIDITY IS CLEARLY NOT 746 - WATER IS CLEAR (~10-20)

MS/MSD N/A

Duplicate ID No.: N/A

Signature(s): Monica L Tiburzi

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date:
Weather:

Project Number: 328432.FI.FQ.35
Well ID: JR35-730
Sample ID: JR35-GW7306B
Sampling Team:
CONTINUED...

Total Depth: FT.(BTOC)
Depth to water: (-) FT.(BTOC)
Water Column: FT.
(x) 0.163 GAL/FT.
Well Volume: GAL.
Total Purge Vol.: GAL.

Purge Device: Peristaltic Pump, new HDPE tubing

Measuring Device: Electronic WL indicator
Date and Time:

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

SAMPLE DATA

Date: / Time:	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: ____	Depth to water	Color / Odor / Comments
Method: Horiba U-22									

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: ____	Depth to water (ft)	Color / Odor / Comments
1030	2.75	20.03	41.2	0.00	5.81	-5	118		12.02	CLEAR
1035	3.00	20.01	24.8	0.00	5.81	-5	137		12.01	CLEAR
1040	3.25	20.03	18.1	0.00	5.81	-5	141		12.01	CLEAR
1045	3.50	20.04	130*	0.00	5.81	-6	135		12.02	CLEAR

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes:

Flow rate = 0.225 L/min

Ferrous Iron =

* CONDUCTIVITY IS SUSPECT. SAMPLE COLLECTED.

MS/MSD N/A | Duplicate ID No.: N/A

Signature(s): Monica A. Tiffany

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

PG 1 of 3

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date: 6/21/06
Weather: HOT (80's) SUNNY

Project Number: 328432.FI.FQ.35
Well ID: IR35-MW73IW
Sample ID: IR35-GW73IW06B
Sampling Team: DAVID DRY
MONICA TIBURZI

Total Depth: 47.30 FT.(BTOC)
Depth to water: (-) 11.68 FT.(BTOC)
Water Column: 35.62 FT.
(x) 0.163 GAL/FT.
Well Volume: 5.81 GAL.
Total Purge Vol.: 8.1 GAL.

Purge Device: Peristaltic Pump, new HDPE tubing

Measuring Device: Electronic WL indicator
Date and Time: 6/19 11:30

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

SAMPLE DATA

Date: 6/21/06 Time: 1135	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: Sal	Depth to water	Color / Odor / Comments TDS
Method: Horiba U-22	21.33	0.484	2.68	7.83	-215	447.0	0.02	11.84	0.315

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: Sal	Depth to water (ft)	Color / Odor / Comments TDS
9:25	0	20.37	0.335	12.09	6.58	155	56.7	0.01	11.83	0.216
9:30	0.3	20.36	0.332	9.50	6.82	133	50.7	0.01	11.81	0.219
9:35	0.6	20.36	0.453	7.47	7.07	-117	207.0	0.02	11.83	0.297
9:40	0.9	20.46	0.474	6.53	7.22	-141	328.6	0.02	11.83	0.308
9:45	1.2	20.34	0.474	6.21	7.25	-144	373.0	0.02	11.83	0.307
9:50	1.5	20.31	0.471	5.51	7.36	-156	389.2	0.02	11.83	0.305
9:55	1.8	20.34	0.470	4.94	7.45	-166	281.0	0.02	11.83	0.305
10:00	2.1	20.35	0.471	4.62	7.49	-172	315.0	0.02	11.83	0.306
1005	2.4	20.45	0.471	4.22	7.54	-178	372.0	0.02	11.83	0.307
1010	2.7	20.55	0.478	3.98	7.59	-183	500.0	0.02	11.83	0.309
1015	3.0	20.62	0.479	3.79	7.64	-190	568.0	0.02	11.84	0.311

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes:
Flow rate = 250 mL/min = .25 L/min
Ferrous Iron = 0.2 mg/L

PID = 0.0 PPM

MS/MSD N/A Duplicate ID No.: N/A

Signature(s): Monica Tiburzi

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

PG 2 of 3

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date:
Weather:

Project Number: 328432.FI.FQ.35
Well ID: IR 35-MW73IW
Sample ID:
Sampling Team:

Total Depth: FT.(BTOC)
Depth to water: (-) FT.(BTOC)
Water Column: FT.
(x) 0.163 GAL/FT.
Well Volume: GAL.
Total Purge Vol.: GAL.

Purge Device: Peristaltic Pump, new HDPE tubing

Measuring Device: Electronic WL indicator
Date and Time:

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

SAMPLE DATA

Date: / Time:	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: ____	Depth to water	Color / Odor / Comments
Method: Horiba U-22									

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: Sal	Depth to water (ft)	Color / Odor / Comments TDS
1020	3.3	20.67	0.476	3.72	7.67	-193	550.7	0.02	11.84	0.309
1025	3.6	20.64	0.471	3.57	7.70	-196	583.0	0.02	11.84	0.306
1030	3.9	20.72	0.484	3.46	7.71	-199	221.0	0.02	11.84	0.315
1035	4.2	20.78	0.481	3.39	7.75	-202	349.0	0.02	11.84	0.313
1035	4.5	20.75	0.484	3.30	7.74	-204	332.0	0.02	11.84	0.315
1040	4.8	20.83	0.480	3.22	7.77	-207	303.0	0.02	11.84	0.312
1045	5.1	20.89	0.479	3.18	7.77	-207	273.0	0.02	11.84	0.312
1050	5.4	20.86	0.476	3.15	7.77	-207	321.0	0.02	11.84	0.309
1055	5.7	21.00	0.474	3.11	7.79	-209	337.0	0.02	11.84	0.307
1100	6.0	21.00	0.472	3.07	7.79	-211	388.0	0.02	11.84	0.306
1105	6.3	21.06	0.474	3.01	7.80	-212	450.0	0.02	11.84	0.309

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes:

Flow rate =

Ferrous Iron =

Turbidity readings are incorrect - water is clear

MS/MSD N/A

Duplicate ID No.: N/A

Signature(s): Monica Long

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Pg 3 of 3

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date:
Weather:

Project Number: 328432.FI.FQ.35
Well ID: IR73-MW73IW
Sample ID:
Sampling Team:

Total Depth: FT.(BTOC)
Depth to water: (-) FT.(BTOC)
Water Column: FT.
(x) 0.163 GAL/FT.
Well Volume: GAL.
Total Purge Vol.: GAL.

Measuring Device: Electronic WL indicator
Date and Time:

Purge Device: Peristaltic Pump, new HDPE tubing

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

SAMPLE DATA

Date: / Time:	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: ____	Depth to water	Color / Odor / Comments
Method: Horiba U-22									

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: Sal	Depth to water (ft)	Color / Odor / Comments TDS
1110	6.6	21.14	0.476	2.94	7.82	-213	400.0	0.02	11.84	0.309
1115	6.9	21.15	0.474	2.92	7.82	-214	409.0	0.02	11.84	0.307
1120	7.2	21.21	0.483	2.84	7.82	-214	436.0	0.02	11.84	0.313
1125	7.5	21.24	0.483	2.76	7.83	-216	389.0	0.02	11.84	0.314
1130	7.8	21.13	0.480	2.73	7.84	-215	426.0	0.02	11.84	0.313
1135	8.1	21.33	0.484	2.68	7.83	-215	447.0	0.02	11.84	0.315

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes:

Flow rate =

Ferrous Iron =

MS/MSD N/A

Duplicate ID No.: N/A

Signature(s): Monica L Libby

CH2MHILL

Pg 1 of 2

GROUNDWATER SAMPLING DATA SHEET

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date: 6/20/06
Weather: Hot (92°) Sunny

Project Number: 328432.FI.FQ.35
Well ID: IR35-MW74
Sample ID: IR35-GW-7406B
Sampling Team: DAVID DRY
MONICA TIBURZI

Total Depth: 18.23 FT.(BTOC)
Depth to water: (-) 9.95 FT.(BTOC)
Water Column: 8.28 FT.
(x) 0.163 GAL/FT.
Well Volume: 1.35 GAL.
Total Purge Vol.: 6.0 GAL.

Measuring Device: Electronic WL indicator
Date and Time: 6/20/06 11:30 AM

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

PID = 0.0 ppm

Purge Device: Peristaltic Pump, new HDPE tubing

SAMPLE DATA

Date: 6/20/06 Time: 1425	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: Fe	Depth to water	Color / Odor / Comments
Method: Horiba U-22	59.35*	0.000	5.87	6.20	183	95.4	0.5 mg/L		

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: ____	Depth to water (ft)	Color / Odor / Comments
~~1225~~	~~0~~	~~20.72~~	~~.414~~	~~9.29~~	~~6.30~~	~~181~~	~~170~~		~~9.95~~ MJ	~~10.31~~ 0 Mod
~~1230~~	~~.25~~	~~20.58~~	~~.466~~	~~7.14~~	~~6.57~~	~~18~~	~~14.6~~		~~10.30~~ 0 MJ	
~~1233~~	~~0~~ 0	~~MJ~~							~~10.21~~	~~MJ~~ J
1240	0	NOT	FILLING	HORIBA -		SET UP	w/ NEW	EQUIPMENT	~~10.21~~	
1250	0	30.61	0.00	10.95	7.23	197	106.0		10.24	
1255	0.1	38.25	0.001	8.85	7.29	211	90.7		10.26	
1300	0.25	40.95	0.000	8.12	7.23	228	89.7		10.26	
1305	0.75	~~43.07~~	0.000	7.85	7.10	244	87.3		10.33	TEMP = 43.50
1310	1.25	47.09	0.000	6.98	7.13	238	81.5		10.31	
1315	1.50	45.58	0.000	7.77	6.93	236	82.2		10.31	
1320	1.75	46.00	0.000	7.94	6.88	226	84.0		—	

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes:

Flow rate = ~~.25 L/min~~ MJ .245 L/min

Ferrous Iron = 0.5 mg/L

MS/MSD | Duplicate ID No.:

Signature(s): Monica L Tiburzi

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date:
Weather:

Project Number: 328432.FI.FQ.35
Well ID: IR35-MW 74 (cont)
Sample ID:
Sampling Team:

Total Depth: FT.(BTOC)
Depth to water: (-) FT.(BTOC)
Water Column: FT.
(x) 0.163 GAL/FT.
Well Volume: GAL.
Total Purge Vol.: 6.0 GAL.

Measuring Device: Electronic WL indicator
Date and Time:

Purge Device: Peristaltic Pump, new HDPE tubing

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

SAMPLE DATA

Date: / Time:	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: _____	Depth to water	Color / Odor / Comments
Method: Horiba U-22									

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: _____	Depth to water (ft)	Color / Odor / Comments
1325	2.0	47.51	0.000	7.60	6.88	224	86.0		–	
1330	2.25	50.36	0.000	6.95	6.89	216	84.7		–	
1335	3	48.92	0.000	7.53	6.81	208	81.1		–	
1340	3.75	47.71	0.000	8.08	6.71	201	81.3		–	
1350	4.75	47.95	0.000	8.32	6.71	206	84.7			
1355	5.0	53.47	0.00	6.64	6.74	205	87.1			
1400	5.25	55.57*	0.000	6.27	6.74	200	91.8			
1415	6.00	59.37*	0.00	5.87	6.20	183	95.4			

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes: * BLINKING ON HORIBA- INDICATES ERROR. SAMPLE COLLECTED

Flow rate =

Ferrous Iron =

MS/MSD | Duplicate ID No.:

Signature(s): Monica L Lbuzi

CH2MHILL

Pg 1 of 2

GROUNDWATER SAMPLING DATA SHEET

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date: 6/20/06
Weather: 92° SUNNY

Project Number: 328432.FI.FQ.35
Well ID: IR35-MW741W
Sample ID: IR35-GW741W06B
Sampling Team: MONICA TIBURZI
~~MONICA~~ DAVID DRY

Total Depth: 44.65 FT.(BTOC)
Depth to water: (-) 10.22 FT.(BTOC)
Water Column: 34.43 FT.
(x) 0.163 GAL/FT.
Well Volume: 5.61 GAL.
Total Purge Vol.: 7.0 GAL.

Purge Device: Peristaltic Pump, new HDPE tubing

Measuring Device: Electronic WL indicator
Date and Time: 6/20/06 11:35 AM

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

PID: 0.0 ppm

SAMPLE DATA

Date: 6/20/06 Time: 1355	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: Fe	Depth to water	Color / Odor / Comments
Method: Horiba U-22	20.20	.529	10.10	6.86	-121	23.1	0.0 mg/L		

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: ____	Depth to water (ft)	Color / Odor / Comments
1225	0	20.12	.414	9.29	6.30	181	17.0		10.31	
1230	0.25	20.58	.466	7.14	6.57	18	14.6		10.30	
1235	0.50	20.70	.524	5.75	6.69	-59	20.0		10.30	
1240	0.75	20.61	.531	6.75	5.59	-70	18.7		—	
1245	1.00	20.62	.531	5.35	6.78	-79	18.5		—	
1250	1.25	20.68	.531	5.50	6.80	-87	18.4		—	
1255	2.25	18.50	.526	5.99	6.81	-93	18.4		—	TEMP=20.64
1300	2.75	20.57	.526	6.44	6.83	-98	18.3		—	
1305	3.5	20.48	.524	7.00	6.82	-106	19.8		—	
1310	4.25	20.81	.518	7.40	6.85	-109	21.5			
1315	4.75	20.77	.516	7.89	6.86	-113	20.4			

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes:
Flow rate = .25 L/min
Ferrous Iron = 0.0 mg/L

MS/MSD
Duplicate ID No.: IR35-GW741W06BP

Signature(s): Monica Tiburzi

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date:
Weather:

Project Number: 328432.FI.FQ.35
Well ID: IR35-MW14IW(cont)
Sample ID:
Sampling Team:

Total Depth: FT.(BTOC)
Depth to water: (-) FT.(BTOC)
Water Column: FT.
(x) 0.163 GAL/FT.
Well Volume: GAL.
Total Purge Vol.: GAL.

Purge Device: Peristaltic Pump, new HDPE tubing

Measuring Device: Electronic WL indicator
Date and Time:

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

SAMPLE DATA

Date: 6/20/06 Time: 1355	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other:	Depth to water	Color / Odor / Comments
Method: Horiba U-22									

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other:	Depth to water (ft)	Color / Odor / Comments
1320	5	20.67	.516	8.23	6.86	-113	31.0		—	
1325	5.50	20.52	.515	8.67	6.85	-116	30.2		—	
1330	6.00	20.65	.513	~~8.84~~	6.87	-117	24.9			DO: 9.10
1335	6.50	20.14	.508	9.60	6.86	-120	24.0			
1340	7.00	20.20	.529	10.10	6.86	-121	23.1		—	

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes:
Flow rate =

Ferrous Iron =

MS/MSD | Duplicate ID No.:

Signature(s): Monica L Lang

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date: 6/22/06
Weather: FOGGY, UPPER 70s

Project Number: 328432.FI.FQ.35
Well ID: IR35-MW801W
Sample ID: IR35-~~GW806B~~ GW801W06B
Sampling Team: MONICA TIBURZI

Total Depth: 49.15 FT.(BTOC)
Depth to water: (-) 7.60 FT.(BTOC)
Water Column: 41.59 FT.
(x) 0.163 GAL/FT.
Well Volume: 6.77 GAL.
Total Purge Vol.: 6.90 GAL.

Measuring Device: Electronic WL indicator
Date and Time: 6/19

PID = 0.0 ppm

Purge Device: Peristaltic Pump, new HDPE tubing

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

SAMPLE DATA

Date: 6/22 Time: 1030	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: Fe	Depth to water	Color / Odor / Comments
Method: Horiba U-22	24.00	.708	3.18	7.46	-166	216	0.8	—	CLEAR

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other:	Depth to water (ft)	Color / Odor / Comments
800	0	21.71	0.513	10.54	6.67	14	58.1		7.46	CLEAR
805	0.1	21.71	.502	6.34	7.16	-65	45.3		7.86	CLEAR
810	0.5	21.78	.504	5.74	7.24	-74	53.8		7.89	CLEAR
815	0.75	21.84	.500	5.51	7.28	-79	65.5		7.79	CLEAR
820	1.0	21.93	.499	5.32	7.33	-83	65.2		7.81	CLEAR
825	1.5	21.95	.498	5.12	7.35	-85	60.5		7.81	CLEAR
830	2.0	21.97	.498	4.90	7.37	-87	72.3		7.82*	CLEAR
835	2.5	22.10	.498	4.73	7.40	-89	68.3			CLEAR
840	3.0	22.26	.497	4.55	7.40	-90	66.6			CLEAR
845	3.25	22.54 ✓	.499 ✓	4.50 ✓	7.41 ✓	-91 ✓	71.6 ✓			CLEAR
850	3.50	22.54	.499	4.36	7.42	-94	73.3			CLEAR

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes:

Flow rate = 0.2 L/min

Ferrous Iron = 0.8 mg/L

* WATER LEVEL METER IS NOT WORKING, BUT WL IS STABLE ∴ REMOVE METER, DO NOT CHANGE FLOWRATE

MS/MSD ~~YES~~ N/A Duplicate ID No.: N/A

Signature(s): Monica Tiburzi

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date: 6/22/06
Weather: 80° CLOUDY, SOME SUN

Project Number: 328432.FI.FQ.35
Well ID: IR35- MW801W
Sample ID: IR35- GW801W06B
Sampling Team: M. TIBURZI

CONTINUED

Total Depth: _____ FT.(BTOC)
Depth to water: (-) _____ FT.(BTOC)
Water Column: _____ FT.
(x) 0.163 GAL/FT.
Well Volume: 6.77 GAL.
Total Purge Vol.: _____ GAL.

Measuring Device: Electronic WL indicator
Date and Time: _____

Purge Device: Peristaltic Pump, new HDPE tubing

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

SAMPLE DATA

Date: / Time:	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: _____	Depth to water	Color / Odor / Comments
Method: Horiba U-22									

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: _____	Depth to water (ft)	Color / Odor / Comments
855	3.75	22.61	0.512	4.28	7.42	-111	71.6			CLEAR
900	4.00	22.53	.546	4.12	7.43	-136	85.7			CLEAR
905	4.25	22.77	.627	3.96	7.43	-146	84.7			CLEAR
910	4.50	22.92	.654	3.78	7.43	-148	83.3			CLEAR
915	4.75	23.24	.680	3.67	7.43	-152	84.1			CLEAR
920	5.00	23.41	.696	3.54	7.44	-155	77.8			CLEAR
930	5.25	22.39	.777	3.44	7.49	-164	85.9			CLEAR
940	5.50	22.29	.762	3.33	7.51	-169	132			CLEAR
950	5.75	22.48	.747	3.24	7.52	-163	161			CLEAR
1000	6.00	23.27	.726	3.14	7.51	-169	224*			CLEAR
1010	6.50	24.87	.692	2.99	7.46	-169	204			CLEAR

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes:

Flow rate = 0.2 L/min

Ferrous Iron =

PUMP IS HAVING TROUBLE ~1 DEPTH - PUMPING ATK. SLOW. POSSIBLY A HOLE IN TUBE?

MS/MSD ~~YES~~ N/A | Duplicate ID No.: N/A

Signature(s): Monica Tiburzi

* TURBIDITY IS NOT 224 → CLEAR WATER

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: Dept of Navy, Camp Lejeune
Location: OU 10, Site 35
Event: GW sampling
Date: 6/22/06
Weather:

Project Number: 328432.FI.FQ.35
Well ID: IR35 - MW801W
Sample ID: IR35 - GW801W06
Sampling Team: M. TIBURZI
CONTINUED

Total Depth: FT.(BTOC)
Depth to water: (-) FT.(BTOC)
Water Column: FT.
(x) 0.163 GAL/FT.
Well Volume: 6.77 GAL.
Total Purge Vol.: GAL.

Measuring Device: Electronic WL indicator
Date and Time:

Purge Device: Peristaltic Pump, new HDPE tubing

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653
6	1.469

SAMPLE DATA

Date: / Time:	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: ____	Depth to water	Color / Odor / Comments
Time: 1030									
Method: Horiba U-22									

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP (redox) mV	Turbidity NTU	Other: ____	Depth to water (ft)	Color / Odor / Comments
1020	6.75	24.91	.710	3.09	7.44	-166	171			CLEAR
1025	6.9	24.00	.708	3.18	7.46	-166	216			

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements		No. of containers
VOCs	HCL			2
MEE	HCL			2
Alk, Anions, Ferrous Iron				1
Sulfide				1
TOC				1
Ferric Iron	HNO3			1

Observations/Notes:
Flow rate =

Ferrous Iron =

MS/MSD N/A
Duplicate ID No.: N/A

Signature(s): Monica L Tiburzi

CH2M HILL

Project Number:

GROUNDWATER SAMPLING DATA SHEET

Client: NAVY
Location: CTO-35
Event: 2ND QTR
Date: 4-25-06
Weather: PRTLY CLOUDY - COOL

Well ID: IR35 MW 80 DW
Sample ID: IR35 GW80DW 0603

Sample Team: R. Dele

Total Depth: 65.45 FT.(BTOC) Measuring Device:
Depth to water: (-) 8.32 FT.(BTOC) Date and Time:
Water Column: 57.13 FT.
(x) .163 GAL/FT.
Well Volume: 9.30 GAL.
Total Purge Volume: 9.3 GAL.
Purge Device: peristaltic pump with new HDPE tubing

WELL DIAMETER
[(2" DIA.= 0.163 GAL/FT.) (4" DIA. = 0.653 GAL/FT.)]
(1" DIA.= 0.041 GAL/FT.) (1 1/4 " DIA.= 0.064 GAL/FT.)

200 mL Purge Rate

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp., °C	Cond. (µS/cm)	DO (mg/L)	pH	Redox (mV)	Turbidity (visual)	Color / Odor / Comments	DTW
0935	.2gals	20.64	.215	0.00	8.06	-54	788	CLOUDY	8.40
0955	2gals	20.69	0.217	0.00	7.99	-110	50.5	HAZY	8.40
1015	3gals	20.87	.217	0.00	8.02	-125	15.3	HAZY	8.40
1035	5gals	21.15	.217	0.00	8.00	-130	12.4	Clear	8.40
1055	6gal	21.25	0.217	0.00	8.00	-133	7.52	clear	8.42
1115	8gal	21.44	0.217	0.00	8.00	-136	4.08	Clear	8.42
1135	9.3gal	21.54	.217	0.00	7.99	-137	2.52	Clear	8.42
1140	Sample Time								

Sample information: method, container number, size, and type, preservative used.

Sampled for - VOC, TOC, RSK175, Ferric Iron, SULFIDE, ALKALITY

Sample Time 1140
Sample Appearance

Notes:
Ferrous Iron = 0% Mg/L

Signed by: K H Dele 4-25-06
Date

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC CTO-105
Location: SITE 35 MCAS New River
Event: GW SAMPLING
Date: 8-6-06
Weather: SUNNY 90's

Project Number: 328432. FI. FQ. 35
Well ID: 35-MW 01
Sample ID: IR35-GW01-0606
Sampling Team: J FRANK/RDH

Total Depth: 25 FT.(BTOC)
Depth to water: (-) 6.70 FT.(BTOC)
Water Column: 18.30 FT.
(x) 0.163 GAL/FT.
Well Volume: 2.98 GAL. x
Total Purge Vol.: 8.94 GAL. 3x

Purge Device: PERISTALTIC

Measuring Device: HORIBA U-22 / HERON
Date and Time: 8-6-06 1015

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

SAMPLE DATA

Date: 8-6-06 Time: 1120	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
Method: Low flow	20.39	0.534	1.40	7.34	-137	19	6.85	CLEAR

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
1030	0.5	20.64	0.587	3.40	7.81	-149	142.0	6.81	CLEAR
1040	1.5	20.52	0.572	2.10	7.72	-146	218	6.85	CLEAR
1050	2.5	20.50	0.549	2.01	7.64	-143	135	6.85	CLEAR
1100	3.5	20.48	0.544	1.86	7.47	-140	81	6.85	CLEAR
1110	4.5	20.42	0.539	1.52	7.40	-139	36	6.86	CLEAR
1120	5.5	20.39	0.534	1.40	7.34	-137	19	6.85	CLEAR

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
VOC	HCl	40 mL	2
TOC	HCl	40 mL	1
MEE	HCl	40 mL	2
Fe^{3+}	HNO_3	250 mL	1
ALK/ANIONS/Fe^{2+}	—	500 mL	1
SULFIDE	ZnAc NaOH	250 mL	1

Observations/Notes:

HACH TURBIDIMETER 3.2 NTU
HACH Fe^{2+} 1.4 mg/L

TUBING SET 2 ft ABOVE BOTTOM

MS/MSD ✓ Duplicate ID No.:

Signature(s): [signature] 8-6-06

CH2MHILL

GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC CTO-105
Location: SITE 35 MCAS NEW RIVER
Event: GW SAMPLING
Date: 8-6-06
Weather: SUNNY 90's

Project Number: 329M32.FI.FQ35
Well ID: 35-MW81IW
Sample ID: IR35-GW81IW-06C
Sampling Team: J FRANK / RDH

Total Depth: 48 FT.(BTOC)
Depth to water: (-) 6.82 FT.(BTOC)
Water Column: 41.18 FT.
(x) 0.163 GAL/FT.
Well Volume: 6.71 GAL. x
Total Purge Vol.: 20.19 GAL. 3x

Purge Device: PERISTALTIC

Measuring Device: HORIBA U-22 / HERON
Date and Time: 8-6-06 1015

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

SAMPLE DATA

Date: 8-6-06 Time:	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
Method: Low flow	~~21.34~~ 21.34	0.589	1.09	7.35	-93	18.5	6.89	CLEAR

FIELD PARAMETERS

Time	Purge Vol. (gals)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other: DTW	Color / Odor / Comments
1200	0	21.28	0.556	2.75	7.59	32	164	6.88	CLEAR
1210	1	21.19	0.571	1.64	7.43	-59	107	6.92	CLEAR
1220	2	21.13	0.571	1.35	7.39	-75	70.8	6.91	CLEAR
1230	3	21.30	0.577	1.22	7.36	-84	57.1	6.91	CLEAR
1240	4	21.33	0.586	1.17	7.36	-88	36.6	6.90	CLEAR
1250	5	21.33	0.582	1.14	7.38	-90	23.1	6.89	CLEAR
1300	6	21.33	0.584	1.11	7.35	-92	22.2	6.90	CLEAR
1310	7	21.31	0.588	1.10	7.36	-93	21.5	6.89	CLEAR
1320	8	21.34	0.589	1.09	7.35	-93	18.5	6.89	CLEAR

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
VOC	HCl	40 mL	2
MTBE	HCl	40 mL	2
TOC	HCl	40 mL	1
Fe^{3+}	HNO_3	250 mL	1
ALK / ANIONS / Fe^{2+}	—	500 mL	1
SULFIDE	ZnAc NaOH	250 mL	1

Observations/Notes:

HACH TURBIDIMETER 7.55 NTU
HACH Fe^{2+} — mg/L

TUBING SET 3 ft ABOVE BOTTOM

MS/MSD
Duplicate ID No.: IR35-GW81IWD-06C
Signature(s): James E. Frank 8-6-06

Appendix E
Laboratory Reports for the April, June, and August 2006 Monitoring Well Sampling Events

Appendix E
Laboratory Analytical Data
Site 35 Amended Remedial Investigation
MCB Camp Lejeune, North Carolina

Station ID	IR35-MW01DW		IR35-MW02		IR35-MW03DW	IR35-MW04		IR35-MW06		IR35-MW06DW	IR35-MW07DW	IR35-MW09	IR35-MW09IW	IR35-MW10	IR35-MW10IW		IR35-MW14	IR35-MW14IW
Sample ID	IR35-GW01DW-06B	IR35-GW01DW-06B2	IR35-GW02-06B	IR35-GW02-06B2	IR35-GW03DW-06B	IR35-GW04-06B	IR35-GW04-06B2	IR35-GW06-06B	IR35-GW06-06B2	IR35-GW06DW-06B	IR35-GW07DW-06B	IR35-GW09-06B	IR35-GW09IW-06B	IR35-GW10-06B	IR35-GW10IW-06B	IR35-GW10IW-06BDUP	IR35-GW14-06B	IR35-GW14IW-06B
Sample Date	04/23/06	04/24/06	04/23/06	04/24/06	04/24/06	04/23/06	04/24/06	04/23/06	04/24/06	04/24/06	06/22/06	04/24/06	04/24/06	04/24/06	04/24/06	04/24/06	04/25/06	04/25/06
Chemical Name																		
Volatile Organic Compounds (UG/L)																		
1,1,1-Trichloroethane	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	0.5 UJ	NA	0.5 UJ	NA	0.5 U	0.5 UJ	NA	0.5 UJ	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 UJ	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethane	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1.2	1.3 J	0.67	0.5 U
1,2,3-Trichlorobenzene	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromo-3-chloropropane	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ
1,2-Dichloroethane	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloropropane	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-Dichlorobenzene	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-Dichlorobenzene	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Butanone	5 U	NA	5 U	NA	5 U	5 U	NA	5 U	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Hexanone	5 U	NA	5 U	NA	5 U	5 U	NA	5 U	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone	5 U	NA	5 U	NA	5 U	5 U	NA	5 U	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	5 UJ	NA	5 UJ	NA	5 U	5 UJ	NA	5 UJ	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	0.5 UJ	NA	0.5 UJ	NA	0.5 U	0.5 UJ	NA	0.5 UJ	NA	0.5 U	0.5 U	0.5 U	5.6	0.5 U	4.5	5.2 J	0.5 U	2
Bromochloromethane	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromodichloromethane	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromoform	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromomethane	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Carbon disulfide	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chlorobenzene	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroethane	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroform	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloromethane	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Cyclohexane	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dibromochloromethane	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dichlorodifluoromethane (Freon-12)	0.5 UJ	NA	0.5 UJ	NA	0.5 UJ	0.5 UJ	NA	0.5 UJ	NA	0.5 UJ	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
Ethylbenzene	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.54	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methyl acetate	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methyl-tert-butyl ether (MTBE)	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylcyclohexane	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylene chloride	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Styrene	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ
Toluene	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	1.2	0.5 U	0.94	0.93 J	0.5 U	0.5 U
Trichloroethene	0.5 U	NA	0.5 U	NA	0.64	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.6	2.2	23	23 J	21	15
Trichlorofluoromethane(Freon-11)	0.5 UJ	NA	0.5 UJ	NA	0.5 UJ	0.5 UJ	NA	0.5 UJ	NA	0.5 UJ	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
Vinyl chloride	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.31 J	0.5 U	4	5 J	0.5 U	2
Xylene, total	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.37 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.32 J	NA	0.5 U	NA	5.2	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	22	21	200	240	120	70
cis-1,3-Dichloropropene	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 UJ	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
isopropylbenzene	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trans-1,2-Dichloroethene	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	5.2	1.5	14	15 J	6.6	6.3
trans-1,3-Dichloropropene	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 UJ	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Total Metals (UG/L)																		
Iron	540	NA	18,000	NA	640	470	NA	2,500	NA	200 U	260	790	1,700	1,300	1,800	1,800	1,400	2,400
Wet Chemistry (MG/L)																		
Alkalinity	NA	160	NA	190	230	NA	49	NA	20 U	290	280	290	310	340	350	330	330	330
Chloride	NA	24	NA	9.8	49 J	NA	6.2	NA	9.3	46 J	45 J	23 J	26 J	22 J	21 J	24 J	31 J	24 J
Ethane	0.026 U	NA	0.026 U	NA	0.027 U	0.026 U	NA	0.026 U	NA	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.027 U	5.00E-04 U	5.00E-04 U
Ethene	0.035 U	NA	0.035 U	NA	0.036 U	0.035 U	NA	0.035 U	NA	0.035 U	0.035 U	0.035 U	0.035 U	0.035 U	0.035 U	0.036 U	5.00E-04 U	5.00E-04 U
Ferric iron	NA	10 U	NA	13	10 U	NA	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ferrous iron	NA	1 UJ	NA	5.3 J	1 UJ	NA	1 UJ	NA	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
Methane	0.014 U	NA	1.3	NA	0.062	0.014 U	NA	0.014 U	NA	0.014 U	0.014 U	0.014 U	0.63	0.083	0.8	0.57	0.0052 U	5.00E-04 U
Nitrate	NA	0.23 J	NA	0.13 UJ	0.13 U	NA	2.5 J	NA	0.15 J	0.13 U	0.13 U	0.5 J	0.13 U	0.13 U	0.13 U	0.16 J	0.14	0.13 U
Nitrite	NA	0.13 U	NA	0.13 U	0.13 U	NA	0.13 U	NA	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
Sulfate	NA	27	NA	56	11	NA	36	NA	18	5.2	6.2 J	160	15	24	22	24	80 J	27 J
Sulfide	0.03 U	NA	0.03 U	NA	0.03 U	0.03 U	NA	0.03 U	NA	0.03 U	0.03 UJ	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Total organic carbon (TOC)	10 U	NA	10 U	NA	10 U	10 U	NA	10 U	NA	10 U	10 U	10 U	10 U	53	10 U	10 U	26	10 U

NA - Not analyzed
J - Reported value is estimated
U - Analyte not detected
UJ - Not detected, quantitation limit may be inaccurate

Appendix E
Laboratory Analytical Data
Site 35 Amended Remedial Investigation
MCB Camp Lejeune, North Carolina

Station ID	IR35-MW29		IR35-MW29IW	IR35-MW30		IR35-MW30DW		IR35-MW30IW		IR35-MW31	IR35-MW31IW	IR35-MW32		IR35-MW32IW			
Sample ID	IR35-GW29-06B	IR35-GW29-06BDUP	IR35-GW29IW-06B	IR35-GW30-06B	IR35-GW30-06B2	IR35-GW30DW-06B	IR35-GW30DW-06B2	IR35-GW30IW-06B	IR35-GW30IW-06B2	IR35-GW31-06B	IR35-GW31IW-06B	IR35-GW32-06B	IR35-GW32-06B2	IR35-GW32IW-06B	IR35-GW32IW-06BDUP	IR35-GW32IW-06B2	IR35-GW32IW-06B2DUP
Sample Date	04/24/06	04/24/06	04/24/06	04/23/06	04/24/06	04/23/06	04/24/06	04/23/06	04/24/06	04/24/06	04/24/06	04/23/06	04/24/06	04/23/06	04/23/06	04/24/06	04/24/06
Chemical Name																	
Volatile Organic Compounds (UG/L)																	
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	NA
1,1,2,2-Tetrachloroethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	100	NA	0.5 U	0.5 U	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	0.5 U	0.5 U	0.5 U	0.5 UJ	NA	0.5 UJ	NA	0.5 UJ	NA	0.5 U	0.5 U	0.5 UJ	NA	0.5 UJ	0.5 UJ	NA	NA
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 UJ	NA	0.5 U	NA	0.5 UJ	NA	0.5 U	0.5 U	1.2	NA	0.5 U	0.5 U	NA	NA
1,1-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	NA
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	NA	0.48 J	NA	2.3	0.56	0.5 UJ	NA	0.5 U	0.5 UJ	NA	NA
1,2,3-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	NA
1,2,4-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	NA
1,2-Dibromo-3-chloropropane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	NA
1,2-Dibromoethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	NA
1,2-Dichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	NA
1,2-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	NA
1,2-Dichloropropane	0.5 U	0.5 U	0.5 U	0.5 UJ	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	NA	0.5 UJ	0.5 U	NA	NA
1,3-Dichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	NA
1,4-Dichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	NA
2-Butanone	5 U	5 U	5 U	5 U	NA	5 U	NA	5 U	NA	5 U	5 U	5 U	NA	5 U	5 U	NA	NA
2-Hexanone	5 U	5 U	5 U	5 U	NA	5 U	NA	5 U	NA	5 U	5 U	5 U	NA	5 U	5 U	NA	NA
4-Methyl-2-pentanone	5 U	5 U	5 U	5 U	NA	5 U	NA	5 U	NA	5 U	5 U	5 U	NA	5 U	5 U	NA	NA
Acetone	5 U	5 U	5 U	5 UJ	NA	5 UJ	NA	5 UJ	NA	5 U	5 U	5 UJ	NA	5 UJ	5 UJ	NA	NA
Benzene	22	22	1.7	0.5 UJ	NA	0.5 UJ	NA	1.7 J	NA	0.45 J	0.51	0.5 U	NA	3.5 J	3.2 J	NA	NA
Bromochloromethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	NA	NA
Bromodichloromethane	0.5 U	0.5 U	0.5 U	0.5 UJ	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	NA	0.5 UJ	0.5 U	NA	NA
Bromoform	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.87	NA	0.5 U	0.5 U	NA	NA
Bromomethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	NA
Carbon disulfide	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	NA
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	NA
Chlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	NA
Chloroethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	NA
Chloroform	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	NA	NA
Chloromethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	NA
Cyclohexane	0.5 U	0.5 U	0.5 U	0.5 UJ	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	NA	0.5 UJ	0.5 U	NA	NA
Dibromochloromethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	NA
Dichlorodifluoromethane (Freon-12)	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	NA	0.5 UJ	NA	0.5 UJ	NA	0.5 UJ	0.5 UJ	0.5 UJ	NA	0.5 UJ	0.5 UJ	NA	NA
Ethylbenzene	11	11	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	NA
Methyl acetate	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	NA
Methyl-tert-butyl ether (MTBE)	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	NA
Methylcyclohexane	0.5 U	0.5 U	0.5 U	0.5 UJ	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	NA	0.5 UJ	0.5 U	NA	NA
Methylene chloride	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 UJ	NA	0.5 U	0.5 U	NA	NA
Styrene	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	NA
Tetrachloroethene	0.5 U	0.5 U	1.5	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	NA	0.89	0.79	NA	NA
Toluene	20	20	0.5 U	0.5 U	NA	0.5 U	NA	0.5	NA	0.5 U	0.5 U	0.5 U	NA	1.5	1.2	NA	NA
Trichloroethene	2.8	4	30	0.5 U	NA	0.5 U	NA	110	NA	4.1	29	13	NA	24	22	NA	NA
Trichlorofluoromethane(Freon-11)	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	NA	0.5 UJ	NA	0.5 UJ	NA	0.5 UJ	0.5 UJ	0.5 UJ	NA	0.5 UJ	0.5 UJ	NA	NA
Vinyl chloride	0.5 U	0.5 U	1.5	0.5 U	NA	0.5 U	NA	0.91	NA	19	2	1	NA	3.6	2.7	NA	NA
Xylene, total	17	16	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	NA
cis-1,2-Dichloroethene	81	100	86	0.5 U	NA	0.5 U	NA	50	NA	40	150	29	NA	97	94	NA	NA
cis-1,3-Dichloropropene	0.5 U	0.5 U	0.5 U	0.5 UJ	NA	0.5 U	NA	0.5 UJ	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	NA
isopropylbenzene	9	8.2	0.5 U	0.5 U	NA	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	NA
trans-1,2-Dichloroethene	26	32	27	0.5 U	NA	0.5 U	NA	9.1	NA	4.8	14	12	NA	12	8.5	NA	NA
trans-1,3-Dichloropropene	0.5 U	0.5 U	0.5 U	0.5 UJ	NA	0.5 U	NA	0.5 UJ	NA	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	NA
Total Metals (UG/L)																	
Iron	630	540	780	2,600	NA	200 U	NA	1,000	NA	280	610	600	NA	950	930	NA	NA
Wet Chemistry (MG/L)																	
Alkalinity	78	140	230	NA	20 U	NA	270	NA	360	160	310	NA	20 U	NA	NA	310	330
Chloride	37 J	37 J	18 J	NA	15	NA	29	NA	35	25 J	22 J	NA	45	NA	NA	23	39
Ethane	0.026 U	0.026 U	0.026 U	0.026 U	NA	0.026 U	NA	0.026 U	NA	0.026 U	0.028 U	0.026 U	NA	0.027 U	0.027 U	NA	NA
Ethene	0.035 U	0.035 U	0.035 U	0.035 U	NA	0.035 U	NA	0.035 U	NA	0.035 U	0.037 U	0.035 U	NA	0.036 U	0.036 U	NA	NA
Ferric iron	10 U	10 U	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA	10 U	NA	NA	10 U	10 U
Ferrous iron	1 UJ	1 UJ	1 U	NA	2.7 J	NA	1 UJ	NA	1 UJ	1 U	1 U	NA	1 UJ	NA	NA	1 UJ	1 UJ
Methane	2	1.9	0.29	0.04	NA	0.014 U	NA	0.49	NA	0.086	0.054	0.014 U	NA	0.96	1.2	NA	NA
Nitrate	0.94 J	0.34 J	0.86 J	NA	0.13 UJ	NA	0.13 UJ	NA	0.13 UJ	1.8 J	1.6 J	NA	13 J	NA	NA	0.34 J	0.2 J
Nitrite	0.13 U	0.13 U	0.13 U	NA	0.13 U	NA	0.13 U	NA	0.13 U	0.13 U	0.13 U	NA	0.13 U	NA	NA	0.13 U	0.13 U
Sulfate	10	14	23	NA	39	NA	78	NA	15	59	39	NA	30	NA	NA	53 J	15 J
Sulfide	0.03 U	0.03 U	0.03 U	0.03 U	NA	0.03 U	NA	0.03 U	NA	0.03 U	0.03 U	0.03 U	NA	0.03 U	0.03 U	NA	NA
Total organic carbon (TOC)	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	NA	10 U	10 U	10 U	NA	10 U	10 U	NA	NA

NA - Not analyzed
J - Reported value is estimated
U - Analyte not detected
UJ - Not detected, quantitation limit may be inaccurate

Appendix E
Laboratory Analytical Data
Site 35 Amended Remedial Investigation
MCB Camp Lejeune, North Carolina

Station ID	IR35-MW34	IR35-MW34IW	IR35-MW37		IR35-MW37IW	IR35-MW38	IR35-MW38IW		IR35-MW39IW		IR35-MW40IW	IR35-MW47	IR35-MW47IW	IR35-MW49	IR35-MW49IW	IR35-MW55	IR35-MW55IW	IR35-MW60
Sample ID	IR35-GW34-06B	IR35-GW34IW-06B	IR35-GW37-06B	IR35-GW37-06BDUP	IR35-GW37IW-06B	IR35-GW38-06B	IR35-GW38IW-06B	IR35-GW38IW-06BP	IR35-GW39IW-06B	IR35-GW39IW-06B2	IR35-GW40IW-06B	IR35-GW47-06B	IR35-GW47IW-06B	IR35-GW49-06B	IR35-GW49IW-06B	IR35-GW55-06B	IR35-GW55IW-06B	IR35-GW60-06B
Sample Date	04/24/06	04/24/06	04/25/06	04/25/06	04/25/06	06/22/06	06/22/06	06/22/06	04/23/06	04/24/06	04/24/06	06/21/06	06/21/06	06/21/06	06/21/06	06/21/06	06/21/06	06/22/06
Chemical Name																		
Volatile Organic Compounds (UG/L)																		
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
1,1,2,2-Tetrachloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
1,1-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	NA	0.5 U	0.5 UJ	0.5 UJ	0.42 J	0.5 UJ	0.73 J	1.5 J	0.5 U
1,2,3-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
1,2,4-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
1,2-Dibromo-3-chloropropane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
1,2-Dibromoethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
1,2-Dichlorobenzene	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
1,2-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
1,2-Dichloropropane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 UJ	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
1,3-Dichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
1,4-Dichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
2-Butanone	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 U
2-Hexanone	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 U
4-Methyl-2-pentanone	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 U
Acetone	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 UJ	NA	5 U	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 U
Benzene	0.5 U	0.31 J	0.5 U	0.5 U	6.3	0.5 U	0.31 J	0.36 J	8.8	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
Bromochloromethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
Bromodichloromethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 UJ	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
Bromoform	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
Bromomethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
Carbon disulfide	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
Chlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
Chloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
Chloroform	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
Chloromethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
Cyclohexane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 UJ	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
Dibromochloromethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
Dichlorodifluoromethane (Freon-12)	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 UJ	NA	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
Ethylbenzene	0.5 U	0.5 U	0.5 U	0.5 U	2.6	0.5 U	0.5 U	0.5 U	0.46 J	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
Methyl acetate	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
Methyl-tert-butyl ether (MTBE)	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
Methylcyclohexane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 UJ	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
Methylene chloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
Styrene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
Tetrachloroethene	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
Toluene	0.5 U	0.5 U	0.5 U	0.5 U	5.5	0.5 U	0.5 U	0.5 U	1	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
Trichloroethene	0.5 U	5.4	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	2.3	18 J	9.8 J	3.6 J	5.9 J	35 J	180 J	0.5 U
Trichlorofluoromethane(Freon-11)	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 UJ	NA	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
Vinyl chloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	3.2	1.2 J	1.6 J	7 J	1.8 J	1.4 J	6.6 J	0.5 U
Xylene, total	0.5 U	0.5 U	0.5 U	0.5 U	2.5	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
cis-1,2-Dichloroethene	0.5 U	14	0.5 U	0.5 U	0.5 U	0.5 U	0.33 J	0.31 J	3	NA	76	75 J	37 J	110 J	77 J	96 J	370 J	0.5 U
cis-1,3-Dichloropropene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
isopropylbenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
trans-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5	NA	3	6.5 J	3.1 J	6.1 J	1.1 J	15 J	33 J	0.5 U
trans-1,3-Dichloropropene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U
Total Metals (UG/L)																		
Iron	5,800	990	350	360	750	3,000	1,200	1,100	1,700	NA	1,000	200 U	310	420	510	16,000	200 U	200 U
Wet Chemistry (MG/L)																		
Alkalinity	120	310	20 U	20 U	280	160	300	280	NA	300	260	300	240	290	270	190	330	28
Chloride	27 J	340 J	14 J	13 J	22 J	7.6 J	7.8 J	7.2 J	NA	16	76 J	9.6 J	11 J	11 J	13 J	17 J	13 J	7.7 J
Ethane	0.026 U	0.026 U	5.00E-04 U	5.00E-04 U	5.00E-04 U	0.026 U	0.026 U	0.027 U	0.026 U	NA	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U
Ethene	0.035 U	0.035 U	0.0036 U	0.0049 U	5.00E-04 U	0.035 U	0.035 U	0.036 U	0.035 U	NA	0.035 U	0.035 U	0.035 U	0.035 U	0.035 U	0.035 U	0.035 U	0.034 U
Ferric iron	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	14	10 U	10 U
Ferrous iron	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	NA	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	2.6 J	1 UJ	1 UJ
Methane	0.014 U	0.052	5.00E-04 U	5.00E-04 U	5.00E-04 U	0.12	0.062	0.061	1.8	NA	0.24	0.014 U	0.014 U	0.026	0.036	0.014 U	0.014 U	0.013 U
Nitrate	1.3 J	0.14 J	0.32	0.35	0.21	0.13 U	0.13 U	0.13 U	NA	0.13 UJ	0.13 U	0.21	0.13 U	0.13 U	0.13 U	0.32	0.21	0.13 U
Nitrite	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	NA	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
Sulfate	59	18	24 J	23 J	12 J	14	29	12	NA	5.3	38	30 J	8.1 J	28 J	6.9 J	87 J	130 J	27 J
Sulfide	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	NA	0.03 U	0.03 UJ	0.03 UJ	0.03 UJ	0.03 UJ	0.03 UJ	0.03 UJ	0.03 UJ
Total organic carbon (TOC)	10 U	10 U	10 U	10 U	10 U	13	10 U	10 U	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

NA - Not analyzed
J - Reported value is estimated
U - Analyte not detected
UJ - Not detected, quantitation limit may be inaccurate

Appendix E
Laboratory Analytical Data
Site 35 Amended Remedial Investigation
MCB Camp Lejeune, North Carolina

Station ID	IR35-MW60IW		IR35-MW62	IR35-MW63IW	IR35-MW64IW	IR35-MW66		IR35-MW68IW		IR35-MW69IW	IR35-MW70IW		IR35-MW71IW		IR35-MW72	IR35-MW72IW	IR35-GW72DW[2]	
Sample ID	IR35-GW60IW-06B	IR35-GW60IW-06BP	IR35-GW62-06B	IR35-GW63IW-06B	IR35-GW64IW-06B	IR35-GW66-06B	IR35-GW66-06B2	IR35-GW68IW-06B	IR35-GW68IW-06B2	IR35-GW69IW-06B	IR35-GW70IW-06B	IR35-GW70IW-06B2	IR35-GW71IW-06B	IR35-GW71IW-06B2	IR35-GW72-06B	IR35-GW72IW-06B	IR35-GW72DW-06C	
Sample Date	06/22/06	06/22/06	06/21/06	06/21/06	06/21/06	04/23/06	04/24/06	04/23/06	04/24/06	04/24/06	04/23/06	04/24/06	04/23/06	04/24/06	06/21/06	06/20/06	8/6/06	
Chemical Name																		
Volatile Organic Compounds (UG/L)																		
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 U	0.5 U	2.5 U
1,1,2,2-Tetrachloroethane	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 U	0.5 U	2.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	NA	0.5 UJ	NA	0.5 U	0.5 UJ	NA	0.5 UJ	NA	0.5 UJ	0.5 U	0.5 U	2.5 U
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 UJ	0.5 U	2.5 U
1,1-Dichloroethane	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 U	0.5 U	2.5 U
1,1-Dichloroethene	0.5 U	0.5 U	0.37 J	0.5 UJ	1.4 J	0.5 UJ	NA	0.67	NA	0.5 U	0.5 U	NA	0.5 UJ	NA	0.5 UJ	2.3	0.5 U	2.5 U
1,2,3-Trichlorobenzene	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 U	0.5 U	2.5 U
1,2,4-Trichlorobenzene	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 U	0.5 U	2.5 U
1,2-Dibromo-3-chloropropane	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 U	0.5 U	2.5 U
1,2-Dibromoethane	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 U	0.5 U	2.5 U
1,2-Dichlorobenzene	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 U	0.5 U	2.5 U
1,2-Dichloroethane	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 U	0.5 U	2.5 U
1,2-Dichloropropane	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 U	0.5 U	2.5 U
1,3-Dichlorobenzene	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 U	0.5 U	2.5 U
1,4-Dichlorobenzene	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 U	0.5 U	2.5 U
2-Butanone	5 U	5 U	5 UJ	5 UJ	5 UJ	5 U	NA	5 U	NA	5 U	5 U	NA	5 U	NA	5 UJ	5 U	5 U	25 U
2-Hexanone	5 U	5 U	5 UJ	5 UJ	5 UJ	5 U	NA	5 U	NA	5 U	5 U	NA	5 U	NA	5 UJ	5 U	5 U	25 U
4-Methyl-2-pentanone	5 U	5 U	5 UJ	5 UJ	5 UJ	5 U	NA	5 U	NA	5 U	5 U	NA	5 U	NA	5 UJ	5 U	5 U	25 U
Acetone	5 U	5 U	5 UJ	5 UJ	5 UJ	5 UJ	NA	5 UJ	NA	5 U	5 UJ	NA	5 UJ	NA	5 UJ	5 U	5 U	25 U
Benzene	0.5 U	0.5 U	0.5 J	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 UJ	NA	0.5 U	1.6 J	NA	0.5 U	NA	0.5 UJ	0.5 UJ	0.5 U	2.5 U
Bromochloromethane	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 U	0.5 U	2.5 U
Bromodichloromethane	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 U	0.5 U	2.5 U
Bromoform	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 U	0.5 U	2.5 U
Bromomethane	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 UJ	0.5 U	2.5 U
Carbon disulfide	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 UJ	0.5 U	2.5 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 U	0.5 U	2.5 U
Chlorobenzene	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 U	0.5 U	2.5 U
Chloroethane	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 UJ	0.5 U	2.5 U
Chloroform	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 U	4.2	2.5 U
Chloromethane	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 UJ	0.5 U	2.5 U
Cyclohexane	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 U	0.5 U	2.5 U
Dibromochloromethane	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 U	0.5 U	2.5 U
Dichlorodifluoromethane (Freon-12)	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	NA	0.5 UJ	NA	0.5 UJ	0.5 UJ	NA	0.5 UJ	NA	0.5 UJ	0.5 UJ	0.5 U	2.5 U
Ethylbenzene	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 UJ	0.5 U	2.5 U
Methyl acetate	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 U	0.5 U	2.5 U
Methyl-tert-butyl ether (MTBE)	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 U	0.5 U	2.5 U
Methylcyclohexane	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 U	0.5 U	2.5 U
Methylene chloride	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 U	0.4 J	2.5 U
Styrene	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 UJ	0.5 U	2.5 U
Tetrachloroethene	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.72	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 UJ	0.5 U	2.5 U
Toluene	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 UJ	0.5 U	2.5 U
Trichloroethene	0.5 U	0.5 U	2.2 J	0.77 J	4.9 J	4.3	NA	24	NA	0.5 U	1.1	NA	0.5 U	NA	0.5 UJ	24 J	1.8	1.8 DJ
Trichlorofluoromethane(Freon-11)	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	NA	0.5 UJ	NA	0.5 UJ	0.5 UJ	NA	0.5 UJ	NA	0.5 UJ	0.5 U	0.5 U	2.5 U
Vinyl chloride	0.5 U	0.5 U	9.4 J	0.5 UJ	6.7 J	1.3	NA	1	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	12 J	1.8	2.5 U
Xylene, total	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 UJ	NA	NA
cis-1,2-Dichloroethene	0.5 U	0.5 U	68 J	8 J	140 J	19	NA	27	NA	4.4	0.5 U	NA	10	NA	0.5 UJ	760	52 E	51 D
cis-1,3-Dichloropropene	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 UJ	0.5 U	2.5 U
isopropylbenzene	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 UJ	0.5 U	2.5 U
trans-1,2-Dichloroethene	0.5 U	0.5 U	2.3 J	0.5 UJ	14 J	4.3	NA	2.8	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	47	1.1	2.5 U
trans-1,3-Dichloropropene	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	NA	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	NA	0.5 UJ	0.5 UJ	0.5 U	2.5 U
Total Metals (UG/L)																		
Iron	1,500	1,300	8,600	470	1,600	450	NA	650	NA	660	1,000	NA	1,600	NA	50,000	200 U	NA	NA
Wet Chemistry (MG/L)																		
Alkalinity	260	250	330	270	240	NA	29	NA	110	280	NA	260	NA	260	510	260	270	NA
Chloride	27 J	27 J	8.5 J	17 J	14 J	NA	17	NA	13	59 J	NA	15	NA	19	9.3 J	13 J	16	NA
Ethane	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	NA	0.026 U	NA	0.026 U	0.026 U	NA	0.027 U	NA	0.026 U	0.026 U	26 U	NA
Ethene	0.035 U	0.035 U	0.035 U	0.035 U	0.035 U	0.035 U	NA	0.035 U	NA	0.035 U	0.035 U	NA	0.036 U	NA	0.035 U	0.035 U	35 U	NA
Ferric iron	10 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	NA	10 U	NA	10 U	47	10 U	10 U	NA
Ferrous iron	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	NA	1 UJ	NA	1 UJ	1 U	NA	1 UJ	NA	1 UJ	6.9 J	1 U	1 U	NA
Methane	0.014 U	0.014 U	0.21	0.014 U	0.014 U	0.096	NA	0.025	NA	0.014 U	0.16	NA	0.03	NA	0.014 U	0.014 U	19	NA
Nitrate	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	NA	0.64 J	NA	1.5 J	0.17 J	NA	0.15 J	NA	0.43 J	0.13 U	0.13 U	0.13 U	NA
Nitrite	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	NA	0.13 U	NA	0.13 U	0.13 U	NA	0.13 U	NA	0.13 U	0.13 U	0.13 U	0.13 U	NA
Sulfate	9.7	9.9	72 J	5.5 J	13 J	NA	85	NA	11	62	NA	20	NA	81	160 J	39 J	7.7	NA
Sulfide	0.03 U	0.03 U	0.03 UJ	0.03 UJ	0.03 UJ	0.03 U	NA	0.03 U	NA	0.03 U	0.03 U	NA	0.03 U	NA	0.03 UJ	0.03 UJ	0.03 U	NA
Total organic carbon (TOC)	10 U	10 U	10 U	10 U	10 U	10 U	NA	10 U	NA	10 U	10 U	NA	10 U	NA	12	10 U	10 U	NA

NA - Not analyzed
J - Reported value is estimated
U - Analyte not detected
UJ - Not detected, quantitation limit may be inaccurate

Appendix E
Laboratory Analytical Data
Site 35 Amended Remedial Investigation
MCB Camp Lejeune, North Carolina

Station ID	IR35-MW73		IR35-MW73IW		IR35-MW74		IR35-MW74IW		IR35-MW74IW		IR35-MW80DW		IR35-MW80IW		IR35-GW81[2]		IR35-GW81IW[2]		IR35-GW81IWD[1 2]	
Sample ID	IR35-GW73-06B		IR35-GW73IW-06B		IR35-GW74-06B		IR35-GW74IW-06B		IR35-GW74IW-06BP		IR35-GW80DW-06B		IR35-GW80IW-06B		IR35-GW81-06C		IR35-GW81IW-06C		IR35-GW81IWD-06C	
Sample Date	06/21/06		06/21/06		06/20/06		06/20/06		06/20/06		04/25/06		06/22/06		8/6/06		8/6/06		8/6/06	
Chemical Name																				
Volatile Organic Compounds (UG/L)																				
1,1,1-Trichloroethane	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2,2-Tetrachloroethane	20	J	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2-Trichloroethane	1.7	J	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethane	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethene	0.53	J	1.5	J	0.5	U	2.9		1.4		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,3-Trichlorobenzene	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,4-Trichlorobenzene	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dibromo-3-chloropropane	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dibromoethane	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichlorobenzene	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloroethane	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloropropane	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,3-Dichlorobenzene	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,4-Dichlorobenzene	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
2-Butanone	5	UJ	5	UJ	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
2-Hexanone	5	UJ	5	UJ	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone	5	UJ	5	UJ	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Acetone	5	UJ	5	UJ	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Benzene	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromochloromethane	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromodichloromethane	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromoform	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromomethane	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Carbon disulfide	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Carbon tetrachloride	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chlorobenzene	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloroethane	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloroform	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.7	U	0.5	U	0.5	U	1.3		0.5	U
Chloromethane	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Cyclohexane	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dibromochloromethane	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dichlorodifluoromethane (Freon-12)	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
Ethylbenzene	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Methyl acetate	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Methyl-tert-butyl ether (MTBE)	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Methylcyclohexane	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Methylene chloride	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.31	U	0.5	U	0.5	U	0.5	U
Styrene	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Tetrachloroethene	0.5	J	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Toluene	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.58		0.5	U	0.5	U	0.5	U
Trichloroethene	32	J	1.5	J	0.5	U	0.5	U	6.6		0.5	U	27		0.5	U	0.5	U	0.5	U
Trichlorofluoromethane(Freon-11)	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
Vinyl chloride	1.7	J	250	J	0.5	U	24	J	2.9	J	0.5	U	1.8		0.5	U	0.5	U	0.5	U
Xylene, total	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	NA		NA		NA	
cis-1,2-Dichloroethene	18	J	210	J	0.5	U	150		150		0.5	U	170		0.53		0.42	J	0.5	U
cis-1,3-Dichloropropene	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
isopropylbenzene	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,2-Dichloroethene	6	J	17	J	0.5	U	0.81	J	3.3	J	0.5	U	7.4		0.5	U	0.5	U	0.5	U
trans-1,3-Dichloropropene	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Total Metals (UG/L)																				
Iron	5,700		200	U	760		580		520		220		640		NA		NA		NA	
Wet Chemistry (MG/L)																				
Alkalinity	79		230		400		360		310		560		300		200		220		210	
Chloride	22	J	11	J	10	J	14	J	14	J	43	J	12	J	5.6		5.6		5.8	
Ethane	0.027	U	0.027	U	0.026	U	0.026	U	0.026	U	5.00E-04	U	0.026	U	26	U	27	U	26	U
Ethene	0.036	U	0.036	U	0.035	U	0.035	U	0.035	U	5.00E-04	U	0.035	U	35	U	36	U	35	U
Ferric iron	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Ferrous iron	4.1	J	1	UJ	1	U	1	U	1	U	1.5	J	1	UJ	1	U	1	U	1	U
Methane	0.014	U	0.014	U	0.014	U	0.041		0.035		0.005	U	0.23		14	U	14	U	14	U
Nitrate	0.13	U	0.13	U	0.79		0.13	U	0.13	U	0.13	U	0.18		0.13	U	0.13	U	0.13	U
Nitrite	0.13	U	0.13	U	0.13	U	0.13	U	0.13	U	0.13	U	0.17		0.13	U	0.13	U	0.13	U
Sulfate	100	J	66	J	77	J	16	J	13	J	49	J	130		28		38		37	
Sulfide	0.03	UJ	0.03	UJ	0.03	UJ	0.03	UJ	0.03	UJ	0.03	U	0.03	U	0.03	U	NA		NA	
Total organic carbon (TOC)	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U

NA - Not analyzed
J - Reported value is estimated
U - Analyte not detected
UJ - Not detected, quantitation limit may be inaccurate

Appendix F
Chain of Custody Forms and Data Validation Summary Reports for the April, June, and August 2006 Monitoring Well Sampling Events

DataQual

Environmental Services, LLC

CH2M HILL-VBO
5700 Cleveland Street
Suite 101
Virginia Beach, VA 23462

July 7, 2006
SDG#s E0519, E0520 and E0525–Site 35, Mitkem Corporation
MCB Camp Lejeune, Jacksonville, NC

Dear Ms. Arroyo,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG #s E0519, E0520 and E0525. The data validation was performed in accordance with the EPA CLP Statement of Work, Document OLC03.2 for Low Concentration VOCs, the USEPA CLP National Functional Guidelines for Low Concentration Organic Data Review (June, 2001), and the various methods utilized by the laboratory for the non-CLP parameters. All areas of concern are discussed in the body of the report and a summary of data qualifications is provided.

Sample ID	Lab ID	Matrix	LC-VOA	RSK-175	Alk	IC	SUL	Ferric Fe	Ferrous Fe	TOC
SDG# E0519										
IR35-EB042306	E0519-01A	water	X							
IR35-FB042306	E0519-02A	water	X							
IR35-GW32-06B(2)	E0519-03A	water	X	X	X	X	X	X	X	X
IR35-GW32-06BMS	E0519-03AMS	water	X		X		X		X	
IR35-GW32-06BMSD	E0519-03AMSD	water	X		X		X		X	
IR35-GW32IW-06B(2)	E0519-04A	water	X	X	X	X	X	X	X	X
IR35-GW32IW-06BMS	E0519-04AMS	water				X				
IR35-GW32IW-06BMSD	E0519-04AMSD	water				X				
IR35-GW32IW-06BDUP(2)	E0519-05A	water	X	X	X	X	X	X	X	X
IR35-GW66-06B(2)	E0519-06A	water	X	X	X	X	X	X	X	X
IR35-GW68IW-06B(2)	E0519-07A	water	X	X	X	X	X	X	X	X
IR35-TB042306	E0519-08A	water	X	X						
IR35-GW02-06B(2)	E0519-09A	water	X	X	X	X	X	X	X	X
IR35-GW39IW-06B(2)	E0519-10A	water	X	X	X	X	X	X	X	X
IR35-GW71IW-06B(2)	E0519-11A	water	X	X	X	X	X	X	X	X
IR35-GW30-06B(2)	E0519-12A	water	X	X	X	X	X	X	X	X
IR35-GW30IW-06B(2)	E0519-13A	water	X	X	X	X	X	X	X	X
IR35-GW30-DW-06B(2)	E0519-14A	water	X	X	X	X	X	X	X	X
IR35-GW04-06B(2)	E0519-15A	water	X	X	X	X	X	X	X	X
IR35-GW06-06B(2)	E0519-16A	water	X	X	X	X	X	X	X	X
IR35-GW70IW-06B(2)	E0519-17A	water	X	X	X	X	X	X	X	X
IR35-GW01DW-06B(2)	E0519-18A	water	X	X	X	X	X	X	X	X
SDG# E0520										
IR35-GW10-06B	E0520-01A	water	X	X	X	X	X	X	X	X
IR35-GW10-06BMS	E0520-01AMS	water				X	X		X	
IR35-GW10-06BMSD	E0520-01AMSD	water				X	X		X	
IR35-GW10IW-06B	E0520-02A	water	X	X	X	X	X	X	X	X
IR35-GW03DW-06B	E0520-03A	water	X	X	X	X	X	X	X	X

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Sample ID	Lab ID	Matrix	LC-VOA	RSK-175	Alk	IC	SUL	Ferric Fe	Ferrous Fe	TOC
IR35-GW09-06B	E0520-04A	water	X	X	X	X	X	X	X	X
IR35-GW09IW-06B	E0520-05A	water	X	X	X	X	X	X	X	X
IR35-GW06DW-06B	E0520-06A	water	X	X	X	X	X	X	X	X
IR35-GW06DW-06BMS	E0520-06AMS	water	X							
IR35-GW06DW-06BMSD	E0520-06AMSD	water	X							
IR35-GW40IW-06B	E0520-07A	water	X	X	X	X	X	X	X	X
IR35-GW34-06B	E0520-08A	water	X	X	X	X	X	X	X	X
IR35-GW34IW-06B	E0520-09A	water	X	X	X	X	X	X	X	X
IR35-GW69IW-06B	E0520-10A	water	X	X	X	X	X	X	X	X
IR35-GW10IW-06BDUP	E0520-11A	water	X	X	X	X	X	X	X	X
IR35-GW29-06B	E0520-12A	water	X	X	X	X	X	X	X	X
IR35-GW29-06BMS	E0520-12AMS	water			X					
IR35-GW29-06BMD	E0520-12AMD	water			X					
IR35-GW29IW-06B	E0520-13A	water	X	X	X	X	X	X	X	X
IR35-GW29IW-06BDUP	E0520-14A	water	X	X	X	X	X	X	X	X
IR35-GW31IW-06B	E0520-15A	water	X	X	X	X	X	X	X	X
IR35-GW31-06B	E0520-16A	water	X	X	X	X	X	X	X	X
IR35-EB042406	E0520-17A	water	X							
SDG# E0525										
IR35-GW14-06B	E0525-01A	water	X	X	X	X	X	X	X	X
IR35-GW14-06BMS	E0525-01AMS	water			X	X	X		X	
IR35-GW14-06BMSD	E0525-01AMSD	water			X	X	X		X	
IR35-GW14IW-06B	E0525-02A	water	X	X	X	X	X	X	X	X
IR35-GW37-06B	E0525-03A	water	X	X	X	X	X	X	X	X
IR35-GW37IW-06B	E0525-04A	water	X	X	X	X	X	X	X	X
IR35-GW37-06BDUP	E0525-05A	water	X	X	X	X	X	X	X	X
IR35-EB042506	E0525-06A	water	X							
IR35-TB042506	E0525-07A	water	X	X						
IR35-GW80DW-06B	E0525-08A	water	X	X	X	X	X	X	X	X

(2) – indicates that there were 2 aliquots of each of these samples taken in the field.

The following quality control blanks were provided with these SDGs: samples IR35-TB042306 and IR35-TB042506-trip blanks; sample IR35-FB042306-field blank; samples IR35-EB042306, IR35-EB042406 and IR35-EB042506-equipment blanks. The following field duplicate pairs were provided with these SDGs: sample IR35-GW32IW-06BDUP-field duplicate of IR35-GW32IW-06B; sample IR35-GW32IW-06B2DUP-field duplicate of IR35-GW32IW-06B2; sample IR35-GW68IW-06B2-field duplicate of IR35-GW68IW-06B; sample IR35-GW10IW-06BDUP-field duplicate of IR35-GW10IW-06B; sample IR35-GW29-06BDUP-field duplicate of IR35-GW29-06B; and sample IR35-GW37-06BDUP-field duplicate of sample IR35-GW37-06B. The samples were evaluated based on the following criteria:

- Data Completeness *
- Technical Holding Times
- GC/MS Tuning *
- GC Performance *
- Initial/Continuing Calibrations
- Internal Standards
- Blanks

- Surrogate Recoveries
- Laboratory Control Samples *
- Matrix Spike Recoveries
- Matrix Duplicate RPDs
- Field Duplicates
- Identification/Quantitation
- Reporting Limits *
- Tentatively Identified Compounds *

* - indicates that no qualifications were required based on this criteria

Overall Evaluation of Data/Potential Usability Issues

A summary of qualifications applied to the sample results are noted below for the fractions validated. Specific details regarding qualification of the data are addressed in the Specific Evaluation section of this narrative. If an issue is not addressed there were no actions required based on unmet quality criteria.

LC-VOA

SDG# E0519

The continuing calibration standards associated with the samples exhibited non-compliant %Ds for some compounds. Qualifications were added to the data.

Blank contamination was noted in the holding and field QC blanks associated with samples in this batch. Qualifications were added to the data.

Several samples exhibited non-compliant recoveries for one or two deuterated compounds which resulted in qualifying associated compounds as estimated.

Several samples required a dilution to obtain positive results within the calibration range.

SDG# E0520

The continuing calibration standards associated with the samples exhibited non-compliant %Ds for some compounds. Qualifications were added to the data.

Blank contamination for TICs was noted in the field QC blanks associated with samples in this batch. Qualifications were added to the data.

One sample exhibited high internal standard area recoveries for all standards that resulted in qualifying all positive results as estimated.

Several samples required a dilution to obtain positive results within the calibration range.

SDG# E0525

The continuing calibration standards associated with the samples exhibited non-compliant %Ds for some compounds. Qualifications were added to the data.

Blank contamination was noted in the field QC blanks associated with samples in this batch. Qualifications were added to the data.

Two samples exhibited non-compliant recoveries for one or more deuterated compounds which resulted in qualifying associated compounds as estimated.

Two samples required a dilution to obtain positive results within the calibration range.

RSK-175

SDG # E0519

Three samples required dilutions to obtain positive results within the calibration range. Reported E flagged results were rejected in favor of corresponding results from the dilution analyses.

SDG # E0520

Two samples required dilutions to obtain positive results within the calibration range. Reported E flagged results were rejected in favor of corresponding results from the dilution analyses.

Wet Chemistry Parameters

SDG #E0519

Samples analyzed outside the 24 hour holding time allowed by the lab (flagged H by the lab) for the Ferrous iron analysis were qualified as estimated J/UJ.

The associated MS/MSD analysis for the IC parameter nitrate exhibited recoveries above and below the QC limit of 90%-110%, and a RPD above the 20% QC limit. The analyte was qualified as estimated J/UJ in all samples.

The field duplicate pair of sample IR86-GW32IW-06B exhibited an RPD greater than 100% (112%) for the analyte sulfate in the IC analysis. The reported results for sulfate in the field duplicate pair were qualified as estimated J.

SDG #E0520

Samples analyzed outside the 24 hour holding time allowed by the lab (flagged H by the lab) for the Ferrous iron analysis were qualified as estimated J/UJ.

The associated MS/MSD analyses for the IC parameters chloride and nitrate exhibited recoveries above the upper QC limit of 110% for which qualifications were required. Positive results for chloride and nitrate were qualified as estimated J in all samples.

Two samples required dilution to obtain positive results within the calibration range. Reported E flagged results were rejected in favor of corresponding results from the dilution analyses.

SDG #E0525

Samples analyzed outside the 24 hour holding time allowed by the lab (flagged H by the lab) were qualified as estimated J/UJ for the Ferrous iron analysis.

The associated MS/MSD analysis for the IC parameters chloride and sulfate exhibited recoveries above the upper QC limit of 110%. Positive results for chloride and sulfate were qualified as estimated J.

Specific Evaluation of Data

Data Completeness

Resubmissions were required for the IC and TOC fractions. Calibration data (raw data and/or summaries) were missing from the data package. Sample data was missing from the data package for the IC fraction. This information was requested from the laboratory. All information requested was received from the lab with the exception of the raw data for the TOC initial calibrations. According to an e-mail response from the lab, the instrument does not print out raw data for standards injected as part of the initial calibration sequence. The system processes the results of the standard injections and provides a calibration curve summary. The summary was provided by the lab. Corrected ferrous/ferric results were received from the laboratory for an incorrectly reported result. It was noted that some of the ferrous iron samples were filtered prior to analysis. A general question regarding this was sent to the lab. Samples were filtered due to significant suspended solids. Copies of all e-mail correspondence are included in the validation worksheets portion of this validation report.

Technical Holding Times

According to chain of custody records, sampling was performed on 04/24/06 and samples were received at the laboratory 04/25/06. All sample preparation and analysis was

performed within CLP and/or method holding time requirements with the following exception.

Wet Chemistry

SDGs # E0519, E0520 and E0525

For the ferrous iron fraction, all samples analyzed outside of the 24 hour holding time used by the laboratory were qualified as estimated J/UJ with a qualifier code of HT. These samples were analyzed as soon as possible after receipt. The laboratory used an H flag to indicate these results on the data results forms. The following samples were flagged as estimated J/UJ due to the holding time violation:

SDG E0519: IR35-GW32-06B2, IR35-GW32IW-06B2, IR35-GW32IW-06B2DUP, IR35-GW66-06B2, IR35-GW68IW-06B2, IR35-GW02-06B2, IR35-GW39IW-06B2, IR35-GW71IW-06B2, IR35-GW30-06B2, IR35-GW30IW-06B2, IR35-GW30DW-06B2, IR35-GW04-06B2, IR35-GW06-06B2, IR35-GW70IW-06B2 and IR35-GW01DW-06B2.

SDG E0520: IR35-GW10-06B, IR35-GW10IW-06B, IR35-GW03DW-06B, IR35-GW09-06B, IR35-GW09IW-06B, IR35-GW06DW-06B, IR35-GW40IW-06B, IR35-GW34-06B, IR35-GW34IW-06B, IR35-GW10IW-06BDUP, IR35-GW29-06B, and IR35-GW29-06BDUP.

SDG E0525: IR35-GW14-06B, IR35-GW14IW-06B, IR35-GW37-06B, IR35-GW37IW-06B, IR35-GW37-06BDUP, and IR35-GW80DW-06B.

Initial/Continuing Calibration

VOA

SDG# E0519

Calibration standards exhibited %Ds that were non-compliant. A summary of these non-compliances and affected samples are noted in the following table. Sample results were qualified as indicated.

Standard ID	Compound(s)	RRF, %RSD, %D	Samples	Q Flag	Qualifier Code
CC 04/26/06	dichlorodifluoromethane trichlorofluoromethane 1,1-dichloroethene 1,1,2-trichloro-1,2,2-trifluoroethane acetone methylene chloride	47.0% 42.3% 39.2% 70.1% 85.7% 32.4%	IR35-EB042306, IR35-FB042306, IR35-GW32-06B	J/UJ	CCH

Standard ID	Compound(s)	RRF, %RSD, %D	Samples	Q Flag	Qualifier Code
CC 04/27/06	dichlorodifluoromethane trichlorofluoromethane 1,1,2-trichloro-1,2,2-trifluoroethane acetone benzene	49.4% 35.0% 49.8% 61.9% 32.6%	IR35-GW32IW-06B, IR35-GW32IW-06BDUP, IR35-GW68IW-06B, IR35-TB042306, IR35-GW02-06B, IR35-GW30-06B, IR35-GW30IW-06B, IR35-GW30DW-06B, IR35-GW04-06B, IR35-GW06-06B, IR35-GW70IW-06B, IR35-GW01DW-06B	J/UJ	CCH
CC 05/01/06	dichlorodifluoromethane trichlorofluoromethane 1,1-dichloroethene 1,1,2-trichloro-1,2,2-trifluoroethane acetone	71.8% 50.5% 39.2% 52.9% 81.0%	IR35-GW66-06B, IR35-GW39IW-06B, IR35-GW71IW-06B	J/UJ	CCH

SDG# E0520

Calibration standards exhibited %Ds that were non-compliant. A summary of these non-compliances and affected samples are noted in the following table. Sample results were qualified as indicated.

Standard ID	Compound(s)	RRF, %RSD, %D	Samples	Q Flag	Qualifier Code
CC 05/01/06	dichlorodifluoromethane trichlorofluoromethane	75.3% 55.3%	all samples	J/UJ	CCH

SDG# E0525

Calibration standards exhibited %Ds that were non-compliant. A summary of these non-compliances and affected samples are noted in the following table. Sample results were qualified as indicated.

Standard ID	Compound(s)	RRF, %RSD, %D	Samples	Q Flag	Qualifier Code
CC 05/02/06 CC 05/03/06	dichlorodifluoromethane trichlorofluoromethane	57.3%, 52.6% 46.0%, 35.0%	all samples	J/UJ	CCH
CC 05/02/06	1,2-dichlorobenzene tetrachloroethene	33.3% 31.1%	IR35-GW14-06B, IR35-GW14IW-06B, IR35-GW37-06B	J/UJ	CCH

Internal Standards

VOA

SDG# E0520

Sample IR35-GW10IW-06BDUP exhibited high recoveries for all three internal standards; therefore all positive results were qualified as estimated (J), qualifier code: ISH.

Blanks

VOA

SDG# E0519

The associated holding and field QC blanks exhibited contamination as noted in the following table. Compounds for which there was no action required, are not included in the following table. The method blanks associated with field QC blanks exhibited some contamination but the QC blanks were not qualified, per the request of the client.

Blank ID	Compound	Concentration	Reporting Limit
VHBLK5A	chloroform	0.30J ug/L	0.50 ug/L
IR35-TB042306	chloroform	1.8 ug/L	0.50 ug/L
IR35-EB042306	chloroform	3.5 ug/L	0.50 ug/L
IR35-EB042406	chloroform	2.9 ug/L	0.50 ug/L
IR35-FB042305	chloroform	3.9 ug/L	0.50 ug/L

Associated samples and required qualifications are noted in the following table.

Sample ID	Compound	Q Flag	Qual Code
IR35-GW30DW-06B	chloroform	CRQL	BL

SDG# E0520

Due to method and/or field blank TIC contamination, some sample TICs were rejected (R), qualifier code BL.

SDG# E0525

The associated field QC blanks exhibited contamination as noted in the following table. Compounds for which there was no action required, are not included in the following table. The method blanks associated with field QC blanks exhibited some contamination but the QC blanks were not qualified, per the request of the client.

Blank ID	Compound	Concentration	Reporting Limit
IR35-TB042506	chloroform	3.5 ug/L	0.50 ug/L
IR35-FB042305	chloroform	3.9 ug/L	0.50 ug/L

Associated samples and required qualifications are noted in the following table.

Sample ID	Compound	Q Flag	Qual Code
IR35-GW80DW-06B	chloroform	U	BL

Surrogates

VOA

SDG# E0519

The samples listed in the table below exhibited non-compliant surrogate (deuterated monitoring compounds) recovery for the surrogates listed, qualifications were applied as listed.

Sample ID	Non-compliant DMC	% Rec	QC Limit	Q Flag	Qual Code
IR35-GW32IW-06BDUP	chloroform-d	76%	80-123%	J/UJ	SSL
IR35-GW30DW-06B	chloroform-d	132%	80-123%	J	SSH
IR35-GW04-06B	chloroform-d	136%	80-123%	J	SSH
IR35-GW06-06B	chloroform-d	132%	80-123%	J	SSH
	trans-1,3-dichloropropene-d4	78%	80-123%	J/UJ	SSL
IR35-GW70IW-06B	chloroform-d	134%	80-123%	J	SSH
IR35-GW01DW-06B	chloroform-d	14%	80-123%	J	SSH
IR35-FB042306	toluene-d8	72%	77-120%	J/UJ	SSL
	trans-1,3-dichloropropene-d4	70%	80-128%		
IR35-GW32-06B	1,1,2,2-tetrachloroethane-d2	138%	75-131%	J	SSH
IR35-GW32IW-06B	1,2-dichloropropane-d6	74%	84-123%	J/UJ	SSL
IR35-GW30-06B	1,2-dichloropropane-d6	78%	84-123%	J/UJ	SSL
	trans-1,3-dichloropropene-d4	54%	80-128%		
IR35-GW30IW-06B	1,2-dichloropropane-d6	80%	84-123%	J/UJ	SSL
	trans-1,3-dichloropropene-d4	70%	80-128%		

SDG# E0525

The samples listed in the table below exhibited non-compliant surrogate (deuterated monitoring compounds) recovery for the surrogates listed, qualifications were applied as listed.

Sample ID	Non-compliant DMC	% Rec	QC Limit	Q Flag	Qual Code
IR35-EB042506	vinyl chloride-d3	0%	49-138%	J/R	SSL
	1,1-dichloroethene-d2	56%	65-130%	J/UJ	SSL
	1,2-dichloropropane-d6	82%	84-123%	J/UJ	SSL
IR35-GW37IW-06B	1,2-dichloropropane-d6	78%	84-123%	J/UJ	SSL

Matrix Spike Recoveries

Wet Chemistry

SDG #E0520

The MS/MSD pair of sample IR35-GW10-06B analyzed for the IC fraction exhibited spike recoveries above the upper QC limit of %110 for chloride and nitrate in the MS and the MSD. Associated samples, non-compliant analytes and required qualifications are noted in the following table.

MS/MSD ID	Analyte	% R	QC Limit	Affected Samples	Q Flag	Qual Code
IR35-GW10-06B	chloride	118/111	90-110%	all samples +	J+	MSH
	nitrate	126/122				

SDG #E0525

The MS/MSD pair of sample IR35-GW14-06B analyzed for the IC fraction exhibited spike recoveries above the upper QC limit of %110 for chloride and sulfate. Associated samples, non-compliant analytes and required qualifications are noted in the following table.

MS/MSD ID	Analyte	% R	QC Limit	Affected Samples	Q Flag	Qual Code
IR35-GW14-06B	chloride	119	90-110%	all samples +	J+	MSH
	sulfate	117				

Matrix Duplicate Precision

Wet Chemistry

SDG #E0519

The MS/MSD pair of sample IR35-GW32IW-06B2 analyzed for the IC fraction exhibited non-compliant spike recoveries above and below the QC limit of %90-110% for nitrogen as N (nitrate) in the MS and MSD. The disparate recoveries caused the RPD for the spike pair to be above the QC limit of 20% RPD. Associated samples, non-compliant analytes and required qualifications are noted in the following table.

MS/MSD ID	Analyte	RPD	QC Limit	Affected Samples	Q Flag	Qual Code
IR35-GW32IW-06B	nitrate	25.1	20%	all samples +/-	J/UJ	MDP

Field Duplicates

Wet Chemistry

SDG# E0519

The field duplicate pair of sample IR35-GW32IW-06B2 exhibited an RPD greater than 100% (112%) for the analyte sulfate in the IC analysis. The reported results for sulfate in the field duplicate pair were qualified as estimated J with a qualifier code of FD.

Identification/Quantitation

VOA

SDG# E0519

A dilution was required for samples IR35-GW32-06B, IR35-GW32IW-06B, IR35-GW32IW-06BDUP, IR35-GW68IW-06B and IR35-GW30IW-06B; therefore, the E-flagged compound results were not used in the initial analysis in favor of the corresponding D-flagged compound result in the dilution (qualifier code: DL).

SDG# E0520

A dilution was required for samples IR35-GW10IW-06B, IR35-GW40IW-06B, IR35-GW10IW-06BDUP, IR35-GW29-06B, IR35-GW29IW-06B, IR35-GW29-06BDUP, IR35-GW31IW-06B and IR35-GW31-06B; therefore, the E-flagged compound results were not used in the initial analysis in favor of the corresponding D-flagged compound result in the dilution.

SDG# E0525

A dilution was required for samples IR35-GW14-06B and IR35-GW14IW-06B; therefore, the E-flagged compound results were not used in the initial analysis in favor of the corresponding D-flagged compound result in the dilution.

RSK-175

SDG# E0519

Samples IR35-GW39IW-06B, IR35-GW02-06B, and IR35-GW39IW-06BDUP required dilutions to accurately quantitate target compounds. All E-flagged results in the initial analysis of these samples are rejected in favor of the corresponding result reported in the dilution analysis with a qualifier code of DL.

SDG# E0520

Samples IR35-GW29-06B and IR35-GW29-06BDUP required dilutions to accurately quantitate target compounds. All E-flagged results in the initial analysis of these samples are rejected in favor of the corresponding result reported in the dilution analysis with a qualifier code of DL.

Wet Chemistry Parameters

SDG# E0520

Samples IR35-GW34IW-06B and IR35-GW40IW-06 required dilutions to accurately quantitate target analyte. All E-flagged results in the initial analysis of these samples are rejected in favor of the corresponding result reported in the dilution analysis with a qualifier code of DL.

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,

Laura Maschhoff

Laura Maschhoff
President

Jacqueline Cleveland

Jacqueline Cleveland
Vice President

Summary of Data Qualifications

VOA

SDG# E0519

Sample ID	Compound	Results	Q-Flag	Qualifier Code
IR35-EB042306, IR35-FB042306, IR35-GW32-06B	dichlorodifluoromethane trichlorofluoromethane 1,1-dichloroethene 1,1,2-trichloro-1,2,2- trifluoroethane acetone methylene chloride	+/-	J/UJ	CCH
IR35-GW32IW-06B, IR35-GW32IW-06BDUP, IR35-GW68IW-06B, IR35-TB042306, IR35-GW02-06B, IR35-GW30-06B, IR35-GW30IW-06B, IR35-GW30DW-06B, IR35-GW04-06B, IR35-GW06-06B, IR35-GW70IW-06B, IR35-GW01DW-06B	dichlorodifluoromethane trichlorofluoromethane 1,1,2-trichloro-1,2,2- trifluoroethane acetone benzene	+/-	J/UJ	CCH
IR35-GW66-06B, IR35-GW39IW-06B, IR35-GW71IW-06B	dichlorodifluoromethane trichlorofluoromethane 1,1-dichloroethene 1,1,2-trichloro-1,2,2- trifluoroethane acetone	+/-	J/UJ	CCH
IR35-GW30DW-06B	chloroform	+	U	BL
IR35-GW32IW-06BDUP	chloroform-d	+/-	J/UJ	SSL
IR35-GW30DW-06B	chloroform-d	+	J	SSH
IR35-GW04-06B	chloroform-d	+	J	SSH
IR35-GW06-06B	chloroform-d	+	J	SSH
	trans-1,3-dichloropropene-d4	+/-	J/UJ	SSL
IR35-GW70IW-06B	chloroform-d	+	J	SSH
IR35-GW01DW-06B	chloroform-d	+	J	SSH
IR35-FB042306	toluene-d8	+/-	J/UJ	SSL
	trans-1,3-dichloropropene-d4			
IR35-GW32-06B	1,1,2,2-tetrachloroethane-d2	+	J	SSH
IR35-GW32IW-06B	1,2-dichloropropane-d6	+/-	J/UJ	SSL
IR35-GW30-06B	1,2-dichloropropane-d6	+/-	J/UJ	SSL
	trans-1,3-dichloropropene-d4			
IR35-GW30IW-06B	1,2-dichloropropane-d6	+/-	J/UJ	SSL
	trans-1,3-dichloropropene-d4			
IR35-GW32-06B, IR35-GW32IW-06B, IR35-GW32IW-06BDUP, IR35-GW68IW-06B and IR35-GW30IW-06B	all E-flagged compounds	+	R	DL
IR35-GW32-06BDL, IR35-GW32IW-06BDL, IR35-GW32IW-06BDUPDL, IR35-GW68IW-06BDL and IR35-GW30IW-06BDL	all results except D-flagged compounds	+/-	R	DL

Summary of Data Qualifications

VOA

SDG# E0520

Sample ID	Compound	Results	Q-Flag	Qualifier Code
all samples	dichlorodifluoromethane trichlorofluoromethane	+/-	J/UJ	CCH
IR35-GW10IW-06DUP	all results	+	J	ISH
all samples	TICs (field blanks)	+	R	BL
IR35-GW10IW-06B, IR35-GW40IW-06B, IR35-GW10IW-06BDUP, IR35-GW29-06B, IR35-GW29IW-06B, IR35-GW29-06BDUP, IR35-GW31IW-06B and IR35-GW31-06B	all E-flagged compounds	+	R	DL
IR35-GW10IW-06BDL, IR35-GW40IW-06BDL, IR35-GW10IW-06BDUPDL, IR35-GW29-06BDL, IR35-GW29IW-06BDL, IR35-GW29-06BDUPDL, IR35-GW31IW-06BDL and IR35-GW31-06BDL	all results except D-flagged compounds	+/-	R	DL

SDG# E0525

Sample ID	Compound	Results	Q-Flag	Qualifier Code
all samples	dichlorodifluoromethane trichlorofluoromethane	+/-	J/UJ	CCH
IR35-GW14-06B, IR35-GW14IW-06B, IR35-GW37-06B	1,2-dichlorobenzene tetrachloroethene	+/-	J/UJ	CCH
IR35-GW80DW-06B	chloroform	+	U	BL
IR35-EB042506	vinyl chloride-d3	+/-	J/R	SSL
	1,1-dichloroethene-d2	+/-	J/UJ	SSL
	1,2-dichloropropane-d6	+/-	J/UJ	SSL
IR35-GW37IW-06B	1,2-dichloropropane-d6	+/-	J/UJ	SSL
IR35-GW14-06B, IR35-GW14IW-06B	all E-flagged compounds	+	R	DL
IR35-GW14-06BDL, IR35-GW14IW-06BDL	all results except D-flagged compounds	+/-	R	DL

RSK-175

SDG# E0519

Sample ID	Compound	Results	Q-Flag	Qual Code
IR35-GW39IW-06B, IR35-GW02-06B, IR35-GW32IW-06BDUP	methane	+E	R	DL
IR35-GW39IW-06BDL, IR35-GW02-06BDL, IR35-GW32IW-06BDUPDL	ethane ethene	+/-	R	DL

Summary of Data Qualifications

RSK-175

SDG# E0520

Sample ID	Compound	Results	Q-Flag	Qual Code
IR35-GW29-06B, IR35-GW29-06BDUP	methane	+E	R	DL
IR35-GW29-06BDL, IR35-GW29-06BDUPDL	ethane ethene	+/-	R	DL

Wet Chemistry Parameters

SDG # E0519

Sample ID	Analyte	Results	Q-Flag	Qual Code
IR35-GW32-06B2, IR35-GW32IW-06B2, IR35-GW32IW-06B2DUP, IR35-GW66-06B2, IR35-GW68IW-06B2, IR35-GW02-06B2, IR35-GW39IW-06B2, IR35-GW71IW-06B2, IR35-GW30-06B2, IR35-GW30IW-06B2, IR35-GW30DW-06B2, IR35-GW04-06B2, IR35-GW06-06B2, IR35-GW70IW-06B2, IR35-GW01DW-06B2	Ferrous Fe	+/- H	J/UJ	HT
all samples	nitrate	+/-	J/UJ	MDP
IR35-GW32IW-06B2, IR35-GW32IW-06B2DUP	sulfate	+	J	FD

SDG # E0520

Sample ID	Analyte	Results	Q-Flag	Qual Code
IR35-GW10-06B, IR35-GW10IW-06B, IR35-GW03DW-06B, IR35-GW09-06B, IR35-GW09IW-06B, IR35-GW06DW-06B, IR35-GW40IW-06B, R35-GW34-06B, IR35-GW34IW-06B, IR35-GW10IW-06BDUP, IR35-GW29-06B, IR35-GW29-06BDUP	Ferrous Fe	+/- H	J/UJ	HT
all samples	chloride nitrate	+	J	MSH
IR35-GW34IW-06B, IR35-GW40IW-06B	chloride	+E	R	DL

SDG # E0525

Sample ID	Analyte	Results	Q-Flag	Qual Code
IR35-GW14-06B, IR35-GW14IW-06B, IR35-GW37-06B, IR35-GW37IW-06B, IR35-GW37-06BDUP, IR35-GW80DW-06B	Ferrous Fe	+/- H	J/UJ	HT
all samples	chloride sulfate	+	J	MSH

Glossary of Qualification Flags and Abbreviations

Qualification Flags (Q-Flags)

U	not detected above the reported sample quantitation limit
J	estimated value
UJ	reported quantitation limit is qualified as estimated
R	result is rejected; the presence or absence of the analyte cannot be verified
D	result value is based on dilution analysis result
NJ	analyte has been tentatively identified, estimated value
L	analyte present, biased low
UL	not detected, quantitation limit is probably higher
K	analyte present, biased high

Method/Preparation Blank Qualification Flags (Q-Flags)

NA	The sample result for the blank contaminant is greater than the sample RL and is greater than 5X (10X for common laboratory contaminants) the blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.
U	The sample result for the blank contaminant is greater than the sample RL and is less than 5X (10X for common laboratory contaminants) the blank value.
RL	The sample result for the blank contaminant is less than the sample RL and is less than 5X (10X for common laboratory contaminants) the blank value.

General Abbreviations

RL	reporting limit
+	positive result
-	non-detect result

QUALIFIER CODE REFERENCE

Qualifier	Description
TN	Tune
BSL	Blank Spike/LCS - High Recovery
BSH	Blank Spike/LCS - Low Recovery
BD	Blank Spike/Blank Spike Duplicate (LCS/LCSD) Precision
BRL	Below Reporting Limit
ISL	Internal Standard - Low Recovery
ISH	Internal Standard - High Recovery
MSL	Matrix Spike and/or Matrix Spike Duplicate - Low Recovery
MSH	Matrix Spike and/or Matrix Spike Duplicate - High Recovery
MI	Matrix interference obscuring the raw data
MDP	Matrix Spike/Matrix Spike Duplicate Precision
2S	Second Source - Bad reproducibility between tandem detectors
SSL	Spiked Surrogate - Low Recovery
SSH	Spiked Surrogate - High Recovery
SD	Serial Dilution Reproducibility
ICL	Initial Calibration - Low Relative Response Factors (RRF)
ICH	Initial Calibration - High Relative Response Factors (RRF)
ICB	Initial Calibration - Bad Linearity or Curve Function
CCL	Continuing Calibration - Low Recovery or %Difference
CCH	Continuing Calibration - High Recovery or %Difference
LD	Lab Duplicate Reproducibility
HT	Holding Time
PD	Pesticide Degradation
2C	Second Column - Poor Dual Column Reproducibility
LR	Concentration Exceeds Linear Range
BL	Blank Contamination
RE	Redundant Result - due to Re-analysis or Re-extraction
DL	Redundant Result - due to Dilution
FD	Field Duplicate
OT	Other - explained in data validation report

CH2M HILL-VBO
5700 Cleveland Street
Suite 101
Virginia Beach, VA 23462

August 13, 2006
SDG#s ME0841 and ME0864 –Site 35, Mitkem Corporation
MCB Camp Lejeune, Jacksonville, NC

Dear Ms. Arroyo,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG #s ME0841 and ME0864. The data validation was performed in accordance with the EPA CLP Statement of Work, Document OLC03.2 for Low Concentration VOCs and the USEPA CLP National Functional Guidelines for Low Concentration Organic Data Review (June, 2001), and the various methods utilized by the laboratory for the non-CLP parameters. All areas of concern are discussed in the body of the report and a summary of data qualifications is provided.

Sample ID	**Lab ID**	**Matrix**	**LC-VOA**	**RSK-175**	**Alk**	**IC**	**SUL**	**Ferric** Fe	**Ferrous** Fe	**TOC**
SDG# ME0841										
IR35-GW72IW-06B	E0841-01	water	X	X	X	X	X	X	X	X
IR35-GW72IW-06BMS	E0841-01MS	water							X	
IR35-GW72IW-06BMD	E0841-01MD	water							X	
IR35-GW74-06B	E0841-02	water	X	X	X	X	X	X	X	X
IR35-GW74IW-06B	E0841-03	water	X	X	X	X	X	X	X	X
IR35-GW74IW-06BP	E0841-04	water	X	X	X	X	X	X	X	X
IR35-GW74IW-06BPMS	E0841-04MS	water				X				
IR35-GW74IW-06BPMSD	E0841-04MSD	water				X				
IR35-TB062006	E0841-05	water	X							
IR35-GW49-06B	E0841-06	water	X	X	X	X	X	X	X	X
IR35-GW55IW-06B	E0841-07	water	X	X	X	X	X	X	X	X
IR35-GW64IW-06B	E0841-08	water	X	X	X	X	X	X	X	X
IR35-GW62IW-06B	E0841-09	water	X	X	X	X	X	X	X	X
IR35-GW63-06B	E0841-10	water	X	X	X	X	X	X	X	X
IR35-GW49IW-06B	E0841-11	water	X	X	X	X	X	X	X	X
IR35-GW47-06B	E0841-12	water	X	X	X	X	X	X	X	X
IR35-GW55-06B	E0841-13	water	X	X	X	X	X	X	X	X
IR35-GW47IW-06B	E0841-14	water	X	X	X	X	X	X	X	X
IR35-GW73IW-06B	E0841-15	water	X	X	X	X	X	X	X	X
IR35-GW72-06B	E0841-16	water	X	X	X	X	X	X	X	X
IR35-GW73-06B	E0841-17	water	X	X	X	X	X	X	X	X
IR35-TB062106	E0841-18	water	X							
IR35-GW07DW-06B	E0841-19	water	X	X	X	X	X	X	X	X
IR35-GW60-06B	E0841-20	water	X	X	X	X	X	X	X	X
IR35-GW60-06B MS	E0841-20MS	water	X	X	X	X	X		X	X
IR35-GW60-06B MSD	E0841-20MSD	water	X	X	X	X	X		X	X

Sample ID	Lab ID	Matrix	LC-VOA	RSK-175	Alk	IC	SUL	Ferric Fe	Ferrous Fe	TOC
SDG#ME0864										
IR35-GW60IW-06B	E0864-01	water	X	X	X	X	X	X	X	X
IR35-GW60IW-06BP	E0864-02	water	X	X	X	X	X	X	X	X
IR35-GW38-06B	E0864-03	water	X	X	X	X	X	X	X	X
IR35-GW80IW-06B	E0864-04	water	X	X	X	X	X	X	X	X
IR35-GW38IW-06B	E0864-05	water	X	X	X	X	X	X	X	X
IR35-GWGW38IW-06BP	E0864-06	water	X	X	X	X	X	X	X	X
IR35-TB062206	E0864-07	water	X							
IR35-FB062206	E0864-08	water	X	X	X	X	X	X	X	X
IR35-EB062206	E0864-09	water	X	X	X	X	X	X	X	X
IR35-GW38-06B MS	E0864-03MS	water	X	X	X	X	X		X	X
IR35-GW38-06B MSD	E0864-03MSD	water	X	X	X	X	X		X	X

The following quality control samples were provided with these SDGs: samples IR35-TB0062006, IR35-TB062106 and IR35-TB062206 -trip blanks; sample IR35-FB062206-field blank; samples IR35-EB062206-equipment blank; sample IR35-GW74IW-06BP-field duplicate of sample IR35-GW74IW-06B; sample IR35-GW38IW-06BP-field duplicate of sample IR35-GW34IW-06B and sample IR35-GW60IW-06BP-field duplicate of sample IR35-GW60IW-06B. The samples were evaluated based on the following criteria:

- Data Completeness *
- Technical Holding Times
- GC/MS Tuning *
- GC Performance *
- Initial/Continuing Calibrations *
- Internal Standards *
- Blanks
- Surrogate Recoveries
- Laboratory Control Samples *
- Matrix Spike Recoveries
- Matrix Duplicate RPDs *
- Field Duplicates
- Identification/Quantitation
- Reporting Limits *
- Tentatively Identified Compounds *

* - indicates that no qualifications were required based on this criteria

Overall Evaluation of Data/Potential Usability Issues

A summary of qualifications applied to the sample results are noted below for the fractions validated. Specific details regarding qualification of the data are addressed in the Specific Evaluation section of this narrative. If an issue is not addressed there were no actions required based on unmet quality criteria.

LC-VOA

SDG# ME0841

Two of the four field sample coolers tested at 13ºC at time of receipt to the laboratory. These samples were at this temperature for less than two days. The National Functional Guidelines criterion for low concentration volatiles temperature is 4Cº±2ºC. Therefore, the field samples that were in these coolers were qualified as estimated due to non-compliant sample temperature.

One sample exhibited non-compliant recoveries for several deuterated compounds which resulted in qualifying associated compounds as estimated.

The field duplicate pair that was submitted in the data package did not exhibit comparable results for two compounds. This resulted in the qualification of the positive results as estimated.

Several samples required a dilution to obtain positive results within the calibration range.

SDG# ME0864

Blank contamination was noted in the holding and field QC blanks associated with samples in this batch. Qualifications were added to the data.

Several samples exhibited non-compliant recoveries for one to four deuterated compounds which resulted in qualifying associated compounds as estimated.

Several samples required a dilution to obtain positive results within the calibration range.

Wet Chemistry Parameters

SDG #E0841

Samples analyzed outside the 24 hour holding time allowed by the lab (flagged H by the lab) for the Ferrous iron analysis were qualified as estimated J/UJ.

The associated MS/MSD analyses for the IC parameters chloride and sulfate exhibited recoveries below the QC limit of 80%-120%. The analytes were qualified as estimated J/UJ in all samples.

The associated MS analysis for sulfide exhibited a recovery below the QC limit of 75%-125%. The analyte was qualified as estimated J/UJ in all samples.

SDG #E0864

Samples analyzed outside the 24 hour holding time allowed by the lab (flagged H by the lab) for the Ferrous iron analysis were qualified as estimated J/UJ.

The associated MS/MSD analyses for the IC parameter chloride exhibited recoveries below the QC limit of 80%-120%. The analyte was qualified as estimated J/UJ in all samples.

Specific Evaluation of Data

Data Completeness

The SDG was received complete and intact. Resubmissions were not required.

Technical Holding Times

According to chain of custody records, sampling was performed on 04/23-25/06 and samples were received at the laboratory 04/25-26/06. All sample preparation and analysis was performed within CLP holding time requirements.

LC-VOA

SDG# ME0841

Two of the four field sample coolers tested at 13ºC at time of receipt to the laboratory. These field samples were at this temperature for less than two days. The National Functional Guidelines criterion for low concentration volatiles temperature is 4Cº±2ºC. Therefore, the samples listed were qualified as estimated due to non-compliant sample temperature, (qualifier code, OT): IR35-GW49-06B, IR35-GW55IW-06B, IR35-GW64IW-06B, IR35-GW62IW-06B, IR35-GW63-06B, IR35-GW49IW-06-B, IR35-GW47-06B, IR35-GW55-06B, IR35-GW47IW-06B, IR35GW73IW-06B, IR35-GW72-06B, IR35-GW73-06B and IR35-TB062106.

Wet Chemistry

SDGs # E0841 and E0864

For the ferrous iron fraction, all samples analyzed outside of the 24 hour holding time used by the laboratory were qualified as estimated J/UJ with a qualifier code of HT. These samples were analyzed as soon as possible after receipt. The laboratory used an H flag to indicate these results on the data results forms. The following samples were flagged as estimated J/UJ due to the holding time violation:

SDG E0841: IR35-GW49-06B, IR35-GW55IW-06B, IR35-GW64IW-06B, IR35-GW62IW-06B, IR35-GW63-06B, IR35-GW49IW-06B, IR35-GW47-06B, IR35-GW55-

06B, IR35-GW47IW-06B, IR35-GW73IW-06B, IR35-GW72-06B, IR35-GW73-06B, IR35-GW07DW-06B and IR35-GW60-06B.

SDG E0864: IR35-GW60IW-06B, IR35-GW60IW-06BP, IR35-GW38-06B, IR35-GW80IW-06B, IR35-GW38IW-06B, and IR35-GW38IW-06BP.

Blanks

LC-VOA

SDG# ME0864

The associated holding and field QC blanks exhibited contamination as noted in the following table. Compounds for which there was no action required, are not included in the following table.

Blank ID	Compound	Concentration	Reporting Limit
VHBLK2D	methylene chloride	0.40J ug/L	0.50 ug/L
IR35-TB062206	methylene chloride	0.51 ug/L	0.50 ug/L

Associated samples and required qualifications are noted in the following table.

Sample ID	Compound	Q Flag	Qual Code
IR35-GW80IW-06B	methylene chloride	CRQL	BL

Surrogates

LC-VOA

SDG# ME0841

The samples listed in the table below exhibited non-compliant surrogate (deuterated monitoring compounds) recovery for the surrogates listed, qualifications were applied as listed.

Sample ID	Non-compliant DMC	% Rec	QC Limit	Q Flag	Qual Code
IR35-GW72IW-06B	vinyl chloride	30%	49-138%	J/UJ	SSL
	chloroethane-d5	46%	60-126%		
	1,1-dichloroethene-d2	58%	65-130%		
	benzene-d6	72%	78-121%		
	toluene-d8	74%	77-120%		
	trans-1,3-dichloroporpene-d4	32%	80-128%		

SDG# ME0864

The samples listed in the table below exhibited non-compliant surrogate (deuterated monitoring compounds) recovery for the surrogates listed, qualifications were applied as listed.

Sample ID	Non-compliant DMC	% Rec	QC Limit	Q Flag	Qual Code
IR35-FB062206	chloroform-d	78%	80-123%	J/UJ	SSL
	1,2-dichloropropane-d6	68%	84-123%		
	toluene-d8	76%	77-120%		
	trans-1,3-dichloropropene-d4	74%	80-128%		
IR35-EB062206	1,1-dichloroethene-d2	64%	65-130%	J/UJ	SSL
	1,2-dichloropropane-d6	72%	84-123%		
	trans-1,3-dichloropropene-d4	72%	80-128%		
IR35-TB062206	1,2-dichloropropane-d6	74%	84-123%	J/UJ	SSL
	trans-1,3-dichloropropene-d4	74%	80-128%		
IR35-GW60IW-06BP	1,2-dichloropropane-d6	78%	84-123%	J/UJ	SSL
IR35-GW38IW-06BP	1,2-dichloropropane-d6	82%	84-123%	J/UJ	SSL

Matrix Spike Recoveries

Wet Chemistry

SDG #E0841

The MS/MSD pair of sample IR35-GW60-06B and the MS of sample IR35-GW74IW-06BP analyzed for the IC fraction and/or the sulfide fraction exhibited spike recoveries below the lower QC limits. Associated samples, non-compliant analytes and required qualifications are noted in the following table.

MS/MSD ID	Analyte	% R	QC Limit	Affected Samples	Q Flag	Qual Code
IR35-GW60-06B	chloride	43/45.8	80-120%	all samples	J/UJ	MSL
	sulfate	28.3/28.9				
	sulfide	63.3	75-125%			
IR35-GW74IW-06BP	chloride	73.8	80-120%			

SDG #E0864

The MS/MSD pair of sample IR35-GW60IW-06B analyzed for the IC fraction exhibited spike recoveries below the lower QC limits. Associated samples, non-compliant analytes and required qualifications are noted in the following table.

MS/MSD ID	Analyte	% R	QC Limit	Affected Samples	Q Flag	Qual Code
IR35-GW60-06B	chloride	43/45.8	80-120%	all samples	J/UJ	MSL
	sulfate	28.3/28.9				
	sulfide	63.3	75-125%			
IR35-GW74IW-06BP	chloride	62.7/65.6	80-120%			

Field Duplicates

LC-VOA

SDG# ME0841

Sample IR35-GW74IW-06B and field duplicate sample IR35-GW74IW-06BP exhibited non-compliant results for vinyl chloride (157% RPD) and trans-1,2-dichloroethene (121% RPD); therefore, these compounds were qualified as estimated (J), qualifier code: FD.

Identification/Quantitation

LC-VOA

SDG# ME0841

A dilution was required for samples IR35-GW72IW-06B, IR35-GW74IW-06B, IR35-GW74IWP-06B, IR35-GW55IW-06B, IR35-GW49-06B, IR35-GW64IW-06B, IR35-GW62IW-06B, IR35-GW49IW-06B, IR35-GW47-06B, IR35-GW55-06B, IR35-GW47IW-06B, IR35-GW73IW-06B and IR35-GW73-06B; therefore, the E-flagged compound results were not used in the initial analysis in favor of the corresponding D-flagged compound result in the dilution (qualifier code: DL).

SDG# ME0864

A dilution was required for sample IR35-GW80IW-06B; therefore, the E-flagged compound results were not used in the initial analysis in favor of the corresponding D-flagged compound result in the dilution (qualifier code: DL).

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,

Laura Maschhoff
President

Jacqueline Cleveland
Vice-President

Summary of Data Qualifications

LC-VOA

SDG# ME0841

Sample ID	Compound	Results	Q-Flag	Qualifier Code
IR35-GW49-06B, IR35-GW55IW-06B, IR35-GW64IW-06B, IR35-GW62IW-06B, IR35-GW63-06B, IR35-GW49IW-06B, IR35-GW47-06B, IR35-GW55-06B, IR35-GW47IW-06B, IR35GW73IW-06B, IR35-GW72-06B, IR35-GW73-06B, IR35-TB062106	all results	+/-	J/UJ	OT
IR35-GW72IW-06B	all compounds associated with: vinyl chloride chloroethane-d5 1,1-dichloroethene-d2 benzene-d6 toluene-d8 trans-1,3-dichloroporpene-d4	+/-	J/UJ	SSL
IR35-GW74IW-06B, IR35-GW74IW-06BP	vinyl chloride trans-1,2-dichloroethene	+	J	FD
IR35-GW72IW-06B, IR35-GW74IW-06B, IR35-GW74IWP-06B, IR35-GW49-06B, IR35-GW64IW-06B, IR35-GW62IW-06B, IR35-GW49IW-06B, IR35-GW47-06B, IR35-GW55-06B, IR35-GW47IW-06B, IR35-GW73IW-06B, IR35-GW73-06B, IR35-GW55IW-06B	all E-flagged compounds	+	R	DL
IR35-GW72IW-06BDL, IR35-GW74IW-06BDL, IR35-GW74IWP-06BDL, IR35-GW49-06BDL, IR35-GW64IW-06BDL, IR35-GW62IW-06BDL, IR35-GW49IW-06BDL, IR35-GW47-06BDL, IR35-GW55-06BDL, IR35-GW47IW-06BDL, IR35-GW73IW-06BDL, IR35-GW73-06BDL, IR35-GW55IW-06BDL	all results except D-flagged compounds	+/-	R	DL

SDG# ME864

Sample ID	Compound	Results	Q-Flag	Qualifier Code
IR35-GW80IW-06B	methylene chloride	+	CRQL	BL
IR35-FB062206	chloroform-d	+/-	J/UJ	SSL
	1,2-dichloropropane-d6			
	toluene-d8			
	trans-1,3-dichloropropene-d4			
IR35-EB062206	1,1-dichloroethene-d2	+/-	J/UJ	SSL
	1,2-dichloropropane-d6			
	trans-1,3-dichloropropene-d4			
IR35-TB062206	1,2-dichloropropane-d6	+/-	J/UJ	SSL

Sample ID	Compound	Results	Q-Flag	Qualifier Code
	trans-1,3-dichloropropene-d4			
IR35-GW60IW-06BP	1,2-dichloropropane-d6	+/-	J/UJ	SSL
IR35-GW38IW-06BP	1,2-dichloropropane-d6	+/-	J/UJ	SSL
IR35-GW80IW-06B	all E-flagged compounds	+	R	DL
IR35-GW80IW-06B DL	all results except D-flagged compounds	+/-	R	DL

Wet Chemistry Parameters

SDG # E0841

Sample ID	Analyte	Results	Q-Flag	Qual Code
IR35-GW49-06B, IR35-GW55IW-06B, IR35-GW64IW-06B, IR35-GW62IW-06B, IR35-GW63-06B, IR35-GW49IW-06B, IR35-GW47-06B, IR35-GW55-06B, IR35-GW47IW-06B, IR35-GW73IW-06B, IR35-GW72-06B, IR35-GW73-06B, IR35-GW07DW-06B, IR35-GW60-06B	Ferrous Fe	+/- H	J/UJ	HT
all samples	chloride sulfate sulfide	+/-	J/UJ	MSL

SDG # E0864

Sample ID	Analyte	Results	Q-Flag	Qual Code
IR35-GW60IW-06B, IR35-GW60IW-06BP, IR35-GW38-06B, IR35-GW80IW-06B, IR35-GW38IW-06B, IR35-GW38IW-06BP	Ferrous Fe	+/- H	J/UJ	HT
all samples	chloride	+/-	J/UJ	MSL

Glossary of Qualification Flags and Abbreviations

Qualification Flags (Q-Flags)

U	not detected above the reported sample quantitation limit
J	estimated value
UJ	reported quantitation limit is qualified as estimated
R	result is rejected; the presence or absence of the analyte cannot be verified
D	result value is based on dilution analysis result
NJ	analyte has been tentatively identified, estimated value
L	analyte present, biased low
UL	not detected, quantitation limit is probably higher
K	analyte present, biased high

Method/Preparation Blank Qualification Flags (Q-Flags)

NA	The sample result for the blank contaminant is greater than the sample RL and is greater than 5X (10X for common laboratory contaminants) the blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.
U	The sample result for the blank contaminant is greater than the sample RL and is less than 5X (10X for common laboratory contaminants) the blank value.
RL	The sample result for the blank contaminant is less than the sample RL and is less than 5X (10X for common laboratory contaminants) the blank value.

General Abbreviations

RL	reporting limit
+	positive result
-	non-detect result

QUALIFIER CODE REFERENCE

Qualifier	Description
TN	Tune
BSL	Blank Spike/LCS - High Recovery
BSH	Blank Spike/LCS - Low Recovery
BD	Blank Spike/Blank Spike Duplicate (LCS/LCSD) Precision
BRL	Below Reporting Limit
ISL	Internal Standard - Low Recovery
ISH	Internal Standard - High Recovery
MSL	Matrix Spike and/or Matrix Spike Duplicate - Low Recovery
MSH	Matrix Spike and/or Matrix Spike Duplicate - High Recovery
MI	Matrix interference obscuring the raw data
MDP	Matrix Spike/Matrix Spike Duplicate Precision
2S	Second Source - Bad reproducibility between tandem detectors
SSL	Spiked Surrogate - Low Recovery
SSH	Spiked Surrogate - High Recovery
SD	Serial Dilution Reproducibility
ICL	Initial Calibration - Low Relative Response Factors (RRF)
ICH	Initial Calibration - High Relative Response Factors (RRF)
ICB	Initial Calibration - Bad Linearity or Curve Function
CCL	Continuing Calibration - Low Recovery or %Difference
CCH	Continuing Calibration - High Recovery or %Difference
LD	Lab Duplicate Reproducibility
HT	Holding Time
PD	Pesticide Degradation
2C	Second Column - Poor Dual Column Reproducibility
LR	Concentration Exceeds Linear Range
BL	Blank Contamination
RE	Redundant Result - due to Re-analysis or Re-extraction
DL	Redundant Result - due to Dilution
FD	Field Duplicate
OT	Other - explained in data validation report

CH2M HILL-VBO
5700 Cleveland Street
Suite 101
Virginia Beach, VA 23462

October 6, 2006
SDG# E1197 –Site 35, Mitkem Corporation
MCB Camp Lejeune, Jacksonville, NC

Dear Ms. Arroyo,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # E1197. The data validation was performed in accordance with the EPA CLP Statement of Work, Document OLC03.2 for Low Concentration VOCs and the USEPA CLP National Functional Guidelines for Low Concentration Organic Data Review (June, 2001), and the various methods utilized by the laboratory for the non-CLP parameters. All areas of concern are discussed in the body of the report and a summary of data qualifications is provided.

Sample ID	**Lab ID**	**Matrix**	**LC-VOA**	**RSK-175**	**Alk**	**IC**	**SUL**	**Ferric** Fe	**Ferrous** Fe	**TOC**
SDG# ME1197										
IR35-GW72DW-06C	E1197-01	water	X	X	X	X	X	X	X	X
IR35-GW81-06C	E1197-02	water	X	X	X	X	X	X	X	X
IR35-GW81IW-06C	E1197-03	water	X	X	X	X	X	X	X	X
IR35-GW81IWD-06C	E1197-04	water	X	X	X	X	X	X	X	X
IR35-EB080606	E1197-05	water	X							
IR35-FB080606	E1197-06	water	X							
IR35-TB080606	E1197-07	water	X							
IR35-GW81-06C MS	E1197-02MS	water	X	X	X	X	X		X	X
IR35-GW81-06C MSD	E1197-02MSD	water	X	X	X	X	X		X	X

The following quality control samples were provided with these SDGs: sample IR35-IR35-TB080606-trip blank; sample IR35-FB080606-field blank; sample IR35-EB080606-equipment blank; and sample IR35-GW81IWD-06C-field duplicate of sample IR35-GW81IW-06C. The samples were evaluated based on the following criteria:

- Data Completeness *
- Technical Holding Times
- GC/MS Tuning *
- Initial/Continuing Calibrations
- Internal Standards *
- Blanks
- Deuterated Monitoring Compounds
- Laboratory Control Samples *
- Matrix Spike Recoveries

- Matrix Duplicate RPDs *
- Field Duplicates
- Identification/Quantitation
- Reporting Limits *
- Tentatively Identified Compounds *

* - indicates that no qualifications were required based on this criteria

Overall Evaluation of Data/Potential Usability Issues

A summary of qualifications applied to the sample results are noted below for the fractions validated. Specific details regarding qualification of the data are addressed in the Specific Evaluation section of this narrative. If an issue is not addressed there were no actions required based on unmet quality criteria.

LC-VOA

The associated continuing calibrations exhibited a high %D which resulted in qualifying compounds as estimated.

Blank contamination was noted in the holding and field QC blanks associated with samples in this batch. Qualifications were added to the data.

Two samples exhibited non-compliant recoveries for one to four deuterated compounds which resulted in qualifying associated compounds as estimated.

One sample required a dilution to obtain positive results within the calibration range.

Wet Chemistry Parameters

Samples analyzed outside the 24 hour holding time allowed by the lab (flagged H by the lab) for the Ferrous iron and Ferric iron analysis were qualified as estimated J/UJ.

The associated MS/MSD analysis for sulfide exhibited recoveries below the QC limit of 75%-125%. The analyte was qualified as estimated J/UJ in all samples.

Specific Evaluation of Data

Data Completeness

A resubmission request was required for the IC data in this SDG. Initial calibration curve summaries and ICV/CCV recoveries were not present in the data package. These items were requested on 10/1/06 and received from the laboratory via e-mail on 10/4/06.

Technical Holding Times

According to chain of custody records, sampling was performed on 08/06/06 and samples were received at the laboratory 08/08/06. All sample preparation and analysis was performed within CLP or method holding time requirements with the following exception.

Wet Chemistry

For the ferrous and ferric iron fractions, all samples analyzed outside of the 24 hour holding time used by the laboratory were qualified as estimated J/UJ with a qualifier code of HT. These samples were analyzed as soon as possible after receipt. The laboratory used an H flag to indicate these results on the data results forms.

Initial/Continuing Calibration

LC-VOA

Calibration standards exhibited high %Ds that were non-compliant. A summary of these non-compliances and affected samples are noted in the following table. Sample results are qualified as indicated.

Standard ID	Compound(s)	RRF, %RSD, %D	Samples	Q Flag	Qual Code
CC 08/11/06 CC 08/11/06-2	dichlorodifluoromethane	42.7% 45.2%	all samples	J/UJ	CCH
CC 08/11/06	acetone	77.4%	IR35-GW81-06C, IR35-GW81IWD-06C	J/UJ	CCH
CC 08/11/06-2	tetrachloroethene	39.4%	IR35-GW81IW-06C, IR35-GW72DW-06C, IR35-EB080606, IR35-FB080606, IR35-TB080606	J/UJ	CCH

Blanks

LC-VOA

The associated holding and field QC blanks exhibited contamination as noted in the following table. Compounds for which there was no action required, are not included in the following table.

Blank ID	Compound	Concentration	Reporting Limit	Action Level
VBLK2Z	methylene chloride	0.50 ug/L	0.50 ug/L	5.0 ug/L
IR35-EB080606	methylene chloride	0.35 ug/L	5.0 ug/L	3.5 ug/L
IR35-FB080606	methylene chloride	0.30 ug/L	0.50 ug/L	3.0 ug/L

Associated samples and required qualifications are noted in the following table.

Sample ID	Compound	Q Flag	Qual Code
IR35-GW72DW-06C	methylene chloride	CRQL	BL

Deuterated Monitoring Compounds

LC-VOA

The following samples exhibited non-compliant DMC recovery for the DMC listed. All compounds associated with the non-compliant DMC were qualified as listed on the table below.

Sample ID	Non-compliant Surrogate	% Rec	QC Limit	Q Flag	Qual Code
IR35-GW81-06C	1,2-dichloropropane-d6	80%	84-123%	J/UJ	SSL
IR35-GW81IWD-06C	1,2-dichloropropane-d6	82%	84-123%	J/UJ	SSL
	trans-1,3-dichloropropane-d4	78%	80-128%		

Matrix Spike Recoveries

Wet Chemistry

The MS/MSD pair of sample IR35-GW81-06C analyzed for the sulfide fraction exhibited spike recoveries below the lower QC limits. Associated samples, non-compliant analytes and required qualifications are noted in the following table.

MS/MSD ID	Analyte	% R	QC Limit	Affected Samples	Q Flag	Qual Code
IR35-GW81-06C	sulfide	40.8/50.8	75%-125%	all samples	J/UJ	MSL

Field Duplicates

LC-VOA

Sample IR35-GW81IW-06C and field duplicate sample IR35-GW81IWD-06C exhibited non-compliant results for chloroform (200% RPD); therefore, this compound was qualified as estimated (J/UJ), qualifier code: FD.

Identification/Quantitation

LC-VOA

A dilution was required for sample IR35-GW72DW-06C; therefore, the E-flagged compound results were not used in the initial analysis in favor of the corresponding D-flagged compound result in the dilution (qualifier code: DL).

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,

Laura Maschhoff
President

Jacqueline Cleveland
Vice President

Summary of Data Qualifications

LC-VOA

Sample ID	Compound	Results	Q-Flag	Qualifier Code
all samples	dichlorodifluoromethane	+/-	J/UJ	CCH
IR35-GW81-06C, IR35-GW81IWD-06C	acetone	+/-	J/UJ	CCH
IR35-GW81IW-06C, IR35-GW72DW-06C, IR35-EB080606, IR35-FB080606, IR35-TB080606	tetrachloroethene	+/-	J/UJ	CCH
IR35-GW72DW-06C	methylene chloride	+	CRQL	BL
IR35-GW81-06C	compounds associated with: 1,2-dichloropropane-d6	+/-	J/UJ	SSL
IR35-GW81IWD-06C	compounds associated with: 1,2-dichloropropane-d6 trans-1,3-dichloropropane-d4	+/-	J/UJ	SSL
IR35-GW81IW-06C, IR35-GW81IWD-06C	chloroform	+/-	J/UJ	FD
IR35-GW72DW-06C	all E-flagged compounds	+	R	FD
IR35-GW72DW-06CDL	all compounds except D-flagged results	+/-	R	DL

Ferrous Iron/Ferric Iron

Sample ID	Compound	Results	Q-Flag	Qual Code
all samples	ferrous iron	+/-	J/UJ	HT
	ferric iron			

Sulfide

Sample ID	Compound	Results	Q-Flag	Qual Code
all samples	sulfide	+/-	J/UJ	MSL

Glossary of Qualification Flags and Abbreviations

Qualification Flags (Q-Flags)

U	not detected above the reported sample quantitation limit
J	estimated value
UJ	reported quantitation limit is qualified as estimated
R	result is rejected; the presence or absence of the analyte cannot be verified
D	result value is based on dilution analysis result
NJ	analyte has been tentatively identified, estimated value
L	analyte present, biased low
UL	not detected, quantitation limit is probably higher
K	analyte present, biased high

Method/Preparation Blank Qualification Flags (Q-Flags)

NA	The sample result for the blank contaminant is greater than the sample RL and is greater than 5X (10X for common laboratory contaminants) the blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.
U	The sample result for the blank contaminant is greater than the sample RL and is less than 5X (10X for common laboratory contaminants) the blank value.
RL	The sample result for the blank contaminant is less than the sample RL and is less than 5X (10X for common laboratory contaminants) the blank value.

General Abbreviations

RL	reporting limit
+	positive result
-	non-detect result

QUALIFIER CODE REFERENCE

Qualifier	Description
TN	Tune
BSL	Blank Spike/LCS - High Recovery
BSH	Blank Spike/LCS - Low Recovery
BD	Blank Spike/Blank Spike Duplicate (LCS/LCSD) Precision
BRL	Below Reporting Limit
ISL	Internal Standard - Low Recovery
ISH	Internal Standard - High Recovery
MSL	Matrix Spike and/or Matrix Spike Duplicate - Low Recovery
MSH	Matrix Spike and/or Matrix Spike Duplicate - High Recovery
MI	Matrix interference obscuring the raw data
MDP	Matrix Spike/Matrix Spike Duplicate Precision
2S	Second Source - Bad reproducibility between tandem detectors
SSL	Spiked Surrogate - Low Recovery
SSH	Spiked Surrogate - High Recovery
SD	Serial Dilution Reproducibility
ICL	Initial Calibration - Low Relative Response Factors (RRF)
ICH	Initial Calibration - High Relative Response Factors (RRF)
ICB	Initial Calibration - Bad Linearity or Curve Function
CCL	Continuing Calibration - Low Recovery or %Difference
CCH	Continuing Calibration - High Recovery or %Difference
LD	Lab Duplicate Reproducibility
HT	Holding Time
PD	Pesticide Degradation
2C	Second Column - Poor Dual Column Reproducibility
LR	Concentration Exceeds Linear Range
BL	Blank Contamination
RE	Redundant Result - due to Re-analysis or Re-extraction
DL	Redundant Result - due to Dilution
FD	Field Duplicate
OT	Other - explained in data validation report

MITKEM CORPORATION
175 Metro Center Boulevard
Warwick, Rhode Island 02886-1755
(401) 732-3400 • Fax (401) 732-3499
email: mitkem@mitkem.com

CHAIN-OF-CUSTODY RECORD

REPORT TO		INVOICE TO		
COMPANY: CH2M Hill	PHONE: 704/329-0073	COMPANY	PHONE	LAB PROJECT #:
NAME: DAVID DRY / CLT	FAX: 704/329-0141	NAME	FAX	
ADDRESS: 4828 Parkway Plaza Blvd Ste 200		ADDRESS		TURNAROUND TIME:
CITY/ST/ZIP: Charlotte NC 28217		CITY/ST/ZIP		

CLIENT PROJECT NAME:	CLIENT PROJECT #:	CLIENT P.O.#:
CTO-105	328422.F1.F2.35	

REQUESTED ANALYSES: VOC (8260) / MEP (PCB 1254 w/ Hcl)

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED 2006	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS	VOC (8260)	MEP (PCB 1254 w/ Hcl)											COMMENTS
IR35-G-W14-06B	04/25 / 0800		X	X				4	2	2											
IR35-G-W14IW-06B	04/25 / 0855		X	X				4	2	2											
IR35-G-W37-06B	04/25 / 0810		X	X				4	2	2											
IR35-G-W37IW-06B	04/25 / 0950		X	X				4	2	2											
IR35-G-W37-06BDUP	04/25 / 0810		X	X				4	2	2											
IR35-EB042506WMB	04/25 / 0910		X	X				2	2												
IR35-TB042506WMB	04/25 / 0700		X	X				4	2	2											
IR35-~~GW30~~ GW30DW-06B	04/25 / 1140		X	X				4	2	2											
	/																				
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	/																				

TSF#	RELINQUISHED BY	DATE/TIME	ACCEPTED BY	DATE/TIME
	[signature]	4/25/06 1200		/
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		/		/

ADDITIONAL REMARKS:

COOLER TEMP:

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email: mitkem@mitkem.com

CHAIN-OF-CUSTODY RECORD

REPORT TO		INVOICE TO		
COMPANY: CH2M Hill	PHONE: 704 329 0073	COMPANY	PHONE	LAB PROJECT #:
NAME: DAVID DRY / CLT	FAX: 704 329 0141	NAME	FAX	
ADDRESS: 4523 Parkway Plaza Blvd Ste 200		ADDRESS		TURNAROUND TIME:
CITY/ST/ZIP: Charlotte, NC 28217		CITY/ST/ZIP		

CLIENT PROJECT NAME:	CLIENT PROJECT #:	CLIENT P.O.#:
CTU-105	325432.FI.FQ.35	

REQUESTED ANALYSES

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS	Sulfide	TOC	Formic + Ion Chromatography											COMMENTS
	2006																					
IR35-GW14-06B	04/25 / 0800		X	X				4	1	1	1	1										
IR35-GW14W-06B	04/25 / 0855		X	X				4	1	1	1	1										
IR35-GW37-06B	04/25 / 0810		X	X				4	1	1	1	1										
IR35-GW37W-06B	04/25 / 0950		X	X				4	1	1	1	1										
IR35-GW37-06BDUP	04/25 / 0810		X	X				4	1	1	1	1										
IR35-GW30DW-06B	04/25 / 1140		X	X				4	1	1	1	1										
	/																					
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	/																					

TSF#	RELINQUISHED BY	DATE/TIME	ACCEPTED BY	DATE/TIME	ADDITIONAL REMARKS:	COOLER TEMP:
	[signature]	4/25/06 / 1200		/		
		/		/		
		/		/		

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MITKEM CORPORATION
175 Metro Center Boulevard
Warwick, Rhode Island 02886-1755
(401) 732-3400 • Fax (401) 732-3499
email: mitkem@mitkem.com

CHAIN-OF-CUSTODY RECORD

REPORT TO		INVOICE TO		
COMPANY CH2M HILL	PHONE 7043290073	COMPANY	PHONE	LAB PROJECT #:
NAME DAVID DRYJCLT	FAX 7043290141	NAME	FAX	
ADDRESS 4824 Parkway Plaza BLVD Ste 200		ADDRESS		TURNAROUND TIME:
CITY/ST/ZIP Charlotte, NC 28217		CITY/ST/ZIP		Percentical

CLIENT PROJECT NAME:	CLIENT PROJECT #:	CLIENT P.O.#:
CTO-105	328432.FI.FQ35	

REQUESTED ANALYSES: VOC w/HCL; MMA BSX/125 w/HCL

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS	VOC w/HCL	MMA BSX/125 w/HCL											COMMENTS
	2006																				
IR35-EB042306	4/23/0830		X	X				2	2												
IR35-FB042306	4/23/0845		X	X				2	2												
IR35-GW32-06B	4/23/0925		X	X				8	6	2											MS/MSD ALSO
IR35-GW32IW-06B	4/23/1030		X	X				4	2	2											
IR35-GW32IW-06BDUP	4/23/1040		X	X				4	2	2											Duplicate
IR35-GW66-06B	4/23/0810		X	X				4	2	2											
IR35-GW68IW-06B	4/23/0830		X	X				4	2	2											
IR35-TB042306	4/23/0700		X	X				4	2	2											
IR35-GW02-06B	4/23/0935		X	X				4	2	2											
IR35-GW39IW-06B	4/23/1105		X	X				4	2	2											
IR35-GW71IW-06B	4/23/1235		X	X				4	2	2											
IR35-GW30-06B	4/23/1525		X	X				4	2	2											

TSF#	RELINQUISHED BY	DATE/TIME	ACCEPTED BY	DATE/TIME
	[illegible]	4/24/06 1700		/
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ADDITIONAL REMARKS:

COOLER TEMP:

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email: mitkem@mitkem.com

CHAIN-OF-CUSTODY RECORD

REPORT TO		INVOICE TO		
COMPANY CH2M HILL	PHONE 7043290073	COMPANY	PHONE	LAB PROJECT #:
NAME DAVID DRY / CLT	FAX 7043290141	NAME	FAX	
ADDRESS 4828 Parkway Plaza BLVD STE 200		ADDRESS		TURNAROUND TIME:
CITY/ST/ZIP Charlotte, NC 28217		CITY/ST/ZIP		Pertinent

CLIENT PROJECT NAME:	CLIENT PROJECT #:	CLIENT P.O.#:
CTO-105	328432.FI.FQ.35	

REQUESTED ANALYSES

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED 2006	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS	Sulfide	TOC	Ferric Iron										COMMENTS
IR35-GW32-06B	4/23/0925		X	X				3	1	1	1										
IR35-GW32IW-06B	4/23/1030		X	X				3	1	1	1										
IR35-GW32IW-06BDUP	4/23/1040		X	X				3	1	1	1										Duplicate
IR35-GW68-06B	4/23/0810		X	X				3	1	1	1										
IR35-GW68IW-06B	4/23/0830		X	X				3	1	1	1										
IR35-GW02-06B	4/23/0935		X	X				3	1	1	1										
IR35-GW39IW-06B	4/23/1105		X	X				3	1	1	1										
IR35-GW70IW-06B	4/23/1025		X	X				3	1	1	1										
IR35-GW71IW-06B	4/23/1235		X	X				3	1	1	1										
IR35-GW30-06B	4/23/1525		X	X				3	1	1	1										
IR35-GW30IW-06B	4/23/1445		X	X				3	1	1	1										
IR35-GW30DW-06B	4/23/1530		X	X				3	1	1	1										

TSF#	RELINQUISHED BY	DATE/TIME	ACCEPTED BY	DATE/TIME	ADDITIONAL REMARKS:	COOLER TEMP:
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CHAIN-OF-CUSTODY RECORD

REPORT TO		INVOICE TO		
COMPANY: CH2M HILL	PHONE: 7043290073	COMPANY	PHONE	LAB PROJECT #:
NAME: DAVID DRY/CLT	FAX: 7043290141	NAME	FAX	
ADDRESS: 4824 Parkway Plaza BLVD STE 200		ADDRESS		TURNAROUND TIME: Prioritized
CITY/ST/ZIP: Charlotte, NC 28217		CITY/ST/ZIP		

CLIENT PROJECT NAME:	CLIENT PROJECT #:	CLIENT P.O.#:
CTO-105	328432.FI.FQ.35	

REQUESTED ANALYSES: ALK, ANIONS, FERROUS

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS	ALK, ANIONS, FERROUS	COMMENTS
	2006									
IR35-GW32-06B2	4/24/0720		X	X				1	1	
IR35-GW32IW-06B2	4/24/0725		X	X				1	1	
IR35-GW32IW-06B2DUP	4/24/0735		X	X				1	1	
IR35-GW66-06B2	4/24/0810		X	X				1	1	
IR35-GW39IW-06B2	4/24/0730		X	X				1	1	
IR35-GW70IW-06B2	4/24/0755		X	X				1	1	
IR35-GW71IW-06B2	4/24/0740		X	X				1	1	
IR35-GW68IW-06B2	4/24/0710		X	X				1	1	
IR35-GW02-06B2	4/24/0723		X	X				1	1	
IR35-GW30-06B2	4/24/0745		X	X				1	1	
IR35-GW30IW-06B2	4/24/0745		X	X				1	1	
IR35-GW30DW-06B2	4/24/0750		X	X				1	1	

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CHAIN-OF-CUSTODY RECORD

REPORT TO		INVOICE TO		
COMPANY CH2M HILL	PHONE 7043290073	COMPANY	PHONE	LAB PROJECT #:
NAME DAVID DRY/CLT	FAX 7043290141	NAME	FAX	
ADDRESS 4824 Parkway Plaza BLVD STE 200		ADDRESS		TURNAROUND TIME:
CITY/ST/ZIP Charlotte, NC 28217		CITY/ST/ZIP		Per contract

CLIENT PROJECT NAME:	CLIENT PROJECT #:	CLIENT P.O.#:
CTO-185	328432.FI.FQ.31	

REQUESTED ANALYSES: VOC; MGK 8260/175 w/HCL; MGK 8260/175 w/HCL

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED 2006	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS	VOC	MGK 8260/175 w/HCL	MGK 8260/175 w/HCL											COMMENTS
IR35-GW30IW-06B	4/23/1415		X	X				4	2	2												
IR35GW30DW-06B	4/23/1530		X	X				4	2	2												
IR35-GW04-06B	4/23/1520		X	X				4	2	2												
IR35-GW06-06B	4/23/1545		X	X				4	2	2												
IR35-GW70IW-06B	4/23/1025		X	X				4	2	2												
IR35-GW01DW-06B	4/23/1340		X	X				4	2	2												
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CHAIN-OF-CUSTODY RECORD

REPORT TO		INVOICE TO		
COMPANY: CH2M HILL	PHONE: 7043290073	COMPANY	PHONE	LAB PROJECT #:
NAME: DAVID DRY / CLT	FAX: 7043290111	NAME	FAX	
ADDRESS: 4824 Parkway Plaza Blvd Ste 200		ADDRESS		TURNAROUND TIME:
CITY/ST/ZIP: Charlotte, NC 28217		CITY/ST/ZIP		Per Contract

CLIENT PROJECT NAME:	CLIENT PROJECT #:	CLIENT P.O.#:
CTO-105	328432.FI.FQ35	

REQUESTED ANALYSES

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED 2006	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS	Sulfide	TOC	Ferric Iron	Alkalinity Anions										COMMENTS
IR35-GW10-06B	04/24 / 1040		X	X				4	1	1	1	1										
IR35-GW10IW-06B	04/24 / 0935		X	X				4	1	1	1	1										
IR35-GW03DW-06B	04/24 / 1110		X	X				4	1	1	1	1										
IR35-GW09-06B	04/24 / 0935		X	X				4	1	1	1	1										
IR35-GW09IW-06B	04/24 / 0845		X	X				4	1	1	1	1										
IR35-GW06DW-06B	04/24 / 1059		X	X				4	1	1	1	1										
IR35-GW40IW-06B	04/24 / 1250		X	X				4	1	1	1	1										
IR35-GW34-06B	04/24 / 1055		X	X				4	1	1	1	1										
IR35-GW34IW-06B	04/24 / 1215		X	X				4	1	1	1	1										
IR35-GW69IW-06B	04/24 / 1425		X	X				4	1	1	1	1										
IR35-GW10IW-06BDUP	04/24 / 0945		X	X				4	1	1	1	1										
~~IR35-GW40DW-06B~~	~~04/24 / 0900~~		~~X~~	~~X~~																		

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CHAIN-OF-CUSTODY RECORD

REPORT TO		INVOICE TO		
COMPANY CH2M Hill	PHONE 704 3290073	COMPANY	PHONE	LAB PROJECT #:
NAME David Day / CLT	FAX 704 329 0141	NAME	FAX	
ADDRESS 4828 Parkway Plaza Blvd Ste 200		ADDRESS		TURNAROUND TIME:
CITY/ST/ZIP Charlotte, NC 28217		CITY/ST/ZIP		Percontract

CLIENT PROJECT NAME:	CLIENT PROJECT #:	CLIENT P.O.#:
CTO - 105	329432.F1.F0.35	

REQUESTED ANALYSES

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED 2006	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS	Sulfide	TOC	Ferrous Iron											COMMENTS
IR35-GW04-063	4/23 / 1520		X	X				3	1	1	1											
IR35-GW06-06B	4/23 / 1545		X	X				3	1	1	1											
IR35-GW01DW-06B	4/23 / 1340		X	X				3	1	1	1											
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TSF#	RELINQUISHED BY	DATE/TIME	ACCEPTED BY	DATE/TIME	ADDITIONAL REMARKS:	COOLER TEMP:
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CHAIN-OF-CUSTODY RECORD

REPORT TO		INVOICE TO		
COMPANY CH2M Hill	PHONE 7043290073	COMPANY	PHONE	LAB PROJECT #:
NAME DAVID DRY/CLT	FAX 7043290141	NAME	FAX	
ADDRESS 4824 Parkway Plaza Blvd Ste 200		ADDRESS		TURNAROUND TIME:
CITY/ST/ZIP Charlotte, NC 28217		CITY/ST/ZIP		Percontract

CLIENT PROJECT NAME:	CLIENT PROJECT #:	CLIENT P.O.#:
CTU-105	32342.FI.FQ.35	

REQUESTED ANALYSES: AK, AK, AK, AK, Serious

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED 2006	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS														COMMENTS
IR35-GW01DW-06B2	04/24 / 0720		X	X				1	1													
IR35-GW04[illegible]-06B2	04/24 / 0740		X	X				1	1													
IR35-GW06-06B2	04/24 / 0716		X	X				1	1													
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TSF#	RELINQUISHED BY	DATE/TIME	ACCEPTED BY	DATE/TIME	ADDITIONAL REMARKS:	COOLER TEMP:
	Mercedes Harris	04/24/06 / 1700		/		
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CHAIN-OF-CUSTODY RECORD

REPORT TO		INVOICE TO		
COMPANY: CH2M Hill	PHONE: 704 329 0073	COMPANY	PHONE	LAB PROJECT #:
NAME: DAVID DRY/CLT	FAX: 704 329 0141	NAME	FAX	
ADDRESS: 4824 Parkway Plaza Blvd Ste 200		ADDRESS		TURNAROUND TIME:
CITY/ST/ZIP: Charlotte, NC 28217		CITY/ST/ZIP		per contract

CLIENT PROJECT NAME:	CLIENT PROJECT #:	CLIENT P.O.#:
CTO-105	328432.FI.FQ.35	

REQUESTED ANALYSES: Sulfide, TOC, Ferric Iron, Alkalinity/Anions

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS	Sulfide	TOC	Ferric Iron	Alkalinity/Anions										COMMENTS
	2006																					
IR35-GW29-06B	4/24 / 1245		X	X				4	1	1	1	1										
IR35-GW29IW-06B	4/24 / 1415		X	X				4	1	1	1	1										
IR35-GW29-06BDUP	4/24 / 1255		X	X				4	1	1	1	1										
IR35-GW31IW-06B	4/24 / 1410		X	X				4	1	1	1	1										
IR35-GW31-06B	4/24 / 1500		X	X				4	1	1	1	1										
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TSF#	RELINQUISHED BY	DATE/TIME	ACCEPTED BY	DATE/TIME
	Meredith Hinson	4/24/06 / 1700		/
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ADDITIONAL REMARKS:

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CHAIN-OF-CUSTODY RECORD

REPORT TO		INVOICE TO		
COMPANY: CH2M Hill	PHONE: 7043290073	COMPANY	PHONE	LAB PROJECT #:
NAME: DAVID DRY / CCT	FAX: 7043290141	NAME	FAX	
ADDRESS: 4824 Parkway Plaza Blvd Ste 200		ADDRESS		TURNAROUND TIME: per contract
CITY/ST/ZIP: Charlotte, NC 28217		CITY/ST/ZIP		

CLIENT PROJECT NAME:	CLIENT PROJECT #:	CLIENT P.O.#:
CTO-105	328432.FI.FQ.35	

REQUESTED ANALYSES: VOC w/ HCl; MEE RSK-175 w/HCl

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS	VOC w/ HCl	MEE RSK-175 w/HCl											COMMENTS
	2006																				
IR35-GW29-06B	4/24 / 1245		X	X				4	2	2											
IR35-GW29IW-06B	4/24 / 1415		X	X				4	2	2											
IR35-GW29-06BDUP	4/24 / 1255		X	X				4	2	2											
IR35-GW31IW-06B	4/24 / 1410		X	X				4	2	2											
IR35-GW31-06B	4/24 / 1500		X	X				4	2	2											
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TSF#	RELINQUISHED BY	DATE/TIME	ACCEPTED BY	DATE/TIME
	Meredith C Harris	04/24/06 / 1700		/
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CHAIN-OF-CUSTODY RECORD

REPORT TO		INVOICE TO		
COMPANY CH2M Hill	PHONE 7043290073	COMPANY	PHONE	LAB PROJECT #:
NAME DAVID DRY / CLT	FAX 7043290141	NAME	FAX	
ADDRESS 4824 Parkway Plaza Blvd Ste 200		ADDRESS		TURNAROUND TIME: per contract
CITY/ST/ZIP Charlotte, NC 28217		CITY/ST/ZIP		

CLIENT PROJECT NAME:	CLIENT PROJECT #:	CLIENT P.O.#:
CTO - 105	328432 F2.FQ.35	

REQUESTED ANALYSES

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS	VOC w/HCl	MEE RSK-175 w/HCl											COMMENTS
	2006																				
IR35-GW10-06B	04/24 / 1040		X	X				4	2	2											
IR35-GW10IW-06B	04/24 / 0935		X	X				4	2	2											
IR35-GW30W-06B	04/24 / 1110		X	X				4	2	2											
IR35-GW09-06B	04/24 / 0935		X	X				4	2	2											
IR35-GW09IW-06B	04/24 / 0845		X	X				4	2	2											
IR35-GW06DW-06B	04/24 / 1059		X	X				6	4	2											MS/MSD Also for VOCs
IR35-GW40IW-06B	04/24 / 1250		X	X				4	2	2											
IR35-GW34-06B	04/24 / 1055		X	X				4	2	2											
IR35-GW34IW-06B	04/24 / 1215		X	X				4	2	2											
IR35-GW69IW-06B	04/24 / 1425		X	X				4	2	2											
IR35-GW10IW-06BDUP	04/24 / 0945		X	X				4	2	2											
IR35-EB042406	04/24 / 0900		X	X				2	2												

TSF#	RELINQUISHED BY	DATE/TIME	ACCEPTED BY	DATE/TIME
	Meredith Hanna	04/24/06 / 1700		/
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CHAIN-OF-CUSTODY RECORD

REPORT TO		INVOICE TO		
COMPANY CH2M HILL	PHONE 704-329-0072	COMPANY CH2M HILL	PHONE 704-329-0072	LAB PROJECT #: E0864
NAME RICK POWELL	FAX 704-329-0141	NAME TEG WILLIAMS	FAX 704-329-0141	
ADDRESS 4824 PARKWAY PLAZA SUITE 200		ADDRESS 4824 PARKWAY PLAZA BLVD SUITE 200		TURNAROUND TIME:
CITY/ST/ZIP CHARLOTTE NC 28217		CITY/ST/ZIP CHARLOTTE, NC 28217		

CLIENT PROJECT NAME: MCB CAMP LEJEUNE SITE 35
CLIENT PROJECT #: 328432 F1.1Q.35
CLIENT P.O.#:

REQUESTED ANALYSES

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS	VOC	MEE	Alk, Anions, Ferrous Iron	Sulfide	TOC	Ferric Iron							COMMENTS
1R35-GW070W06B	6/22/06 / 1240		X	X				8	2	2	1	1	1	1							
1R35-GW600W06B	/ 1155							24	6	6	3	3	3	3							MS/MSD
1R35-GW601W06B	1240 / ~~1130~~ MOD		X	X			01	8	2	2	1	1	1	1							
1R35-GW601W06B(P)	6/22/06 / 1240		X	X			02	8	2	2	1	1	1	1							
1R35-GW380W06B	/ 850		X	X			03	24	6	6	3	3	3	3							MS/MSD
1R35-GW801W06B	/ 1030		X	X			04	8	2	2	1	1	1	1							
1R35-GW381W06B	/ 910		X	X			05	8	2	2	1	1	1	1							
1R35-GW381W06B(P)	/ 910		X	X			06	8	2	2	1	1	1	1							
TRIP BLANK	/ 1130			X			07	2	2												
TRIP BLANK	/ 1430			X			~~07~~ 08	2	2												
1R35-FB062206	/ 1430		X	X			08	8	2	2	1	1	1	1							
	/																				

TSF#	RELINQUISHED BY	DATE/TIME	ACCEPTED BY	DATE/TIME	ADDITIONAL REMARKS:	COOLER TEMP:
	Monica [illegible]	6/22/06 1430	[illegible]	6/23/06 9:15		1°
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CHAIN-OF-CUSTODY RECORD

REPORT TO		INVOICE TO		
COMPANY CH2M HILL / RICK POWELL	PHONE (704-329-0072)	COMPANY CH2M HILL	PHONE 704-329-0072	LAB PROJECT #:
NAME 4824 PARKWAY PLAZA BLVD	FAX 704-329-0141	NAME TEG WILLIAMS	FAX 704-329-0141	
ADDRESS SUITE 200		ADDRESS 4824 PARKWAY PLAZA BLVD STE 200		TURNAROUND TIME:
CITY/ST/ZIP CHARLOTTE, NC 28217		CITY/ST/ZIP CHARLOTTE, NC 28217		

CLIENT PROJECT NAME:	CLIENT PROJECT #:	CLIENT P.O.#:
SITE 35	328432.F1.FQ.35	

REQUESTED ANALYSES

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS	VOC	MEE	Alk, Anions, Cations	Sulfide	TOC	Phenols							COMMENTS
IR35-GW721W06B	6/20/1440		X	X				8	2	2	1	1	1	1							
IR35-GW7406B	6/20/06/1425		X	X				8	2	2	1	1	1	1							
IR35-GW741W06B	6/20/1355		X	X				8	2	2	1	1	1	1							
IR35-GW741W06BP	6/20/1355		X	X				8	2	2	1	1	1	1							
TRIP BLANK	/			X				2	2												
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TSF#	RELINQUISHED BY	DATE/TIME	ACCEPTED BY	DATE/TIME
	Monica Libby	6/20/06/1600		/
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Warwick, Rhode Island 02886-1755
(401) 732-3400 • Fax (401) 732-3499
email: mitkem@mitkem.com

CHAIN-OF-CUSTODY RECORD

REPORT TO		INVOICE TO		
COMPANY CH2M HILL	PHONE 704-329-0072	COMPANY CH2M HILL	PHONE 704-329-0072	LAB PROJECT #:
NAME RICK POWELL	FAX 704-329-0141	NAME TEG WILLIAMS	FAX 704-329-0141	
ADDRESS 4824 PARKWAY PLAZA BLVD ~~TE~~ STE 200		ADDRESS 4824 PARKWAY PLAZA BLVD STE 200		TURNAROUND TIME:
CITY/ST/ZIP CHARLOTTE NC 28217		CITY/ST/ZIP CHARLOTTE NC 28217		

CLIENT PROJECT NAME: MCB CAMP LEJEUNE SITE 35

CLIENT PROJECT #: 328432.F1.FQ35

CLIENT P.O.#:

REQUESTED ANALYSES

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS	VOC	MEE	ALK. ANIONS	FERROUS IRON	SULFIDE	TOC	FERRIC IRON							COMMENTS
1R35-GW490WOOB	6/21/06 / 1340		X	X				8	2	2	1		1	1	1							
1R35-GW551WOOB	/ ~~1200~~ MOD 1240																					
1R35-GW641WOOB	/ 1035																					
1R35-GW621WOOB	/ 1040																					
1R35-GW630OOB	/ 1205																					
1R35-GW491WOOB	/ 1445																					
1R35-GW470OOB	/ 1450																					
1R35-GW550OOB	/ 1435																					
1R35-GW471WOOB	/ 1440																					
1R35-GW731WOOB	/ 1135																					
1R35-GW720OOB	/ 1230																					
1R35-GW730OOB	/ 1050																					

TSF#	RELINQUISHED BY	DATE/TIME	ACCEPTED BY	DATE/TIME
	Monica Tilley	6/21/06 1630		/
		/		/
		/		/

ADDITIONAL REMARKS: NO TEMP BLANK PROVIDED, USE TRIP BLANK.

COOLER TEMP:

WHITE: LABORATORY COPY YELLOW: REPORT COPY PINK: CLIENT'S COPY

MITKEM CORPORATION
175 Metro Center Boulevard
Warwick, Rhode Island 02886-1755
(401) 732-3400 • Fax (401) 732-3499
email: mitkem@mitkem.com

CHAIN-OF-CUSTODY RECORD

REPORT TO		INVOICE TO		
COMPANY CH2M HILL	PHONE 704-329-0072	COMPANY CH2M HILL	PHONE 704-329-0072	LAB PROJECT #:
NAME RICK POWELL	FAX 704-329-0141	NAME ~~RIC~~ TEG WILLIAMS	FAX 704-329-0141	
ADDRESS 4824 PARKWAY PLAZA BLVD STE 200		ADDRESS 4824 PARKWAY PLAZA BLVD STE 200		TURNAROUND TIME:
CITY/ST/ZIP CHARLOTTE NC 28217		CITY/ST/ZIP CHARLOTTE NC 28217		

CLIENT PROJECT NAME:	CLIENT PROJECT #:	CLIENT P.O.#:
MCB CAMP LEJEUNE SITE 35	328432.F1.PO.55	

REQUESTED ANALYSES

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS	VOC	MEE	ALK ANIONS & KRONS (INCL)	SULFIDE	TOC	FERRIC IRON								COMMENTS
TRIP BLANK	/			X				2	2													
	/																					
	/																					
	/																					
	/																					
	/																					
	/																					
	/																					
	/																					
	/																					
	/																					
	/																					

TSF#	RELINQUISHED BY	DATE/TIME	ACCEPTED BY	DATE/TIME
	Monica Ling	6/21/06 1630		/
		/		/
		/		/

ADDITIONAL REMARKS: NO TEMP BLANK PROVIDED BY LAB. USE TRIP BLANK.

COOLER TEMP:

WHITE: LABORATORY COPY YELLOW: REPORT COPY PINK: CLIENT'S COPY

MITKEM CORPORATION
175 Metro Center Boulevard
Warwick, Rhode Island 02886-1755
(401) 732-3400 • Fax (401) 732-3499
email: mitkem@mitkem.com

CHAIN-OF-CUSTODY RECORD

REPORT TO		INVOICE TO		
COMPANY CH2M HILL	PHONE 704-329-0072	COMPANY CH2M HILL	PHONE 704-329-0072	LAB PROJECT #:
NAME RICK POWELL	FAX 704-329-0141	NAME TEG WILLIAMS	FAX 704-329-0141	
ADDRESS 4824 PARKWAY PLAZA BLVD SUITE 200		ADDRESS 4824 PARKWAY PLAZA BLVD SUITE 200		TURNAROUND TIME:
CITY/ST/ZIP CHARLOTTE NC 28217		CITY/ST/ZIP CHARLOTTE NC 28217		

CLIENT PROJECT NAME:	CLIENT PROJECT #:	CLIENT P.O.#:
MCB CAMP LEJEUNE SITE 35	328432.F1.FQ.35	

REQUESTED ANALYSES

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS	VOC	MEE	ALK. ANIONS	FERROUS IRON	SULFIDE	TOC	FERRIC IRON							COMMENTS
1R35-EB062206	6/22/06 / 1400		X	X				8	2	2	1	1	1	1								
	/																					
	/																					
	/																					
	/																					
	/																					
	/																					
	/																					
	/																					
	/																					
	/																					
	/																					

TSF#	RELINQUISHED BY	DATE/TIME	ACCEPTED BY	DATE/TIME	ADDITIONAL REMARKS:	COOLER TEMP:
	Monica [illegible]	6/22/06 / 1430		/		
		/		/		
		/		/		

WHITE: LABORATORY COPY YELLOW: REPORT COPY PINK: CLIENT'S COPY

MITKEM CORPORATION
175 Metro Center Boulevard
Warwick, Rhode Island 02886-1755
(401) 732-3400 • Fax (401) 732-3499
email: mitkem@mitkem.com

CHAIN-OF-CUSTODY RECORD

REPORT TO		INVOICE TO		
COMPANY CH2MHILL	PHONE (H) 444-329-0047 FA 757-671-8215 x 451	COMPANY AS PER CONTRACT	PHONE	LAB PROJECT #:
NAME R POWELL / F. ARROYO	FAX	NAME	FAX	
ADDRESS 4820 TARTWAY PLAZA BLVD STE 200		ADDRESS		TURNAROUND TIME: AS PER CONTRACT
CITY/ST/ZIP CHARLOTTE NC 28217		CITY/ST/ZIP		

CLIENT PROJECT NAME:	CLIENT PROJECT #:	CLIENT P.O.#:
SITE 35 GW SAMPLING	328032.FI.FQ.35	

REQUESTED ANALYSES

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS	VOC	MEE	TOC	Fe3+	All/Anions/Fe2+	Sulfide							COMMENTS
IR35-GW1HW-000	8-6-04 0930			✓				8	2	2	1	1	1	1							
IR35-GW81-000	8-6-04 1120			✓				24	6	6	3	3	3	3							* MS / MSD
IR35-GW81W-000	8-6-04 1320			✓				8	2	2	1	1	1	1							
IR35-GW81WD-000	8-6-04 1320			✓				8	2	2	1	1	1	1							
IR35-EB080000	8-6-04 1400			✓				2	2												
IR35-FB080000	8-6-04 1430			✓				2	2												
IR35-TB080000	8-6-04 1445			✓				2	2												
	/																				
	/																				
	/																				
	/																				
	/																				

TSF#	RELINQUISHED BY	DATE/TIME	ACCEPTED BY	DATE/TIME
	James E Freeman	8-7-04 1200		/
		/		/
		/		/

ADDITIONAL REMARKS:

COOLER TEMP:

WHITE: LABORATORY COPY YELLOW: REPORT COPY PINK: CLIENT'S COPY

Appendix G
BIOCHLOR Modeling

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

Camp Lejeune
Site 35
Run Name

Data Input Instructions:

115 → 1. Enter value directly....or
↑ *or* 2. Calculate by filling in gray
0.02 cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	62.1	(ft/yr)
or			
Hydraulic Conductivity	K	1.5E-03	(cm/sec)
Hydraulic Gradient	i	0.008	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	29.21	(ft)
(Alpha y) / (Alpha x)*	0.05	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

			Koc		R	
Soil Bulk Density, rho	1.6	(kg/L)				
FractionOrganicCarbon, foc	1.0E-3	(-)				
Partition Coefficient						
PCE			426	(L/kg)	4.41	(-)
TCE			130	(L/kg)	2.04	(-)
DCE			125	(L/kg)	2.00	(-)
VC			30	(L/kg)	1.24	(-)
ETH			302	(L/kg)	3.42	(-)
Common R (used in model)* =					**2.04**	

4. BIOTRANSFORMATION

-1st Order Decay Coefficient*

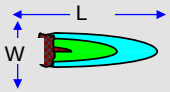
Zone 1	λ (1/yr)	half-life (yrs)	Yield
PCE → TCE	0.000		0.79
TCE → DCE	0.198	3.50	0.74
DCE → VC	0.182	3.80	0.64
VC → ETH	3.465	0.20	0.45

Zone 2	λ (1/yr)	half-life (yrs)
PCE → TCE	0.000	
TCE → DCE	0.000	
DCE → VC	0.000	
VC → ETH	0.000	

λ HELP

5. GENERAL

Simulation Time*	51	(yr)
Modeled Area Width*	600	(ft)
Modeled Area Length*	1540	(ft)
Zone 1 Length*	1540	(ft)
Zone 2 Length*	0	(ft)



Zone 2= L - Zone 1

6. SOURCE DATA

TYPE: Decaying
Single Planar

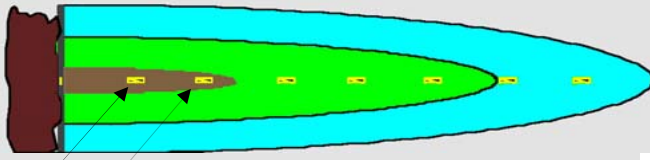
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1 250

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE		0.09
TCE	12.0	0.09
DCE	1.0	0.09
VC	.0	0.09
ETH		0.09

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)											
TCE Conc. (mg/L)		.11	.12	.18			.03			.03	.001
DCE Conc. (mg/L)		.038	.11	.15			.23			.24	.07
VC Conc. (mg/L)		0.0	.003	.002			.003			.011	.008
ETH Conc. (mg/L)											
Distance from Source (ft)		210	385	525			945			1435	1505
Date Data Collected											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | RUN ARRAY | Help | Restore Formulas | RESET | SEE OUTPUT | Paste Example

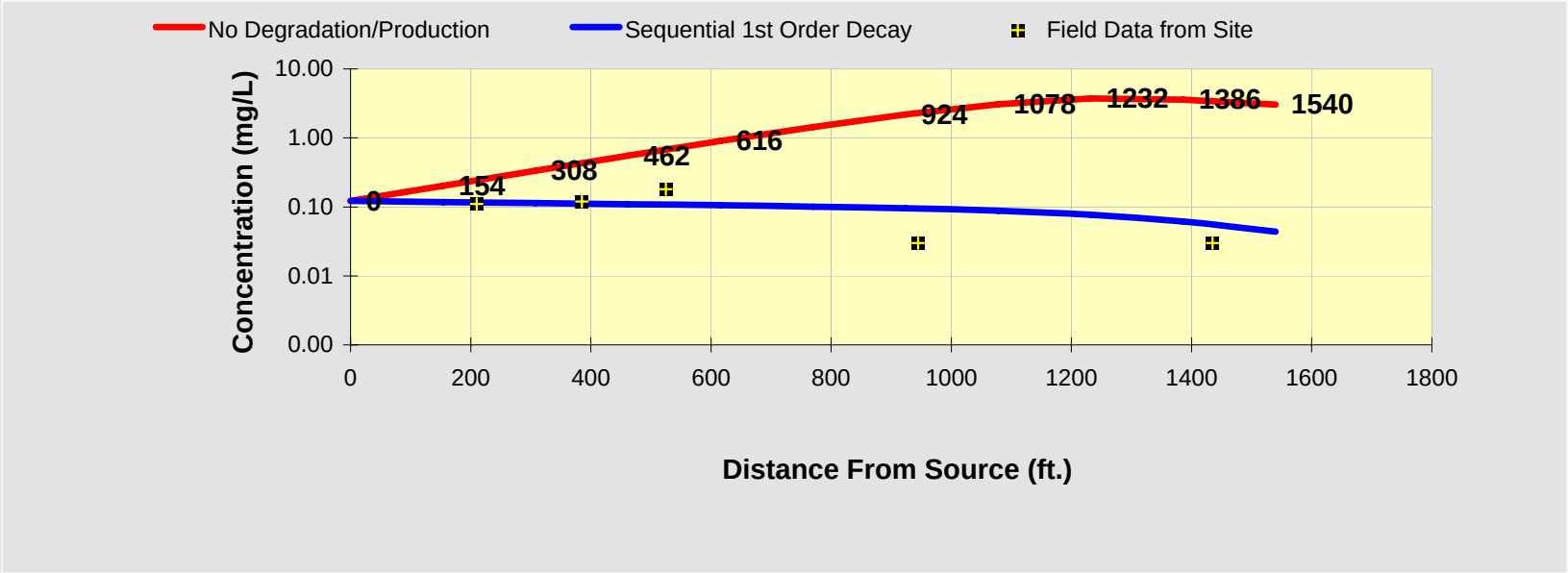
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

TCE	0	154	308	462	616	770	924	1078	1232	1386	1540
No Degradation	0.122	0.202	0.333	0.550	0.901	1.442	2.199	3.082	3.740	3.578	3.028
Biotransformation	0.12183	0.118	0.113	0.109	0.105	0.101	0.096	0.088	0.077	0.062	0.044

Monitoring Well Locations (ft)

		210	385	525			945			1435	1505
Field Data from Site		0.110	0.120	0.180			0.030			0.030	0.001



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

51.0 Years

Log ⟺ Linear

Return to Input

To All

To Array

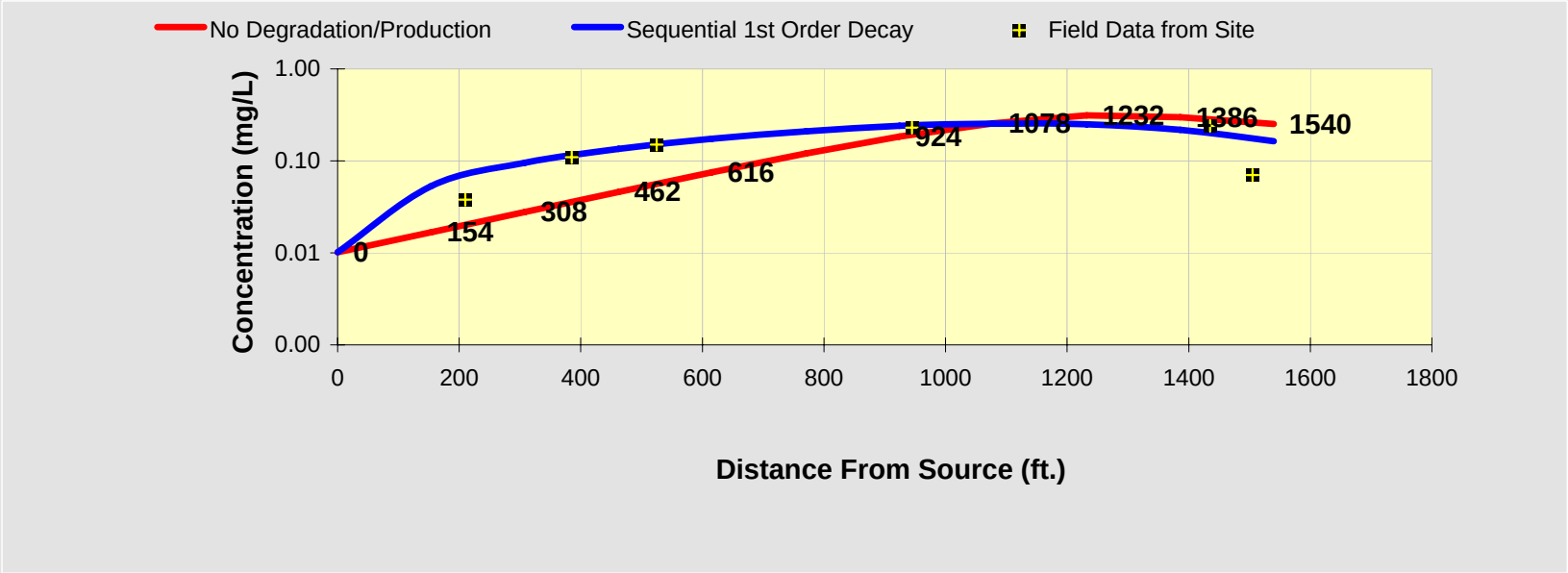
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

DCE	0	154	308	462	616	770	924	1078	1232	1386	1540
No Degradation	0.010	0.017	0.028	0.046	0.075	0.120	0.183	0.257	0.312	0.298	0.252
Biotransformation	0.01015	0.053	0.095	0.136	0.174	0.210	0.241	0.254	0.250	0.218	0.163

Monitoring Well Locations (ft)

		210	385	525			945			1435	1505
Field Data from Site		0.038	0.110	0.150			0.230			0.240	0.070



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

51.0 Years

Log ⟺ Linear

Return to Input

To All

To Array

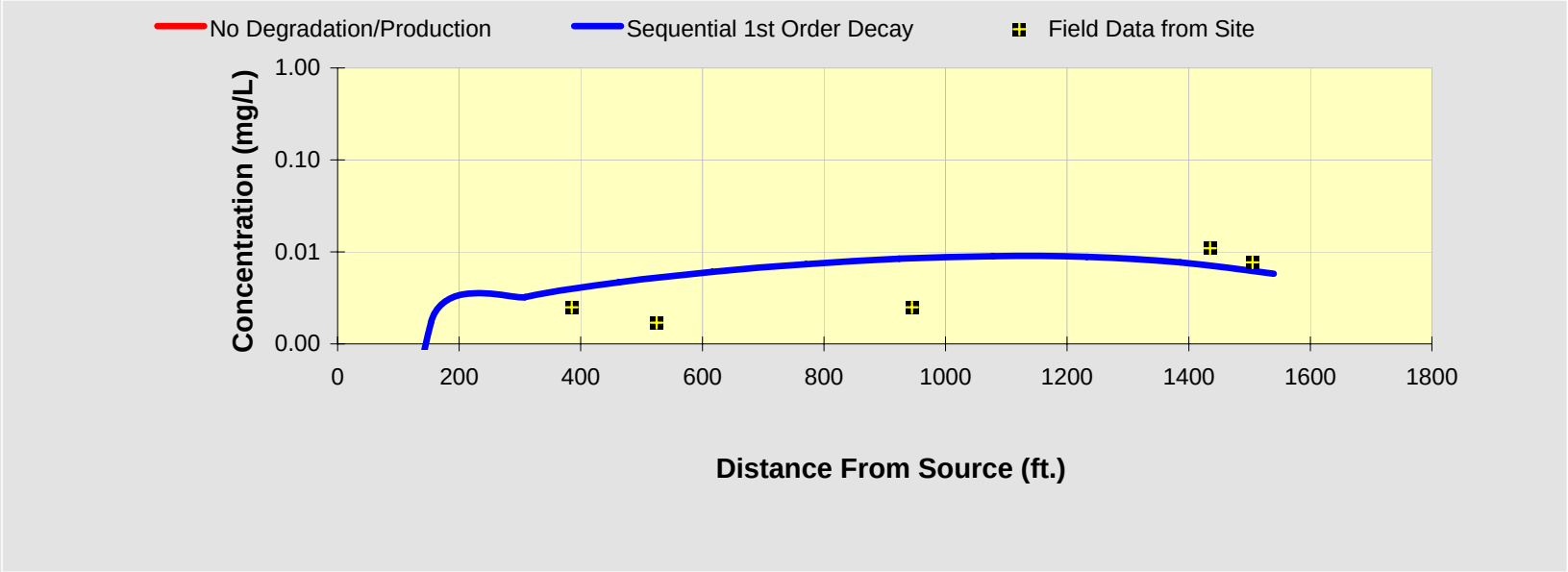
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

VC	0	154	308	462	616	770	924	1078	1232	1386	1540
No Degradation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Biotransformation	0.00000	0.002	0.003	0.005	0.006	0.007	0.008	0.009	0.009	0.008	0.006

Monitoring Well Locations (ft)

		210	385	525			945			1435	1505
Field Data from Site		0.000	0.003	0.002			0.003			0.011	0.008



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

51.0 Years

Log ⟺ Linear

Return to Input

To All

To Array

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

Camp Lejeune
Site 35
Run Name

Data Input Instructions:

115 → 1. Enter value directly....or
↑ *or* 2. Calculate by filling in gray
0.02 cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	62.1	(ft/yr)
or			
Hydraulic Conductivity	K	1.5E-03	(cm/sec)
Hydraulic Gradient	i	0.008	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	29.21	(ft)
(Alpha y) / (Alpha x)*	0.05	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

Soil Bulk Density, rho	1.6	(kg/L)		
FractionOrganicCarbon, foc	1.0E-3	(-)		
Partition Coefficient	Koc			
PCE	426	(L/kg)	4.41	(-)
TCE	130	(L/kg)	2.04	(-)
DCE	125	(L/kg)	2.00	(-)
VC	30	(L/kg)	1.24	(-)
ETH	302	(L/kg)	3.42	(-)
Common R (used in model)* =			**2.04**	

4. BIOTRANSFORMATION **-1st Order Decay Coefficient***

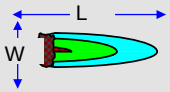
Zone 1	λ (1/yr)	half-life (yrs)	Yield
PCE → TCE	0.000		0.79
TCE → DCE	0.198	3.50	0.74
DCE → VC	0.182	3.80	0.64
VC → ETH	3.465	0.20	0.45

Zone 2	λ (1/yr)	half-life (yrs)
PCE → TCE	0.000	
TCE → DCE	0.000	
DCE → VC	0.000	
VC → ETH	0.000	

λ HELP

5. GENERAL

Simulation Time*	61	(yr)
Modeled Area Width*	600	(ft)
Modeled Area Length*	1540	(ft)
Zone 1 Length*	1540	(ft)
Zone 2 Length*	0	(ft)



Zone 2= L - Zone 1

6. SOURCE DATA TYPE: Decaying Single Planar

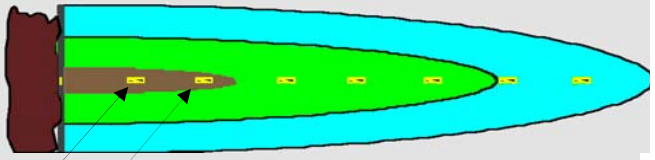
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1 250

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE		0.09
TCE	12.0	0.09
DCE	1.0	0.09
VC	.0	0.09
ETH		0.09

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)											
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)											
Date Data Collected											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | RUN ARRAY | Help | Restore Formulas | RESET | SEE OUTPUT | Paste Example

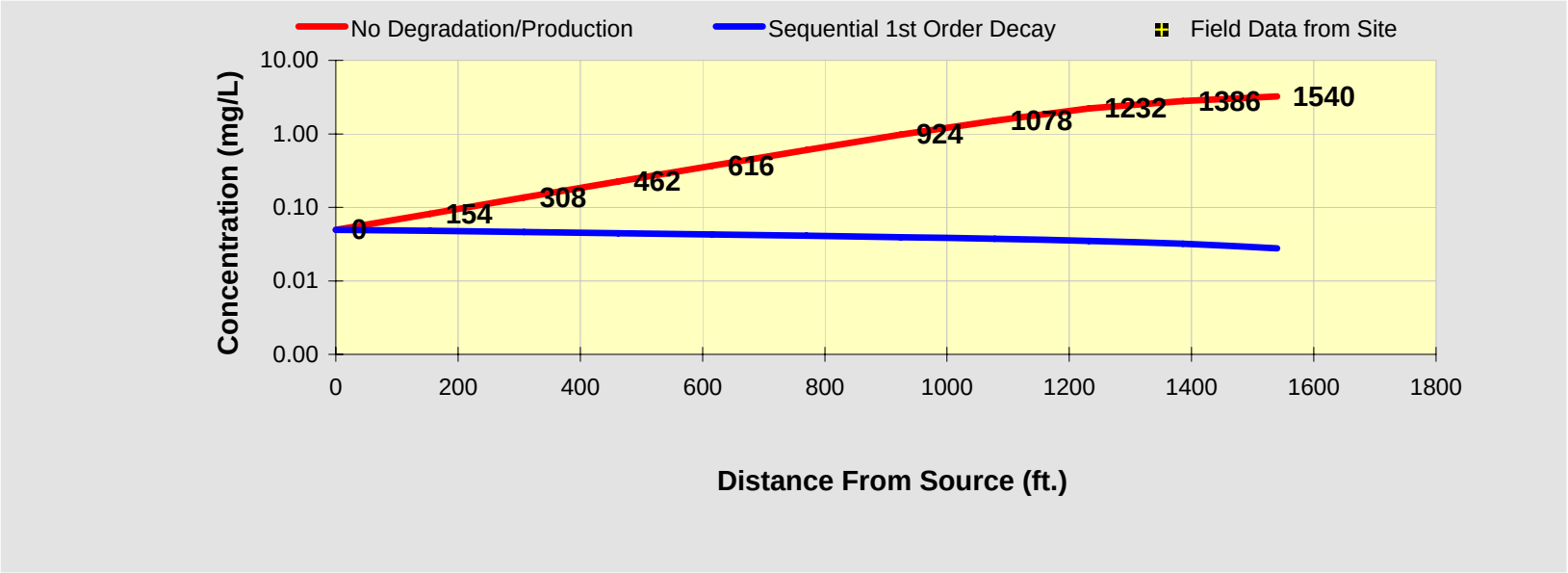
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

TCE	0	154	308	462	616	770	924	1078	1232	1386	1540
No Degradation	0.050	0.082	0.136	0.224	0.369	0.604	0.972	1.512	2.224	2.789	3.240
Biotransformation	0.04953	0.048	0.046	0.045	0.043	0.041	0.039	0.037	0.035	0.032	0.028

Monitoring Well Locations (ft)

Field Data from Site											



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:
61.0 Years
Log ⟺ Linear

Return to Input

To All

To Array

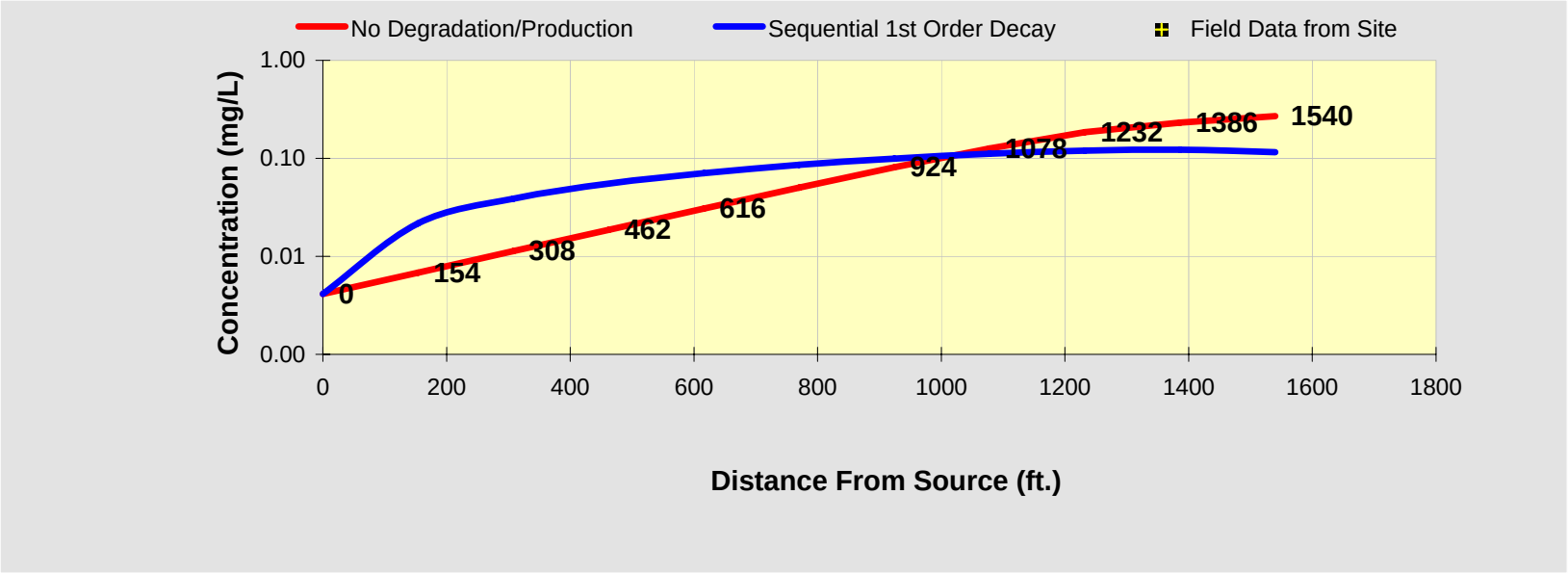
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

DCE	0	154	308	462	616	770	924	1078	1232	1386	1540
No Degradation	0.004	0.007	0.011	0.019	0.031	0.050	0.081	0.126	0.185	0.232	0.270
Biotransformation	0.00413	0.022	0.039	0.055	0.071	0.086	0.099	0.111	0.120	0.122	0.116

Monitoring Well Locations (ft)

Field Data from Site											



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

61.0 Years

Log ⇔ Linear

Return to Input

To All

To Array

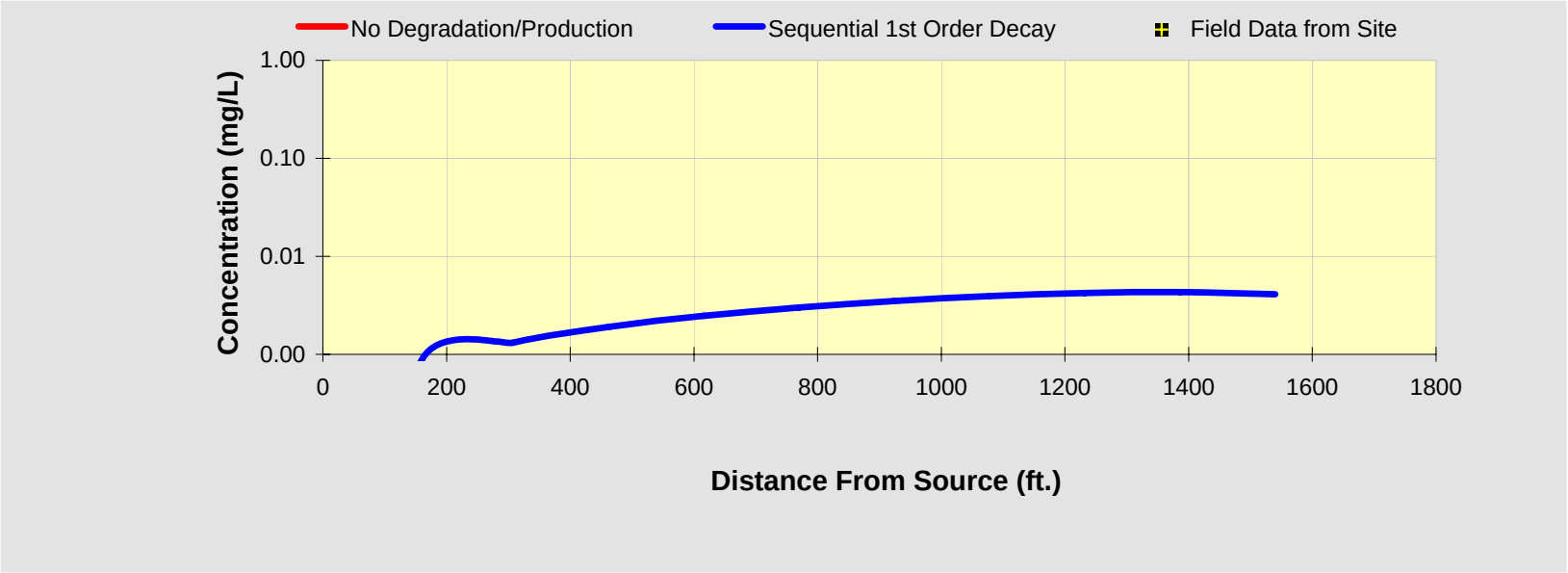
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

VC	0	154	308	462	616	770	924	1078	1232	1386	1540
No Degradation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Biotransformation	0.00000	0.001	0.001	0.002	0.002	0.003	0.003	0.004	0.004	0.004	0.004

Monitoring Well Locations (ft)

Field Data from Site											



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:
61.0 Years
Log ⟺ Linear

Return to Input

To All

To Array

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

Camp Lejeune
Site 35
Run Name

Data Input Instructions:

115 → 1. Enter value directly....or
↑ *or* 2. Calculate by filling in gray
0.02 cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	62.1	(ft/yr)
or			
Hydraulic Conductivity	K	1.5E-03	(cm/sec)
Hydraulic Gradient	i	0.008	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	29.21	(ft)
(Alpha y) / (Alpha x)*	0.05	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

Soil Bulk Density, rho	1.6	(kg/L)		
FractionOrganicCarbon, foc	1.0E-3	(-)		
Partition Coefficient	Koc			
PCE	426	(L/kg)	4.41	(-)
TCE	130	(L/kg)	2.04	(-)
DCE	125	(L/kg)	2.00	(-)
VC	30	(L/kg)	1.24	(-)
ETH	302	(L/kg)	3.42	(-)
Common R (used in model)* =			**2.04**	

4. BIOTRANSFORMATION **-1st Order Decay Coefficient***

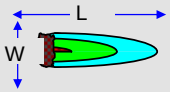
Zone 1	λ (1/yr)	half-life (yrs)	Yield
PCE → TCE	0.000		0.79
TCE → DCE	0.198	3.50	0.74
DCE → VC	0.182	3.80	0.64
VC → ETH	3.465	0.20	0.45

Zone 2	λ (1/yr)	half-life (yrs)
PCE → TCE	0.000	
TCE → DCE	0.000	
DCE → VC	0.000	
VC → ETH	0.000	

λ HELP

5. GENERAL

Simulation Time*	71	(yr)
Modeled Area Width*	600	(ft)
Modeled Area Length*	1540	(ft)
Zone 1 Length*	1540	(ft)
Zone 2 Length*	0	(ft)



Zone 2= L - Zone 1

6. SOURCE DATA TYPE: Decaying Single Planar

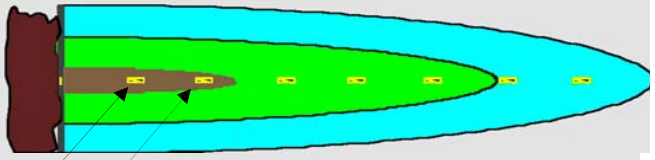
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1 250

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE		0.09
TCE	12.0	0.09
DCE	1.0	0.09
VC	.0	0.09
ETH		0.09

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)											
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)											
Date Data Collected											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | RUN ARRAY | Help | Restore Formulas | RESET | SEE OUTPUT | Paste Example

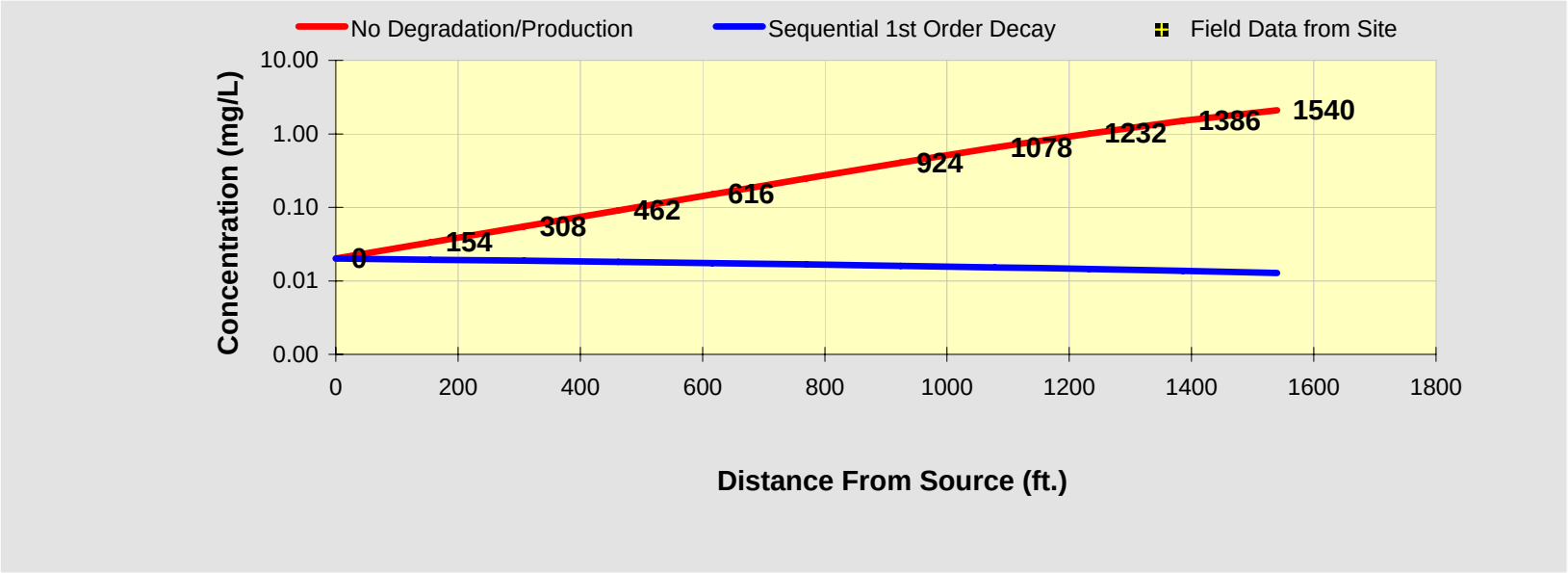
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

TCE	0	154	308	462	616	770	924	1078	1232	1386	1540
No Degradation	0.020	0.033	0.055	0.091	0.150	0.247	0.404	0.652	1.009	1.505	2.093
Biotransformation	0.02014	0.019	0.019	0.018	0.017	0.017	0.016	0.015	0.015	0.014	0.013

Monitoring Well Locations (ft)

Field Data from Site											



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

71.0 Years

Log ⇔ Linear

Return to Input

To All

To Array

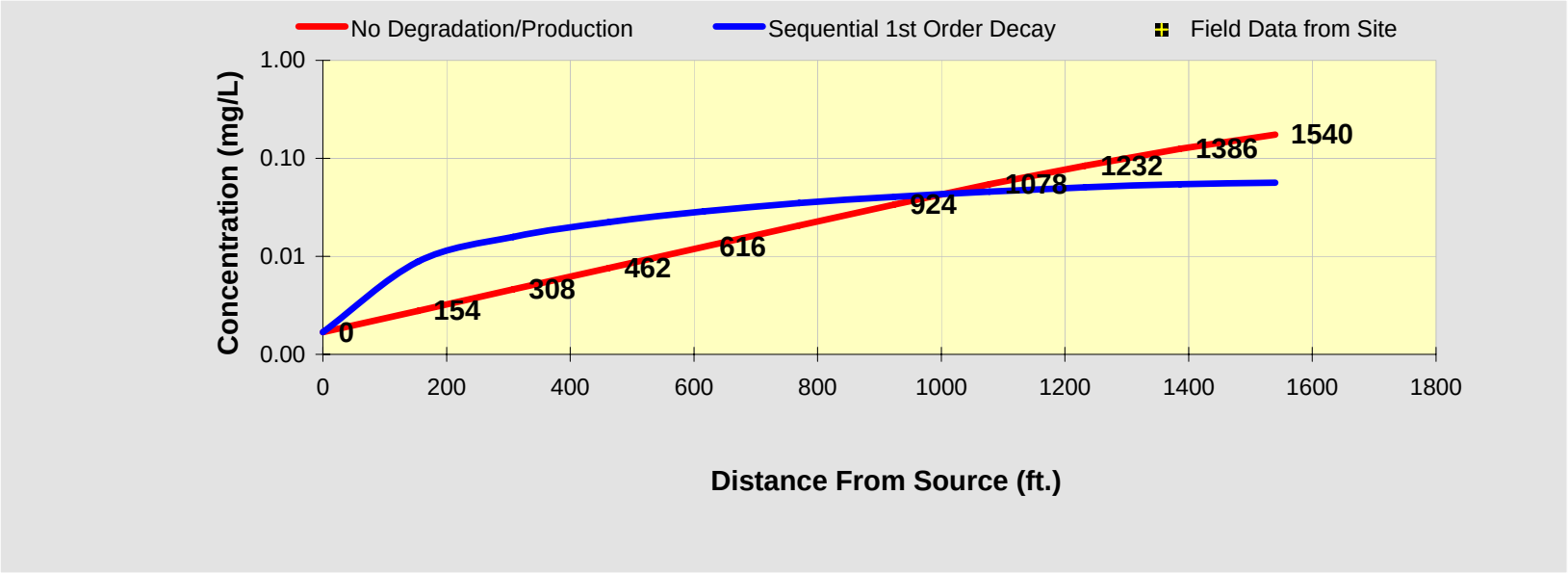
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

DCE	0	154	308	462	616	770	924	1078	1232	1386	1540
No Degradation	0.002	0.003	0.005	0.008	0.013	0.021	0.034	0.054	0.084	0.125	0.174
Biotransformation	0.00168	0.009	0.016	0.022	0.029	0.035	0.041	0.046	0.051	0.054	0.056

Monitoring Well Locations (ft)

Field Data from Site											



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

71.0 Years

Log ⇔ Linear

Return to Input

To All

To Array

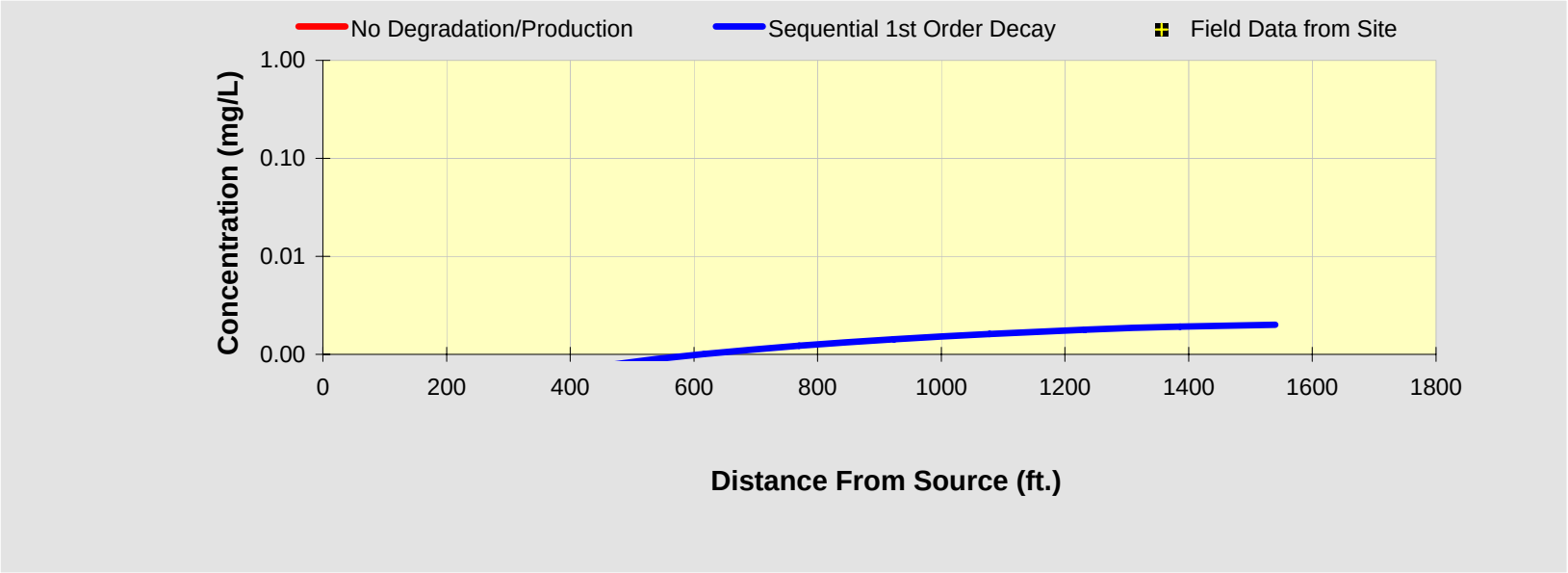
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

VC	0	154	308	462	616	770	924	1078	1232	1386	1540
No Degradation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Biotransformation	0.00000	0.000	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002

Monitoring Well Locations (ft)

Field Data from Site											



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

71.0 Years

Log ⇔ Linear

Return to Input

To All

To Array

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

Camp Lejeune
Site 35
Run Name

Data Input Instructions:

115 → 1. Enter value directly....or
↑ *or* 2. Calculate by filling in gray
0.02 cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	62.1	(ft/yr)
or			
Hydraulic Conductivity	K	1.5E-03	(cm/sec)
Hydraulic Gradient	i	0.008	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	29.21	(ft)
(Alpha y) / (Alpha x)*	0.05	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

Soil Bulk Density, rho	1.6	(kg/L)		
FractionOrganicCarbon, foc	1.0E-3	(-)		
Partition Coefficient	Koc			
PCE	426	(L/kg)	4.41	(-)
TCE	130	(L/kg)	2.04	(-)
DCE	125	(L/kg)	2.00	(-)
VC	30	(L/kg)	1.24	(-)
ETH	302	(L/kg)	3.42	(-)
Common R (used in model)* =			**2.04**	

4. BIOTRANSFORMATION **-1st Order Decay Coefficient***

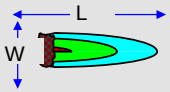
Zone 1	λ (1/yr)	half-life (yrs)	Yield
PCE → TCE	0.000		0.79
TCE → DCE	0.198	3.50	0.74
DCE → VC	0.182	3.80	0.64
VC → ETH	3.465	0.20	0.45

Zone 2	λ (1/yr)	half-life (yrs)
PCE → TCE	0.000	
TCE → DCE	0.000	
DCE → VC	0.000	
VC → ETH	0.000	

λ HELP

5. GENERAL

Simulation Time*	81	(yr)
Modeled Area Width*	600	(ft)
Modeled Area Length*	1540	(ft)
Zone 1 Length*	1540	(ft)
Zone 2 Length*	0	(ft)



Zone 2= L - Zone 1

6. SOURCE DATA TYPE: Decaying Single Planar

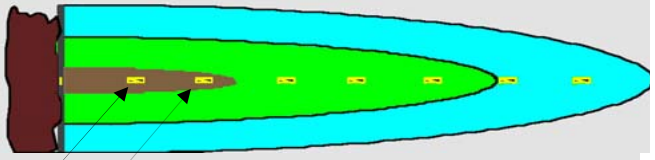
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1 250

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE		0.09
TCE	12.0	0.09
DCE	1.0	0.09
VC	.0	0.09
ETH		0.09

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)											
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)											
Date Data Collected											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | RUN ARRAY | Help | Restore Formulas | RESET | SEE OUTPUT | Paste Example

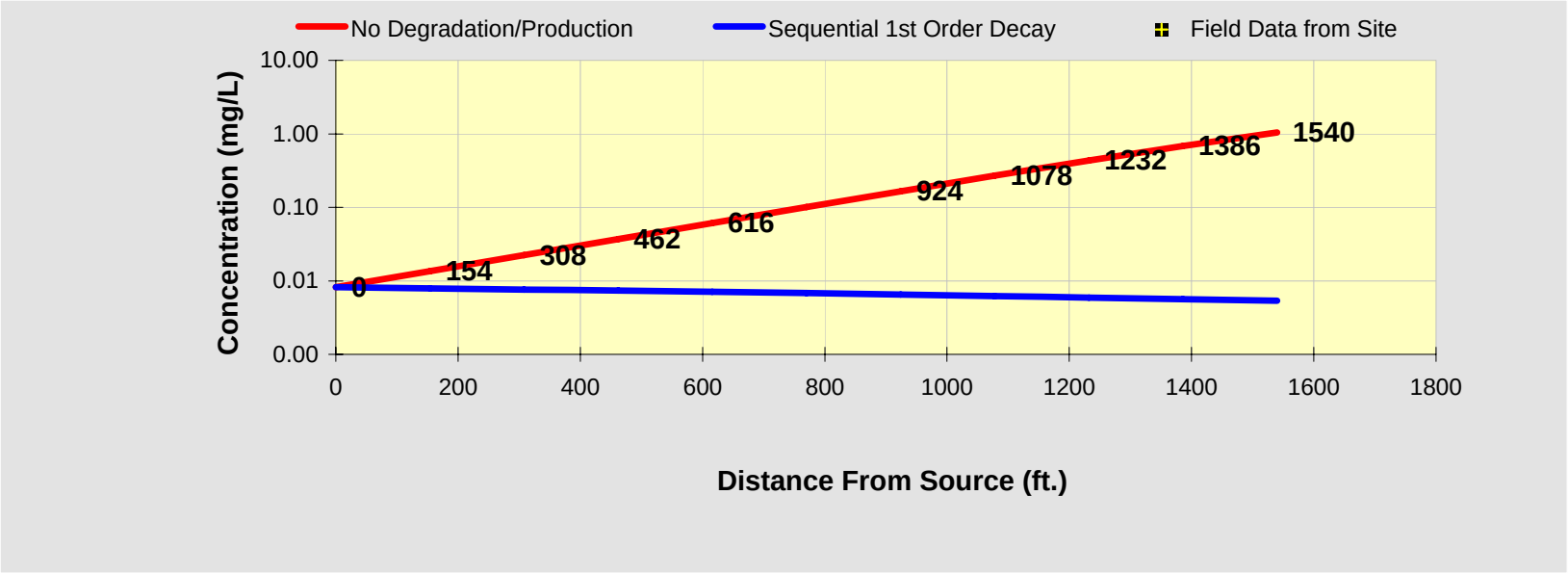
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

TCE	0	154	308	462	616	770	924	1078	1232	1386	1540
No Degradation	0.008	0.014	0.022	0.037	0.061	0.101	0.165	0.269	0.433	0.684	1.044
Biotransformation	0.00819	0.008	0.008	0.007	0.007	0.007	0.007	0.006	0.006	0.006	0.005

Monitoring Well Locations (ft)

Field Data from Site											



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

81.0 Years

Log ⇔ Linear

Return to Input

To All

To Array

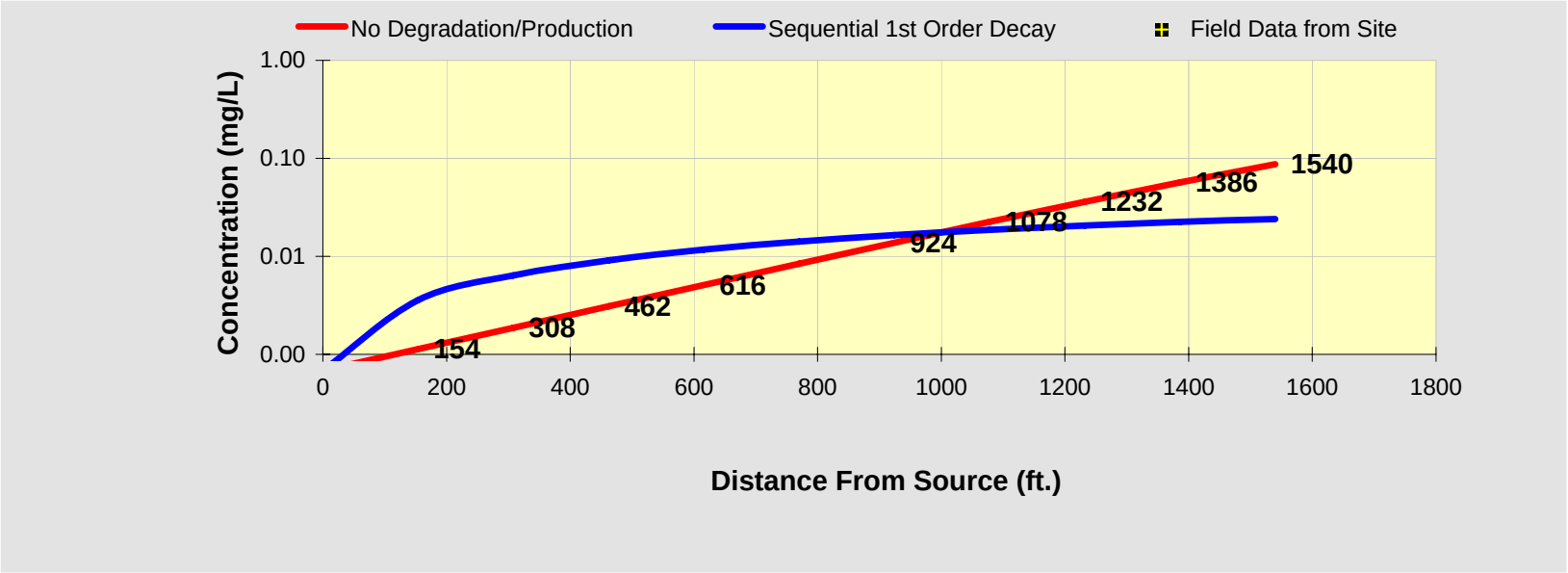
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

DCE	0	154	308	462	616	770	924	1078	1232	1386	1540
No Degradation	0.001	0.001	0.002	0.003	0.005	0.008	0.014	0.022	0.036	0.057	0.087
Biotransformation	0.00068	0.004	0.006	0.009	0.012	0.014	0.017	0.019	0.021	0.022	0.024

Monitoring Well Locations (ft)

Field Data from Site											



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:
81.0 Years
Log ⇔ Linear

Return to Input

To All

To Array

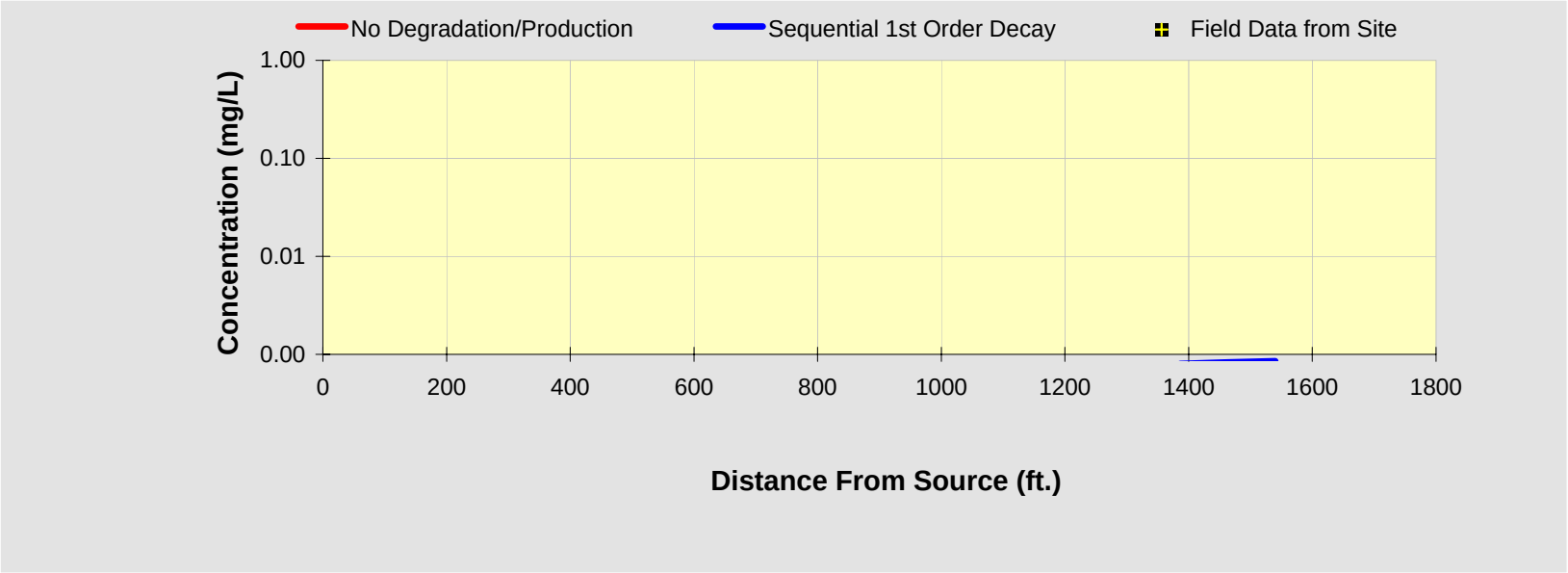
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

VC	0	154	308	462	616	770	924	1078	1232	1386	1540
No Degradation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Biotransformation	0.00000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001

Monitoring Well Locations (ft)

Field Data from Site											



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:
81.0 Years
Log ⟺ Linear

Return to Input

To All

To Array

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

Camp Lejeune
Site 35
Run Name

Data Input Instructions:

115 → 1. Enter value directly....or
↑ *or* 2. Calculate by filling in gray
0.02 cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

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or			
Hydraulic Conductivity	K	1.5E-03	(cm/sec)
Hydraulic Gradient	i	0.008	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	29.21	(ft)
(Alpha y) / (Alpha x)*	0.05	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

Soil Bulk Density, rho	1.6	(kg/L)		
FractionOrganicCarbon, foc	1.0E-3	(-)		
Partition Coefficient	Koc			
PCE	426	(L/kg)	4.41	(-)
TCE	130	(L/kg)	2.04	(-)
DCE	125	(L/kg)	2.00	(-)
VC	30	(L/kg)	1.24	(-)
ETH	302	(L/kg)	3.42	(-)
Common R (used in model)* =			**2.04**	

4. BIOTRANSFORMATION

-1st Order Decay Coefficient*

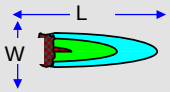
Zone 1	λ (1/yr)	half-life (yrs)	Yield
PCE → TCE	0.000		0.79
TCE → DCE	0.198	3.50	0.74
DCE → VC	0.182	3.80	0.64
VC → ETH	3.465	0.20	0.45

Zone 2	λ (1/yr)	half-life (yrs)
PCE → TCE	0.000	
TCE → DCE	0.000	
DCE → VC	0.000	
VC → ETH	0.000	

λ HELP

5. GENERAL

Simulation Time*	91	(yr)
Modeled Area Width*	600	(ft)
Modeled Area Length*	1540	(ft)
Zone 1 Length*	1540	(ft)
Zone 2 Length*	0	(ft)



Zone 2= L - Zone 1

6. SOURCE DATA

TYPE: Decaying Single Planar

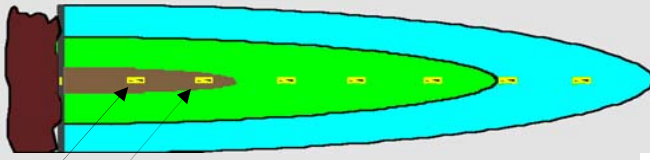
Source Options

Source Thickness in Sat. Zone* 20 (ft)

Width* (ft) Y1 250

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE		0.09
TCE	12.0	0.09
DCE	1.0	0.09
VC	.0	0.09
ETH		0.09

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)											
TCE Conc. (mg/L)											
DCE Conc. (mg/L)											
VC Conc. (mg/L)											
ETH Conc. (mg/L)											
Distance from Source (ft)											
Date Data Collected											

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | RUN ARRAY | Help | Restore Formulas | RESET | SEE OUTPUT | Paste Example

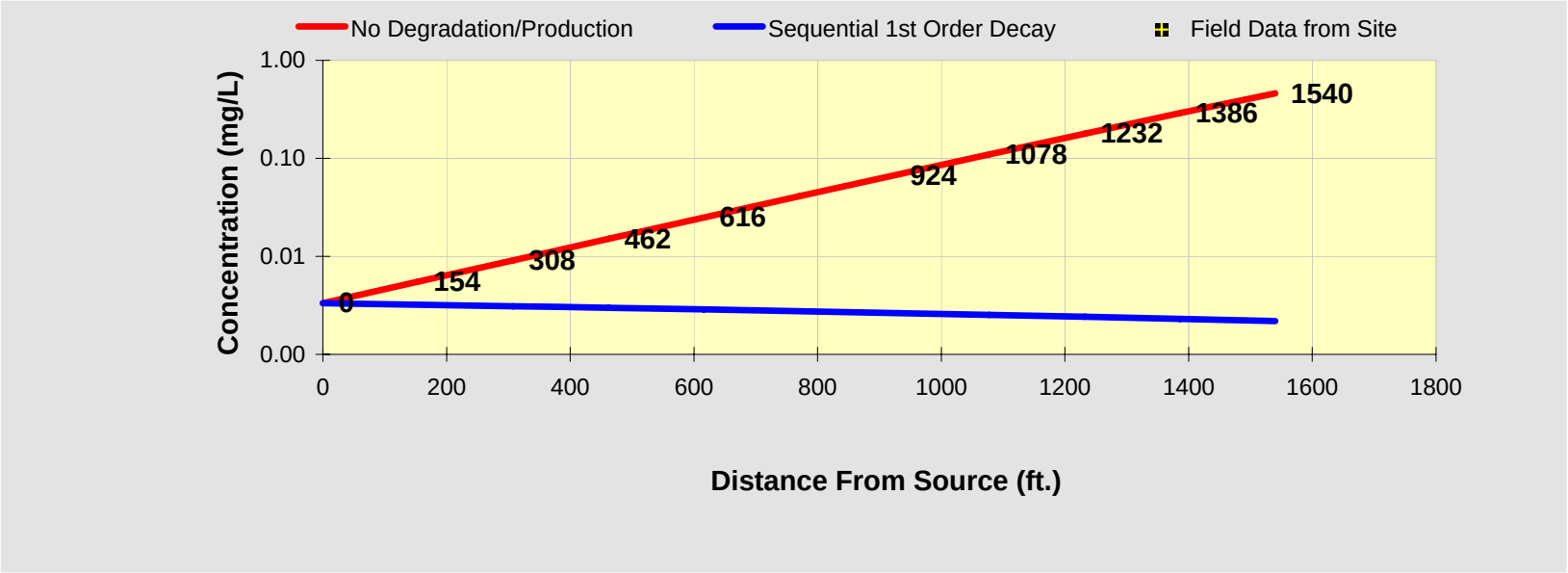
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

TCE	0	154	308	462	616	770	924	1078	1232	1386	1540
No Degradation	0.003	0.006	0.009	0.015	0.025	0.041	0.067	0.110	0.179	0.289	0.460
Biotransformation	0.00333	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002

Monitoring Well Locations (ft)

Field Data from Site											



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

91.0 Years

Log ⇔ Linear

Return to Input

To All

To Array

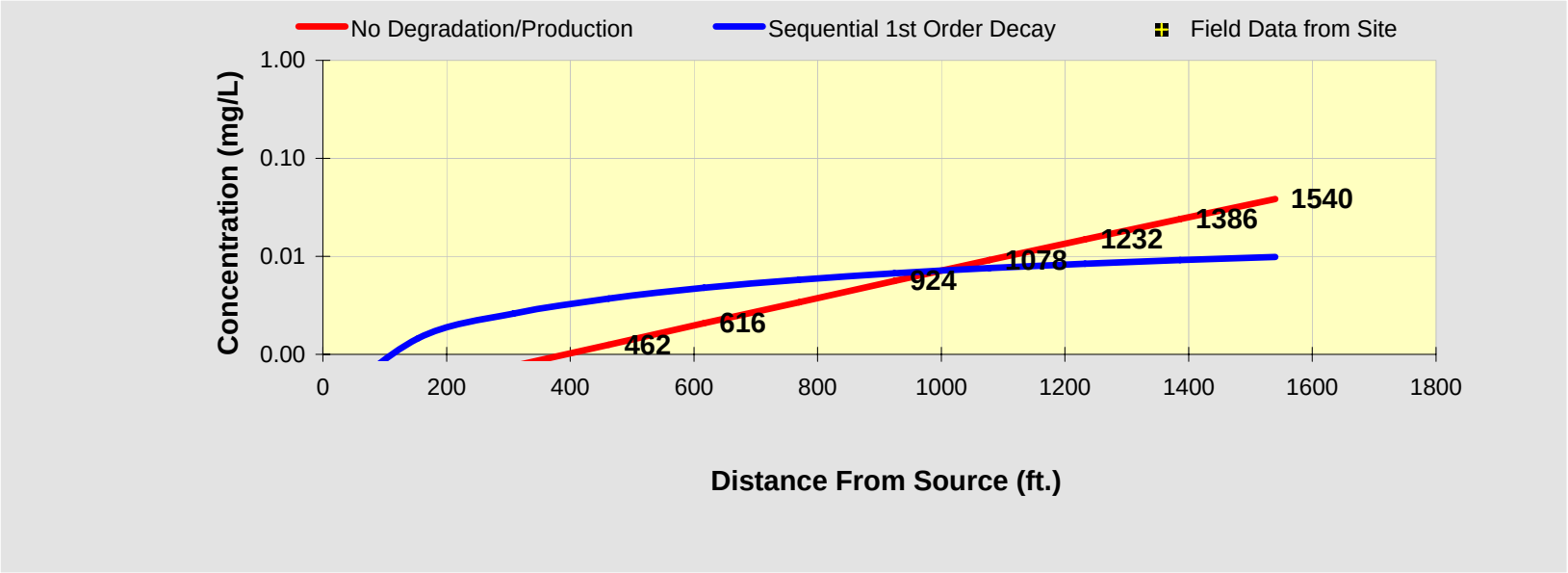
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

DCE	0	154	308	462	616	770	924	1078	1232	1386	1540
No Degradation	0.000	0.000	0.001	0.001	0.002	0.003	0.006	0.009	0.015	0.024	0.038
Biotransformation	0.00028	0.001	0.003	0.004	0.005	0.006	0.007	0.008	0.008	0.009	0.010

Monitoring Well Locations (ft)

Field Data from Site											



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

91.0 Years

Log ⇔ Linear

Return to Input

To All

To Array

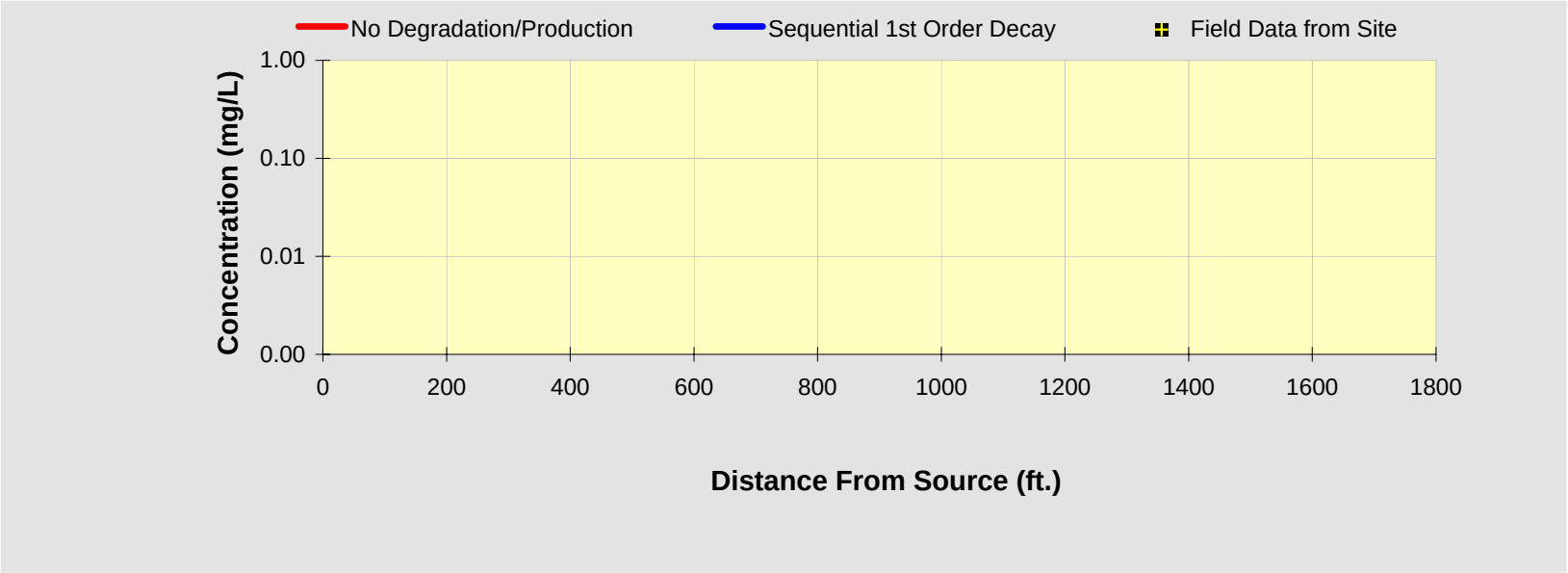
DISSOLVED CHLORINATED SOLVENT CONCENTRATIONS ALONG PLUME CENTERLINE (mg/L) at Z=0

Distance from Source (ft)

VC	0	154	308	462	616	770	924	1078	1232	1386	1540
No Degradation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Biotransformation	0.00000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Monitoring Well Locations (ft)

Field Data from Site											



See PCE

See TCE

See DCE

See VC

See ETH

Prepare Animation

Time:

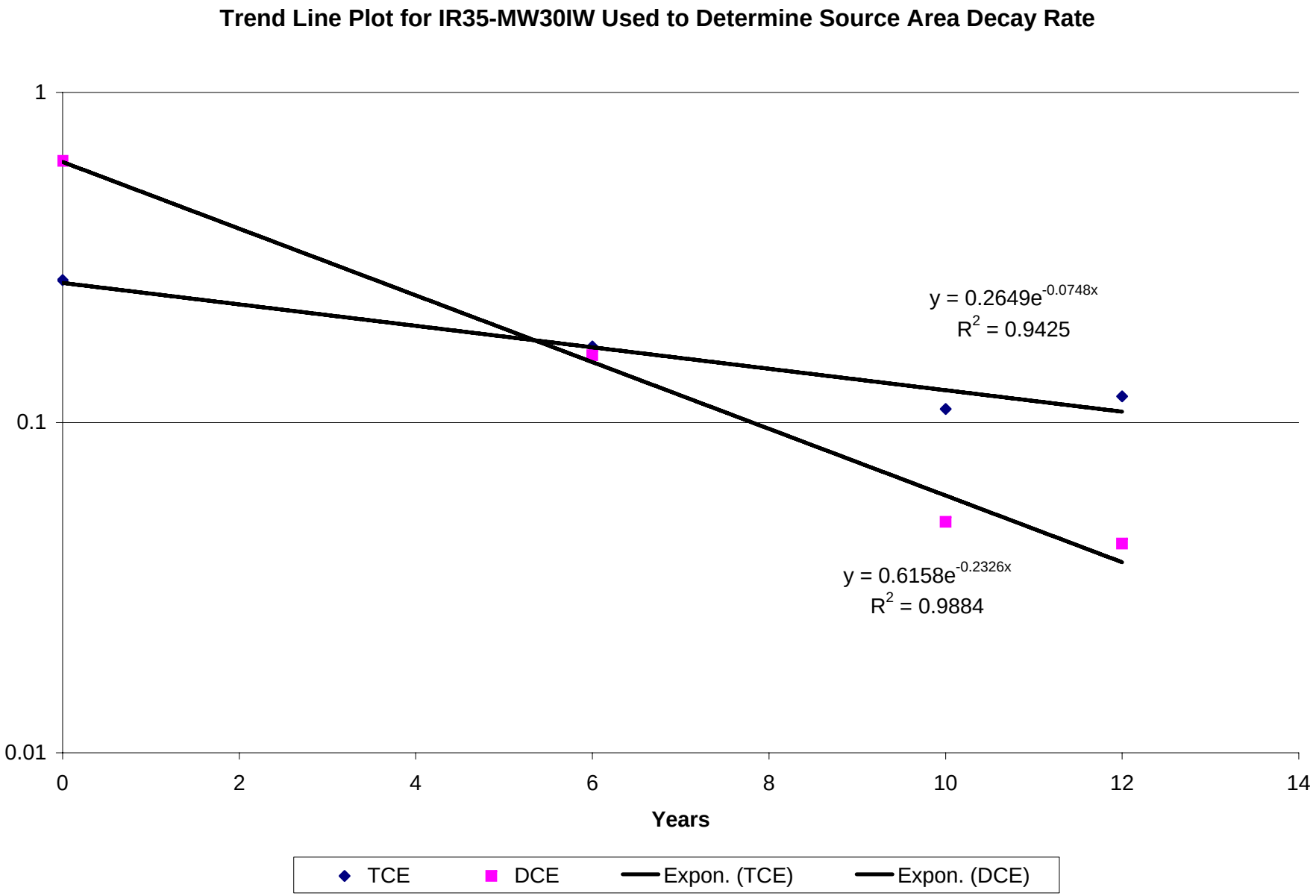
91.0 Years

Log ⇔ Linear

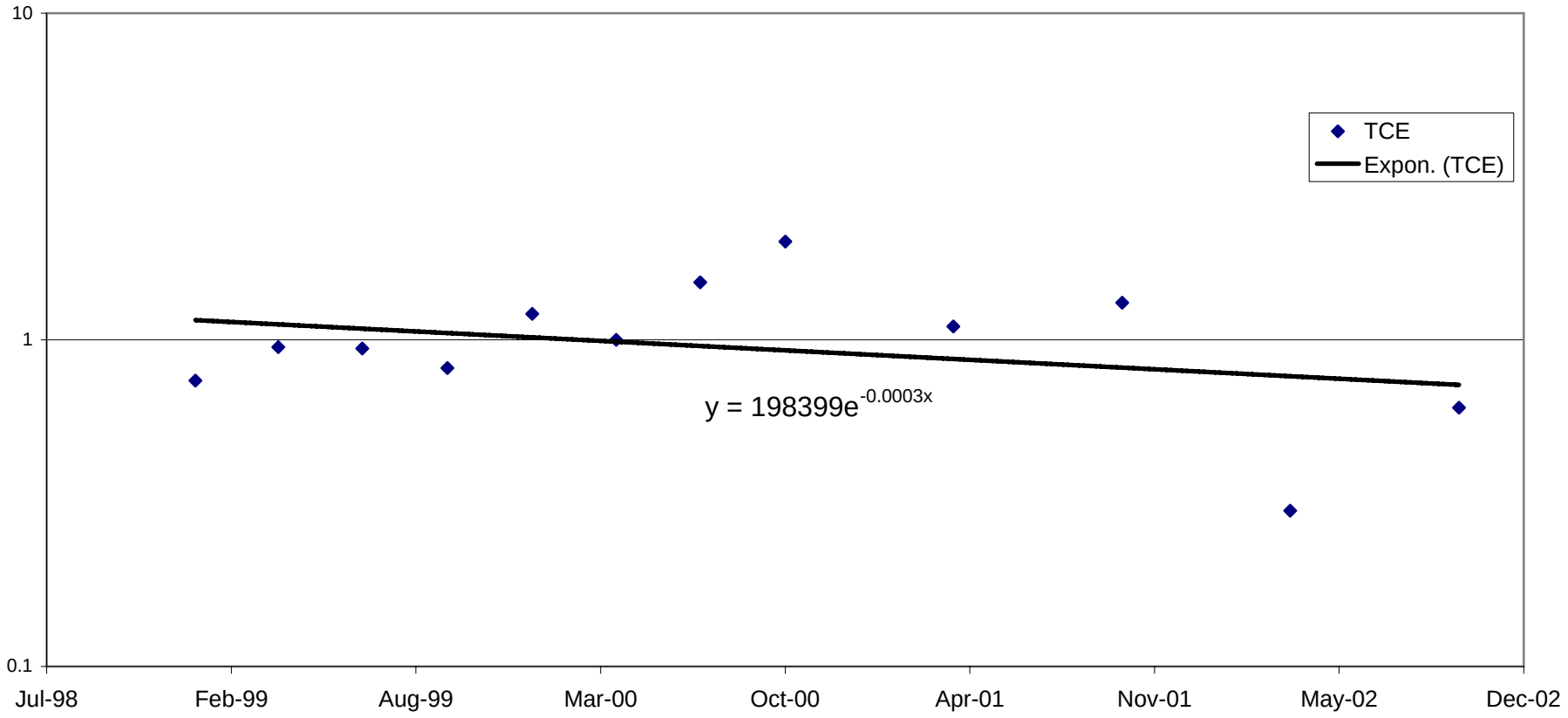
Return to Input

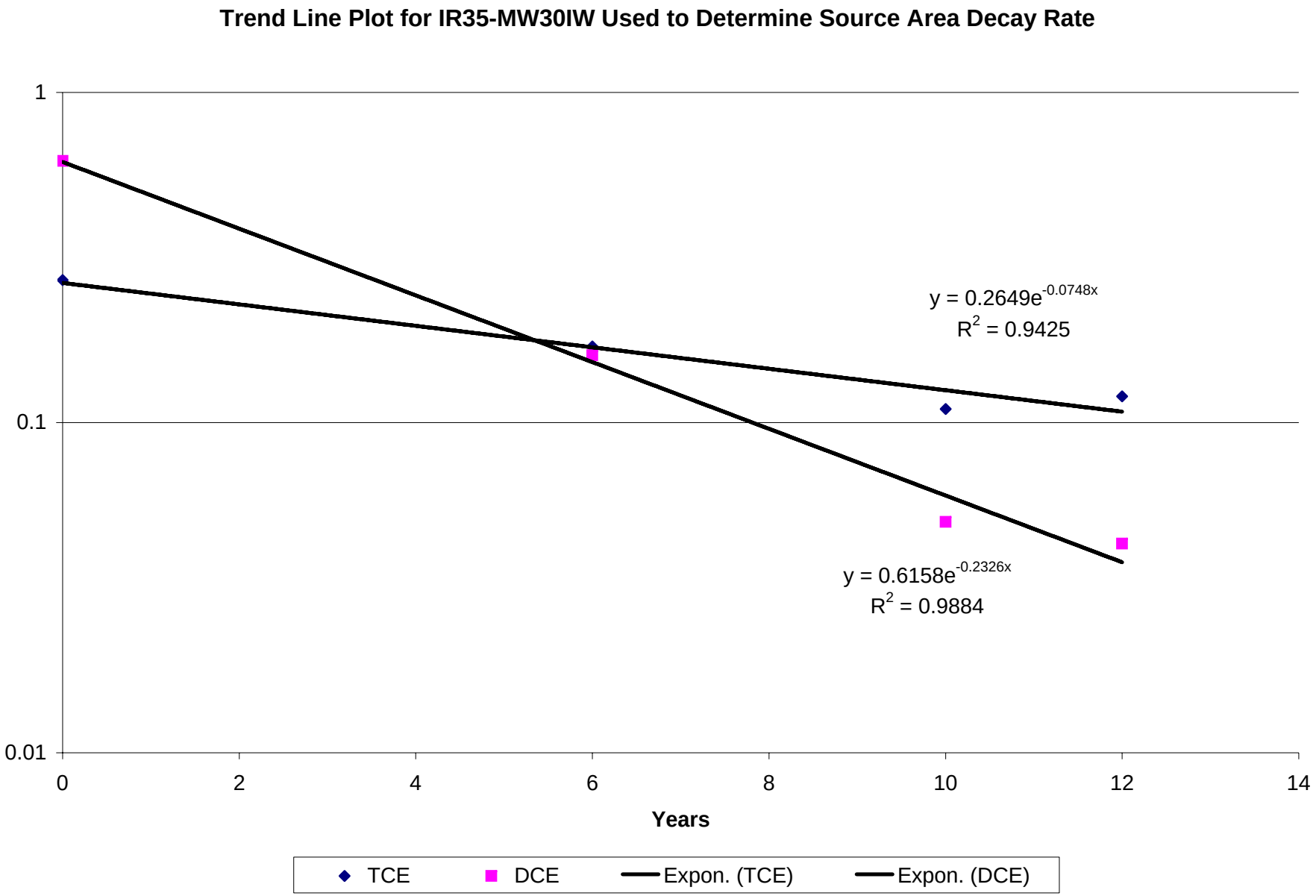
To All

To Array


Trend Line Plot for IR35-MW30IW Used to Determine Source Area Decay Rate
1
0.1
0.01
0
2
4
6
8
10
12
14
Years
y = 0.2649e^-0.0748x
R^2 = 0.9425
y = 0.6158e^-0.2326x
R^2 = 0.9884
TCE
DCE
Expon. (TCE)
Expon. (DCE)

Trend Line Plot for IR35-MW55IW Used to Determine Source Area Decay Rate




Trend Line Plot for IR35-MW30IW Used to Determine Source Area Decay Rate
1
0.1
0.01
0
2
4
6
8
10
12
14
Years
y = 0.2649e^-0.0748x
R^2 = 0.9425
y = 0.6158e^-0.2326x
R^2 = 0.9884
TCE
DCE
Expon. (TCE)
Expon. (DCE)

Appendix H
Human Health Risk Assessment Tables

TABLE 6-28

TOTAL SITE RISK
OPERABLE UNIT NO. 10 (SITE 35)
REMEDIAL INVESTIGATION, CTO-0212
MCB CAMP LEJEUNE, NORTH CAROLINA

Receptors	Soil		Groundwater		Surface Water		Sediment		Fish		TOTALS	
	ICR	HI	ICR	HI	ICR	HI	ICR	HI	ICR	HI	ICR	HI
Future Child Resident	4.5E-05 (<1)	0.93 (1)	2.1E-03 (99)	103 (99)	NA	NA	NA	NA	NA	NA	2.1E-03	104
Future Adult Resident	2.7E-05 (<1)	0.10 (<1)	4.3E-03 (99)	44 (99)	NA	NA	NA	NA	NA	NA	4.3E-03	44
Future Construction Worker	1.2E-07 (100)	0.02 (100)	NA	NA	NA	NA	NA	NA	NA	NA	1.2E-07	0.02
Current Military Personnel	3.1E-06 (100)	0.09 (100)	NA	NA	NA	NA	NA	NA	NA	NA	3.1E-06	0.09
Current Recreational Child	NA	NA	NA	NA	1.1E-07 (27)	<0.01 (<1)	3.3E-07 (73)	0.01 (99)	NA	NA	4.4E-07	0.01
Current Recreational Adult	NA	NA	NA	NA	1.2E-07 (<1)	<0.01 (<1)	4.5E-07 (<1)	<0.01 (<1)	1.8E-05 (99)	1.8 (99)	1.9E-05	1.8

Notes: ICR = Incremental Lifetime Cancer Risk
HI = Hazard Index
ND = Not Determined
NA = Not Applicable
( ) = Percent Contribution to Total Risk

TABLE 6-6

TOTAL SITE GROUNDWATER RISK
SITE 35 - CAMP GEIGER AREA FUEL FARM
REMEDIAL INVESTIGATION
MCB, CAMP LEJEUNE, NORTH CAROLINA
CONTRACT TASK ORDER 0232

Receptors	Rounds 2 and 3 Organics Groundwater		Low-Flow Purge Sampling Inorganics Groundwater		Total Groundwater Risk	
	ICR	HI	ICR	HI	ICR	HI
Future Child Resident	9.1×10^{-5} (65)	37 (77)	5.2×10^{-5} (35)	11 (23)	1.4×10^{-4}	48
Future Adult Resident	2.0×10^{-4} (65)	16 (77)	1.1×10^{-4} (35)	4.7 (23)	3.1×10^{-4}	21

Notes:

ICR = Incremental Lifetime Cancer Risk
HI = Hazard Index
( ) = Percent contribution to total risk

TABLE 4-1
POSITIVE DETECTION SUMMARY
ROUND 3, GROUNDWATER
INORGANICS
SITE 35, CAMP GEIGER AREA FUEL FARM
SUPPLEMENTAL GROUNDWATER INVESTIGATION - CTO 0232
MCB, CAMP LEJEUNE, NORTH CAROLINA
CONTRACT TASK ORDER 0232

LOCATION	35-EMW03-02	35-EMW05-02	35-EMW07-02	35-GW05-02m	35-MW09D-02	35-MW09S-02
LAB ID	D95-7537-1	D95-7597-6	D95-7537-2	D95-7537-8	D95-7597-2	D95-7597-7
DATE SAMPLED	08/10/95	08/11/95	08/10/95	08/11/95	08/12/95	08/12/95
METALS (ug/L)						
Aluminum	96.5	93.2 J	20 U	25.9	26.2 J	198 J
Antimony	20 U	20 U	20 U	20 U	20 U	20 U
Arsenic	2 U	8.7 J	2 U	2 U	1.4 U	3.2 J
Barium	20 U	21.7 J	20 U	20 U	20.9 J	57.7 J
Calcium	89900	45100	105000	56900	104000	98600
Cobalt	9 J	3.8 J	2.8 J	2 U	2 U	2 U
Iron	3350	20200	106	337	1650	162
Lead	1 UJ	12.1 J	1 UJ	1 U	1 UJ	1 UJ
Magnesium	2240 J	3610 J	3480 J	2280	2260 J	4110 J
Manganese	22.9	51.7	26.2	22.1	19.7	38.6
Potassium	734 J	1160 J	2150 J	4400	844 J	3350 J
Selenium	2.5 UJ	2.5 UJ	2.5 U	2.5 U	2.5 UJ	3.4 J
Silver	2 U	2 U	2 U	2 U	2 U	2 U
Sodium	8120	9090	7940	31900	8740	29000
Thallium	0.7 U	9.9 U	0.7 U	1	9.9 U	9.9 U
Vanadium	2 U	2 U	2 U	2 U	2 U	5.5 J
Zinc	10.5 J	5 U	10.6 J	6.7	10.9 U	18.5 U

QUALIFIER DEFINITIONS
J = Analyte present. Reported value may not be accurate or precise.
U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.
UJ = Not detected. Quantitation limit may be inaccurate or imprecise.

NOTES
mg/kg = milligrams per kilogram

TABLE 4-1
POSITIVE DETECTION SUMMARY
ROUND 3, GROUNDWATER
INORGANICS
SITE 35, CAMP GEIGER AREA FUEL FARM
SUPPLEMENTAL GROUNDWATER INVESTIGATION - CTO 0232
MCB, CAMP LEJEUNE, NORTH CAROLINA
CONTRACT TASK ORDER 0232

LOCATION	35-MW10D-02	35-MW10S-02	35-MW14D-02	35-MW14S-02	35-MW16D-02	35-MW16S-02
LAB ID	95-7537-15	95-7537-14	95-7537-17	95-7537-16	95-7537-13	95-7537-11
DATE SAMPLED	08/09/95	08/09/95	08/10/95	08/10/95	08/09/95	08/10/95
METALS (ug/L)						
Aluminum	20 U	303	28.6 J	20 U	20 U	20 U
Antimony	20 U	20 U	20 U	20 U	20 U	20 U
Arsenic	2 U	3.5 J	2 U	4.2 J	2 U	10.3
Barium	20 U	20 U	33.7 J	27.1 J	20 U	32.2 J
Calcium	122000	75000	119000	142000	96900	124000
Cobalt	2 U	2 U	2 U	2.9 J	6.1 J	16 J
Iron	1490	152	1070	4490	2580	40400
Lead	1	1 U	15.4	1 U	1 U	8.9
Magnesium	2420	1800 J	2450 J	4520 J	3440 J	4580 J
Manganese	19	7.5 J	23.4	44.6	275	141
Potassium	811	860 J	1270 J	1460 J	970 J	793 J
Selenium	2.5 U	2.5 U	2.5 U	2.5 UJ	2.5 U	2.5 UJ
Silver	2 U	2 U	2 U	2 U	2 U	10.9
Sodium	8390	9970	9560	10400	8380	4350 J
Thallium	0.7 U	0.7 U	0.7 U	0.7 UJ	0.7 UJ	0.9 J
Vanadium	2 U	9.1 J	2 U	2 U	2 U	2 U
Zinc	13.8	6.5 J	29.5	22.5	12.9 J	11.5 J

QUALIFIER DEFINITIONS
J = Analyte present. Reported value may not be accurate or precise.
U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.
UJ = Not detected. Quantitation limit may be inaccurate or imprecise.

NOTES
mg/kg = milligrams per kilogram

TABLE 4-1
POSITIVE DETECTION SUMMARY
ROUND 3, GROUNDWATER
INORGANICS
SITE 35, CAMP GEIGER AREA FUEL FARM
SUPPLEMENTAL GROUNDWATER INVESTIGATION - CTO 0232
MCB, CAMP LEJEUNE, NORTH CAROLINA
CONTRACT TASK ORDER 0232

LOCATION	35-MW19D-02	35-MW19S-02	35-MW22D-02	35-MW22S-02	35-MW29A-02	35-MW29B-02
LAB ID	D95-7537-5	D95-7537-6	D95-7597-8	D95-7597-9	D95-7597-4	D95-7597-5
DATE SAMPLED	08/11/95	08/11/95	08/13/95	08/13/95	08/12/95	08/12/95
METALS (ug/L)						
Aluminum	47.8 J	282	22.6 J	123 U	357	20 U
Antimony	20 U	20 U	20 U	20 J	20 U	20 U
Arsenic	2 U	2 U	1.4 U	7.1 J	13.3	1.4 U
Barium	20 U	20 U	24.7 J	32.5 U	81.7 J	20 U
Calcium	109000	35600	104000	133000	7460	93500
Cobalt	2.2 J	4.4 J	2 U	5.6 J	3.3 J	2 U
Iron	113	266	1110	15700	9360	933
Lead	1 UJ	1 U	2.5 J	1 UJ	1 UJ	1.4 J
Magnesium	4990 J	1880 J	3020 J	3230 J	1550 J	1890 J
Manganese	36.7	102	41.2	63.5	29.2	17.1
Potassium	3360 J	2650 J	1120 J	2320 J	2170 J	1110 J
Selenium	2.5 U	2.5 U	2.5 UJ	2.5 UJ	2.5 UJ	2.5 UJ
Silver	2 U	2 U	2 U	2 U	2 U	2 U
Sodium	10500	11300	7050	5080	14600	6460
Thallium	0.7 J	0.7 U	9.9 U	9.9 U	9.9 U	9.9 U
Vanadium	2 U	2 U	2 U	2 U	2 U	2 U
Zinc	10.4 J	9.9 J	5.9 U	5 U	17.4 U	11.6 U

QUALIFIER DEFINITIONS
J = Analyte present. Reported value may not be accurate or precise.
U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.
UJ = Not detected. Quantitation limit may be inaccurate or imprecise.

NOTES
mg/kg = milligrams per kilogram

TABLE 4-1
POSITIVE DETECTION SUMMARY
ROUND 3, GROUNDWATER
INORGANICS
SITE 35, CAMP GEIGER AREA FUEL FARM
SUPPLEMENTAL GROUNDWATER INVESTIGATION - CTO 0232
MCB, CAMP LEJEUNE, NORTH CAROLINA
CONTRACT TASK ORDER 0232

LOCATION	35-MW33A-02	35-MW33D-02
LAB ID	D95-7597-1	D95-7597-3
DATE SAMPLED	08/12/95	08/12/95
METALS (ug/L)		
Aluminum	520	20 U
Antimony	20 U	20 U
Arsenic	1.4 U	1.4 U
Barium	98.4 J	20 U
Calcium	6380	102000
Cobalt	2 U	2 U
Iron	58.4 J	648
Lead	6 J	1.5 J
Magnesium	3620 J	2170 J
Manganese	8.8 J	20.1
Potassium	1840 J	929 J
Selenium	2.6 J	2.5 UJ
Silver	2 U	2 U
Sodium	5370	7340
Thallium	9.9 U	9.9 U
Vanadium	2 U	2 U
Zinc	7.6 U	24.3 U

QUALIFIER DEFINITIONS
J = Analyte present. Reported value may not be accurate or precise.
U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.
UJ = Not detected. Quantitation limit may be inaccurate or imprecise.

NOTES
mg/kg = milligrams per kilogram

Table 2.1
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MCB CAMP LEJEUNE
NORTH CAROLINA

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Previously Identified as COPC in 1995 HHRA	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
Surface Soil	78-93-3	2-Butanone	8.5E-02 J	8.5E-02 J	MG/KG	IR35-SS01-02D-10232002, IR35-SS02-02D-10232002	2/2	NA	8.5E-02	NA	2.8E+03 N	NA	NA	NO	NO	BSL
	75-15-0	Carbon disulfide	3.3E-02	3.3E-02	MG/KG	IR35-SS07-00-05181994	1/12	NA	3.3E-02	NA	6.7E+01 N	NA	NA	NO	NO	BSL
	100-42-5	Styrene	4.5E-03 J	4.5E-03 J	MG/KG	IR35-SS02-02D-10232002	1/2	NA	4.5E-03	NA	6.5E+02 N	NA	NA	NO	NO	BSL
	108-88-3	Toluene	2.8E-03 J	1.9E-02 J	MG/KG	IR35-SS05-00-04291994	3/15	NA	1.9E-02	NA	5.0E+02 N	NA	NA	NO	NO	BSL
	1330-20-7	Xylene, total	2.0E-02 J	4.3E-02	MG/KG	IR35-SS13-00-05181994	2/15	NA	4.3E-02	NA	6.0E+01 N	NA	NA	NO	NO	BSL
	83-32-9	Acenaphthene	2.0E-01 J	2.0E-01 J	MG/KG	IR35-SS05-00-04291994	1/13	NA	2.0E-01	NA	3.4E+02 N	NA	NA	NO	NO	BSL
	56-55-3	Benzo(a)anthracene	5.7E-01	5.7E-01	MG/KG	IR35-SS05-00-04291994	1/13	NA	5.7E-01	NA	1.5E-01 C	NA	NA	NO	YES	ASL
	50-32-8	Benzo(a)pyrene	6.3E-01	6.3E-01	MG/KG	IR35-SS05-00-04291994	1/13	NA	6.3E-01	NA	1.5E-02 C	NA	NA	NO	YES	ASL
	205-99-2	Benzo(b)fluoranthene	3.4E-01 J	1.2E+00	MG/KG	IR35-SS05-00-04291994	2/13	NA	1.2E+00	NA	1.5E-01 C	NA	NA	YES	YES	ASL
	191-24-2	Benzo(g,h,i)perylene	2.1E-01 J	3.7E-01	MG/KG	IR35-SS05-00-04291994	2/13	NA	3.7E-01	NA	1.7E+02 N	NA	NA	YES	NO	BSL
	86-74-8	Carbazole	1.8E-01 J	1.8E-01 J	MG/KG	IR35-SS05-00-04291994	1/13	NA	1.8E-01	NA	5.8E+00 C	NA	NA	NO	NO	BSL
	218-01-9	Chrysene	2.0E-01 J	6.8E-01	MG/KG	IR35-SS05-00-04291994	2/13	NA	6.8E-01	NA	1.5E+01 C	NA	NA	NO	NO	BSL
	53-70-3	Dibenz(a,h)anthracene	1.8E-01 J	1.8E-01 J	MG/KG	IR35-SS05-00-04291994	1/13	NA	1.8E-01	NA	1.5E-02 C	NA	NA	NO	YES	ASL
	206-44-0	Fluoranthene	4.2E-01	1.6E+00	MG/KG	IR35-SS05-00-04291994	2/13	NA	1.6E+00	NA	2.3E+02 N	NA	NA	NO	NO	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	3.8E-01	3.8E-01	MG/KG	IR35-SS05-00-04291994	1/13	NA	3.8E-01	NA	1.5E-01 C	NA	NA	NO	YES	ASL
	85-01-8	Phenanthrene	1.9E-01 J	1.2E+00	MG/KG	IR35-SS05-00-04291994	2/13	NA	1.2E+00	NA	1.7E+03 N	NA	NA	YES	NO	BSL
	108-95-2	Phenol	3.1E+00	3.1E+00	MG/KG	IR35-SS09-00-05181994	1/13	NA	3.1E+00	NA	1.8E+03 N	NA	NA	NO	NO	BSL
	129-00-0	Pyrene	3.0E-01 J	1.2E+00	MG/KG	IR35-SS05-00-04291994	2/13	NA	1.2E+00	NA	1.7E+02 N	NA	NA	NO	NO	BSL
	72-54-8	4,4'-DDD	5.6E-04 J	3.2E+00	MG/KG	IR35-SS13-00-05181994	9/10	NA	3.2E+00	NA	2.0E+00 C	NA	NA	YES	YES	ASL
	72-55-9	4,4'-DDE	1.6E-03 J	1.6E+00	MG/KG	IR35-SS13-00-05181994	10/10	NA	1.6E+00	NA	1.4E+00 C	NA	NA	NO	YES	ASL
	50-29-3	4,4'-DDT	1.6E-03 J	2.6E-01	MG/KG	IR35-SS09-00-05181994	10/10	NA	2.6E-01	NA	1.7E+00 C	NA	NA	NO	NO	BSL
	60-57-1	Dieldrin	3.5E-04 J	2.1E-01	MG/KG	IR35-SS13-00-05181994	4/10	NA	2.1E-01	NA	3.0E-02 C	NA	NA	YES	YES	ASL
	33213-65-9	Endosulfan II	4.2E-04 J	2.9E-03 J	MG/KG	IR35-SS04-00-05101994	2/10	NA	2.9E-03	NA	3.7E+01 N	NA	NA	YES	NO	BSL
	72-20-8	Endrin	6.8E-04 J	7.9E-03	MG/KG	IR35-SS04-00-05101994	3/10	NA	7.9E-03	NA	1.8E+00 N	NA	NA	NO	NO	BSL
	7421-93-4	Endrin aldehyde	3.7E-04 J	1.6E-03 J	MG/KG	IR35-SS04-00-05101994	2/10	NA	1.6E-03	NA	1.8E+00 N	NA	NA	YES	NO	BSL
	53494-70-5	Endrin ketone	1.2E-03 J	1.2E-03 J	MG/KG	IR35-SS04-00-05101994	1/10	NA	1.2E-03	NA	1.8E+00 N	NA	NA	YES	NO	BSL
	5103-71-9	alpha-Chlordane	4.1E-03	3.6E-02	MG/KG	IR35-SS11-00-05181994	2/10	NA	3.6E-02	NA	1.6E+00 C	NA	NA	NO	NO	BSL
	5103-74-2	gamma-Chlordane	2.7E-02	2.7E-02	MG/KG	IR35-SS11-00-05181994	1/10	NA	2.7E-02	NA	1.6E+00 C	NA	NA	NO	NO	BSL
	319-85-7	beta-BHC	5.3E-04 J	1.6E-03 J	MG/KG	IR35-SS11-00-05181994	2/10	NA	1.6E-03	NA	2.7E-01 C	NA	NA	NO	NO	BSL
	7429-90-5	Aluminum	2.0E+03	7.9E+03	MG/KG	IR35-SS07-00-05181994	12/12	NA	7.9E+03	5.5E+03	7.7E+03 N	NA	NA	NO	YES	ASL
	7440-36-0	Antimony	7.4E+00 J	8.0E+00 J	MG/KG	IR35-SS04-00-05101994	2/10	NA	8.0E+00	3.6E-01	3.1E+00 N	NA	NA	NO	YES	ASL
	7440-38-2	Arsenic	2.9E-01 J	8.9E-01 J	MG/KG	IR35-SS06-00-04291994	10/12	NA	8.9E-01	6.3E-01	3.9E-01 C	NA	NA	YES	YES	ASL
	7440-39-3	Barium	6.2E+00	8.6E+01	MG/KG	IR35-SS13-00-05181994	12/12	NA	8.6E+01	1.4E+01	1.5E+03 N	NA	NA	NO	NO	BSL
	7440-41-7	Beryllium	2.2E-01	2.2E-01	MG/KG	IR35-SS07-00-05181994	1/12	NA	2.2E-01	1.0E-01	1.6E+01 N	NA	NA	NO	NO	BSL
	7440-43-9	Cadmium	4.0E-02 J	1.5E+01 J	MG/KG	IR35-SS04-00-05101994	10/10	NA	1.5E+01	2.3E-02	7.0E+00 N	NA	NA	NO	YES	ASL
	7440-70-2	Calcium	6.0E+02 J	5.0E+04 J	MG/KG	IR35-SS10-00-05171994	12/12	NA	5.0E+04	4.4E+02	NA	NA	NA	NO	NO	NUT
	7440-47-3	Chromium	1.9E+00	9.8E+01	MG/KG	IR35-SS04-00-05101994	11/13	NA	9.8E+01	6.1E+00	2.8E+02 C	NA	NA	NO	NO	BSL
	7440-48-4	Cobalt	1.3E+00	4.3E+00	MG/KG	IR35-SS04-00-05101994	3/13	NA	4.3E+00	2.9E-01	2.3E+00 N	NA	NA	NO	YES	ASL
	7440-50-8	Copper	2.0E+00	5.8E+01	MG/KG	IR35-SS13-00-05181994	11/12	NA	5.8E+01	2.6E+00	3.1E+02 N	NA	NA	NO	NO	BSL

Table 2.1

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

MCB CAMP LEJEUNE

NORTH CAROLINA

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Previously Identified as COPC in 1995 HHRA	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	7439-89-6	Iron	1.3E+03	1.0E+04 J	MG/KG	IR35-SS07-00-05181994	12/12	NA	1.0E+04	3.2E+03	5.5E+03 N	NA	NA	NO	YES	ASL
	7439-92-1	Lead	7.2E+00 J	7.1E+01 J	MG/KG	IR35-SS04-00-05101994	12/12	NA	7.1E+01	8.5E+00	4.0E+02	NA	NA	YES	NO	BSL
	7439-95-4	Magnesium	5.9E+01	9.5E+02	MG/KG	IR35-SS10-00-05171994	12/12	NA	9.5E+02	2.4E+02	NA	NA	NA	NO	NO	NUT
	7439-96-5	Manganese	4.1E+00	6.7E+01	MG/KG	IR35-SS13-00-05181994	12/12	NA	6.7E+01	9.2E+00	1.8E+02 N	NA	NA	YES	NO	BSL
	7440-02-0	Nickel	1.3E+00	1.7E+01	MG/KG	IR35-SS13-00-05181994	10/13	NA	1.7E+01	1.2E+00	1.6E+02 N	NA	NA	NO	NO	BSL
	7782-49-2	Selenium	9.4E-01 J	1.2E+00 J	MG/KG	IR35-SS13-00-05181994	2/12	NA	1.2E+00	5.0E-01	3.9E+01 N	NA	NA	NO	NO	BSL
	7440-28-0	Thallium	6.0E-02	4.8E-01	MG/KG	IR35-SS13-00-05181994	10/12	NA	4.8E-01	3.6E-01	5.1E-01 N	NA	NA	NO	NO	BSL
	7440-62-2	Vanadium	3.6E+00	2.1E+01	MG/KG	IR35-SS13-00-05181994	12/12	NA	2.1E+01	8.9E+00	5.5E+01 N	NA	NA	NO	NO	BSL
	7440-66-6	Zinc	1.4E+02	4.3E+02	MG/KG	IR35-SS04-00-05101994	2/2	NA	4.3E+02	6.6E+00	2.3E+03 N	NA	NA	NO	NO	BSL

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening.

[3] Background values are the lower of two times the arithmetic mean basewide background surface soil or subsurface soil concentrations.
Background values are from *Final Base Background Soil Study Report, Marine Corps Base Camp Lejeune, North Carolina*, Baker Environmental, April 25, 2001.

[4] USEPA, September 12, 2008. Regional Screening Levels for Chemical Contaminants at Superfund Sites. [Online]. Available: http://epa-prgs.ornl.gov/chemicals/index.shtml
Regional Screening Level (RSL) value for pyrene used as surrogate for benzo(g,h,i)perylene.
The value of 5.8 mg/kg for carbazole in residential soil was calculated based on the exposure equations and assumptions used for development of Regional Screening Levels (USEPA, 2008).
RSL value for anthracene used as surrogate for phenanthrene.
RSL value for chlordane used as surrogate for alpha-chlordane and gamma-chlordane.
RSL value for chromium VI used as surrogate for chromium.
The adjusted value of 150 mg/kg for cobalt in residential soil was calculated based on the exposure equations and assumptions used for development of Regional Screening Levels (USEPA, 2008).
The soil value of 400 mg/kg for lead is from the Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities, USEPA, July 14, 1994.
RSL value for manganese (water) used as surrogate for manganese.
RSL value for endosulfan used as surrogate for endosulfan II.
RSL value for endrin used as surrogate for endrin aldehyde and endrin ketone.

[5] Rationale Codes

Selection Reason:	Above Screening Levels (ASL)
Deletion Reason:	No Toxicity Information (NTX)
	Essential Nutrient (NUT)
	Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
J = Estimated Value
C = Carcinogenic RSL
N = Noncarcinogenic RSL, divided by 10 to adjust for exposure to multiple constituents
NA = Not available/not applicable

Table 2.2
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MCB CAMP LEJEUNE
NORTH CAROLINA

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Air

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
Emissions from Surface Soil	78-93-3	2-Butanone	5.8E-03	5.8E-03	µg/m^3	IR35-SS01-02D-10232002, IR35-SS02-02D-10232002	2/2	--	5.8E-03	NA	5.2E+02 N	NA	NA	NO	BSL
	75-15-0	Carbon disulfide	3.0E-02	3.0E-02	µg/m^3	IR35-SS07-00-05181994	1/12	--	3.0E-02	NA	7.3E+01 N	NA	NA	NO	BSL
	100-42-5	Styrene	3.6E-04	3.6E-04	µg/m^3	IR35-SS02-02D-10232002	1/2	--	3.6E-04	NA	1.0E+02 N	NA	NA	NO	BSL
	108-88-3	Toluene	5.0E-04	3.4E-03	µg/m^3	IR35-SS05-00-04291994	3/15	--	3.4E-03	NA	5.2E+02 N	NA	NA	NO	BSL
	1330-20-7	Xylene, total	3.0E-03	6.4E-03	µg/m^3	IR35-SS13-00-05181994	2/15	--	6.4E-03	NA	1.0E+01 N	NA	NA	NO	BSL
	83-32-9	Acenaphthene	1.0E-03	1.0E-03	µg/m^3	IR35-SS05-00-04291994	1/13	--	1.0E-03	NA	NA	NA	NA	NO	NTX
	56-55-3	Benzo(a)anthracene	4.2E-07	4.2E-07	µg/m^3	IR35-SS05-00-04291994	1/13	--	4.2E-07	NA	8.7E-03 C	NA	NA	NO	BSL
	50-32-8	Benzo(a)pyrene	4.6E-07	4.6E-07	µg/m^3	IR35-SS05-00-04291994	1/13	--	4.6E-07	NA	8.7E-04 C	NA	NA	NO	BSL
	205-99-2	Benzo(b)fluoranthene	2.5E-07	8.7E-07	µg/m^3	IR35-SS05-00-04291994	2/13	--	8.7E-07	NA	8.7E-03 C	NA	NA	NO	BSL
	191-24-2	Benzo(g,h,i)perylene	1.5E-07	2.7E-07	µg/m^3	IR35-SS05-00-04291994	2/13	--	2.7E-07	NA	NA	NA	NA	NO	NTX
	86-74-8	Carbazole	1.3E-07	1.3E-07	µg/m^3	IR35-SS05-00-04291994	1/13	--	1.3E-07	NA	NA	NA	NA	NO	NTX
	218-01-9	Chrysene	1.5E-07	5.0E-07	µg/m^3	IR35-SS05-00-04291994	2/13	--	5.0E-07	NA	8.7E-02 C	NA	NA	NO	BSL
	53-70-3	Dibenz(a,h)anthracene	1.4E-07	1.4E-07	µg/m^3	IR35-SS05-00-04291994	1/13	--	1.4E-07	NA	8.0E-04 C	NA	NA	NO	BSL
	206-44-0	Fluoranthene	3.1E-07	1.2E-06	µg/m^3	IR35-SS05-00-04291994	2/13	--	1.2E-06	NA	NA	NA	NA	NO	NTX
	193-39-5	Indeno(1,2,3-cd)pyrene	2.8E-07	2.8E-07	µg/m^3	IR35-SS05-00-04291994	1/13	--	2.8E-07	NA	8.7E-03 C	NA	NA	NO	BSL
	85-01-8	Phenanthrene	1.4E-07	8.7E-07	µg/m^3	IR35-SS05-00-04291994	2/13	--	8.7E-07	NA	NA	NA	NA	NO	NTX
	108-95-2	Phenol	2.3E-06	2.3E-06	µg/m^3	IR35-SS09-00-05181994	1/13	--	2.3E-06	NA	2.1E+01 N	NA	NA	NO	BSL
	129-00-0	Pyrene	9.1E-05	3.6E-04	µg/m^3	IR35-SS05-00-04291994	2/13	--	3.6E-04	NA	NA	NA	NA	NO	NTX
	72-54-8	4,4'-DDD	4.1E-10	2.4E-06	µg/m^3	IR35-SS13-00-05181994	9/10	--	2.4E-06	NA	NA	NA	NA	NO	NTX
	72-55-9	4,4'-DDE	1.2E-09	1.2E-06	µg/m^3	IR35-SS13-00-05181994	10/10	--	1.2E-06	NA	NA	NA	NA	NO	NTX
	50-29-3	4,4'-DDT	1.2E-09	1.9E-07	µg/m^3	IR35-SS09-00-05181994	10/10	--	1.9E-07	NA	2.5E-02 C	NA	NA	NO	BSL
	60-57-1	Dieldrin	2.6E-10	1.6E-07	µg/m^3	IR35-SS13-00-05181994	4/10	--	1.6E-07	NA	5.3E-04 C	NA	NA	NO	BSL
	33213-65-9	Endosulfan II	3.1E-10	2.1E-09	µg/m^3	IR35-SS04-00-05101994	2/10	--	2.1E-09	NA	NA	NA	NA	NO	NTX
	72-20-8	Endrin	5.0E-10	5.8E-09	µg/m^3	IR35-SS04-00-05101994	3/10	--	5.8E-09	NA	NA	NA	NA	NO	NTX
	7421-93-4	Endrin aldehyde	2.7E-10	1.2E-09	µg/m^3	IR35-SS04-00-05101994	2/10	--	1.2E-09	NA	NA	NA	NA	NO	NTX
	53494-70-5	Endrin ketone	8.8E-10	8.8E-10	µg/m^3	IR35-SS04-00-05101994	1/10	--	8.8E-10	NA	NA	NA	NA	NO	NTX
	5103-71-9	alpha-Chlordane	3.0E-09	2.6E-08	µg/m^3	IR35-SS11-00-05181994	2/10	--	2.6E-08	NA	NA	NA	NA	NO	NTX
	5103-74-2	gamma-Chlordane	2.0E-08	2.0E-08	µg/m^3	IR35-SS11-00-05181994	1/10	--	2.0E-08	NA	NA	NA	NA	NO	NTX
	319-85-7	beta-BHC	3.9E-10	1.2E-09	µg/m^3	IR35-SS11-00-05181994	2/10	--	1.2E-09	NA	4.6E-03 C	NA	NA	NO	BSL
	7429-90-5	Aluminum	1.5E-03	5.8E-03	µg/m^3	IR35-SS07-00-05181994	13/13	--	5.8E-03	NA	5.2E-01 N	NA	NA	NO	BSL
	7440-36-0	Antimony	5.4E-06	5.9E-06	µg/m^3	IR35-SS04-00-05101994	2/10	--	5.9E-06	NA	NA	NA	NA	NO	NTX
	7440-38-2	Arsenic	2.1E-07	6.5E-07	µg/m^3	IR35-SS08-00-04291994	11/13	--	6.5E-07	NA	5.7E-04 C	NA	NA	NO	BSL
	7440-39-3	Barium	4.6E-06	6.3E-05	µg/m^3	IR35-SS13-00-05181994	13/13	--	6.3E-05	NA	5.2E-02 N	NA	NA	NO	BSL
	7440-41-7	Beryllium	1.6E-07	1.6E-07	µg/m^3	IR35-SS07-00-05181994	1/12	--	1.6E-07	NA	1.0E-03 C	NA	NA	NO	BSL
	7440-43-9	Cadmium	2.9E-08	1.1E-05	µg/m^3	IR35-SS04-00-05101994	10/10	--	1.1E-05	NA	NA	NA	NA	NO	NTX
	7440-70-2	Calcium	4.4E-04	3.6E-02	µg/m^3	IR35-SS10-00-05171994	13/13	--	3.6E-02	NA	NA	NA	NA	NO	NUT
	7440-47-3	Chromium	1.4E-06	7.2E-05	µg/m^3	IR35-SS04-00-05101994	11/13	--	7.2E-05	NA	2.0E-04 C	NA	NA	NO	BSL
	7440-48-4	Cobalt	9.6E-07	3.2E-06	µg/m^3	IR35-SS04-00-05101994	3/13	--	3.2E-06	NA	2.7E-04 C	NA	NA	NO	BSL
	7440-50-8	Copper	1.5E-06	4.3E-05	µg/m^3	IR35-SS13-00-05181994	12/13	--	4.3E-05	NA	NA	NA	NA	NO	NTX
	7439-89-6	Iron	9.2E-04	7.4E-03	µg/m^3	IR35-SS08-00-04291994	13/13	--	7.4E-03	NA	NA	NA	NA	NO	NTX
	7439-92-1	Lead	5.3E-06	5.2E-05	µg/m^3	IR35-SS04-00-05101994	13/13	--	5.2E-05	NA	NA	NA	NA	NO	NTX
	7439-95-4	Magnesium	4.3E-05	7.0E-04	µg/m^3	IR35-SS10-00-05171994	13/13	--	7.0E-04	NA	NA	NA	NA	NO	NUT
	7439-96-5	Manganese	3.0E-06	4.9E-05	µg/m^3	IR35-SS13-00-05181994	13/13	--	4.9E-05	NA	NA	NA	NA	NO	NTX
	7440-02-0	Nickel	9.6E-07	1.3E-05	µg/m^3	IR35-SS13-00-05181994	10/13	--	1.3E-05	NA	NA	NA	NA	NO	NTX
	7782-49-2	Selenium	6.9E-07	8.8E-07	µg/m^3	IR35-SS13-00-05181994	2/13	--	8.8E-07	NA	NA	NA	NA	NO	NTX
	7440-28-0	Thallium	4.4E-08	3.5E-07	µg/m^3	IR35-SS08-00-04291994	11/13	--	3.5E-07	NA	NA	NA	NA	NO	NTX
	7440-62-2	Vanadium	2.6E-06	1.5E-05	µg/m^3	IR35-SS13-00-05181994	13/13	--	1.5E-05	NA	NA	NA	NA	NO	NTX

Table 2.2
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MCB CAMP LEJEUNE
NORTH CAROLINA

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Air

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	7440-66-6	Zinc	1.0E-04	3.2E-04	$\mu g/m^3$	IR35-SS04-00-05101994	2/2	--	3.2E-04	NA	NA	NA	NA	NO	NTX

[1] Minimum/Maximum calculated air concentrations from surface soil concentrations. Air concentrations calculated as $C_{air} = C_{soil}*1000*(1/PEF + 1/VF)$.
PEF = 1.36E9 m^3/kg. VF calculated for volatile constituents only, on Table 2.2A. PEF and VF from USEPA's Soil Screening Guidance. (USEPA, July 1996)
[2] Maximum concentration is used for screening.
[3] Background values are not available.
[4] USEPA, September 12, 2008. Regional Screening Levels for Chemical Contaminants at Superfund Sites. Adjusted Residential Ambient Air RSL.
(USEPA, 2008). [Online]. Available: http://epa-prgs.ornl.gov/chemicals/index.shtml
RSL value for pyrene used as surrogate for benzo(g,h,i)perylene and phenanthrene.
[5] Rationale Codes

Selection Reason:	Above Screening Levels (ASL)
Deletion Reason:	No Toxicity Information (NTX)
	Essential Nutrient (NUT)
	Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
C = Carcinogenic RSL
NA = Not available
N = Noncarcinogenic RSL, divided by 10 to adjust for exposure to multiple constituents

Table 2.2A

Calculation of Volatilization Factor - Surface Soil

MCB CAMP LEJEUNE

NORTH CAROLINA

Chemical	Diffusivity in Air (D_i) (cm^2/s)	Henry's Law Constant (H') (unitless)	Diffusivity in Water (D_w) (cm^2/s)	Soil Organic Carbon Partition Coeff. (K_{oc}) (cm^3/g)	Soil Water Partition Coeff. ($K_d = K_{oc} \times F_{oc}$) ($g/cm^3$)	Solubility in Water (S) (mg/L)	Apparent Diffusivity (D_A) (cm^2/s)	Volatilization Factor (VF) (m^3/kg)	
2-Butanone	9.10E-02	2.30E-03	1.00E-05	3.83E+00	2.30E-02	2.23E+05	9.09E-05	1.48E+04	
Carbon disulfide	1.10E-01	5.90E-01	1.30E-05	1.00E+00	6.00E-03	1.18E+03	1.59E-02	1.12E+03	
Styrene	7.10E-02	1.10E-01	8.80E-06	5.18E+02	3.11E+00	3.10E+02	1.29E-04	1.24E+04	
Toluene	7.80E-02	2.70E-01	9.20E-06	2.68E+02	1.61E+00	5.26E+02	6.38E-04	5.57E+03	
Xylene, total	8.50E-02	2.70E-01	9.90E-06	4.43E+02	2.66E+00	1.06E+02	4.35E-04	6.74E+03	
Acenaphthene	5.10E-02	7.40E-03	8.30E-06	6.12E+03	3.67E+01	3.90E+00	5.47E-07	1.90E+05	
Pyrene	2.80E-02	4.90E-04	7.20E-06	6.94E+04	4.16E+02	1.35E-01	1.86E-09	3.26E+06	

Volatilization factor (VF) = (m^3/kg)

$$\frac{Q/C * (3.14 * D_A * T)^{1/2} * 10^{-4}\ m^2/cm^2}{2 * r_b * D_A}$$

Apparent Diffusivity (D_A) = (cm^2/s)

$$\frac{[(Q_a^{10/3} * D_i * H' + Q_w^{10/3} * D_w)/n^2]}{(r_b * K_d + Q_w + Q_a * H')}$$

Soil Saturation Concentration (C_{sat}) =

$$S/r_b * (K_d * r_b + Q_w + H' * Q_a)$$

Parameters	Values
Q/C - Inverse of the mean concentration at the center of a 0.5-acre-square source located in Raleigh-Durham, NC (g/m^2-s per kg/m^3)	77.26
T - Exposure interval(s)	9.5E+08
ρ_b - Soil bulk density (g/cm^3)	1.5
Θ_a - Air-filled soil porosity (L_{air}/L_{water}) = n - Θ_w	0.28
n - Total soil porosity (Lpore/Lsoil) = 1 - (ρ_b/ρ_s)	0.43
Θ_w - Water-filled soil porosity (Lwater/Lsoil)	0.15
ρ_s - Soil particle density (g/cm^3)	2.65
f_{oc} - fraction organic carbon in soil (g/g)	0.006

Equations from USEPA, 1996. *Soil Screening Guidance: User's Guide.* EPA/540/R-96/018.

Physical/chemical properties from Oak Ridge National Laboratory (ORNL). September 12, 2008. Regional Screening Levels for Chemical Contaminants at Superfund Sites.

Table 2.3
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MCB CAMP LEJEUNE
NORTH CAROLINA

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Previously Identified as COPC in 1995 HHRA	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
Soil*	78-93-3	2-Butanone	7.1E-03 J	8.5E-02 J	MG/KG	IR35-SS01-02D-10232002, IR35-SS02-02D-10232002	5/17	NA	8.5E-02	NA	2.8E+03 N	NA	NA	NO	NO	BSL
	108-10-1	4-Methyl-2-pentanone	5.1E-03 J	5.1E-03 J	MG/KG	IR35-IS45-03-10252002	1/17	NA	5.1E-03	NA	5.3E+02 N	NA	NA	NO	NO	BSL
	67-64-1	Acetone	1.1E-02 J	1.4E-01 J	MG/KG	35-MW34B-03	6/22	NA	1.4E-01	NA	6.1E+03 N	NA	NA	NO	NO	BSL
	71-43-2	Benzene	2.4E-02 J	1.1E+00 J	MG/KG	IR35-IS36-06-10242002	5/17	NA	1.1E+00	NA	1.1E+00 C	NA	NA	NO	YES	ASL
	75-15-0	Carbon disulfide	4.9E-04 J	3.3E-02	MG/KG	IR35-SS07-00-05181994	2/18	NA	3.3E-02	NA	6.7E+01 N	NA	NA	NO	NO	BSL
	100-41-4	Ethylbenzene	1.4E-03 J	2.1E+01	MG/KG	IR35-IS36-06-10242002	9/17	NA	2.1E+01	NA	5.7E+00 C	NA	NA	NO	YES	ASL
	75-09-2	Methylene chloride	4.2E-03 J	7.5E-03	MG/KG	IR35-IS45-03-10252002	9/22	NA	7.5E-03	NA	1.1E+01 C	NA	NA	NO	NO	BSL
	91-20-3	Naphthalene	5.2E-02 J	5.4E+01 J	MG/KG	IR35-IS36-06-10242002	11/17	NA	5.4E+01	NA	3.9E+00 C	NA	NA	NO	YES	ASL
	100-42-5	Styrene	4.5E-03 J	4.5E-03 J	MG/KG	IR35-SS02-02D-10232002	1/17	NA	4.5E-03	NA	6.5E+02 N	NA	NA	NO	NO	BSL
	127-18-4	Tetrachloroethene	8.0E-03	8.5E-02 J	MG/KG	IR35-IS37-04-10242002	6/21	NA	8.5E-02	NA	5.7E-01 C	NA	NA	NO	NO	BSL
	108-88-3	Toluene	5.5E-04 J	1.9E-02 J	MG/KG	IR35-SS05-00-04291994	4/18	NA	1.9E-02	NA	5.0E+02 N	NA	NA	NO	NO	BSL
	1330-20-7	Xylene, total	2.0E-02 J	2.7E+01	MG/KG	IR35-IS36-06-10242002	10/18	NA	2.7E+01	NA	6.0E+01 N	NA	NA	NO	NO	BSL
	120-83-2	2,4-Dichlorophenol	8.9E-01 J	8.9E-01 J	MG/KG	IR35-IS44-04D-10252002	1/12	NA	8.9E-01	NA	1.8E+01 N	NA	NA	NO	NO	BSL
	91-57-6	2-Methylnaphthalene	2.4E-01 J	2.2E+02 J	MG/KG	IR35-IS36-06-10242002	10/15	NA	2.2E+02	NA	3.1E+01 N	NA	NA	NO	YES	ASL
	83-32-9	Acenaphthene	2.0E-01 J	7.7E+00 J	MG/KG	IR35-IS36-06-10242002	6/16	NA	7.7E+00	NA	3.4E+02 N	NA	NA	NO	NO	BSL
	120-12-7	Anthracene	7.7E-01 J	2.7E+00 J	MG/KG	IR35-IS36-06-10242002	5/15	NA	2.7E+00	NA	1.7E+03 N	NA	NA	NO	NO	BSL
	56-55-3	Benzo(a)anthracene	5.7E-01	5.7E-01	MG/KG	IR35-SS05-00-04291994	1/15	NA	5.7E-01	NA	1.5E-01 C	NA	NA	NO	YES	ASL
	50-32-8	Benzo(a)pyrene	6.3E-01	6.3E-01	MG/KG	IR35-SS05-00-04291994	1/15	NA	6.3E-01	NA	1.5E-02 C	NA	NA	NO	YES	ASL
	205-99-2	Benzo(b)fluoranthene	3.4E-01 J	1.2E+00	MG/KG	IR35-SS05-00-04291994	3/15	NA	1.2E+00	NA	1.5E-01 C	NA	NA	YES	YES	ASL
	191-24-2	Benzo(g,h,i)perylene	2.1E-01 J	3.7E-01	MG/KG	IR35-SS05-00-04291994	2/14	NA	3.7E-01	NA	1.7E+02 N	NA	NA	NO	NO	BSL
	86-74-8	Carbazole	1.8E-01 J	1.8E-01 J	MG/KG	IR35-SS05-00-04291994	1/13	NA	1.8E-01	NA	5.8E+00 C	NA	NA	NO	NO	BSL
	218-01-9	Chrysene	2.0E-01 J	6.8E-01	MG/KG	IR35-SS05-00-04291994	2/14	NA	6.8E-01	NA	1.5E+01 C	NA	NA	NO	NO	BSL
	53-70-3	Dibenz(a,h)anthracene	1.8E-01 J	1.8E-01 J	MG/KG	IR35-SS05-00-04291994	1/13	NA	1.8E-01	NA	1.5E-02 C	NA	NA	NO	YES	ASL
	132-64-9	Dibenzofuran	2.1E+00 J	1.1E+01 J	MG/KG	IR35-IS36-06-10242002	8/15	NA	1.1E+01	NA	7.8E+00 N	NA	NA	NO	YES	ASL
	206-44-0	Fluoranthene	4.2E-01	1.6E+00	MG/KG	IR35-SS05-00-04291994	2/14	NA	1.6E+00	NA	2.3E+02 N	NA	NA	NO	NO	BSL
	86-73-7	Fluorene	4.1E-02 J	1.1E+01 J	MG/KG	IR35-IS36-06-10242002	9/15	NA	1.1E+01	NA	2.3E+02 N	NA	NA	NO	NO	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	3.8E-01	3.8E-01	MG/KG	IR35-SS05-00-04291994	1/13	NA	3.8E-01	NA	1.5E-01 C	NA	NA	NO	YES	ASL
	78-59-1	Isophorone	2.7E+00 J	2.7E+00 J	MG/KG	IR35-IS51-04-10252002	1/12	NA	2.7E+00	NA	5.1E+02 C	NA	NA	NO	NO	BSL
	85-01-8	Phenanthrene	7.4E-02 J	2.3E+01 J	MG/KG	IR35-IS36-06-10242002	12/17	NA	2.3E+01	NA	1.7E+03 N	NA	NA	NO	NO	BSL
	108-95-2	Phenol	3.1E+00	3.1E+00	MG/KG	IR35-SS09-00-05181994	1/13	NA	3.1E+00	NA	1.8E+03 N	NA	NA	NO	NO	BSL
	129-00-0	Pyrene	2.8E-01 J	1.2E+00	MG/KG	IR35-SS05-00-04291994	3/15	NA	1.2E+00	NA	1.7E+02 N	NA	NA	NO	NO	BSL
	117-81-7	bis(2-Ethylhexyl)phthalate	5.8E-02 J	4.8E-01	MG/KG	IR35-IS33-09-10252002	5/12	NA	4.8E-01	NA	3.5E+01 C	NA	NA	NO	NO	BSL
	72-54-8	4,4'-DDD	5.6E-04 J	3.2E+00	MG/KG	IR35-SS13-00-05181994	9/10	NA	3.2E+00	NA	2.0E+00 C	NA	NA	NO	YES	ASL
	72-55-9	4,4'-DDE	1.6E-03 J	1.6E+00	MG/KG	IR35-SS13-00-05181994	10/10	NA	1.6E+00	NA	1.4E+00 C	NA	NA	NO	YES	ASL
	50-29-3	4,4'-DDT	1.6E-03 J	2.6E-01	MG/KG	IR35-SS09-00-05181994	10/10	NA	2.6E-01	NA	1.7E+00 C	NA	NA	NO	NO	BSL
	60-57-1	Dieldrin	3.5E-04 J	2.1E-01	MG/KG	IR35-SS13-00-05181994	4/10	NA	2.1E-01	NA	3.0E-02 C	NA	NA	NO	YES	ASL
	33213-65-9	Endosulfan II	4.2E-04 J	2.9E-03 J	MG/KG	IR35-SS04-00-05101994	2/10	NA	2.9E-03	NA	3.7E+01 N	NA	NA	NO	NO	BSL
	72-20-8	Endrin	6.8E-04 J	7.9E-03	MG/KG	IR35-SS04-00-05101994	3/10	NA	7.9E-03	NA	1.8E+00 N	NA	NA	NO	NO	BSL

Table 2.3

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

MCB CAMP LEJEUNE

NORTH CAROLINA

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Previously Identified as COPC in 1995 HHRA	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	7421-93-4	Endrin aldehyde	3.7E-04 J	1.6E-03 J	MG/KG	IR35-SS04-00-05101994	2/10	NA	1.6E-03	NA	1.8E+00 N	NA	NA	NO	NO	BSL
	53494-70-5	Endrin ketone	1.2E-03 J	1.2E-03 J	MG/KG	IR35-SS04-00-05101994	1/10	NA	1.2E-03	NA	1.8E+00 N	NA	NA	NO	NO	BSL
	5103-71-9	alpha-Chlordane	4.1E-03	3.6E-02	MG/KG	IR35-SS11-00-05181994	2/10	NA	3.6E-02	NA	1.6E+00 C	NA	NA	NO	NO	BSL
	5103-74-2	gamma-Chlordane	2.7E-02	2.7E-02	MG/KG	IR35-SS11-00-05181994	1/10	NA	2.7E-02	NA	1.6E+00 C	NA	NA	NO	NO	BSL
	319-85-7	beta-BHC	5.3E-04 J	1.6E-03 J	MG/KG	IR35-SS11-00-05181994	2/10	NA	1.6E-03	NA	2.7E-01 C	NA	NA	NO	NO	BSL
	7429-90-5	Aluminum	1.9E+03	7.9E+03	MG/KG	IR35-SS07-00-05181994	19/19	NA	7.9E+03	5.5E+03	7.7E+03 N	NA	NA	NO	YES	ASL
	7440-36-0	Antimony	7.4E+00 J	8.0E+00 J	MG/KG	IR35-SS04-00-05101994	2/10	NA	8.0E+00	3.6E-01	3.1E+00 N	NA	NA	NO	YES	ASL
	7440-38-2	Arsenic	1.9E-01 J	2.7E+00 J	MG/KG	35-GWDS5-03	16/16	NA	2.7E+00	6.3E-01	3.9E-01 C	NA	NA	YES	YES	ASL
	7440-39-3	Barium	5.4E+00 J	8.6E+01	MG/KG	IR35-SS13-00-05181994	19/19	NA	8.6E+01	1.4E+01	1.5E+03 N	NA	NA	NO	NO	BSL
	7440-41-7	Beryllium	2.2E-01	2.2E-01	MG/KG	IR35-SS07-00-05181994	1/12	NA	2.2E-01	1.0E-01	1.6E+01 N	NA	NA	NO	NO	BSL
	7440-43-9	Cadmium	4.0E-02 J	1.5E+01 J	MG/KG	IR35-SS04-00-05101994	15/15	NA	1.5E+01	2.3E-02	7.0E+00 N	NA	NA	NO	YES	ASL
	7440-70-2	Calcium	3.6E+02 J	5.0E+04 J	MG/KG	IR35-SS10-00-05171994	19/19	NA	5.0E+04	4.4E+02	NA	NA	NA	NO	NO	NUT
	7440-47-3	Chromium	1.9E+00	9.8E+01	MG/KG	IR35-SS04-00-05101994	17/17	NA	9.8E+01	6.1E+00	3.9E+01 C	NA	NA	NO	YES	ASL
	7440-48-4	Cobalt	1.3E+00	4.3E+00	MG/KG	IR35-SS04-00-05101994	4/13	NA	4.3E+00	2.9E-01	2.3E+00 N	NA	NA	NO	YES	ASL
	7440-50-8	Copper	1.2E+00	5.8E+01	MG/KG	IR35-SS13-00-05181994	16/16	NA	5.8E+01	2.6E+00	3.1E+02 N	NA	NA	NO	NO	BSL
	7439-89-6	Iron	4.4E+02 J	1.1E+04 J	MG/KG	35-GWDS5-03	19/19	NA	1.1E+04	3.2E+03	5.5E+03 N	NA	NA	NO	YES	ASL
	7439-92-1	Lead	6.5E+00 J	1.4E+02	MG/KG	35-MW29B-01	19/19	NA	1.4E+02	8.5E+00	4.0E+02	NA	NA	YES	NO	BSL
	7439-95-4	Magnesium	5.9E+01	9.5E+02	MG/KG	IR35-SS10-00-05171994	18/18	NA	9.5E+02	2.4E+02	NA	NA	NA	NO	NO	NUT
	7439-96-5	Manganese	3.2E+00	6.7E+01	MG/KG	IR35-SS13-00-05181994	19/19	NA	6.7E+01	9.2E+00	1.8E+02 N	NA	NA	NO	NO	BSL
	7440-02-0	Nickel	1.2E+00	1.7E+01	MG/KG	IR35-SS13-00-05181994	10/13	NA	1.7E+01	1.2E+00	1.6E+02 N	NA	NA	NO	NO	BSL
	7440-09-7	Potassium	5.6E+02	5.6E+02	MG/KG	35-GWDS5-03	1/1	NA	5.6E+02	1.2E+02	NA	NA	NA	NO	NO	NUT
	7782-49-2	Selenium	1.7E-01 J	1.2E+00 J	MG/KG	IR35-SS13-00-05181994	5/12	NA	1.2E+00	5.0E-01	3.9E+01 N	NA	NA	NO	NO	BSL
	7440-22-4	Silver	3.9E-01	3.9E-01	MG/KG	35-GWDS01-03	1/1	NA	3.9E-01	1.3E-01	3.9E+01 N	NA	NA	NO	NO	BSL
	7440-28-0	Thallium	6.0E-02	2.1E+00	MG/KG	35-GWDS4-02	14/14	NA	2.1E+00	3.6E-01	5.1E-01 N	NA	NA	YES	YES	ASL
	7440-62-2	Vanadium	3.0E+00 J	2.1E+01	MG/KG	IR35-SS13-00-05181994	19/19	NA	2.1E+01	8.9E+00	5.5E+01 N	NA	NA	NO	NO	BSL
	7440-66-6	Zinc	1.6E+01	4.3E+02	MG/KG	IR35-SS04-00-05101994	2/2	NA	4.3E+02	6.6E+00	2.3E+03 N	NA	NA	NO	NO	BSL

* Surface soil & subsurface soil combined

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening.

[3] Background values are the lower of two times the arithmetic mean basewide background surface soil or subsurface soil concentrations.
Background values are from *Final Base Background Soil Study Report, Marine Corps Base Camp Lejeune, North Carolina* ,
Baker Environmental, April 25, 2001.

[4] USEPA, September 12, 2008. Regional Screening Levels for Chemical Contaminants at Superfund Sites. [Online].
Available: http://epa-prgs.ornl.gov/chemicals/index.shtml
Regional Screening Level (RSL) value for pyrene used as surrogate for benzo(g,h,i)perylene.
The value of 5.8 mg/kg for carbazole in residential soil was calculated based on the exposure equations and assumptions used
for development of Regional Screening Levels (USEPA, 2008).
The adjusted value of 7.8 mg/kg for dibenzofuran in residential soil was calculated based on the exposure equations and assumptions used
for development of Regional Screening Levels (USEPA, 2008).

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/
To Be Considered
J = Estimated Value
C = Carcinogenic RSL
N = Noncarcinogenic RSL, divided by 10 to adjust for exposure to multiple constituents
NA = Not available/not applicable

Table 2.3

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

MCB CAMP LEJEUNE

NORTH CAROLINA

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Previously Identified as COPC in 1995 HHRA	COPC Flag	Rationale for [5] Contaminant Deletion or Selection

RSL value for anthracene used as surrogate for phenanthrene.

RSL value for chlordane used as surrogate for alpha-chlordane and gamma-chlordane.

RSL value for chromium VI used as surrogate for chromium.

The soil value of 400 mg/kg for lead is from the Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities, USEPA, July 14, 1994.

RSL value for manganese (water) used as surrogate for manganese.

RSL value for endosulfan used as surrogate for endosulfan II.

RSL value for endrin used as surrogate for endrin aldehyde and endrin ketone.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)

Deletion Reason: No Toxicity Information (NTX)
Essential Nutrient (NUT)
Below Screening Level (BSL)

Table 2.4
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MCB CAMP LEJEUNE
NORTH CAROLINA

Scenario Timeframe: Current
Medium: Soil*
Exposure Medium: Air

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
Emissions from Soil*	78-93-3	2-Butanone	4.8E-04	5.8E-03	µg/m^3	IR35-SS01-02D-10232002, IR35-SS02-02D-10232002	5/17	--	5.8E-03	NA	5.2E+02 N	NA	NA	NO	BSL
	108-10-1	4-Methyl-2-pentanone	4.1E-04	4.1E-04	µg/m^3	IR35-IS45-03-10252002	1/17	--	4.1E-04	NA	3.1E+02 N	NA	NA	NO	BSL
	67-64-1	Acetone	7.2E-04	9.4E-03	µg/m^3	35-MW34B-03	6/22	--	9.4E-03	NA	3.2E+03 N	NA	NA	NO	BSL
	71-43-2	Benzene	5.3E-03	2.4E-01	µg/m^3	IR35-IS36-06-10242002	5/17	--	2.4E-01	NA	3.1E-01 C	NA	NA	NO	BSL
	75-15-0	Carbon disulfide	4.4E-04	3.0E-02	µg/m^3	IR35-SS07-00-05181994	2/18	--	3.0E-02	NA	7.3E+01 N	NA	NA	NO	BSL
	100-41-4	Ethylbenzene	1.9E-04	2.8E+00	µg/m^3	IR35-IS36-06-10242002	9/17	--	2.8E+00	NA	9.7E-01 C	NA	NA	YES	ASL
	75-09-2	Methylene chloride	1.5E-03	2.7E-03	µg/m^3	IR35-IS45-03-10252002	9/22	--	2.7E-03	NA	5.2E+00 C	NA	NA	NO	BSL
	91-20-3	Naphthalene	8.4E-04	8.7E-01	µg/m^3	IR35-IS36-06-10242002	11/17	--	8.7E-01	NA	7.2E-02 C	NA	NA	YES	ASL
	100-42-5	Styrene	3.6E-04	3.6E-04	µg/m^3	IR35-SS02-02D-10232002	1/17	--	3.6E-04	NA	1.0E+02 N	NA	NA	NO	BSL
	127-18-4	Tetrachloroethene	2.7E-03	2.8E-02	µg/m^3	IR35-IS37-04-10242002	6/21	--	2.8E-02	NA	4.1E-01 C	NA	NA	NO	BSL
	108-88-3	Toluene	9.9E-05	3.4E-03	µg/m^3	IR35-SS05-00-04291994	4/18	--	3.4E-03	NA	5.2E+02 N	NA	NA	NO	BSL
	1330-20-7	Xylene, total	3.0E-03	4.0E+00	µg/m^3	IR35-IS36-06-10242002	10/18	--	4.0E+00	NA	1.0E+01 N	NA	NA	NO	BSL
	120-83-2	2,4-Dichlorophenol	6.5E-07	6.5E-07	µg/m^3	IR35-IS44-04D-10252002	1/12	--	6.5E-07	NA	NA	NA	NA	NO	NTX
	91-57-6	2-Methylnaphthalene	3.1E-03	2.8E+00	µg/m^3	IR35-IS36-06-10242002	10/15	--	2.8E+00	NA	NA	NA	NA	NO	NTX
	83-32-9	Acenaphthene	1.0E-03	4.1E-02	µg/m^3	IR35-IS36-06-10242002	6/16	--	4.1E-02	NA	NA	NA	NA	NO	NTX
	120-12-7	Anthracene	1.1E-03	3.8E-03	µg/m^3	IR35-IS36-06-10242002	5/15	--	3.8E-03	NA	NA	NA	NA	NO	NTX
	56-55-3	Benzo(a)anthracene	4.2E-07	4.2E-07	µg/m^3	IR35-SS05-00-04291994	1/15	--	4.2E-07	NA	8.7E-03 C	NA	NA	NO	BSL
	50-32-8	Benzo(a)pyrene	4.6E-07	4.6E-07	µg/m^3	IR35-SS05-00-04291994	1/15	--	4.6E-07	NA	8.7E-04 C	NA	NA	NO	BSL
	205-99-2	Benzo(b)fluoranthene	2.5E-07	8.7E-07	µg/m^3	IR35-SS05-00-04291994	3/15	--	8.7E-07	NA	8.7E-03 C	NA	NA	NO	BSL
	191-24-2	Benzo(g,h,i)perylene	1.5E-07	2.7E-07	µg/m^3	IR35-SS05-00-04291994	2/14	--	2.7E-07	NA	NA	NA	NA	NO	NTX
	86-74-8	Carbazole	1.3E-07	1.3E-07	µg/m^3	IR35-SS05-00-04291994	1/13	--	1.3E-07	NA	NA	NA	NA	NO	NTX
	218-01-9	Chrysene	1.5E-07	5.0E-07	µg/m^3	IR35-SS05-00-04291994	2/14	--	5.0E-07	NA	8.7E-02 C	NA	NA	NO	BSL
	53-70-3	Dibenz(a,h)anthracene	1.4E-07	1.4E-07	µg/m^3	IR35-SS05-00-04291994	1/13	--	1.4E-07	NA	8.0E-04 C	NA	NA	NO	BSL
	132-64-9	Dibenzofuran	1.5E-06	8.1E-06	µg/m^3	IR35-IS36-06-10242002	8/15	--	8.1E-06	NA	NA	NA	NA	NO	NTX
	206-44-0	Fluoranthene	3.1E-07	1.2E-06	µg/m^3	IR35-SS05-00-04291994	2/14	--	1.2E-06	NA	NA	NA	NA	NO	NTX
	86-73-7	Fluorene	1.1E-04	2.9E-02	µg/m^3	IR35-IS36-06-10242002	9/15	--	2.9E-02	NA	NA	NA	NA	NO	NTX
	193-39-5	Indeno(1,2,3-cd)pyrene	2.8E-07	2.8E-07	µg/m^3	IR35-SS05-00-04291994	1/13	--	2.8E-07	NA	8.7E-03 C	NA	NA	NO	BSL
	78-59-1	Isophorone	2.0E-06	2.0E-06	µg/m^3	IR35-IS51-04-10252002	1/12	--	2.0E-06	NA	2.1E+02 N	NA	NA	NO	BSL
	85-01-8	Phenanthrene	5.4E-08	1.7E-05	µg/m^3	IR35-IS36-06-10242002	12/17	--	1.7E-05	NA	NA	NA	NA	NO	NTX
	108-95-2	Phenol	2.3E-06	2.3E-06	µg/m^3	IR35-SS09-00-05181994	1/13	--	2.3E-06	NA	2.1E+01 N	NA	NA	NO	BSL
	129-00-0	Pyrene	8.7E-05	3.6E-04	µg/m^3	IR35-SS05-00-04291994	3/15	--	3.6E-04	NA	NA	NA	NA	NO	NTX
	117-81-7	bis(2-Ethylhexyl)phthalate	4.3E-08	3.5E-07	µg/m^3	IR35-IS33-09-10252002	5/12	--	3.5E-07	NA	NA	NA	NA	NO	NTX
	72-54-8	4,4'-DDD	4.1E-10	2.4E-06	µg/m^3	IR35-SS13-00-05181994	9/10	--	2.4E-06	NA	NA	NA	NA	NO	NTX
	72-55-9	4,4'-DDE	1.2E-09	1.2E-06	µg/m^3	IR35-SS13-00-05181994	10/10	--	1.2E-06	NA	NA	NA	NA	NO	NTX
	50-29-3	4,4'-DDT	1.2E-09	1.9E-07	µg/m^3	IR35-SS09-00-05181994	10/10	--	1.9E-07	NA	2.5E-02 C	NA	NA	NO	BSL
	60-57-1	Dieldrin	2.6E-10	1.6E-07	µg/m^3	IR35-SS13-00-05181994	4/10	--	1.6E-07	NA	5.3E-04 C	NA	NA	NO	BSL
	33213-65-9	Endosulfan II	3.1E-10	2.1E-09	µg/m^3	IR35-SS04-00-05101994	2/10	--	2.1E-09	NA	NA	NA	NA	NO	NTX
	72-20-8	Endrin	5.0E-10	5.8E-09	µg/m^3	IR35-SS04-00-05101994	3/10	--	5.8E-09	NA	NA	NA	NA	NO	NTX
	7421-93-4	Endrin aldehyde	2.7E-10	1.2E-09	µg/m^3	IR35-SS04-00-05101994	2/10	--	1.2E-09	NA	NA	NA	NA	NO	NTX
	53494-70-5	Endrin ketone	8.8E-10	8.8E-10	µg/m^3	IR35-SS04-00-05101994	1/10	--	8.8E-10	NA	NA	NA	NA	NO	NTX
	5103-71-9	alpha-Chlordane	3.0E-09	2.6E-08	µg/m^3	IR35-SS11-00-05181994	2/10	--	2.6E-08	NA	NA	NA	NA	NO	NTX
	5103-74-2	gamma-Chlordane	2.0E-08	2.0E-08	µg/m^3	IR35-SS11-00-05181994	1/10	--	2.0E-08	NA	NA	NA	NA	NO	NTX
	319-85-7	beta-BHC	3.9E-10	1.2E-09	µg/m^3	IR35-SS11-00-05181994	2/10	--	1.2E-09	NA	4.6E-03 C	NA	NA	NO	BSL
	7429-90-5	Aluminum	1.4E-03	5.8E-03	µg/m^3	IR35-SS07-00-05181994	20/20	--	5.8E-03	NA	5.2E-01 N	NA	NA	NO	BSL
	7440-36-0	Antimony	5.4E-06	5.9E-06	µg/m^3	IR35-SS04-00-05101994	2/10	--	5.9E-06	NA	NA	NA	NA	NO	NTX
	7440-38-2	Arsenic	1.4E-07	2.0E-06	µg/m^3	IR35-SS08-00-04291994	17/17	--	2.0E-06	NA	5.7E-04 C	NA	NA	NO	BSL
	7440-39-3	Barium	4.0E-06	6.3E-05	µg/m^3	IR35-SS13-00-05181994	20/20	--	6.3E-05	NA	5.2E-02 N	NA	NA	NO	BSL

Table 2.4
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MCB CAMP LEJEUNE
NORTH CAROLINA

Scenario Timeframe: Current
Medium: Soil*
Exposure Medium: Air

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	7440-41-7	Beryllium	1.6E-07	1.6E-07	$\mu g/m^3$	IR35-SS07-00-05181994	1/12	--	1.6E-07	NA	1.0E-03 C	NA	NA	NO	BSL
	7440-43-9	Cadmium	2.9E-08	1.1E-05	$\mu g/m^3$	IR35-SS04-00-05101994	15/15	--	1.1E-05	NA	NA	NA	NA	NO	NTX
	7440-70-2	Calcium	2.7E-04	3.6E-02	$\mu g/m^3$	IR35-SS10-00-05171994	19/19	--	3.6E-02	NA	NA	NA	NA	NO	NUT
	7440-47-3	Chromium	1.4E-06	7.2E-05	$\mu g/m^3$	IR35-SS04-00-05101994	17/17	--	7.2E-05	NA	2.0E-04 C	NA	NA	NO	BSL
	7440-48-4	Cobalt	9.6E-07	3.2E-06	$\mu g/m^3$	IR35-SS04-00-05101994	4/13	--	3.2E-06	NA	2.7E-04 C	NA	NA	NO	BSL
	7440-50-8	Copper	8.8E-07	4.3E-05	$\mu g/m^3$	IR35-SS13-00-05181994	17/17	--	4.3E-05	NA	NA	NA	NA	NO	NTX
	7439-89-6	Iron	3.3E-04	7.7E-03	$\mu g/m^3$	IR35-SS08-00-04291994	20/20	--	7.7E-03	NA	NA	NA	NA	NO	NTX
	7439-92-1	Lead	4.8E-06	1.1E-04	$\mu g/m^3$	35-MW29B-01	20/20	--	1.1E-04	NA	NA	NA	NA	NO	NTX
	7439-95-4	Magnesium	4.3E-05	7.0E-04	$\mu g/m^3$	IR35-SS10-00-05171994	19/19	--	7.0E-04	NA	NA	NA	NA	NO	NUT
	7439-96-5	Manganese	2.4E-06	4.9E-05	$\mu g/m^3$	IR35-SS13-00-05181994	20/20	--	4.9E-05	NA	NA	NA	NA	NO	NTX
	7440-02-0	Nickel	8.8E-07	1.3E-05	$\mu g/m^3$	IR35-SS13-00-05181994	10/13	--	1.3E-05	NA	NA	NA	NA	NO	NTX
	7440-09-7	Potassium	4.1E-04	4.1E-04	$\mu g/m^3$	35-GWDS5-03	1/1	--	4.1E-04	NA	NA	NA	NA	NO	NUT
	7782-49-2	Selenium	1.3E-07	8.8E-07	$\mu g/m^3$	IR35-SS13-00-05181994	6/13	--	8.8E-07	NA	NA	NA	NA	NO	NTX
	7440-22-4	Silver	2.9E-07	2.9E-07	$\mu g/m^3$	35-GWDS01-03	1/1	--	2.9E-07	NA	NA	NA	NA	NO	NTX
	7440-28-0	Thallium	4.4E-08	1.5E-06	$\mu g/m^3$	35-GWDS4-02	15/15	--	1.5E-06	NA	NA	NA	NA	NO	NTX
	7440-62-2	Vanadium	2.2E-06	1.5E-05	$\mu g/m^3$	IR35-SS13-00-05181994	20/20	--	1.5E-05	NA	NA	NA	NA	NO	NTX
	7440-66-6	Zinc	1.2E-05	3.2E-04	$\mu g/m^3$	IR35-SS04-00-05101994	3/3	--	3.2E-04	NA	NA	NA	NA	NO	NTX

[1] Minimum/Maximum calculated air concentrations from sediment concentrations. Air concentrations calculated as $C_{air} = C_{soil}*1000*(1/PEF + 1/VF)$.
PEF = 1.36E9 m^3/kg. VF calculated for volatile constituents only, on Table 2.4A. PEF and VF from USEPA's Soil Screening Guidance. (USEPA, July 1996)

[2] Maximum concentration is used for screening.

[3] Background values are not available.

[4] Oak Ridge National Laboratory (ORNL). September 12, 2008. Regional Screening Levels for Chemical Contaminants at Superfund Sites. Adjusted Residential Ambient Air RSL.
(ORNL, September 12, 2008). [Online]. Available: http://epa-prgs.ornl.gov/chemicals/index.shtml
RSL value for pyrene used as surrogate for benzo(g,h,i)perylene and phenanthrene.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)
Deletion Reason: No Toxicity Information (NTX)
Essential Nutrient (NUT)
Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
C = Carcinogenic RSL
NA = Not available
N = Noncarcinogenic RSL, divided by 10 to adjust for exposure to multiple constituents

Table 2.4A

Calculation of Volatilization Factor - Ward A Pond Sediment

MCB CAMP LEJEUNE

NORTH CAROLINA

Chemical	Diffusivity in Air (D_i) (cm^2/s)	Henry's Law Constant (H') (unitless)	Diffusivity in Water (D_w) (cm^2/s)	Soil Organic Carbon Partition Coeff. (K_{oc}) (cm^3/g)	Soil Water Partition Coeff. ($K_d = K_{oc} \times F_{oc}$) ($g/cm^3$)	Solubility in Water (S) (mg/L)	Apparent Diffusivity (D_A) (cm^2/s)	Vo
2-Butanone	9.10E-02	2.30E-03	1.00E-05	3.83E00	2.30E-02	2.23E05	9.09E-05	1
4-Methyl-2-pentanone	7.00E-02	5.60E-03	8.30E-06	1.09E01	6.55E-02	1.90E04	1.26E-04	1
Acetone	1.10E-01	1.60E-03	1.10E-05	1.98E00	1.19E-02	1.00E06	8.42E-05	1
Benzene	9.00E-02	2.30E-01	1.00E-05	1.66E02	9.93E-01	1.79E03	9.70E-04	4
Carbon disulfide	1.10E-01	5.90E-01	1.30E-05	1.00E00	6.00E-03	1.18E03	1.59E-02	1
Ethylbenzene	6.80E-02	3.20E-01	8.50E-06	5.18E02	3.11E+00	1.69E02	3.55E-04	7
Methylene chloride	1.00E-01	1.30E-01	1.30E-05	2.37E01	1.42E-01	1.30E04	2.59E-03	2
Naphthalene	6.00E-02	1.80E-02	8.40E-06	1.84E03	1.10E+01	3.10E01	5.18E-06	6
Styrene	7.10E-02	1.10E-01	8.80E-06	5.18E02	3.11E+00	3.10E02	1.29E-04	1
Tetrachloroethene	5.00E-02	7.20E-01	9.50E-06	1.07E02	6.41E-01	2.06E02	2.19E-03	3
Toluene	7.80E-02	2.70E-01	9.20E-06	2.68E02	1.61E+00	5.26E02	6.38E-04	5
Xylene, total	8.50E-02	2.70E-01	9.90E-06	4.43E02	2.66E+00	1.06E02	4.35E-04	6
2-Methylnaphthalene	5.20E-02	2.10E-02	7.80E-06	2.98E03	1.79E+01	2.46E01	3.24E-06	7
Acenaphthene	5.10E-02	7.40E-03	8.30E-06	6.12E03	3.67E+01	3.90E00	5.47E-07	1
Anthracene	3.90E-02	2.30E-03	7.90E-06	2.04E04	1.22E+02	4.34E-02	3.94E-08	7
Fluorene	4.40E-02	3.90E-03	7.90E-06	1.13E04	6.77E+01	1.89E00	1.36E-07	3
Pyrene	2.80E-02	4.90E-04	7.20E-06	6.94E04	4.16E+02	1.35E-01	1.86E-09	3

Volatilization factor (VF) = (m^3/kg)

$$\frac{Q/C * (3.14 * D_A * T)^{1/2} * 10^{-4}\ m^2/cm^2}{2 * r_b * D_A}$$

Apparent Diffusivity (D_A) = (cm^2/s)

$$\frac{[(Q_a^{10/3} * D_i * H' + Q_w^{10/3} * D_w)/n^2]}{(r_b * K_d + Q_w + Q_a * H')}$$

Parameters	Values
Q/C - Inverse of the mean concentration at the center of a 0.5-acre-square source located in Raleigh-Durham, NC (g/m^2-s per kg/m^3) default value from Supplemental SSL guidance document	77.26
T - Exposure interval(s)	9.5E+08
ρ_b - Soil bulk density (g/cm^3)	1.5
Θ_a - Air-filled soil porosity (L_{air}/L_{water}) = n - Θ_w	0.28
n - Total soil porosity (Lpore/Lsoil) = 1 - (ρ_b/ρ_s)	0.43
Θ_w - Water-filled soil porosity (L_{water}/L_{soil})	0.15
ρ_s - Soil particle density (g/cm^3)	2.65
f_{oc} - fraction organic carbon in soil (g/g)	0.006

Equations from USEPA, 1996. *Soil Screening Guidance: User's Guide.* EPA/540/R-96/018.

Physical/chemical properties from Oak Ridge National Laboratory (ORNL). September 12, 2008. Regional Screening Levels for Chemical Contaminants at Superfund Sites.

Table 2.5
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MCB CAMP LEJEUNE
NORTH CAROLINA

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Previously Identified as COPC in 1995 HHRA	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
Sediment	540-59-0	1,2-Dichloroethene (total)	3.2E-02	3.2E-02	MG/KG	IR35-DS03SD-02A-02162002	1/11	0.0062 - 0.025	3.2E-02	NA	7.0E+02 N	NA	NA	NO	NO	BSL
	78-93-3	2-Butanone	3.5E-03	3.5E-03	MG/KG	IRBC-SD14-02A-02152002	1/11	0.025 - 0.1	3.5E-03	NA	2.8E+04 N	NA	NA	NO	NO	BSL
	67-64-1	Acetone	8.7E-03 J	1.3E-01 J	MG/KG	IR35-SD01-612-04201994	4/12	0.025 - 0.1	1.3E-01	NA	6.1E+04 N	NA	NA	NO	NO	BSL
	75-15-0	Carbon disulfide	2.6E-03 J	1.5E-02	MG/KG	IRBC-SD07-02A-02152002	2/11	0.0062 - 0.025	1.5E-02	NA	2.6E+02 N	NA	NA	NO	NO	BSL
	100-41-4	Ethylbenzene	1.6E-03 J	1.6E-03	MG/KG	IRBC-SD14-02A-02152002	1/17	0.0062 - 0.025	1.6E-03	NA	5.7E+01 C	NA	NA	NO	NO	BSL
	108-88-3	Toluene	2.1E-03 J	8.0E-03 J	MG/KG	IR35-SD03-06-05171994	2/12	0.0062 - 0.025	8.0E-03	NA	9.3E+02 N	NA	NA	NO	NO	BSL
	75-01-4	Vinyl chloride	1.5E-02 J	1.5E-02 J	MG/KG	IR35-DS03SD-02A-02162002	1/11	0.012 - 0.05	1.5E-02	NA	6.0E-01 C	NA	NA	NO	NO	BSL
	1330-20-7	Xylene, total	6.2E-03 J	6.2E-03 J	MG/KG	IRBC-SD04-02A-02152002	1/11	0.0062 - 0.025	6.2E-03	NA	3.0E+02 N	NA	NA	NO	NO	BSL
	156-59-2	cis-1,2-Dichloroethene	3.1E-02	3.1E-02	MG/KG	IR35-DS03SD-02A-02162002	1/11	0.0031 - 0.013	3.1E-02	NA	7.8E+02 N	NA	NA	NO	NO	BSL
	84-74-2	Di-n-butylphthalate	2.2E-01 J	2.2E-01 J	MG/KG	IR36-SD06-612-05181994	1/1	NA	2.2E-01	NA	6.1E+03 N	NA	NA	NO	NO	BSL
	84-66-2	Diethylphthalate	3.5E-01 J	2.1E+00 J	MG/KG	IR36-SD05-06-05181994	3/3	NA	2.1E+00	NA	4.9E+04 N	NA	NA	YES	NO	BSL
	117-81-7	bis(2-Ethylhexyl)phthalate	4.7E-01 J	7.0E-01 J	MG/KG	IR35-SD05-06-05171994	3/3	NA	7.0E-01	NA	3.5E+02 C	NA	NA	NO	NO	BSL
	72-54-8	4,4'-DDD	1.1E-03 J	2.2E-01 J	MG/KG	IR36-SD05-06-05181994	3/3	NA	2.2E-01	NA	2.0E+01 C	NA	NA	YES	NO	BSL
	72-55-9	4,4'-DDE	1.0E-03 J	2.4E-01 J	MG/KG	IR36-SD05-06-05181994	5/5	NA	2.4E-01	NA	1.4E+01 C	NA	NA	YES	NO	BSL
	50-29-3	4,4'-DDT	6.6E-04 J	4.6E-02 J	MG/KG	IR36-SD05-612-05181994	14/14	NA	4.6E-02	NA	1.7E+01 C	NA	NA	YES	NO	BSL
	60-57-1	Dieldrin	1.4E-03 J	1.4E-02 J	MG/KG	IR36-SD07-612-05181994	6/6	NA	1.4E-02	NA	3.0E-01 C	NA	NA	YES	NO	BSL
	33213-65-9	Endosulfan II	8.4E-04 J	3.5E-03 J	MG/KG	IR35-SD04-612-04201994	8/8	NA	3.5E-03	NA	3.7E+02 N	NA	NA	YES	NO	BSL
	72-20-8	Endrin	4.4E-04 J	8.5E-04 J	MG/KG	IR35-SD05-612-05171994	5/5	NA	8.5E-04	NA	1.8E+01 N	NA	NA	YES	NO	BSL
	7421-93-4	Endrin aldehyde	1.0E-03 J	7.6E-03 J	MG/KG	IR36-SD05-06-05181994	5/5	NA	7.6E-03	NA	1.8E+01 N	NA	NA	YES	NO	BSL
	53494-70-5	Endrin ketone	2.8E-03 J	3.1E-03 J	MG/KG	IR35-SD05-06-05171994	2/2	NA	3.1E-03	NA	1.8E+01 N	NA	NA	YES	NO	BSL
	76-44-8	Heptachlor	9.1E-04 J	2.3E-03 J	MG/KG	IR35-SD03-06-05171994	2/2	NA	2.3E-03	NA	1.1E+00 C	NA	NA	NO	NO	BSL
	1024-57-3	Heptachlor epoxide	4.3E-04 J	1.4E-03 J	MG/KG	IR35-SD07-612-04201994	7/7	NA	1.4E-03	NA	5.3E-01 C	NA	NA	YES	NO	BSL
	72-43-5	Methoxychlor	4.9E-04 J	3.4E-03 J	MG/KG	IR35-SD07-612-04201994	6/6	NA	3.4E-03	NA	3.1E+02 N	NA	NA	YES	NO	BSL
	5103-71-9	alpha-Chlordane	5.1E-04 J	1.3E-02 J	MG/KG	IR36-SD07-06-05181994	3/3	NA	1.3E-02	NA	1.6E+00 C	NA	NA	YES	NO	BSL
	2103-74-2	gamma-Chlordane	3.6E-03	9.7E-03	MG/KG	IR35-SD07-612-04201994	6/6	NA	1.3E-02	NA	1.6E+00 C	NA	NA	YES	NO	BSL
	319-85-7	beta-BHC	5.9E-04 J	5.9E-04 J	MG/KG	IR35-SD07-06-04201994	1/1	NA	5.9E-04	NA	2.7E+00 C	NA	NA	NO	NO	BSL
	319-86-8	delta-BHC	9.2E-04 J	1.0E-03 J	MG/KG	IR35-SD06-06-05171994	2/2	NA	1.0E-03	NA	2.7E+00 C	NA	NA	NO	NO	BSL
	7429-90-5	Aluminum	1.2E+03	3.3E+04	MG/KG	IR36-SD02-01C-07172001	22/22	24.8 - 300	3.3E+04	NA	7.7E+04 N	NA	NA	NO	NO	BSL
	7440-38-2	Arsenic	3.4E-01 J	6.9E+00	MG/KG	IR35-DS01SD-02A-02162002	33/36	1.2 - 14	6.9E+00	NA	3.9E+00 C	NA	NA	YES	YES	ASL
	7440-39-3	Barium	6.7E+00 J	6.4E+01	MG/KG	IR35-DS01SD-02A-02162002	16/21	24.8 - 300	6.4E+01	NA	1.5E+04 N	NA	NA	YES	NO	BSL
	7440-41-7	Beryllium	1.9E-01 J	8.7E-01 J	MG/KG	IR35-DS01SD-02A-02162002	12/21	0.62 - 7.6	8.7E-01	NA	1.6E+02 N	NA	NA	YES	NO	BSL
	7440-43-9	Cadmium	1.6E-01 J	2.5E+00	MG/KG	IR36-SD03-01C-07172001	16/21	0.62 - 7.6	2.5E+00	NA	7.0E+01 N	NA	NA	NO	NO	BSL
	7440-70-2	Calcium	3.0E+02 J	4.8E+04	MG/KG	IR36-SD04-01C-07172001	39/39	620 - 7300	4.8E+04	NA	NA	NA	NA	NO	NO	NUT
	7440-47-3	Chromium	4.6E+00	5.0E+01	MG/KG	IR36-SD05-01B-04042001	26/26	1.2 - 15	5.0E+01	NA	2.8E+03 C	NA	NA	YES	NO	BSL

Table 2.5

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

MCB CAMP LEJEUNE

NORTH CAROLINA

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Previously Identified as COPC in 1995 HHRA	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	7440-48-4	Cobalt	8.9E-01 J	8.7E+00 J	MG/KG	IR36-SD03-01C-07172001	16/21	6.2 - 76	8.7E+00	NA	2.3E+01 N	NA	NA	YES	NO	BSL
	7440-50-8	Copper	4.4E+00	9.4E+01	MG/KG	IR36-SD03-01C-07172001	19/21	3.1 - 38	9.4E+01	NA	3.1E+03 N	NA	NA	YES	NO	BSL
	7439-89-6	Iron	1.1E+03 J	4.4E+04	MG/KG	IR36-SD03-01C-07172001	29/29	12.4 - 150	4.4E+04	NA	5.5E+04 N	NA	NA	NO	NO	BSL
	7439-92-1	Lead	4.7E+00 J	1.2E+02	MG/KG	IR36-SD02-01B-04042001	31/31	0.37 - 4.4	1.2E+02	NA	4.0E+02	NA	NA	YES	NO	BSL
	7439-95-4	Magnesium	6.2E+02 J	3.9E+03 J	MG/KG	IR36-SD05-01C-07172001	18/21	620 - 7300	3.9E+03	NA	NA	NA	NA	NO	NO	NUT
	7439-96-5	Manganese	3.2E+00 J	7.2E+02	MG/KG	IR36-SD04-01C-07172001	28/29	1.9 - 23	7.2E+02	NA	1.8E+03 N	NA	NA	YES	NO	BSL
	7439-97-6	Mercury	2.8E-02 J	1.7E+00	MG/KG	IR36-SD04-01C-07172001	14/21	0.095 - 0.71	1.7E+00	NA	2.3E+01 N	NA	NA	NO	NO	BSL
	7440-02-0	Nickel	3.2E+00 J	6.2E+01	MG/KG	IR36-SD03-01C-07172001	17/23	5 - 61	6.2E+01	NA	1.6E+03 N	NA	NA	YES	NO	BSL
	7440-09-7	Potassium	3.1E+02 J	2.4E+03	MG/KG	IR35-DS01SD-02A-02162002	16/21	620 - 7300	2.4E+03	NA	NA	NA	NA	NO	NO	NUT
	7782-49-2	Selenium	2.3E-01 J	3.0E+00	MG/KG	IRBC-SD05-02A-02152002	14/25	0.62 - 7.3	3.0E+00	NA	3.9E+02 N	NA	NA	YES	NO	BSL
	7440-22-4	Silver	2.7E-01 J	3.1E+00 J	MG/KG	IR36-SD05-01C-07172001	4/21	1.2 - 15	3.1E+00	NA	3.9E+02 N	NA	NA	NO	NO	BSL
	7440-23-5	Sodium	6.4E+02 J	1.2E+04	MG/KG	IR36-SD05-01C-07172001	17/21	620 - 7300	1.2E+04	NA	NA	NA	NA	NO	NO	NUT
	7440-28-0	Thallium	2.2E-01 J	6.6E-01 J	MG/KG	IR35-SD01-06-04201994	4/25	1.2 - 14	6.6E-01	NA	5.1E+00 N	NA	NA	YES	NO	BSL
	7440-62-2	Vanadium	9.4E-01 J	6.3E+01	MG/KG	IR36-SD03-01B-04042001	26/29	6.2 - 76	6.3E+01	NA	5.5E+02 N	NA	NA	YES	NO	BSL
	7440-66-6	Zinc	3.1E+01	6.9E+02	MG/KG	IR36-SD04-01C-07172001	23/24	2.5 - 30	6.9E+02	NA	2.3E+04 N	NA	NA	YES	NO	BSL

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening.

[3] Background values not available.

[4] Oak Ridge National Laboratory (ORNL). September 12, 2008. Regional Screening Levels for Chemical Contaminants at Superfund Sites. [Online]. Available: http://epa-prgs.ornl.gov/chemicals/index.shtml

RSL value for chlordane used as surrogate for alpha-chlordane and gamma-chlordane.

RSL value for technical-HCH used as surrogate for delta-BHC.

RSL value for chromium VI (particulates) used as surrogate for chromium.

The adjusted value of 150 mg/kg for cobalt in residential soil was calculated based on the exposure equations and assumptions used for development of Regional Screening Levels (ORNL, 2008).

The soil value of 400 mg/kg for lead is from the Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities, USEPA, July 14, 1994.

RSL value for manganese (water) used as surrogate for manganese.

RSL value for mercury (inorganic salts) used as surrogate for mercury.

RSL value for endosulfan used as surrogate for endosulfan II.

RSL value for endrin used as surrogate for endrin aldehyde and endrin ketone.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)

Deletion Reason: No Toxicity Information (NTX)

COPC = Chemical of Potential Concern

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered

J = Estimated Value

C = Carcinogenic

C = Carcinogenic RSL

N = Noncarcinogenic RSL, divided by 10 to adjust for exposure to multiple constituents

NA = Not available/not applicable

Table 2.5
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MCB CAMP LEJEUNE
NORTH CAROLINA

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Previously Identified as COPC in 1995 HHRA	COPC Flag	Rationale for [5] Contaminant Deletion or Selection

Essential Nutrient (NUT)
Below Screening Level (BSL)

Table 2.6
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MCB CAMP LEJEUNE
NORTH CAROLINA

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	Previously Identified as COPC in 1995 HHRA	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
Brinson Creek	78-93-3	2-Butanone	6.0E-01 J	6.0E-01 J	UG/L	IR35-SW03D-08B	1/6	2.5 - 2.5	6.0E-01	NA	7.1E+03 N	NA	NA	NO	NO	BSL
	67-64-1	Acetone	3.7E+00	9.0E+00	UG/L	IR35-SW03-08B	6/6	2.5 - 2.5	9.0E+00	NA	2.2E+04 N	NA	NA	NO	NO	BSL
	75-15-0	Carbon disulfide	1.1E-01 J	1.1E-01 J	UG/L	IR35-SW01-08B	1/6	0.5 - 0.5	1.1E-01	NA	1.0E+03 N	NA	NA	NO	NO	BSL
	67-66-3	Chloroform	2.6E-01 J	2.6E-01 J	UG/L	IR35-SW05-08B	1/6	0.5 - 0.5	2.6E-01	NA	5.7E+00 A	NA	NA	NO	NO	BSL
	156-59-2	cis-1,2-Dichloroethene	1.6E-01 J	3.3E-01 J	UG/L	IR35-SW03D-08B	4/6	0.5 - 0.5	3.3E-01	NA	3.7E+02 N	NA	NA	NO	NO	BSL
	7429-90-5	Aluminum	1.6E+02 J	6.1E+03	UG/L	IR36-SW01-01C-07172001	8/8	200 - 200	6.1E+03	NA	3.7E+03 N	NA	NA	NO	YES	ASL
	7440-36-0	Antimony	1.5E+00	1.5E+00	UG/L	IR35-SW04-04121994	1/9	60 - 60	1.5E+00	NA	5.6E+00 A	NA	NA	YES	NO	BSL
	7440-38-2	Arsenic	2.2E+00 J	5.1E+00 J	UG/L	IR36-SW01-01C-07172001	8/9	10 - 10	5.1E+00	NA	1.0E+01 NC	NA	NA	YES	NO	BSL
	7440-39-3	Barium	1.7E+01 J	4.9E+01 J	UG/L	IR35-SW07-04201994	12/12	200 - 200	4.9E+01	NA	1.0E+03 NC	NA	NA	NO	NO	BSL
	7440-41-7	Beryllium	4.6E-01 J	5.0E-01 J	UG/L	IR36-SW01-01C-07172001	2/8	5 - 5	5.0E-01	NA	7.6E-03 A	NA	NA	NO	YES	ASL
	7440-43-9	Cadmium	3.1E-01 J	4.3E-01 J	UG/L	IR35-DS03SW-02A-02162002	3/8	5 - 5	4.3E-01	NA	1.0E+01 A	NA	NA	NO	NO	BSL
	7440-70-2	Calcium	6.1E+04	1.5E+05 J	UG/L	IR35-SW01-02D-10242002	8/8	5000 - 5000	1.5E+05	NA	NA	NA	NA	NO	NO	NUT
	7440-47-3	Chromium	1.2E+00 J	1.2E+01	UG/L	IR35-DS03SW-02A-02162002	3/9	10 - 10	1.2E+01	NA	1.1E+02 N	NA	NA	YES	NO	BSL
	7440-48-4	Cobalt	1.5E+00 J	1.7E+01 J	UG/L	IR35-SW05-04121994	5/11	50 - 50	1.7E+01	NA	1.9E+02 NC	NA	NA	YES	NO	BSL
	7440-50-8	Copper	1.5E+00 J	7.6E+00 J	UG/L	IR36-SW01-01C-07172001	4/8	25 - 25	7.6E+00	NA	1.3E+03 A	NA	NA	NO	NO	BSL
	7439-89-6	Iron	3.1E+02	6.3E+03	UG/L	IR36-SW01-01C-07172001	11/11	100 - 100	6.3E+03	NA	3.0E+02 A	NA	NA	NO	YES	ASL
	7439-92-1	Lead	2.1E+00	9.7E+01 J	UG/L	IR35-SW07-04201994	6/11	3 - 3	9.7E+01	NA	1.5E+01 M	NA	NA	YES	YES	ASL
	7439-95-4	Magnesium	3.1E+03	3.6E+05 J	UG/L	IR35-SW01-02D-10242002	11/11	5000 - 5000	3.6E+05	NA	NA	NA	NA	NO	NO	NUT
	7439-96-5	Manganese	3.7E+01	8.4E+01 J	UG/L	IR35-SW01-02D-10242002	8/8	15 - 15	8.4E+01	NA	2.0E+02 NC	NA	NA	YES	NO	BSL
	7439-97-6	Mercury	1.2E-01 J	3.2E+00 J	UG/L	IR35-SW04-04121994	2/9	0.2 - 0.2	3.2E+00	NA	1.4E-01 A	NA	NA	YES	YES	ASL
	7440-02-0	Nickel	2.7E+00 J	5.8E+00 J	UG/L	IR36-SW01-01C-07172001	3/8	40 - 40	5.8E+00	NA	2.5E+01 NC	NA	NA	NO	NO	BSL
	7440-09-7	Potassium	2.8E+03	1.7E+05 J	UG/L	IR35-SW01-02D-10242002	12/12	5000 - 5000	1.7E+05	NA	NA	NA	NA	NO	NO	NUT
	7782-49-2	Selenium	1.3E+00 J	1.3E+00 J	UG/L	IR35-SW04-04121994	1/9	5 - 5	1.3E+00	NA	1.7E+02 A	NA	NA	NO	NO	BSL
	7440-23-5	Sodium	5.7E+04	2.9E+06	UG/L	IR35-SW01-02D-10242002	11/11	5000 - 100000	2.9E+06	NA	NA	NA	NA	NO	NO	NUT
	7440-28-0	Thallium	1.0E+00 J	1.7E+01	UG/L	IR35-SW01-02D-10242002	4/9	10 - 10	1.7E+01	NA	2.4E-01 NC	NA	NA	YES	YES	ASL
	7440-62-2	Vanadium	9.7E-01 J	1.5E+01 J	UG/L	IR35-SW07-04201994	6/9	50 - 50	1.5E+01	NA	1.8E+01 N	NA	NA	YES	NO	BSL
	7440-66-6	Zinc	1.4E+01 J	1.3E+02 J	UG/L	IR35-SW07-04201994	5/9	20 - 20	1.3E+02	NA	7.4E+03 A	NA	NA	YES	NO	BSL

Table 2.6

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

MCB CAMP LEJEUNE

NORTH CAROLINA

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening.

[3] Background values not available.

[4] If available, National Recommended Water Quality Criteria (NRWQC; USEPA, 2006), Human Health for Consumption of Water and Organisms value for Priority Toxic Pollutants. If based on noncarcinogenic effects, value divided by 10 to account for exposure to multiple constituents.

If NRWQC not available, Tap Water Risk-Based Screening Level (RSL) from Regional Screening Levels for Chemical Contaminants at Superfund Sites (USEPA, September 2008). [Online]. Available: http://epa-prgs.ornl.gov/chemicals/index.shtml

RSL value for hexavalent chromium used as surrogate for total chromium.

NC = North Carolina WQS for Human Health and Water Supply, May 2007.

Screening value for lead is the action level provided in the National Primary Drinking Water Standards (USEPA, 2003).

[5] Rationale Codes

Selection Reason:	Above Screening Levels (ASL)
Deletion Reason:	No Toxicity Information (NTX)
	Essential Nutrient (NUT)
	Below Screening Level (BSL)

COPC = Chemical of Potential Concern

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered

NA = Not available

J = Estimated Value

A = National Recommended Water Quality Criteria, Human Health for Consumption of Water and Organisms

C = Carcinogenic RSL

M = Action level for lead

N = Noncarcinogenic RSL, divided by 10 to adjust for exposure to multiple constituents

NC = North Carolina WQS for Human Health and Water Supply, May 2007.

Table 2.7

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

MCB CAMP LEJEUNE

NORTH CAROLINA

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
Indoor Air	79-34-5	1,1,2,2-Tetrachloroethane	1.5E+00	1.7E+01 J	UG/L	IR35-MW35A-04271996	4/30	0.5 - 2.5	1.7E+01	NA	3.0E+00 C	NA	NA	YES	ASL
	79-00-5	1,1,2-Trichloroethane	1.1E-01 J	5.3E-01 J	UG/L	IR35-MW73-02D-10232002	3/30	0.5 - 2.5	5.3E-01	NA	5.0E+00 C	NA	NA	NO	BSL
	75-35-4	1,1-Dichloroethene	4.3E-01 J	5.8E-01	UG/L	IR35-MW14-08B	2/30	0.5 - 2.5	5.8E-01	NA	1.9E+02 N	NA	NA	NO	BSL
	107-06-2	1,2-Dichloroethane	3.3E-01 J	3.3E-01 J	UG/L	IR35-MW73-02D-10232002	1/17	1 - 1	3.3E-01	NA	5.0E+00 C	NA	NA	NO	BSL
	540-59-0	1,2-Dichloroethene (total)	3.6E+00	1.6E+01	UG/L	IR35-MW19S-04271996	5/9	1 - 2	1.6E+01	NA	2.1E+02 N	NA	NA	NO	BSL
	156-59-2	cis-1,2-Dichloroethene	3.9E-01 J	6.6E+02	UG/L	IR35-MW21S-05131994	12/25	0.5 - 4.2	6.6E+02	NA	2.1E+02 N	NA	NA	YES	ASL
	156-60-5	trans-1,2-Dichloroethene	3.0E-01 J	1.8E+02	UG/L	IR35-MW33AW-05191994	11/25	0.5 - 2.5	1.8E+02	NA	1.8E+02 N	NA	NA	NO	BSL
	67-64-1	Acetone	2.9E+00	1.3E+01	UG/L	IR35-MW62-08B	3/17	2.5 - 13	1.3E+01	NA	2.0E+05 N	NA	NA	NO	BSL
	71-43-2	Benzene	1.2E+00	1.6E+01	UG/L	IR35-MW29-04B	5/30	0.5 - 2.5	1.6E+01	NA	1.4E+00 C	NA	NA	YES	ASL
	75-15-0	Carbon disulfide	1.1E-01 J	2.0E-01 J	UG/L	IR35-MW29-04B	2/22	0.5 - 2.5	2.0E-01	NA	5.6E+02 N	NA	NA	NO	BSL
	100-41-4	Ethylbenzene	2.0E-01 J	3.6E+01	UG/L	IR35-MW14S-05121994	9/30	0.5 - 2.5	3.6E+01	NA	7.0E+02 C	NA	NA	NO	BSL
	1634-04-4	Methyl-tert-butyl ether (MTBE)	4.4E+01	3.2E+02	UG/L	IR35-MW21S-05131994	3/22	0.5 - 5	3.2E+02	NA	1.2E+05 N	NA	NA	NO	BSL
	127-18-4	Tetrachloroethene	1.9E+00	1.9E+00	UG/L	IR35-MW66D-08B	1/30	0.5 - 2.5	1.9E+00	NA	5.0E+00 C	NA	NA	NO	BSL
	108-88-3	Toluene	1.2E-01 J	5.9E+01	UG/L	IR35-MW14S-05121994	14/28	0.5 - 2.5	5.9E+01	NA	1.8E+04 N	NA	NA	NO	BSL
	79-01-6	Trichloroethene	4.0E-01	9.0E+02	UG/L	IR35-MW21S-05131994	14/28	0.5 - 4.2	9.0E+02	NA	2.9E+00 C	NA	NA	YES	ASL
	75-01-4	Vinyl chloride	1.9E-01 J	1.6E+01	UG/L	IR35-MW62-08B	4/30	0.5 - 2.5	1.6E+01	NA	2.0E+00 C	NA	NA	YES	ASL
	1330-20-7	Xylene, total	1.4E+00	5.0E+01	UG/L	IR35-MW21S-05131994	6/28	0.5 - 3	5.0E+01	NA	3.4E+02 N	NA	NA	NO	BSL
	--	m- and p-Xylene	8.0E+00	8.0E+00	UG/L	IR35-MW29-04B	1/5	2 - 2	8.0E+00	NA	3.2E+02 N	NA	NA	NO	BSL
	95-47-6	o-Xylene	2.0E-01 J	4.0E+00	UG/L	IR35-MW29-04B	2/18	0.5 - 2.5	4.0E+00	NA	4.7E+02 N	NA	NA	NO	BSL

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening.

[3] Background values not available.

[4] Tap Water Risk-Based Screening Level (RSL) from Regional Screening Levels for Chemical Contaminants at Superfund Sites. September 12, 2008. [Online]. Available: http://epa-prgs.ornl.gov/chemicals/index.shtml

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)

Deletion Reason: No Toxicity Information (NTX)
Essential Nutrient (NUT)
Below Screening Level (BSL)

COPC = Chemical of Potential Concern

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered

J = Estimated Value

C = Carcinogenic

N = Noncarcinogenic

Table 2.7A

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

MCB CAMP LEJEUNE

NORTH CAROLINA

Constituent	Unit Risk Factor (URF) $(ug/m^3)^{-1}$	Reference Concentration (RfC) mg/m^3	Target Indoor Air Concentration, carcinogen (C_{Cancer}) ug/m^3	Target Indoor Air Concentration, non-carcinogen ($C_{non\text{-}Cancer}$) ug/m^3	Target Indoor Air Concentration ($C_{target,ia}$) ug/m^3	Henry's Law Dimensionless	Target Groundwater Concentration (C_{gw}) ug/L
Benzene[1]	7.80E-06	3.00E-02	3.12E-01	3.00E+01	3.12E-01	2.28E-01	1.37E+00
Trichloroethene[1]	2.00E-06		1.22E+00	NA	1.22E+00	4.21E-01	2.89E+00

Notes:

[1] Due to change in toxicity value(s), the vapor intrusion screening level [i.e., target groundwater concentration from Table 2c, Subsurface Vapor Intrusion Guidance (EPA, 2002)] for this constituent was updated using the methodology presented in URF and RfCs obtained from EPA's Integrated Risk Information System (IRIS) Database. [Online at http://www.epa.gov/iris/index.html].

URF for Trichloroethene obtained from California EPA's Toxicity Criteria Database: Cancer Potency. [Online at http://www.oehha.ca.gov/risk/chemicalDB//index.asp].

Variables	Units	Value
C_{Cancer} = Target indoor air conc., cancer	ug/m^3	Solved by Eq. 1
$C_{non\text{-}Cancer}$ = Target indoor air conc., non-cancer	ug/m^3	Solved by Eq. 2
$C_{target,ia}$ = Target indoor air conc., minimum	ug/m^3	Solved by Eq. 3
C_{gw} = Target groundwater conc.	ug/L	Solved by Eq. 4
TCR = Target Cancer Risk	unitless	1.00E-06
THQ = Target Hazard Quotient	unitless	1
URF = Unit Risk Factor	$(ug/m^3)^{-1}$	Chemical-specific
RfC = Reference Concentration	mg/m^3	Chemical-specific
ATc = Averaging Time, carcinogens	days	25,550
EF = Exposure Frequency	days/year	350
ED = Exposure Duration	years	30
CF = Conversion Factor	ug/mg	1000
H = Dimensionless Henry's Law Constant	unitless	Chemical-specific
alpha		0.1
alpha		0.01
alpha (α) = Attenuation Factor	unitless	0.001

Equation 1:	C_{cancer} =	[(TCR x ATc)/(EF x ED x URF)]
Equation 2:	$C_{non\text{-}cancer}$ =	(THQ x RfC x CF)
Equation 3:	$C_{target,ia}$ =	Minimum(C_{cancer}, $C_{non\text{-}cancer}$)
Equation 4:	Cgw =	$C_{target,ia}$ x 10^{-3} m^3/L * 1/H * 1/α

Table 3.1
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
MCB CAMP LEJEUNE
NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)		Maximum Concentration (Qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
Surface Soil											
	Benzo(a)anthracene	MG/KG	NA	NA		5.7E-01		5.7E-01	MG/KG	Max	7
	Benzo(a)pyrene	MG/KG	NA	NA		6.3E-01		6.3E-01	MG/KG	Max	7
	Benzo(b)fluoranthene	MG/KG	7.6E-01	NA		1.2E+00		1.2E+00	MG/KG	Max	7
	Dibenz(a,h)anthracene	MG/KG	1.8E-01	NA		1.8E-01	J	1.8E-01	MG/KG	Max	7
	Indeno(1,2,3-cd)pyrene	MG/KG	NA	NA		3.8E-01		3.8E-01	MG/KG	Max	7
	4,4'-DDD	MG/KG	3.6E-01	6.7E+01		3.2E+00		3.2E+00	MG/KG	Max	2, 6
	4,4'-DDE	MG/KG	2.3E-01	9.3E-01	(NP)	1.6E+00		9.3E-01	MG/KG	Adj. Gamma	1, 3, 4
	Dieldrin	MG/KG	5.7E-02	NA		2.1E-01		2.1E-01	MG/KG	Max	7
	Aluminum	MG/KG	3.6E+03	4.5E+03	(N)	7.9E+03		4.5E+03	MG/KG	95% Mod-t	5
	Antimony	MG/KG	7.7E+00	9.6E+00		8.0E+00	J	8.0E+00	MG/KG	Max	7
	Arsenic	MG/KG	5.7E-01	6.9E-01	(N)	8.9E-01	J	6.9E-01	MG/KG	95% Stud-t	1, 2, 3, 4
	Cadmium	MG/KG	1.8E+00	6.4E+00	(NP)	1.5E+01	J	6.4E+00	MG/KG	99% Cheb-m	1
	Cobalt	MG/KG	2.5E+00	NA		4.3E+00		4.3E+00	MG/KG	Max	7
	Iron	MG/KG	5.5E+03	1.5E+04	(NP)	3.0E+04	J	1.5E+04	MG/KG	95% Cheb-m	5
	Thallium	MG/KG	1.9E-01	2.9E-01	(NP)	5.3E-01	J	2.9E-01	MG/KG	App. Gamma	3, 4

ProUCL, Version 4.00.02 used to determine distribution of data and to calculate EPC, following recommendations based on distribution and standard deviation in users guide (USEPA. April 2007. ProUCL, Version 4.00.02. Prepared by Lockheed Martin Environmental Services).

Options: Maximum Detected Value (Max); 95% Adjusted Gamma (Adj. Gamma); Modified-T test UCL (95% Mod-t); 95% UCL of Normal Data (95% UCL-N); 95% Chebyshev (Mean, Sd) UCL (95% Cheb-m); 99% Chebyshev (Mean, Sd) UCL (99% Cheb-m); 95% Approximate Gamma (App. Gamma); 95% Student's-T test UCL (95% Stud-t)

Table 3.1

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

MCB CAMP LEJEUNE

NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale

(1) Shapiro-Wilk W Test/Lilliefors test indicates data are log-normally distributed.
(2) Shapiro-Wilk W Test/Lilliefors indicates data are normally distributed.
(3) Anderson-Darling Test indicates data are gamma distributed.
(4) Kolmogorov-Smirnov Test indicates data are gamma distributed.
(5) Distribution tests are inconclusive (data are not normal, log-normal, or gamma-distributed).
(6) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.
(7) Maximum detected concentration used because sample size is less than 5.

MG/KG = milligrams per kilograr
G = Gamma distribution
J = Estimated Value
L = Log-normal distribution
N = Normal distribution
NP = Non-Parametric

Table 3.2
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
MCB CAMP LEJEUNE
NORTH CAROLINA

Scenario Timeframe: Current/Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)		Maximum Concentration (Qualifier)		Exposure Point Concentration				
								Value	Units	Statistic	Rationale	
Soil*												CAS
	Benzene	MG/KG	1.8E-01	3.7E-01	(NP)	1.1E+00	J	3.7E-01	MG/KG	95% KM-bt	1, 2, 3, 4	71-43-2
	Ethylbenzene	MG/KG	2.9E+00	6.1E+00	(NP)	2.1E+01		6.1E+00	MG/KG	95% KM-BCA	3, 4	100-41-4
	2-Methylnaphthalene	MG/KG	6.2E+01	1.0E+02	(NP)	2.2E+02	J	1.0E+02	MG/KG	95% KM-bt	2	91-57-6
	Naphthalene	MG/KG	1.3E+01	2.3E+01	(NP)	5.4E+01	J	2.3E+01	MG/KG	95% KM-bt	2	91-20-3
	Benzo(a)anthracene	MG/KG	8.0E+00	NA		5.7E-01		5.7E-01	MG/KG	Max	5, 6	56-55-3
	Benzo(a)pyrene	MG/KG	5.9E+00	NA		6.3E-01		6.3E-01	MG/KG	Max	5, 6	50-32-8
	Benzo(b)fluoranthene	MG/KG	7.6E+00	7.1E-01	(NP)	1.2E+00		7.1E-01	MG/KG	95% KM (t)	5	205-99-2
	Dibenz(a,h)anthracene	MG/KG	8.0E+00	NA		1.8E-01	J	1.8E-01	MG/KG	Max	7	53-70-3
	Dibenzofuran	MG/KG	3.9E+00	6.9E+00	(NP)	1.1E+01	J	6.9E+00	MG/KG	95% KM-bt	1, 2, 3, 4	132-64-9
	Indeno(1,2,3-cd)pyrene	MG/KG	8.0E+00	NA		3.8E-01		3.8E-01	MG/KG	Max	7	193-39-5
	4,4'-DDD	MG/KG	3.7E-01	6.7E+01	(NP)	3.2E+00		3.2E+00	MG/KG	Max	5	72-54-8
	4,4'-DDE	MG/KG	2.3E-01	9.3E-01	(N)	1.6E+00		9.3E-01	MG/KG	App. Gamma	1, 3, 4	72-55-9
	Dieldrin	MG/KG	5.7E-02	NA		2.1E-01		2.1E-01	MG/KG	NA	7	60-57-1
	Aluminum	MG/KG	3.7E+03	4.5E+03	(L)	7.9E+03		4.5E+03	MG/KG	95% H-UCL	1	7429-90-5
	Antimony	MG/KG	8.0E+00	8.0E+00	(NP)	8.0E+00	J	8.0E+00	MG/KG	Max	5	7440-36-0
	Arsenic	MG/KG	7.1E-01	9.5E-01	(G)	2.7E+00	J	9.5E-01	MG/KG	App. Gamma	1, 3, 4	7440-38-2
	Cadmium	MG/KG	1.1E+00	8.0E+00	(NP)	1.5E+01	J	8.0E+00	MG/KG	99% Cheb	1	7440-43-9
	Chromium	MG/KG	1.1E+01	3.4E+01	(NP)	9.8E+01		3.4E+01	MG/KG	95% Cheb-m	5	7440-47-3
	Cobalt	MG/KG	2.2E+00	NA		4.3E+00		4.3E+00	MG/KG	Max	5, 7	7440-48-4
	Iron	MG/KG	4.5E+03	7.1E+03	(L)	3.0E+04	J	7.1E+03	MG/KG	95% H-UCL	1	7439-89-6
	Thallium	MG/KG	3.2E-01	1.7E+00	(NP)	2.1E+00		1.7E+00	MG/KG	99% Cheb-m	5	7440-28-0

Table 3.2

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

MCB CAMP LEJEUNE

NORTH CAROLINA

Scenario Timeframe: Current/Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Point	Chemical of Potential	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			

* Surface soil & subsurface soil combined.

ProUCL, Version 4.00.02 used to determine distribution of data and to calculate EPC, following recommendations based on distribution and standard deviation in users guide (USEPA. April 2007. ProUCL, Version 4.00.02. Prepared by Lockheed Martin Environmental Services).

Options: Maximum Detected Value (Max); 95% Kaplan-Meir (bootstrap t) UCL (95% KM-bt); 99% Chebyshev (Mean, Sd) UCL (99% Cheb-m)
95% Kaplan-Meir (BCA) UCL (95% KM-BCA); 95% Approximate Gamma (App. Gamma); 99% Kaplan-Meir (Chebyshev) UCL;
95% Chebyshev (Mean, Sd) UCL (95% Cheb-m)

(1) Shapiro-Wilk W Test/Lilliefors test indicates data are log-normally distributed.
(2) Shapiro-Wilk W Test/Lilliefors indicates data are normally distributed.
(3) Anderson-Darling Test indicates data are gamma distributed.
(4) Kolmogorov-Smirnov Test indicates data are gamma distributed.
(5) Distribution tests are inconclusive (data are not normal, log-normal, or gamma-distributed).
(6) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.
(7) Maximum detected concentration used because sample size is less than 5.

MG/KG = milligrams per kilogram
G = Gamma distribution
J = Estimated Value
K = Biased High
L = Log-normal distribution
N = Normal distribution
NP = Non-Parametric

Table 3.3
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
MCB CAMP LEJEUNE
NORTH CAROLINA

Scenario Timeframe: Current/Future
Medium: Soil*
Exposure Medium: Air

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration				
						Value	Units	Statistic	Rationale	
Emissions from Soil*										CAS
	Ethylbenzene	MG/KG	2.9E+00	6.1E+00 (NP)	2.1E+01	6.1E+00	MG/KG	95% KM-BCA	3, 4	100-41-4
	Naphthalene	MG/KG	1.3E+01	2.3E+01 (NP)	5.4E+01 J	2.3E+01	MG/KG	95% KM-bt	2	91-20-3

* Surface soil & subsurface soil combined (concentrations are soil concentrations, converted to air concentrations in Table 7s).
ProUCL, Version 4.00.02 used to determine distribution of data and to calculate EPC, following recommendations
based on distribution and standard deviation in users guide (USEPA. April 2007. ProUCL, Version 4.00.02. Prepared by Lockheed Martin Environmental Services).
Options: Maximum Detected Value (Max); 95% Kaplan-Meir (BCA) UCL (95% KM-BCA); 95% Kaplan-Meir (bootstrap t) UCL (95% KM-bt)

(1) Shapiro-Wilk W Test/Lilliefors test indicates data are log-normally distributed.
(2) Shapiro-Wilk W Test/Lilliefors indicates data are normally distributed.
(3) Anderson-Darling Test indicates data are gamma distributed.
(4) Kolmogorov-Smirnov Test indicates data are gamma distributed.
(5) Distribution tests are inconclusive (data are not normal, log-normal, or gamma-distributed).
(6) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.
(7) Maximum detected concentration used because sample size is less than 5.

MG/KG = milligrams per kilogram
G = Gamma distribution
J = Estimated Value
K = Biased High
L = Log-normal distribution
N = Normal distribution
NP = Non-Parametric

Table 3.4

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

MCB CAMP LEJEUNE

NORTH CAROLINA

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Sediment	Arsenic	MG/KG	2.8E+00	3.1E+00 (NP)	6.9E+00	3.1E+00	MG/KG	95% KM-t	1, 2, 3, 4

ProUCL, Version 4.00.02 used to determine distribution of data and to calculate EPC, following recommendations based on distribution and standard deviation in users guide (USEPA. April 2007. ProUCL, Version 4.00.02. Prepared by Lockheed Martin Environmental Services).
Options: 95% Kaplan-Meier (t) UCL (95% KM-t)

(1) Shapiro-Wilk W Test/Lilliefors test indicates data are log-normally distributed.
(2) Shapiro-Wilk W Test/Lilliefors indicates data are normally distributed.
(3) Anderson-Darling Test indicates data are gamma distributed.
(4) Kolmogorov-Smirnov Test indicates data are gamma distributed.
(5) Distribution tests are inconclusive (data are not normal, log-normal, or gamma-distributed).
(6) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.
(7) Maximum detected concentration used because sample size is less than 5.

MG/KG = milligrams per kilogram
G = Gamma distribution
L = Log-normal distribution
N = Normal distribution
NP = Non-Parametric

Table 3.5

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

MCB CAMP LEJEUNE

NORTH CAROLINA

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)		Maximum Concentration (Qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
Brinson Creek											
	Aluminum	UG/L	1.8E+03	5.6E+03	(L)	6.1E+03		5.6E+03	UG/L	1, 3, 4	App. Gamma
	Beryllium	UG/L	2.7E+00	5.0E-01		5.0E-01	J	5.0E-01	UG/L	5, 7	Max
	Iron	UG/L	1.9E+03	3.4E+03	(L)	6.3E+03		3.4E+03	UG/L	1, 3, 4	App. Gamma
	Mercury	UG/L	4.6E-01	5.0E+00	(NP)	3.2E+00	J	3.2E+00	UG/L	5, 6	Max
	Thallium	UG/L	7.5E+00	1.7E+01	(NP)	1.7E+01		1.7E+01	UG/L	1, 2	95% KM-bt

ProUCL, Version 4.00.02 used to determine distribution of data and to calculate EPC, following recommendations
based on distribution and standard deviation in users guide (USEPA. April 2007. ProUCL, Version 4.00.02. Prepared by Lockheed Martin Environmental Services).
Options: Maximum Detected Value (Max); 95% Approximate Gamma (App. Gamma); 95% Kaplan-Meir (BCA) UCL (95% KM-BCA);
95% Kaplan-Meir (bootstrap t) UCL (95% KM-bt)

(1) Shapiro-Wilk W Test/Lilliefors test indicates data are log-normally distributed.
(2) Shapiro-Wilk W Test/Lilliefors indicates data are normally distributed.
(3) Anderson-Darling Test indicates data are gamma distributed.
(4) Kolmogorov-Smirnov Test indicates data are gamma distributed.
(5) Distribution tests are inconclusive (data are not normal, log-normal, or gamma-distributed).
(6) 95% UCL (or mean) exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.
(7) Maximum detected concentration used because sample size is less than 5.

UG/L = micrograms per liter
G = Gamma distribution
J = Estimated Value
L = Log-normal distribution
N = Normal distribution
NP = Non-Parametric

TABLE 4.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
MCB CAMP LEJEUNE
NORTH CAROLINA

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Value Previously Used in 1995 HHRA	Intake Equation/ Model Name
Ingestion	Military Personnel	Adult	Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1	mg/kg	See Table 3.1	- -	CDI (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 1991	Yes	CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	(1)	Yes	
				ED	Exposure Duration	4	years	(1)	Yes	
				CF1	Conversion Factor 1	0.000001	kg/mg	- -	Yes	
				BW	Body Weight	70	kg	EPA, 1991	Yes	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	Yes	
				AT-N	Averaging Time (Non-Cancer)	1,460	days	EPA, 1989	Yes	
Dermal	Military Personnel	Adult	Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1	mg/kg	See Table 3.1	- -	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	3,300	cm^2	EPA, 2004	No	CS x SA x SSAF x DABS x CF1 x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2004	No	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical Specific	--	EPA, 2004	- -	
				CF1	Conversion Factor 1	0.000001	kg/mg	- -	Yes	
				EF	Exposure Frequency	350	days/year	(1)	Yes	
				ED	Exposure Duration	4	years	(1)	Yes	
				BW	Body Weight	70	kg	EPA, 1991	Yes	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	Yes	
				AT-N	Averaging Time (Non-Cancer)	1,460	days	EPA, 1989	Yes	

Notes:
(1) Professional judgment assuming military personnel will reside at the facility for four years.
Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.
EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.
EPA, 2004: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

TABLE 4.2
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
MCB CAMP LEJEUNE
NORTH CAROLINA

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Value Previously Used in 1995 HHRA	Intake Equation/ Model Name
Ingestion	Resident	Adult	Soil*	CS	Chemical Concentration in Soil	See Table 3.2	mg/kg	See Table 3.2	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 1991	Yes	CS x IR-S x EF x ED x CF x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 1991	Yes	
				ED	Exposure Duration	24	years	EPA, 1991	Yes	
				CF	Conversion Factor	0.000001	kg/mg	- -	Yes	
				BW	Body Weight	70	kg	EPA, 1991	Yes	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	Yes	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	Yes	
		Child	Soil*	CS	Chemical Concentration in Soil	See Table 3.2	mg/kg	See Table 3.2	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	200	mg/day	EPA, 1991	Yes	CS x IR-S x EF x ED x CF x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 1991	Yes	
				ED	Exposure Duration	6	years	EPA, 1991	Yes	
				CF	Conversion Factor	0.000001	kg/mg	- -	Yes	
				BW	Body Weight	15	kg	EPA, 1991	Yes	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	Yes	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	Yes	
		Child/Adult	Soil*	CS	Chemical Concentration in Soil	See Table 3.2	mg/kg	See Table 3.2	- -	Carcinogenic
				IR-Sa	Ingestion Rate of Soil-adult	100	mg/day	EPA, 1991	Yes	Chronic Daily Intake (CDI) (mg/kg-day) =
				EDa	Exposure Duration adult	24	years	EPA, 1991	Yes	CS x IR-S x EF x CF x 1/AT
				BWa	Body Weight adult	70	kg	EPA, 1991	Yes	
				IR-Sc	Ingestion Rate of Soil-child	200	mg/day	EPA, 1991	Yes	
				EDc	Exposure Duration child	6	years	EPA, 1991	Yes	IR-S = (EDc * IR-Sc/ BWc) +
				BWc	Body Weight child	15	kg	EPA, 1991	Yes	(EDa * IR-Sa/BWa)
				IR-S	Ingestion Rate of Soil-adjusted	114.29	mg-year/kg-day	- -	- -	
				EF	Exposure Frequency	350	days/year	EPA, 1991	Yes	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	Yes	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	Yes	
	Construction Worker	Adult	Soil*	CS	Chemical Concentration in Soil	See Table 3.2	mg/kg	See Table 3.2	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	480	mg/day	EPA, 1991	Yes	CS x IR-S x EF x ED x CF x 1/BW x 1/AT
				EF	Exposure Frequency	90	days/year	(1)	Yes	
				ED	Exposure Duration	1	years	EPA, 1991	Yes	
				CF	Conversion Factor	0.000001	kg/mg	- -	Yes	
				BW	Body Weight	70	kg	EPA, 1991	Yes	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	Yes	
				AT-N	Averaging Time (Non-Cancer)	365	days	EPA, 1989	Yes	

TABLE 4.2
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
MCB CAMP LEJEUNE
NORTH CAROLINA

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Value Previously Used in 1995 HHRA	Intake Equation/ Model Name
Dermal	Resident	Adult	Soil*	CS	Chemical Concentration in Soil	See Table 3.2	mg/kg	See Table 3.2	- -	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	5,700	cm^2	EPA, 2004	No	CS x SA x SSAF x DABS x CF x EF x
				SSAF	Soil to Skin Adherence Factor	0.07	mg/cm^2-day	EPA, 2004	No	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2004	- -	
				CF	Conversion Factor	0.000001	kg/mg	- -	Yes	
				EF	Exposure Frequency	350	days/year	EPA, 1991	Yes	
				ED	Exposure Duration	24	years	EPA, 1991	Yes	
				BW	Body Weight	70	kg	EPA, 1991	Yes	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	Yes	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	Yes	
		Child	Soil*	CS	Chemical Concentration in Soil	See Table 3.2	mg/kg	See Table 3.2	- -	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	2,800	cm^2	EPA, 2004	No	CS x SA x SSAF x DABS x CF x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2004	No	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2004	- -	
				CF	Conversion Factor	0.000001	kg/mg	- -	Yes	
				EF	Exposure Frequency	350	days/year	EPA, 1991	Yes	
				ED	Exposure Duration	6	years	EPA, 1991	Yes	
				BW	Body Weight	15	kg	EPA, 1991	Yes	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	Yes	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	Yes	
		Child/Adult	Soil*	CS	Chemical Concentration in Soil	See Table 3.2	mg/kg	See Table 3.2	- -	Carcinogenic CDI (mg/kg-day) =
				SAc	Skin Surface Area child	2,800	cm^2	EPA, 2004	No	CS x SA x DABS x CF3 x EF x 1/AT
				SSAFc	Soil to Skin Adherence Factor child	0.2	mg/cm^2-day	EPA, 2004	No	
				EDc	Exposure Duration child	6	years	EPA, 1991	Yes	SA =
				BWc	Body Weight child	15	kg	EPA, 1991	Yes	((EDc * SAc/BWc)*SSAFc) + ((EDa * SAa/BWa)*SSAFa)
				SAa	Skin Surface Area adult	5,700	cm^2	EPA, 2004	No	
				SSAFa	Soil to Skin Adherence Factor-adult	0.07	mg/cm^2-day	EPA, 2004	No	
				EDa	Exposure Duration adult	24	years	EPA, 1991	Yes	
				BWa	Body Weight adult	70	kg	EPA, 1991	Yes	
				SA	Skin Surface Area adjusted	361	cm^2-year/kg-day	- -	- -	
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2004	- -	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	Yes	
				EF	Exposure Frequency	350	days/year	EPA, 1991	Yes	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	Yes	
	Construction Worker	Adult	Soil*	CS	Chemical Concentration in Soil	See Table 3.2	mg/kg	See Table 3.2	- -	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	3,300	cm^2	EPA, 2004	No	CS x SA x SSAF x DABS x CF x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2004	No	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2004	- -	
				CF	Conversion Factor	0.000001	kg/mg	- -	Yes	
				EF	Exposure Frequency	90	days/year	(1)	Yes	
				ED	Exposure Duration	1	years	EPA, 1991	Yes	
				BW	Body Weight	70	kg	EPA, 1991	Yes	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	Yes	
				AT-N	Averaging Time (Non-Cancer)	365	days	EPA, 1989	Yes	

* Surface and subsurface soil combined.

(1) Professional judgment assuming construction activities that are intrusve into the subsurface would be limited to three months over a year long project.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 2004: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

TABLE 4.3
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
MCB CAMP LEJEUNE
NORTH CAROLINA

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Value Previously Used in 1995 HHRA	Intake Equation/ Model Name
Inhalation	Resident	Adult	Emissions from Soil*	CS	Chemical Concentration in Soil	See Table 3.2	mg/kg	See Table 3.2	- -	Chronic Daily Intake (CDI) (mg/m^3) =
				CA	Chemical Concentration in Air	calc	mg/m^3	calc	- -	CA x ET x EF x ED x 1/CF x 1/AT
				PEF	Particulate Emission Factor	1.32E+09	m^3/kg	EPA, 1996	No	
				VF	Volatilization Factor for volatile constituents	calc	m^3/kg	EPA, 1996	- -	CA (mg/m^3) = CS (1/PEF + 1/VF)
				ET	Exposure Time	24	hour/day	--	No	
				EF	Exposure Frequency	350	days/year	EPA, 1991	Yes	
				ED	Exposure Duration	24	years	EPA, 1991	Yes	
				CF	Conversion Factor	24	hour/day	--	No	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	Yes	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	Yes	
		Child	Emissions from Soil*	CS	Chemical Concentration in Soil	See Table 3.2	mg/kg	See Table 3.2	- -	Chronic Daily Intake (CDI) (mg/m^3) =
				CA	Chemical Concentration in Air	calc	mg/m^3	calc	- -	CA x ET x EF x ED x 1/CF x 1/AT
				PEF	Particulate Emission Factor	1.32E+09	m^3/kg	EPA, 1996	No	
				VF	Volatilization Factor for volatile constituents	calc	m^3/kg	EPA, 1996	- -	CA (mg/m^3) = CS (1/PEF + 1/VF)
				ET	Exposure Time	24	hour/day	--	No	
				EF	Exposure Frequency	350	days/year	EPA, 1991	Yes	
				ED	Exposure Duration	6	years	EPA, 1991	Yes	
				CF	Conversion Factor	24	hour/day	--	No	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	Yes	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	Yes	
		Child/Adult	Emissions from Soil*	CS	Chemical Concentration in Soil	See Table 3.2	mg/kg	See Table 3.2	- -	Carcinogenic
				CA	Chemical Concentration in Air	calc	mg/m^3	calc	- -	Chronic Daily Intake (CDI) (mg/m^3) =
				PEF	Particulate Emission Factor	1.32E+09	m^3/kg	EPA, 1996	No	CA x ET x EF x ED x 1/CF x 1/AT
				VF	Volatilization Factor for volatile constituents	calc	m^3/kg	EPA, 1996	- -	
				ET	Exposure Time	24	hour/day	--	No	CA (mg/m^3) = CS (1/PEF + 1/VF)
				ED	Exposure Duration	30	years	EPA, 1991	No	
				EF	Exposure Frequency	350	days/year	EPA, 1991	No	
				CF	Conversion Factor	24	hour/day	--	No	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	No	

TABLE 4.3

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

MCB CAMP LEJEUNE

NORTH CAROLINA

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Value Previously Used in 1995 HHRA	Intake Equation/ Model Name
Inhalation	Construction Worker	Adult	Emissions from Soil*	CS	Chemical Concentration in Soil	See Table 3.2	mg/kg	See Table 3.2	- -	Chronic Daily Intake (CDI) (mg/m^3) =
				CA	Chemical Concentration in Air	calc	mg/m^3	calc	- -	CA x ET x EF x ED x 1/CF x 1/AT
				PEF	Particulate Emission Factor	1.32E+09	m^3/kg	EPA, 1996	No	
				VF	Volatilization Factor for volatile constituents	calc	m^3/kg	EPA, 1996	- -	CA (mg/m^3) = CS (1/PEF + 1/VF)
				ET	Exposure Time	8	hour/day	--	No	
				EF	Exposure Frequency	90	days/year	(1)	Yes	
				ED	Exposure Duration	1	years	EPA, 1991	Yes	
				CF	Conversion Factor	24	hour/day	--	No	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	Yes	
				AT-N	Averaging Time (Non-Cancer)	365	days	EPA, 1989	Yes	

* Surface and subsurface soil combined.

(1) Professional judgment assuming construction activities that are intrusve into the subsurface would be limited to three months over a year long project.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

EPA, 1996: Soil Screening Guidance: User's Guide. OSWER. EPA/540/R-96/018.

EPA, 2000: Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment Bulletins. www.epa.gov/region4/waste/oftecser/healtbul.htm.

EPA, 2007: Region III, Risk-based Concentration Table.

TABLE 4.4
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
MCB CAMP LEJEUNE
NORTH CAROLINA

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Value Previously Used in 1995 HHRA	Intake Equation/ Model Name
Ingestion	Recreational User	Adult	Brinson Creek	CSed	Chemical Concentration in Sediment	See Table 3.4	mg/kg	See Table 3.4	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-Sed	Ingestion Rate of Sediment	100	mg/day	(1)	Yes	CSed x IR-Sed x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	20	days/year	(2)	Yes	
				ED	Exposure Duration	30	years	(2)	Yes	
				CF1	Conversion Factor 1	0.000001	kg/mg	- -	Yes	
				BW	Body Weight	70	kg	EPA, 1991	Yes	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	Yes	
				AT-N	Averaging Time (Non-Cancer)	10,950	days	EPA, 1989	Yes	
		Child	Brinson Creek	CSed	Chemical Concentration in Sediment	See Table 3.4	mg/kg	See Table 3.4	- -	CDI (mg/kg-day) =
				IR-Sed	Ingestion Rate of Sediment	100	mg/day	(1)	Yes	CSed x IR-Sed x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	20	days/year	(2)	Yes	
				ED	Exposure Duration	6	years	EPA, 1991	Yes	
				CF1	Conversion Factor 1	0.000001	kg/mg	- -	Yes	
				BW	Body Weight	15	kg	EPA, 1991	Yes	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	Yes	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	Yes	
Dermal	Recreational User	Adult	Brinson Creek	CSed	Chemical Concentration in Sediment	See Table 3.4	mg/kg	See Table 3.4	- -	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	5,670	cm^2	EPA, 2004, (3)	No	CSed x SA x SSAF x DABS x CF1 x EF x
				SSAF	Soil to Skin Adherence Factor	0.3	mg/cm^2-day	EPA, 2004, (4)	No	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical specific	--	EPA, 2004	- -	
				CF1	Conversion Factor 1	0.000001	kg/mg	- -	- -	
				EF	Exposure Frequency	20	days/year	(2)	Yes	
				ED	Exposure Duration	30	years	(2)	Yes	
				BW	Body Weight	70	kg	EPA, 1991	Yes	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	Yes	
				AT-N	Averaging Time (Non-Cancer)	10,950	days	EPA, 1989	Yes	
		Child	Brinson Creek	CSed	Chemical Concentration in Sediment	See Table 3.4	mg/kg	See Table 3.4	- -	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	1,980	cm^2	EPA, 2004, (3)	No	CSed x SA x SSAF x DABS x CF1 x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2004, (5)	No	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	chem. specific	--	EPA, 2004	- -	
				CF1	Conversion Factor 1	0.000001	kg/mg	- -	- -	
				EF	Exposure Frequency	20	days/year	(2)	Yes	
				ED	Exposure Duration	6	years	(2)	Yes	
				BW	Body Weight	15	kg	EPA, 1991	Yes	
				AT-C	Averaging Time (Cancer)	25550	days	EPA, 1989	Yes	
				AT-N	Averaging Time (Non-Cancer)	2190	days	EPA, 1989	Yes	

Notes:

(1) Professional judgment assuming the sediment ingestion rate is the same as the soil ingestion rate for an adult and half the ingestion rate for a child.

(2) Professional judgment assuming 4 days/month, 5 months/year over 30 years for an adult and 6 years for a child.

(3) The skin surface area includes hands, forearms, lower legs, and feet.

(4) RME SSAF is geometric mean soil adherence factor for reed gatherers.

(5) RME SSAF is geometric mean soil adherence factor for children playing in wet soil.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.

EPA, 2004: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

TABLE 4.5
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
MCB CAMP LEJEUNE
NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Value Previously Used in 1995 HHRA	Intake Equation/ Model Name
Ingestion	Recreational User	Adult	Brinson Creek	CSW	Chemical Concentration in Surface Water	See Table 3.5	µg/l	See Table 3.5	- -	CDI (mg/kg-day) =
				IR-SW	Ingestion Rate of Surface Water	0.01	liters/hr	EPA, 2000	No	CSW x IR-SW x ET x EF x ED x CF1 x 1/BW x 1/AT
				ET	Exposure Time	1	hr/day	(1)	No	
				EF	Exposure Frequency	20	days/year	(2)	Yes	
				ED	Exposure Duration	30	years	EPA, 1991	Yes	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	No	
				BW	Body Weight	70	kg	EPA, 1991	Yes	
				AT-N	Averaging Time (Non-Cancer)	10950	EPA, 1989	EPA, 1989	Yes	
				AT-C	Averaging Time (Cancer)	25550	EPA, 1989	EPA, 1989	Yes	
		Child	Brinson Creek	CSW	Chemical Concentration in Surface Water	See Table 3.5	µg/l	See Table 3.5	- -	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-SW	Ingestion Rate of Surface Water	0.01	liters/hr	EPA, 2000	No	CSW x IR-SW x ET x EF x ED x CF1 x 1/BW x 1/AT
				ET	Exposure Time	1	hr/day	(1)	No	
				EF	Exposure Frequency	20	days/year	(2)	Yes	
				ED	Exposure Duration	6	years	EPA, 1991	Yes	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	No	
				BW	Body Weight	15	kg	EPA, 1991	Yes	
				AT-N	Averaging Time (Non-Cancer)	2190	days	EPA, 1989	Yes	
				AT-C	Averaging Time (Cancer)	25550	days	EPA, 1989	Yes	
Dermal	Recreational User	Adult	Brinson Creek	CW	Chemical Concentration in Water	See Table 3.5	µg/l	See Table 3.5	- -	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	calculated	mg/cm^2-event	calculated	No	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical specific	dimensionless	EPA, 2004	No	
				Kp	Permeability Coefficient	chemical specific	cm/hr	EPA, 2004	No	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical specific	hr/event	EPA, 2004	No	Kp x CW x t_{event} x CF1 x CF2
				t^*	Time to Reach Steady-state	chemical specific	hours	EPA, 2004	No	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical specific	dimensionless	EPA, 2004	No	Organics :
				t_{event}	Event Time	1	hr/event	(1)	No	$t_{event}<t^*$: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	5,670	cm^2	EPA,2004, (3)	No	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				EV	Event Frequency	1	events/day	EPA, 2004	No	x CF1 x CF2
				EF	Exposure Frequency	20	days/year	(2)	Yes	
				ED	Exposure Duration	30	years	EPA, 1991	Yes	$t_{event}>t^*$: DAevent (mg/cm^2-event) =
				BW	Body Weight	70	kg	EPA, 1991	Yes	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	Yes	$((1 + 3B + 3B^2)/(1+B)^2)$) x CF1 x CF2
				AT-N	Averaging Time (Non-Cancer)	10,950	days	EPA, 1989	Yes	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	No	
				CF2	Conversion Factor 2	0.001	l/cm^3	- -	No	

TABLE 4.5
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
MCB CAMP LEJEUNE
NORTH CAROLINA

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Value Previously Used in 1995 HHRA	Intake Equation/ Model Name
Dermal	Recreational User	Child	Brinson Creek	CW	Chemical Concentration in Water	See Table 3.5	µg/l	See Table 3.5	- -	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	calculated	mg/cm^2-event	calculated	No	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	chemical specific	dimensionless	EPA, 2004	No	
				Kp	Permeability Coefficient	chemical specific	cm/hr	EPA, 2004	No	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	chemical specific	hr/event	EPA, 2004	No	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	chemical specific	hours	EPA, 2004	No	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	chemical specific	dimensionless	EPA, 2004	No	Organics :
				t_{event}	Event Time	1	hr/event	(1)	No	t_{event}<t*: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	1,980	cm^2	EPA, 2004 (3)	No	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				EV	Event Frequency	1	events/day	EPA, 2004	No	x CF1 x CF2
				EF	Exposure Frequency	20	days/year	(2)	Yes	
				ED	Exposure Duration	6	years	EPA, 1991	Yes	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	15	kg	EPA, 1991	Yes	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	Yes	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF1 x CF2
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	Yes	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	No	
				CF2	Conversion Factor 2	0.001	l/cm^3	- -	No	

(1) Professional Judgment assuming surface water exposure for 1 hour while wading.
(2) Professional judgment assuming 4 days/month, 5 months/year over 30 years for an adult and 6 years for a child.
(3) The skin surface area in contact with surface water while wading includes hands, forearms, lower legs, and feet.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.
EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.
EPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.
EPA. 2000: Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment Bulletins. EPA Region 4, originally published November 1995, Website version last updated May 2000: http://www.epa.gov/region4/waste/ots/healtbul.htm.
EPA, 2004: Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment (Final). EPA/540/R/99/005. July 2004.

TABLE 5.1

NON-CANCER TOXICITY DATA -- ORAL/DERMAL

MCB CAMP LEJEUNE
NORTH CAROLINA

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (3) (MM/DD/YY)	Value Previously Used in 1995 HHRA
Aluminum	Chronic	1.0E+00	mg/kg-day	NA	1.0E+00	mg/kg-day	Neurological	100	PPRTV	10/23/2006	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	Chronic	4.0E-04	mg/kg-day	15%	6.0E-05	mg/kg-day	Blood	1000/1	IRIS	11/14/2008	Yes
	Subchronic	4.0E-04	mg/kg-day	15%	6.0E-05	mg/kg-day	Blood	1000/1	HEAST	07/01/1997	NA
Arsenic	Chronic	3.0E-04	mg/kg-day	95%	3.0E-04	mg/kg-day	Skin, Vascular	3/1	IRIS	11/14/2008	Yes
	Subchronic	3.0E-04	mg/kg-day	95%	3.0E-04	mg/kg-day	Skin, Vascular	3	HEAST	07/01/1997	NA
Benzene	Chronic	4.0E-03	mg/kg-day	NA	4.0E-03	mg/kg-day	Blood, Immune	300/1	IRIS	12/01/2008	No
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	Chronic	2.0E-03	mg/kg-day	0.7%	1.4E-05	mg/kg-day	Gastrointestinal	300/1	IRIS	12/01/2008	NA
	Subchronic	5.0E-03	mg/kg-day	0.7%	3.5E-05	mg/kg-day	Gastrointestinal	100	HEAST	07/01/1997	Yes
Cadmium	Chronic	1.0E-03	mg/kg-day	2.5%	2.5E-05	mg/kg-day	Kidney	10/1	IRIS	12/01/2008	No
	Subchronic	NA	mg/kg-day	NA	NA	mg/kg-day	NA	NA	NA	NA	NA
Chromium (VI)	Chronic	3.0E-03	mg/kg-day	2.5%	7.5E-05	mg/kg-day	Not identified	300/3	IRIS	12/01/2008	No
	Subchronic	2.0E-02	mg/kg-day	2.5%	5.0E-04	mg/kg-day	Not identified	100	HEAST	07/01/1997	NA
Cobalt	Chronic	3.0E-04	mg/kg-day	NA	3.0E-04	mg/kg-day	Thyroid	3000	PPRTV	08/25/2008	No
	Subchronic	3.0E-03	mg/kg-day	NA	3.0E-03	mg/kg-day	Thyroid	300	PPRTV	08/25/2008	NA
4,4'-DDD	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA	No
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	Chronic	1.0E-02	mg/kg/day	NA	1.0E-02	mg/kg/day	Blood	3000	PPRTV	09/24/2002	Yes
	Subchronic	1.0E-01	mg/kg/day	NA	1.0E-01	mg/kg/day	Blood	300	HEAST	07/01/1997	NA
trans-1,2-Dichloroethene	Chronic	2.0E-02	mg/kg-day	NA	2.0E-02	mg/kg-day	Blood	1000/1	IRIS	12/01/2008	Yes
	Subchronic	2.0E-01	mg/kg-day	NA	2.0E-01	mg/kg-day	Blood	100	HEAST	07/01/1997	NA
Dieldrin	Chronic	5.0E-05	mg/kg-day	NA	5.0E-05	mg/kg-day	Liver	100/1	IRIS	12/01/2008	Yes
	Subchronic	5.0E-05	mg/kg-day	NA	5.0E-05	mg/kg-day	Liver	100	HEAST	07/01/1997	NA
Ethylbenzene	Chronic	1.0E-01	mg/kg-day	NA	1.0E-01	mg/kg-day	Liver and Kidney	1000/1	IRIS	12/01/2008	Yes
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 5.1

NON-CANCER TOXICITY DATA -- ORAL/DERMAL

MCB CAMP LEJEUNE
NORTH CAROLINA

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (3) (MM/DD/YY)	Value Previously Used in 1995 HHRA
Iron	Chronic	7.0E-01	mg/kg/day	NA	7.0E-01	mg/kg/day	Gastrointestinal	1	PPRTV	07/29/2005	NA
	Subchronic	7.0E-01	mg/kg/day	NA	7.0E-01	mg/kg/day	Gastrointestinal	1	PPRTV	07/29/2005	NA
Lead	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	09/24/2007	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercuric chloride	Chronic	3.0E-04	mg/kg-day	7%	2.1E-05	mg/kg-day	Immune System	1000/1	IRIS	11/14/2008	Yes
	Subchronic	3.0E-04	mg/kg-day	7%	2.1E-05	mg/kg-day	Kidney	1000	HEAST	07/01/1997	NA
2-Methylnapthalene	Chronic	4.0E-03	mg/kg-day	58-89%	4.0E-03	mg/kg-day	Respiratory	1000/1	IRIS	12/01/2008	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	Chronic	2.0E-02	mg/kg-day	generally > 50%	2.0E-02	mg/kg-day	Decreased Body Weight	3000/1	IRIS	12/01/2008	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	Chronic	4.0E-03	mg/kg-day	NA	4.0E-03	mg/kg-day	Liver and Kidney	NA	PPRTV	03/30/2000	MA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	Chronic	1.0E-02	mg/kg-day	NA	1.0E-02	mg/kg-day	Liver/whole body	1000/1	IRIS	12/01/2008	Yes
	Subchronic	1.0E-01	mg/kg-day	NA	1.0E-01	mg/kg-day	Liver/whole body	100	HEAST	07/01/1997	NA
Thallium	Chronic	6.5E-05	mg/kg-day	NA	6.5E-05	mg/kg-day	Liver, Blood, Hair	NA	RSL	09/12/2008	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	Chronic	4.0E-03	mg/kg-day	NA	4.0E-03	mg/kg-day	Blood	1000/1	IRIS	12/01/2008	MA
	Subchronic	4.0E-02	mg/kg-day	NA	4.0E-02	mg/kg-day	Blood	100	HEAST	07/01/1997	NA
Trichloroethene	Chronic	NA	mg/kg-day	NA	NA	mg/kg-day	NA	NA	NA	NA	No
	Subchronic	NA	mg/kg-day	NA	NA	mg/kg-day	NA	NA	NA	NA	NA
Vinyl chloride	Chronic	3.0E-03	mg/kg-day	NA	3.0E-03	mg/kg-day	Liver	30/1	IRIS	12/01/2008	NA
	Subchronic	NA	mg/kg-day	NA	NA	mg/kg-day	NA	NA	NA	NA	NA

NA = Not Applicable or Not Available

(1) Source: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evalution Manual (Part E, Supplemetnal Guidance for Dermal Risk Assessment. Final. Section 4.2 and Exhibit 4-1. USEPA recommends that the oral RfD should not be adjusted to estimate the absorbed dose for compounds when the absorption efficiency is greater than 50%. Constituents that do not have oral absorption efficiencies reported on this table were assumed to have an oral absorption efficiency of 100%.

ATSDR = Agency for Toxic Substances and Disease Registry
IRIS = Integrated Risk Information System
HEAST= Health Effects Assessment Summary Tables
NCEA = National Center for Environmental Assessment
PPRTV = Provisional Peer-Reviewed Toxicity Value

RESP = Respiratory System
CNS = Central Nervous System
NOAEL = No adverse effect level

(2) Provide equation for derivation in text.

PPRTV = Provisional Peer-Reviewed Toxicity Value

(3) For IRIS values, provide the date IRIS was searched.
For HEAST values, provide the date of HEAST.
For NCEA values, provide the date of the article provided by NCEA.

TABLE 5.2
NON-CANCER TOXICITY DATA -- INHALATION
MCB CAMP LEJEUNE
NORTH CAROLINA

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC:RfD: Target Organ (2)	Dates (3) (MM/DD/YY)	Value Previously Used in 1995 HHRA
Aluminum	Chronic	3.50E-03	mg/m^3	1.00E-03	mg/kg-day	Neurological	300	PPRTV	10/23/2006	NA
	Subchronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA	NA
Antimony	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	No
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA	No
	Subchronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA	NA
Benzene	Chronic	3.01E-02	mg/m^3	8.6E-03	mg/kg-day	Blood, Immune	300/1	IRIS	12/02/2008	No
	Subchronic	6.0E-02	mg/m^3	1.7E-02	mg/kg-day	Blood	100	NCEA	07/02/1996	NA
Benzo(a)anthracene	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA	NA
	Subchronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA	NA
Benzo(a)pyrene	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA	NA
	Subchronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA	NA
	Subchronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA	NA
Beryllium	Chronic	2.00E-05	mg/m^3	5.7E-06	mg/kg-day	Respiratory / Chronic beryllium disease	10/1	IRIS	12/02/2008	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium (water)	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA	NA
	Subchronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA	NA
Cadmium (food)	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA	NA
	Subchronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA	NA
Chromium (VI)	Chronic	1.0E-04	mg/m^3	2.9E-05	mg/kg-day	Respiratory System	300/1	IRIS	12/02/2008	No
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	Chronic	6.00E-06	mg/m^3	1.7E-06	mg/kg-day	Respiratory System	100	PPRTV	06/22/2004	No
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	Chronic	6.00E-02	mg/m^3	1.7E-02	mg/kg-day	Liver & Lung	3000/1	PPRTV	10/01/2002	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	Chronic	1.00E+00	mg/m^3	2.9E-01	mg/kg-day	Developmental	300/1	IRIS	12/02/2008	Yes

TABLE 5.2

NON-CANCER TOXICITY DATA -- INHALATION

MCB CAMP LEJEUNE

NORTH CAROLINA

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC:RfD: Target Organ (2)	Dates (3) (MM/DD/YY)	Value Previously Used in 1995 HHRA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA	NA
Iron	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA	NA
	Subchronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA	NA
Lead	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mecuric chloride	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	No
2-Methylnapthalene	Chronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA	NA
	Subchronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA	NA
Naphthalene	Chronic	3.00E-03	mg/m^3	8.6E-04	mg/kg-day	Respiratory System	3000/1	IRIS	12/02/2008	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	Chronic	2.70E-01	mg/m^3	7.7E-02	mg/kg-day	Kidney, Liver	NA	ATSDR	06/20/1997	No
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	Chronic	1.00E-01	mg/m^3	2.9E-02	mg/kg-day	Liver	30/1	IRIS	12/02/2008	NA
	Subchronic	NA	mg/m^3	NA	mg/kg-day	NA	NA	NA	NA	NA

NA = Not Applicable or Not Available

(1) Provide equation used for derivation in text.

(2) HEAST, Alternative Methods used as source of barium values.

Chromium and cadmium values were withdrawn from HEAST, but available in Region III RBC Table.

(3) For IRIS values, provide the date IRIS was searched.

For HEAST values, provide the date of HEAST.

For NCEA values, provide the date of the article provided by NCEA.

ATSDR = Agency for Toxic Substances and Disease Registry

IRIS = Integrated Risk Information System

HEAST= Health Effects Assessment Summary Tables

HEAST Table 2 = Health Effects Assessment Summary Tables, Alternate Methods

HEAST Table 3 = Health Effects Assessment Summary Tables, Carcinogenicity

HEAST(4)= Health Effects Assessment Summary Tables, Withdrawn

NCEA = National Center for Environmental Assessment

PPRTV = Provisional Peer-Reviewed Toxicity Value

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
MCB CAMP LEJEUNE
NORTH CAROLINA

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor	Adjusted Dermal Cancer Slope Factor (1)	Units	EPA Carcinogen Group	Source	Date (2) (MM/DD/YY)	Value Previously Used in 1995 HHRA
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	1.5E+00	95%	1.5E+00	(mg/kg-day) $^{-1}$	A	IRIS	12/2/2008	Yes
Benzene	5.50E-02	58-89%	5.50E-02	(mg/kg-day) $^{-2}$	A	IRIS	12/2/2008	No
Benzo(a)anthracene	7.3E-01	58-89%	7.3E-01	(mg/kg-day) $^{-1}$	B2	NCEA	7/1/1993	NA
Benzo(a)pyrene	7.3E+00	58-89%	7.3E+00	(mg/kg-day) $^{-1}$	B2	IRIS	12/2/2008	NA
Benzo(b)fluoranthene	7.3E-01	58-89%	7.3E-01	(mg/kg-day) $^{-1}$	B2	NCEA	7/1/1993	Yes
Beryllium	NA	NA	NA	NA	NA	NA	NA	No
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (VI)	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	2.4E-01	NA	2.4E-01	(mg/kg-day) $^{-1}$	B2	IRIS	12/2/2008	NA
4,4'-DDE	3.4E-01	NA	3.4E-01	(mg/kg-day) $^{-1}$	B2	IRIS	12/2/2008	NA
Dibenz(a,h)anthracene	7.3E+00	58-89%	7.3E+00	(mg/kg-day) $^{-1}$	B2	NCEA	7/1/1993	NA
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	1.6E+01	NA	1.6E+01	(mg/kg-day) $^{-1}$	B2	IRIS	12/2/2008	Yes
Ethylbenzene	1.1E-02	> 50%	1.1E-02	(mg/kg-day) $^{-1}$	D	California EPA	08/01/01	No
Indeno(1,2,3-cd)pyrene	7.3E-01	58-89%	7.3E-01	(mg/kg-day) $^{-1}$	B2	NCEA	7/1/1993	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA
Mercuric chloride	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnapthalene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	2.00E-01	> 50%	2.0E-01	(mg/kg-day) $^{-1}$	C	IRIS	12/2/2008	NA
Tetrachloroethene	5.40E-01	> 50%	5.4E-01	(mg/kg-day) $^{-1}$	C	IRIS	12/2/2008	No
Thallium	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	5.7E-02	> 50%	5.7E-02	(mg/kg-day) $^{-1}$	C	IRIS	12/2/2008	NA
Trichloroethene	1.3E-02	> 50%	1.3E-02	(mg/kg-day) $^{-1}$	NA	IRIS	12/2/2008	No
Vinyl chloride	7.2E-01	> 50%	7.2E-01	(mg/kg-day) $^{-1}$	A	IRIS	12/2/2008	NA

(1) Refer to RAGS, Part E. July 2004.
(2) For IRIS values, provide the date IRIS was searched.
For HEAST values, provide the date of HEAST.
For NCEA values, provide article date provided by NCEA.
For RBC values, provide the date of last change in the Table

EPA Carcinogen Group:
A - Human carcinogen
B1 - Probable human carcinogen - indicates that limited human data are available
B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E - Evidence of noncarcinogenicity

NA = Not Applicable or Not Available
IRIS = Integrated Risk Information System
HEAST= Health Effects Assessment Summary Tables
NCEA = National Center for Environmental Assessment
PPRTV = Provisional Peer-Reviewed Toxicity Value
RSL = Regional Screening Levels for Chemical Contaminants at Superfund Sites (USEPA, September 2008). [Online]. Available: http://epa-prgs.ornl.gov/chemicals/index.shtml

TABLE 6.2
CANCER TOXICITY DATA -- INHALATION
MCB CAMP LEJEUNE
NORTH CAROLINA

Chemical of Potential Concern	Unit Risk	Units	Adjustment (1)	Inhalation Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guidance Description	Source	Date (2) (MM/DD/YY)	Value Previously Used in 1995 HHRA
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	4.3E-03	$(ug/m^3)^{-1}$	3500	1.5E+01	$(mg/kg\text{-}day)^{-1}$	A	IRIS	12/2/2008	Yes
Benzene	7.8E-06	$(ug/m^3)^{-1}$	3500	2.7E-02	$(mg/kg\text{-}day)^{-1}$	A	IRIS	12/2/2008	No
Benzo(a)anthracene	1.1E-04	$(ug/m^3)^{-1}$	3500	3.9E-01	$(mg/kg\text{-}day)^{-1}$	B2	California EPA	08/01/01	NA
Benzo(a)pyrene	1.1E-03	$(ug/m^3)^{-1}$	3500	3.9E+00	$(mg/kg\text{-}day)^{-1}$	B2	California EPA	08/01/01	NA
Benzo(b)fluoranthene	1.1E-04	$(ug/m^3)^{-1}$	3500	3.9E-01	$(mg/kg\text{-}day)^{-1}$	B2	California EPA	08/01/01	No
Beryllium	2.4E-03	$(ug/m^3)^{-1}$	3500	8.4E+00	$(mg/kg\text{-}day)^{-1}$	NA	IRIS	12/2/2008	Yes
Cadmium	1.8E-03	$(ug/m^3)^{-1}$	3500	6.3E+00	$(mg/kg\text{-}day)^{-1}$	NA	IRIS	12/3/2008	Yes
Chromium (VI)	8.4E-02	$(ug/m^3)^{-1}$	3500	2.9E+02	$(mg/kg\text{-}day)^{-1}$	NA	IRIS	12/3/2008	No
Cobalt	9.0E-03	$(ug/m^3)^{-1}$	3500	3.2E+01	$(mg/kg\text{-}day)^{-1}$	NA	PPRTV	8/25/2008	No
4,4'-DDD	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	1.2E-03	$(ug/m^3)^{-1}$	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	4.6E-03	$(ug/m^3)^{-1}$	3500	1.6E+01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	12/2/2008	Yes
Ethylbenzene	2.5E-06	$(ug/m^3)^{-1}$	3500	8.8E-03	$(mg/kg\text{-}day)^{-1}$	D	California EPA	08/01/01	NA
Indeno(1,2,3-cd)pyrene	1.1E-04	$(ug/m^3)^{-1}$	3500	3.9E-01	$(mg/kg\text{-}day)^{-1}$	B2	California EPA	08/01/01	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercuric chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnapthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	3.4E-05	$(ug/m^3)^{-1}$	3500	1.2E-01	$(mg/kg\text{-}day)^{-1}$	NA	California EPA	08/01/01	NA
1,1,2,2-Tetrachloroethane	5.8E-05	$(ug/m^3)^{-1}$	3500	2.0E-01	$(mg/kg\text{-}day)^{-1}$	C	IRIS	12/2/2008	NA
Tetrachloroethene	5.9E-06	$(ug/m^3)^{-1}$	3500	2.1E-02	$(mg/kg\text{-}day)^{-1}$	C	California EPA	08/01/01	No
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	1.6E-05	$(ug/m^3)^{-1}$	3500	5.6E-02	$(mg/kg\text{-}day)^{-1}$	C	IRIS	12/2/2008	NA
Trichloroethene	2.0E-06	$(ug/m^3)^{-1}$	3500	7.0E-03	$(mg/kg\text{-}day)^{-1}$	NA	California EPA	08/01/01	No
Vinyl chloride	4.4E-06	$(ug/m^3)^{-1}$	3500	1.5E-02	$(mg/kg\text{-}day)^{-1}$	A	IRIS	12/2/2008	NA

(1) Adjustment Factor applied to Unit Risk to calculate Inhalation Slope Factor =
70kg x 1/20m^3/day x 1000ug/mg

(2) For IRIS values, provide the date IRIS was searched.
For HEAST values, provide the date of HEAST.
For NCEA values, provide the date of the article provided by NCEA.
For RBC values, provide the date of last change in the Tables.

EPA Group:
A - Human carcinogen
B1 - Probable human carcinogen - indicates that limited human data are available
B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
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IRIS = Integrated Risk Information System
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TABLE 7.1

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

MCB CAMP LEJEUNE

NORTH CAROLINA

Scenario Timeframe: Current/Future
Receptor Population: Military Personnel
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Surface Soil	Ingestion	Benzo(a)anthracene	5.7E-01	mg/kg	4.4E-08	mg/kg/day	7.3E-01	1/mg/kg-day	3.2E-08	7.8E-07	mg/kg/day	NA		NA
				Benzo(a)pyrene	6.3E-01	mg/kg	4.9E-08	mg/kg/day	7.3E+00	1/mg/kg-day	3.6E-07	8.6E-07	mg/kg/day	NA		NA
				Benzo(b)fluoranthene	1.2E+00	mg/kg	9.3E-08	mg/kg/day	7.3E-01	1/mg/kg-day	6.8E-08	1.6E-06	mg/kg/day	NA		NA
				Dibenz(a,h)anthracene	1.8E-01	mg/kg	1.4E-08	mg/kg/day	7.3E+00	1/mg/kg-day	1.1E-07	2.5E-07	mg/kg/day	NA		NA
				Indeno(1,2,3-cd)pyrene	3.8E-01	mg/kg	3.0E-08	mg/kg/day	7.3E-01	1/mg/kg-day	2.2E-08	5.2E-07	mg/kg/day	NA		NA
				4,4'-DDD	3.2E+00	mg/kg	2.5E-07	mg/kg/day	2.4E-01	1/mg/kg-day	6.1E-08	4.4E-06	mg/kg/day	NA		NA
				4,4'-DDE	9.3E-01	mg/kg	7.3E-08	mg/kg/day	3.4E-01	1/mg/kg-day	2.5E-08	1.3E-06	mg/kg/day	NA		NA
				Dieldrin	2.1E-01	mg/kg	1.7E-08	mg/kg/day	1.6E+01	1/mg/kg-day	2.7E-07	2.9E-07	mg/kg/day	NA		NA
				Aluminum	4.5E+03	mg/kg	3.5E-04	mg/kg/day	NA		NA	6.2E-03	mg/kg/day	1.0E+00	mg/kg/day	6.2E-03
				Antimony	8.0E+00	mg/kg	6.3E-07	mg/kg/day	NA		NA	1.1E-05	mg/kg/day	4.0E-04	mg/kg/day	2.7E-02
				Arsenic	6.9E-01	mg/kg	5.4E-08	mg/kg/day	1.5E+00	1/mg/kg-day	8.1E-08	9.5E-07	mg/kg/day	3.0E-04	mg/kg/day	3.2E-03
				Cadmium	6.4E+00	mg/kg	5.0E-07	mg/kg/day	NA		NA	8.8E-06	mg/kg/day	1.0E-03	mg/kg/day	8.8E-03
				Cobalt	4.3E+00	mg/kg	3.4E-07	mg/kg/day	NA		NA	5.9E-06	mg/kg/day	3.0E-04	mg/kg/day	2.0E-02
				Iron	1.5E+04	mg/kg	1.2E-03	mg/kg/day	NA		NA	2.0E-02	mg/kg/day	7.0E-01	mg/kg/day	2.9E-02
				Thallium	2.9E-01	mg/kg	2.2E-08	mg/kg/day	NA		NA	3.9E-07	mg/kg/day	6.5E-05	mg/kg/day	6.0E-03
			Exp. Route Total								1.0E-06					1.0E-01
			Dermal Absorption[1]	Benzo(a)anthracene	5.7E-01	mg/kg	3.8E-08	mg/kg/day	7.3E-01	1/mg/kg-day	2.8E-08	6.7E-07	mg/kg/day	NA		NA
				Benzo(a)pyrene	6.3E-01	mg/kg	4.2E-08	mg/kg/day	7.3E+00	1/mg/kg-day	3.1E-07	7.3E-07	mg/kg/day	NA		NA
				Benzo(b)fluoranthene	1.2E+00	mg/kg	8.0E-08	mg/kg/day	7.3E-01	1/mg/kg-day	5.8E-08	1.4E-06	mg/kg/day	NA		NA
				Dibenz(a,h)anthracene	1.8E-01	mg/kg	1.2E-08	mg/kg/day	7.3E+00	1/mg/kg-day	9.0E-08	2.2E-07	mg/kg/day	NA		NA
				Indeno(1,2,3-cd)pyrene	3.8E-01	mg/kg	2.6E-08	mg/kg/day	7.3E-01	1/mg/kg-day	1.9E-08	4.5E-07	mg/kg/day	NA		NA
				4,4'-DDD	3.2E+00	mg/kg	1.7E-07	mg/kg/day	2.4E-01	1/mg/kg-day	4.0E-08	2.9E-06	mg/kg/day	NA		NA
				4,4'-DDE	9.3E-01	mg/kg	4.8E-08	mg/kg/day	3.4E-01	1/mg/kg-day	1.6E-08	8.4E-07	mg/kg/day	NA		NA
				Dieldrin	2.1E-01	mg/kg	1.1E-08	mg/kg/day	1.6E+01	1/mg/kg-day	1.8E-07	1.9E-07	mg/kg/day	5.0E-05	mg/kg/day	3.8E-03
				Aluminum	4.5E+03	mg/kg	2.3E-06	mg/kg/day	NA		NA	4.1E-05	mg/kg/day	1.0E+00	mg/kg/day	4.1E-05
				Antimony	8.0E+00	mg/kg	4.1E-09	mg/kg/day	NA		NA	7.2E-08	mg/kg/day	6.0E-05	mg/kg/day	1.2E-03
				Arsenic	6.9E-01	mg/kg	1.1E-08	mg/kg/day	1.5E+00	1/mg/kg-day	1.6E-08	1.9E-07	mg/kg/day	3.0E-04	mg/kg/day	6.3E-04
				Cadmium	6.4E+00	mg/kg	3.3E-09	mg/kg/day	NA		NA	5.8E-08	mg/kg/day	2.5E-05	mg/kg/day	2.3E-03
				Cobalt	4.3E+00	mg/kg	2.2E-09	mg/kg/day	NA		NA	3.9E-08	mg/kg/day	3.0E-04	mg/kg/day	1.3E-04
				Iron	1.5E+04	mg/kg	7.7E-06	mg/kg/day	NA		NA	1.4E-04	mg/kg/day	7.0E-01	mg/kg/day	1.9E-04
				Thallium	2.9E-01	mg/kg	1.5E-10	mg/kg/day	NA		NA	2.6E-09	mg/kg/day	6.5E-05	mg/kg/day	4.0E-05
			Exp. Route Total								7.5E-07					8.4E-03
		Exposure Point Total									1.8E-06					1.1E-01
	Exposure Medium Total										1.8E-06					1.1E-01
Surface Soil Total											1.8E-06					1.1E-01
									Total of Receptor Risks Across All Media		1.8E-06			Total of Receptor Hazards Across All Media		1.1E-01

Notes:

1. Dermal absorption factors (DABs) used to calculated dermal absorption intake from soil and sediment are chemical specific. DABS of 0.13 used for the PAHs, DABS of 0.03 used for arsenic.

TABLE 7.2
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
MCB CAMP LEJEUNE
NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Soil*	Ingestion	Benzene	3.7E-01	mg/kg	NA		NA		NA	5.0E-07	mg/kg/day	4.0E-03	mg/kg/day	1.3E-04
				Ethylbenzene	6.1E+00	mg/kg	NA		NA		NA	8.3E-06	mg/kg/day	1.0E-01	mg/kg/day	8.3E-05
				2-Methylnaphthalene	1.0E+02	mg/kg	NA		NA		NA	1.4E-04	mg/kg/day	4.0E-03	mg/kg/day	3.4E-02
				Naphthalene	2.3E+01	mg/kg	NA		NA		NA	3.2E-05	mg/kg/day	2.0E-02	mg/kg/day	1.6E-03
				Benzo(a)anthracene	5.7E-01	mg/kg	NA		NA		NA	7.8E-07	mg/kg/day	NA		NA
				Benzo(a)pyrene	6.3E-01	mg/kg	NA		NA		NA	8.6E-07	mg/kg/day	NA		NA
				Benzo(b)fluoranthene	7.1E-01	mg/kg	NA		NA		NA	9.7E-07	mg/kg/day	NA		NA
				Dibenz(a,h)anthracene	1.8E-01	mg/kg	NA		NA		NA	2.5E-07	mg/kg/day	NA		NA
				Dibenzofuran	6.9E+00	mg/kg	NA		NA		NA	9.5E-06	mg/kg/day	NA		NA
				Indeno(1,2,3-cd)pyrene	3.8E-01	mg/kg	NA		NA		NA	5.2E-07	mg/kg/day	NA		NA
				4,4'-DDD	3.2E+00	mg/kg	NA		NA		NA	4.4E-06	mg/kg/day	NA		NA
				4,4'-DDE	9.3E-01	mg/kg	NA		NA		NA	1.3E-06	mg/kg/day	NA		NA
				Dieldrin	2.1E-01	mg/kg	NA		NA		NA	2.9E-07	mg/kg/day	5.0E-05		5.8E-03
				Aluminum	4.5E+03	mg/kg	NA		NA		NA	6.2E-03	mg/kg/day	1.0E+00	mg/kg/day	6.2E-03
				Antimony	8.0E+00	mg/kg	NA		NA		NA	1.1E-05	mg/kg/day	4.0E-04	mg/kg/day	2.7E-02
				Arsenic	9.5E-01	mg/kg	NA		NA		NA	1.3E-06	mg/kg/day	3.0E-04	mg/kg/day	4.3E-03
				Cadmium	8.0E+00	mg/kg	NA		NA		NA	1.1E-05	mg/kg/day	1.0E-03	mg/kg/day	1.1E-02
				Chromium	3.4E+01	mg/kg	NA		NA		NA	4.6E-05	mg/kg/day	3.0E-03	mg/kg/day	1.5E-02
				Cobalt	4.3E+00	mg/kg	NA		NA		NA	5.9E-06	mg/kg/day	3.0E-04	mg/kg/day	2.0E-02
				Iron	7.1E+03	mg/kg	NA		NA		NA	9.7E-03	mg/kg/day	7.0E-01	mg/kg/day	1.4E-02
				Thallium	1.7E+00	mg/kg	NA		NA		NA	2.3E-06	mg/kg/day	6.5E-05	mg/kg/day	3.5E-02
			Exp. Route Total								0.0E+00					1.7E-01
			Dermal Absorption[1]	Benzene	3.7E-01	mg/kg	NA		NA		NA	NA		NA		NA
				Ethylbenzene	6.1E+00	mg/kg	NA		NA		NA	NA		NA		NA
				2-Methylnaphthalene	1.0E+02	mg/kg	NA		NA		NA	NA		NA		NA
				Naphthalene	2.3E+01	mg/kg	NA		NA		NA	1.6E-05	mg/kg/day	2.0E-02	mg/kg/day	8.2E-04
				Benzo(a)anthracene	5.7E-01	mg/kg	NA		NA		NA	4.0E-07	mg/kg/day	NA	mg/kg/day	NA
				Benzo(a)pyrene	6.3E-01	mg/kg	NA		NA		NA	4.4E-07	mg/kg/day	NA	mg/kg/day	NA
				Benzo(b)fluoranthene	7.1E-01	mg/kg	NA		NA		NA	5.0E-07	mg/kg/day	NA	mg/kg/day	NA
				Dibenz(a,h)anthracene	1.8E-01	mg/kg	NA		NA		NA	1.3E-07	mg/kg/day	NA	mg/kg/day	NA
				Dibenzofuran	6.9E+00	mg/kg	NA		NA		NA	NA		NA		NA
				Indeno(1,2,3-cd)pyrene	3.8E-01	mg/kg	NA		NA		NA	2.7E-07	mg/kg/day	NA	mg/kg/day	NA
				4,4'-DDD	3.2E+00	mg/kg	NA		NA		NA	1.8E-06	mg/kg/day	NA	mg/kg/day	NA
				4,4'-DDE	9.3E-01	mg/kg	NA		NA		NA	5.1E-07	mg/kg/day	NA	mg/kg/day	NA
				Dieldrin	2.1E-01	mg/kg	NA		NA		NA	1.2E-07	mg/kg/day	5.0E-05	mg/kg/day	2.3E-03
				Aluminum	4.5E+03	mg/kg	NA		NA		NA	2.5E-05	mg/kg/day	1.0E+00	mg/kg/day	2.5E-05
				Antimony	8.0E+00	mg/kg	NA		NA		NA	4.4E-08	mg/kg/day	6.0E-05	mg/kg/day	7.3E-04
				Arsenic	9.5E-01	mg/kg	NA		NA		NA	1.6E-07	mg/kg/day	3.0E-04	mg/kg/day	5.2E-04
				Cadmium	8.0E+00	mg/kg	NA		NA		NA	4.4E-08	mg/kg/day	2.5E-05	mg/kg/day	1.8E-03
				Chromium	3.4E+01	mg/kg	NA		NA		NA	1.8E-07	mg/kg/day	7.5E-05	mg/kg/day	2.5E-03
				Cobalt	4.3E+00	mg/kg	NA		NA		NA	2.4E-08	mg/kg/day	3.0E-04	mg/kg/day	7.8E-05
				Iron	7.1E+03	mg/kg	NA		NA		NA	3.9E-05	mg/kg/day	7.0E-01	mg/kg/day	5.5E-05
				Thallium	1.7E+00	mg/kg	NA		NA		NA	9.1E-09	mg/kg/day	6.5E-05	mg/kg/day	1.4E-04
			Exp. Route Total								0.0E+00					8.9E-03
		Exposure Point Total									0.0E+00					1.8E-01
	Exposure Medium Total										0.0E+00					1.8E-01
	Air	Emissions from Soil*	Inhalation	Ethylbenzene	6.1E+00	mg/kg	NA		NA		NA	7.8E-04	mg/m^3	1.0E+00	mg/m^3	7.8E-04
				Naphthalene	2.3E+01	mg/kg	NA		NA		NA	3.6E-04	mg/m^3	3.0E-03	mg/m^3	1.2E-01
			Exp. Route Total								0.0E+00					1.2E-01
		Exposure Point Total									0.0E+00					1.2E-01
	Exposure Medium Total										0.0E+00					1.2E-01
Soil* Total											0.0E+00					3.0E-01
									Total of Receptor Risks Across All Media		0.0E+00			Total of Receptor Hazards Across All Media		3.0E-01

Notes:
* Surface soil & subsurface soil combined.
1. Dermal absorption factors (DABs) used to calculated dermal absorption intake from soil and sediment are chemical specific. DABS of 0.13 used for the PAHs, DABS of 0.03 used for arsenic.

TABLE 7.3
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
MCB CAMP LEJEUNE
NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Soil*	Ingestion	Benzene	3.7E-01	mg/kg	NA		NA		NA	4.7E-06	mg/kg/day	4.0E-03	mg/kg/day	1.2E-03
				Ethylbenzene	6.1E+00	mg/kg	NA		NA		NA	7.7E-05	mg/kg/day	1.0E-01	mg/kg/day	7.7E-04
				2-Methylnaphthalene	1.0E+02	mg/kg	NA		NA		NA	1.3E-03	mg/kg/day	4.0E-03	mg/kg/day	3.2E-01
				Naphthalene	2.3E+01	mg/kg	NA		NA		NA	3.0E-04	mg/kg/day	2.0E-02	mg/kg/day	1.5E-02
				Benzo(a)anthracene	5.7E-01	mg/kg	NA		NA		NA	7.2E-06	mg/kg/day	NA		NA
				Benzo(a)pyrene	6.3E-01	mg/kg	NA		NA		NA	8.0E-06	mg/kg/day	NA		NA
				Benzo(b)fluoranthene	7.1E-01	mg/kg	NA		NA		NA	9.0E-06	mg/kg/day	NA		NA
				Dibenz(a,h)anthracene	1.8E-01	mg/kg	NA		NA		NA	2.4E-06	mg/kg/day	NA		NA
				Dibenzofuran	6.9E+00	mg/kg	NA		NA		NA	8.9E-05	mg/kg/day	NA		NA
				Indeno(1,2,3-cd)pyrene	3.8E-01	mg/kg	NA		NA		NA	4.9E-06	mg/kg/day	NA		NA
				4,4'-DDD	3.2E+00	mg/kg	NA		NA		NA	4.1E-05	mg/kg/day	NA		NA
				4,4'-DDE	9.3E-01	mg/kg	NA		NA		NA	1.2E-05	mg/kg/day	NA		NA
				Dieldrin	2.1E-01	mg/kg	NA		NA		NA	2.7E-06	mg/kg/day	5.0E-05		5.4E-02
				Aluminum	4.5E+03	mg/kg	NA		NA		NA	5.8E-02	mg/kg/day	1.0E+00	mg/kg/day	5.8E-02
				Antimony	8.0E+00	mg/kg	NA		NA		NA	1.0E-04	mg/kg/day	4.0E-04	mg/kg/day	2.6E-01
				Arsenic	9.5E-01	mg/kg	NA		NA		NA	1.2E-05	mg/kg/day	3.0E-04	mg/kg/day	4.0E-02
				Cadmium	8.0E+00	mg/kg	NA		NA		NA	1.0E-04	mg/kg/day	1.0E-03	mg/kg/day	1.0E-01
				Chromium	3.4E+01	mg/kg	NA		NA		NA	4.3E-04	mg/kg/day	3.0E-03	mg/kg/day	1.4E-01
				Cobalt	4.3E+00	mg/kg	NA		NA		NA	5.5E-05	mg/kg/day	3.0E-04	mg/kg/day	1.8E-01
				Iron	7.1E+03	mg/kg	NA		NA		NA	9.0E-02	mg/kg/day	7.0E-01	mg/kg/day	1.3E-01
				Thallium	1.7E+00	mg/kg	NA		NA		NA	2.1E-05	mg/kg/day	6.5E-05	mg/kg/day	3.3E-01
			Exp. Route Total								0.0E+00					1.6E+00
			Dermal Absorption[1]	Benzene	3.7E-01	mg/kg	NA		NA		NA	NA		NA		NA
				Ethylbenzene	6.1E+00	mg/kg	NA		NA		NA	NA		NA		NA
				2-Methylnaphthalene	1.0E+02	mg/kg	NA		NA		NA	NA		NA		NA
				Naphthalene	2.3E+01	mg/kg	NA		NA		NA	1.1E-04	mg/kg/day	2.0E-02	mg/kg/day	5.4E-03
				Benzo(a)anthracene	5.7E-01	mg/kg	NA		NA		NA	2.6E-06	mg/kg/day	NA	mg/kg/day	NA
				Benzo(a)pyrene	6.3E-01	mg/kg	NA		NA		NA	2.9E-06	mg/kg/day	NA	mg/kg/day	NA
				Benzo(b)fluoranthene	7.1E-01	mg/kg	NA		NA		NA	3.3E-06	mg/kg/day	NA	mg/kg/day	NA
				Dibenz(a,h)anthracene	1.8E-01	mg/kg	NA		NA		NA	8.6E-07	mg/kg/day	NA	mg/kg/day	NA
				Dibenzofuran	6.9E+00	mg/kg	NA		NA		NA	NA		NA		NA
				Indeno(1,2,3-cd)pyrene	3.8E-01	mg/kg	NA		NA		NA	1.8E-06	mg/kg/day	NA	mg/kg/day	NA
				4,4'-DDD	3.2E+00	mg/kg	NA		NA		NA	1.2E-05	mg/kg/day	NA	mg/kg/day	NA
				4,4'-DDE	9.3E-01	mg/kg	NA		NA		NA	3.3E-06	mg/kg/day	NA	mg/kg/day	NA
				Dieldrin	2.1E-01	mg/kg	NA		NA		NA	7.6E-07	mg/kg/day	5.0E-05	mg/kg/day	1.5E-02
				Aluminum	4.5E+03	mg/kg	NA		NA		NA	1.6E-04	mg/kg/day	1.0E+00	mg/kg/day	1.6E-04
				Antimony	8.0E+00	mg/kg	NA		NA		NA	2.9E-07	mg/kg/day	6.0E-05	mg/kg/day	4.8E-03
				Arsenic	9.5E-01	mg/kg	NA		NA		NA	1.0E-06	mg/kg/day	3.0E-04	mg/kg/day	3.4E-03
				Cadmium	8.0E+00	mg/kg	NA		NA		NA	2.9E-07	mg/kg/day	2.5E-05	mg/kg/day	1.1E-02
				Chromium	3.4E+01	mg/kg	NA		NA		NA	1.2E-06	mg/kg/day	7.5E-05	mg/kg/day	1.6E-02
				Cobalt	4.3E+00	mg/kg	NA		NA		NA	1.5E-07	mg/kg/day	3.0E-04	mg/kg/day	5.1E-04
				Iron	7.1E+03	mg/kg	NA		NA		NA	2.5E-04	mg/kg/day	7.0E-01	mg/kg/day	3.6E-04
				Thallium	1.7E+00	mg/kg	NA		NA		NA	5.9E-08	mg/kg/day	6.5E-05	mg/kg/day	9.1E-04
			Exp. Route Total								0.0E+00					5.8E-02
		Exposure Point Total									0.0E+00					1.7E+00
	Exposure Medium Total										0.0E+00					1.7E+00
	Air	Emissions from Soil*	Inhalation	Ethylbenzene	6.1E+00	mg/kg	NA		NA		NA	7.8E-04	mg/m^3	1.0E+00	mg/m^3	7.8E-04
				Naphthalene	2.3E+01	mg/kg	NA		NA		NA	3.6E-04	mg/m^3	3.0E-03	mg/m^3	1.2E-01
			Exp. Route Total								0.0E+00					1.2E-01
		Exposure Point Total									0.0E+00					1.2E-01
	Exposure Medium Total										0.0E+00					1.2E-01
Soil* Total											0.0E+00					1.8E+00
Total of Receptor Risks Across All Media											0.0E+00	Total of Receptor Hazards Across All Media				1.8E+00

Notes:
* Surface soil & subsurface soil combined.
1. Dermal absorption factors (DABs) used to calculated dermal absorption intake from soil and sediment are chemical specific. DABS of 0.13 used for the PAHs, DABS of 0.03 used for arsenic.

TABLE 7.4
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
MCB CAMP LEJEUNE
NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Soil*	Ingestion	Benzene	3.7E-01	mg/kg	5.7E-07	mg/kg/day	5.5E-02	1/mg/kg-day	3.2E-08	NA		NA		NA
				Ethylbenzene	6.1E+00	mg/kg	9.5E-06	mg/kg/day	1.1E-02	1/mg/kg-day	1.0E-07	NA		NA		NA
				2-Methylnaphthalene	1.0E+02	mg/kg	1.6E-04	mg/kg/day	NA		NA	NA		NA		NA
				Naphthalene	2.3E+01	mg/kg	3.6E-05	mg/kg/day	NA		NA	NA		NA		NA
				Benzo(a)anthracene	5.7E-01	mg/kg	8.9E-07	mg/kg/day	5.5E-02	1/mg/kg-day	4.9E-08	NA		NA		NA
				Benzo(a)pyrene	6.3E-01	mg/kg	9.8E-07	mg/kg/day	5.5E-02	1/mg/kg-day	5.4E-08	NA		NA		NA
				Benzo(b)fluoranthene	7.1E-01	mg/kg	1.1E-06	mg/kg/day	5.5E-02	1/mg/kg-day	6.1E-08	NA		NA		NA
				Dibenz(a,h)anthracene	1.8E-01	mg/kg	2.9E-07	mg/kg/day	5.5E-02	1/mg/kg-day	1.6E-08	NA		NA		NA
				Dibenzofuran	6.9E+00	mg/kg	1.1E-05	mg/kg/day	5.5E-02	1/mg/kg-day	6.0E-07	NA		NA		NA
				Indeno(1,2,3-cd)pyrene	3.8E-01	mg/kg	6.0E-07	mg/kg/day	5.5E-02	1/mg/kg-day	3.3E-08	NA		NA		NA
				4,4'-DDD	3.2E+00	mg/kg	5.1E-06	mg/kg/day	2.4E-01	1/mg/kg-day	NA	NA		NA		NA
				4,4'-DDE	9.3E-01	mg/kg	1.5E-06	mg/kg/day	3.4E-01	1/mg/kg-day	NA	NA		NA		NA
				Dieldrin	2.1E-01	mg/kg	3.3E-07	mg/kg/day	1.6E+01	1/mg/kg-day	NA	NA		NA		NA
				Aluminum	4.5E+03	mg/kg	7.1E-03	mg/kg/day	NA		NA	NA		NA		NA
				Antimony	8.0E+00	mg/kg	1.3E-05	mg/kg/day	NA		NA	NA		NA		NA
				Arsenic	9.5E-01	mg/kg	1.5E-06	mg/kg/day	1.5E+00	1/mg/kg-day	2.2E-06	NA		NA		NA
				Cadmium	8.0E+00	mg/kg	1.3E-05	mg/kg/day	NA		NA	NA		NA		NA
				Chromium	3.4E+01	mg/kg	5.3E-05	mg/kg/day	NA		NA	NA		NA		NA
				Cobalt	4.3E+00	mg/kg	6.7E-06	mg/kg/day	NA		NA	NA		NA		NA
				Iron	7.1E+03	mg/kg	1.1E-02	mg/kg/day	NA		NA	NA		NA		NA
				Thallium	1.7E+00	mg/kg	2.6E-06	mg/kg/day	NA		NA	NA		NA		NA
			Exp. Route Total								3.2E-06					0.0E+00
			Dermal Absorption[1]	Benzene	3.7E-01	mg/kg	NA		NA		NA	NA		NA		NA
				Ethylbenzene	6.1E+00	mg/kg	NA		NA		NA	NA		NA		NA
				2-Methylnaphthalene	1.0E+02	mg/kg	NA		NA		NA	NA		NA		NA
				Naphthalene	2.3E+01	mg/kg	1.5E-05	mg/kg/day	NA	1/mg/kg-day	NA	NA		NA		NA
				Benzo(a)anthracene	5.7E-01	mg/kg	3.6E-07	mg/kg/day	1.5E+00	1/mg/kg-day	5.5E-07	NA		NA		NA
				Benzo(a)pyrene	6.3E-01	mg/kg	4.0E-07	mg/kg/day	1.5E+00	1/mg/kg-day	6.0E-07	NA		NA		NA
				Benzo(b)fluoranthene	7.1E-01	mg/kg	4.5E-07	mg/kg/day	1.5E+00	1/mg/kg-day	6.8E-07	NA		NA		NA
				Dibenz(a,h)anthracene	1.8E-01	mg/kg	1.2E-07	mg/kg/day	1.5E+00	1/mg/kg-day	1.8E-07	NA		NA		NA
				Dibenzofuran	6.9E+00	mg/kg	0.0E+00	mg/kg/day	1.5E+00	1/mg/kg-day	0.0E+00	NA		NA		NA
				Indeno(1,2,3-cd)pyrene	3.8E-01	mg/kg	2.4E-07	mg/kg/day	1.5E+00	1/mg/kg-day	3.7E-07	NA		NA		NA
				4,4'-DDD	3.2E+00	mg/kg	1.6E-06	mg/kg/day	1.5E+00	1/mg/kg-day	2.4E-06	NA		NA		NA
				4,4'-DDE	9.3E-01	mg/kg	4.6E-07	mg/kg/day	3.4E-01	1/mg/kg-day	1.6E-07	NA		NA		NA
				Dieldrin	2.1E-01	mg/kg	1.0E-07	mg/kg/day	1.6E+01	1/mg/kg-day	1.7E-06	NA		NA		NA
				Aluminum	4.5E+03	mg/kg	2.2E-05	mg/kg/day	NA		NA	NA		NA		NA
				Antimony	8.0E+00	mg/kg	4.0E-08	mg/kg/day	NA		NA	NA		NA		NA
				Arsenic	9.5E-01	mg/kg	1.4E-07	mg/kg/day	1.5E+00	1/mg/kg-day	2.1E-07	NA		NA		NA
				Cadmium	8.0E+00	mg/kg	4.0E-08	mg/kg/day	NA		NA	NA		NA		NA
				Chromium	3.4E+01	mg/kg	1.7E-07	mg/kg/day	NA		NA	NA		NA		NA
				Cobalt	4.3E+00	mg/kg	2.1E-08	mg/kg/day	NA		NA	NA		NA		NA
				Iron	7.1E+03	mg/kg	3.5E-05	mg/kg/day	NA		NA	NA		NA		NA
				Thallium	1.7E+00	mg/kg	8.2E-09	mg/kg/day	NA		NA	NA		NA		NA
			Exp. Route Total								6.8E-06					0.0E+00
		Exposure Point Total									1.0E-05					0.0E+00
	Exposure Medium Total										1.0E-05					0.0E+00
	Air	Emissions from Soil*	Inhalation	Ethylbenzene	6.1E+00	mg/kg	3.3E-04	mg/m^3	2.5E-09	$1/(mg/m^3)$	8.3E-13	NA		NA		NA
				Naphthalene	2.3E+01	mg/kg	1.3E-03	mg/m^3	3.4E-08	$1/(mg/m^3)$	4.3E-11	NA		NA		NA
			Exp. Route Total								4.4E-11					0.0E+00
		Exposure Point Total									4.4E-11					0.0E+00
	Exposure Medium Total										4.4E-11					0.0E+00
Soil* Total											1.0E-05					0.0E+00
									Total of Receptor Risks Across All Media		1.0E-05			Total of Receptor Hazards Across All Media		0.0E+00

Notes:
* Surface soil & subsurface soil combined.
1. Dermal absorption factors (DABs) used to calculated dermal absorption intake from soil and sediment are chemical specific. DABS of 0.13 used for the PAHs, DABS of 0.03 used for arsenic.

TABLE 7.5
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
MCB CAMP LEJEUNE
NORTH CAROLINA

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Soil*	Ingestion	Benzene	3.7E-01	mg/kg	8.9E-09	mg/kg/day	5.5E-02	1/mg/kg-day	4.9E-10	6.2E-07	mg/kg/day	4.0E-03	mg/kg/day	1.6E-04
				Ethylbenzene	6.1E+00	mg/kg	1.5E-07	mg/kg/day	1.1E-02	1/mg/kg-day	1.6E-09	1.0E-05	mg/kg/day	1.0E-01	mg/kg/day	1.0E-04
				2-Methylnaphthalene	2.3E+01	mg/kg	5.6E-07	mg/kg/day	NA		NA	3.9E-05	mg/kg/day	4.0E-03	mg/kg/day	9.8E-03
				Naphthalene	1.0E+02	mg/kg	2.4E-06	mg/kg/day	NA		NA	1.7E-04	mg/kg/day	2.0E-02	mg/kg/day	8.5E-03
				Benzo(a)anthracene	5.7E-01	mg/kg	1.4E-08	mg/kg/day	7.3E-01	1/mg/kg-day	1.0E-08	9.6E-07	mg/kg/day	NA		NA
				Benzo(a)pyrene	6.3E-01	mg/kg	1.5E-08	mg/kg/day	7.3E+00	1/mg/kg-day	1.1E-07	1.1E-06	mg/kg/day	NA		NA
				Benzo(b)fluoranthene	7.1E-01	mg/kg	1.7E-08	mg/kg/day	7.3E-01	1/mg/kg-day	1.2E-08	1.2E-06	mg/kg/day	NA		NA
				Dibenz(a,h)anthracene	1.8E-01	mg/kg	4.4E-09	mg/kg/day	7.3E+00	1/mg/kg-day	3.2E-08	3.1E-07	mg/kg/day	NA		NA
				Dibenzofuran	6.9E+00	mg/kg	1.7E-07	mg/kg/day	NA		NA	1.2E-05	mg/kg/day	NA		NA
				Indeno(1,2,3-cd)pyrene	3.8E-01	mg/kg	9.2E-09	mg/kg/day	2.4E-01	1/mg/kg-day	2.2E-09	6.4E-07	mg/kg/day	NA		NA
				4,4'-DDD	3.2E+00	mg/kg	7.8E-08	mg/kg/day	2.4E-01	1/mg/kg-day	1.9E-08	5.5E-06	mg/kg/day	NA		NA
				4,4'-DDE	9.3E-01	mg/kg	2.3E-08	mg/kg/day	3.4E-01	1/mg/kg-day	7.7E-09	1.6E-06	mg/kg/day	NA		NA
				Dieldrin	2.1E-01	mg/kg	5.1E-09	mg/kg/day	1.6E+01	1/mg/kg-day	8.2E-08	3.6E-07	mg/kg/day	5.0E-05		7.2E-03
				Aluminum	4.5E+03	mg/kg	1.1E-04	mg/kg/day	NA		NA	7.6E-03	mg/kg/day	1.0E+00	mg/kg/day	7.6E-03
				Antimony	8.0E+00	mg/kg	1.9E-07	mg/kg/day	NA		NA	1.4E-05	mg/kg/day	4.0E-04	mg/kg/day	3.4E-02
				Arsenic	4.3E+01	mg/kg	1.0E-06	mg/kg/day	1.5E+00	1/mg/kg-day	1.6E-06	7.2E-05	mg/kg/day	3.0E-04	mg/kg/day	2.4E-01
				Cadmium	8.0E+00	mg/kg	1.9E-07	mg/kg/day	NA		NA	1.4E-05	mg/kg/day	2.0E-02	mg/kg/day	6.8E-04
				Chromium	3.4E+01	mg/kg	8.1E-07	mg/kg/day	NA		NA	5.7E-05	mg/kg/day	3.0E-03	mg/kg/day	1.9E-02
				Cobalt	4.3E+00	mg/kg	1.0E-07	mg/kg/day	NA		NA	7.3E-06	mg/kg/day	3.0E-03	mg/kg/day	2.4E-03
				Iron	7.1E+03	mg/kg	1.7E-04	mg/kg/day	NA		NA	1.2E-02	mg/kg/day	7.0E-01	mg/kg/day	1.7E-02
				Thallium	1.7E+00	mg/kg	4.0E-08	mg/kg/day	NA		NA	2.8E-06	mg/kg/day	6.5E-05	mg/kg/day	4.3E-02
			Exp. Route Total								1.8E-06					3.9E-01
			Dermal Absorption[1]	Benzene	3.7E-01	mg/kg	NA		5.5E-02	1/mg/kg-day	NA	NA		NA		NA
				Ethylbenzene	6.1E+00	mg/kg	NA		1.1E-02	1/mg/kg-day	NA	NA		NA		NA
				2-Methylnaphthalene	2.3E+01	mg/kg	NA		NA		NA	NA		NA		NA
				Naphthalene	1.0E+02	mg/kg	4.3E-07	mg/kg/day	NA		NA	3.0E-05	mg/kg/day	2.0E-02	mg/kg/day	1.5E-03
				Benzo(a)anthracene	5.7E-01	mg/kg	2.4E-09	mg/kg/day	7.3E-01	1/mg/kg-day	1.8E-09	1.7E-07	mg/kg/day	NA	mg/kg/day	NA
				Benzo(a)pyrene	6.3E-01	mg/kg	2.7E-09	mg/kg/day	7.3E+00	1/mg/kg-day	2.0E-08	1.9E-07	mg/kg/day	NA	mg/kg/day	NA
				Benzo(b)fluoranthene	7.1E-01	mg/kg	3.0E-09	mg/kg/day	7.3E-01	1/mg/kg-day	2.2E-09	2.1E-07	mg/kg/day	NA	mg/kg/day	NA
				Dibenz(a,h)anthracene	1.8E-01	mg/kg	7.9E-10	mg/kg/day	7.3E+00	1/mg/kg-day	5.8E-09	5.6E-08	mg/kg/day	NA	mg/kg/day	NA
				Dibenzofuran	6.9E+00	mg/kg	0.0E+00		NA		NA	NA		NA		NA
				Indeno(1,2,3-cd)pyrene	3.8E-01	mg/kg	1.6E-09	mg/kg/day	7.3E-01	1/mg/kg-day	1.2E-09	1.2E-07	mg/kg/day	NA	mg/kg/day	NA
				4,4'-DDD	3.2E+00	mg/kg	1.1E-08	mg/kg/day	2.4E-01	1/mg/kg-day	2.6E-09	7.5E-07	mg/kg/day	NA	mg/kg/day	NA
				4,4'-DDE	9.3E-01	mg/kg	3.1E-09	mg/kg/day	3.4E-01	1/mg/kg-day	1.1E-09	2.2E-07	mg/kg/day	NA	mg/kg/day	NA
				Dieldrin	2.1E-01	mg/kg	7.0E-10	mg/kg/day	1.6E+01	1/mg/kg-day	1.1E-08	4.9E-08	mg/kg/day	5.0E-05	mg/kg/day	9.9E-04
				Aluminum	4.5E+03	mg/kg	1.5E-07	mg/kg/day	NA		NA	1.0E-05	mg/kg/day	1.0E+00	mg/kg/day	1.0E-05
				Antimony	8.0E+00	mg/kg	2.7E-10	mg/kg/day	NA		NA	1.9E-08	mg/kg/day	6.0E-05	mg/kg/day	3.1E-04
				Arsenic	4.3E+01	mg/kg	4.3E-08	mg/kg/day	1.5E+00	1/mg/kg-day	6.4E-08	3.0E-06	mg/kg/day	3.0E-04	mg/kg/day	1.0E-02
				Cadmium	8.0E+00	mg/kg	2.7E-10	mg/kg/day	NA		NA	1.9E-08	mg/kg/day	2.5E-05	mg/kg/day	7.4E-04
				Chromium	3.4E+01	mg/kg	1.1E-09	mg/kg/day	NA		NA	7.8E-08	mg/kg/day	5.0E-04	mg/kg/day	1.6E-04
				Cobalt	4.3E+00	mg/kg	1.4E-10	mg/kg/day	NA		NA	1.0E-08	mg/kg/day	3.0E-03	mg/kg/day	3.3E-06
				Iron	7.1E+03	mg/kg	2.4E-07	mg/kg/day	NA		NA	1.6E-05	mg/kg/day	7.0E-01	mg/kg/day	2.4E-05
				Thallium	1.7E+00	mg/kg	5.5E-11	mg/kg/day	NA		NA	3.9E-09	mg/kg/day	6.5E-05	mg/kg/day	5.9E-05
			Exp. Route Total								1.1E-07					1.4E-02
		Exposure Point Total									1.9E-06					4.0E-01
	Exposure Medium Total										1.9E-06					4.0E-01
	Air	Emissions from Soil*	Inhalation	Ethylbenzene	6.1E+00	mg/kg	9.5E-07	mg/m^3	2.5E-09	1/(mg/m^3)	2.4E-15	6.7E-05	mg/m^3	1.0E+00	mg/m^3	6.7E-05
				Naphthalene	2.3E+01	mg/kg	3.6E-06	mg/m^3	3.4E-08	1/(mg/m^3)	1.2E-13	2.6E-04	mg/m^3	3.0E-03	mg/m^3	8.5E-02
			Exp. Route Total								1.3E-13					8.5E-02
		Exposure Point Total									1.3E-13					8.5E-02
	Exposure Medium Total										1.3E-13					8.5E-02
Soil* Total											1.9E-06					4.9E-01
										Total of Receptor Risks Across All Media	1.9E-06				Total of Receptor Hazards Across All Media	4.9E-01

Notes:
* Surface soil & subsurface soil combined.
1. Dermal absorption factors (DABs) used to calculated dermal absorption intake from soil and sediment are chemical specific. DABS of 0.13 used for the PAHs, DABS of 0.03 used for arsenic.

TABLE 7.6

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

MCB CAMP LEJEUNE

NORTH CAROLINA

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water	Surface Water	Brinson Creek	Ingestion	Aluminum	5.6E+03	ug/L	1.9E-05	mg/kg/day	NA		NA	4.4E-05	mg/kg/day	1.0E+00	mg/kg/day	4.4E-05
				Beryllium	5.0E-01	ug/L	1.7E-09	mg/kg/day	NA		NA	3.9E-09	mg/kg/day	2.0E-03	mg/kg/day	2.0E-06
				Iron	3.4E+03	ug/L	1.1E-05	mg/kg/day	NA		NA	2.7E-05	mg/kg/day	7.0E-01	mg/kg/day	3.8E-05
				Mercury	3.2E+00	ug/L	1.1E-08	mg/kg/day	NA		NA	2.5E-08	mg/kg/day	3.0E-04	mg/kg/day	8.3E-05
				Thallium	1.7E+01	ug/L	5.7E-08	mg/kg/day	NA		NA	1.3E-07	mg/kg/day	6.5E-05	mg/kg/day	2.0E-03
			Exp. Route Total								0.0E+00					2.2E-03
			Dermal	Aluminum	5.6E+03	ug/L	1.1E-05	mg/kg/day	NA		NA	2.5E-05	mg/kg/day	1.0E+00	mg/kg/day	2.5E-05
				Arsenic	5.0E-01	ug/L	9.5E-10	mg/kg/day	NA		NA	2.2E-09	mg/kg/day	1.4E-05	mg/kg/day	1.6E-04
				Iron	3.4E+03	ug/L	6.5E-06	mg/kg/day	NA		NA	1.5E-05	mg/kg/day	7.0E-01	mg/kg/day	2.2E-05
				Manganese	3.2E+00	ug/L	6.1E-09	mg/kg/day	NA		NA	1.4E-08	mg/kg/day	2.1E-05	mg/kg/day	6.8E-04
				Thallium	1.7E+01	ug/L	3.2E-08	mg/kg/day	NA		NA	7.5E-08	mg/kg/day	6.5E-05	mg/kg/day	1.2E-03
			Exp. Route Total								0.0E+00					2.0E-03
		Exposure Point Total									0.0E+00					4.3E-03
	Exposure Medium Total										0.0E+00					4.3E-03
Surface Water Total											0.0E+00					4.3E-03
Sediment	Sediment	Brinson Creek	Ingestion	Arsenic	3.1E+00	mg/kg	1.0E-07	mg/kg/day	1.5E+00	1/mg/kg-day	1.5E-07	2.4E-07	mg/kg/day	3.0E-04	mg/kg/day	8.0E-04
			Exp. Route Total								1.5E-07					8.0E-04
			Dermal Absorption[3]	Arsenic	3.1E+00	mg/kg	5.3E-08	mg/kg/day	1.5E+00	1/mg/kg-day	7.9E-08	1.2E-07	mg/kg/day	3.0E-04	mg/kg/day	4.1E-04
			Exp. Route Total								2.3E-07					4.1E-04
		Exposure Point Total									2.3E-07					4.1E-04
	Exposure Medium Total										2.3E-07					1.2E-03
Sediment Total											2.3E-07					1.2E-03
Brinson Creek Total											2.3E-07					5.5E-03
										Total of Receptor Risks Across All Media	2.3E-07				Total of Receptor Hazards Across All Media	5.5E-03

Notes:
1. DAevent calculated on Table 7.6 Supplement A.
2. Dermal absorption factors (DABS) used to calculated dermal absorption intake from soil and sediment are chemical specific. DABS of 0.03 used for arsenic.

Table 7.6 Supplement A
Calculation of DAevent
Recreational Adult and Child - Surface Water
MCB CAMP LEJEUNE
NORTH CAROLINA

Chemical of Potential Concern	Water Concentration (CW) (μg/L)	Permeability Coefficient[1] (Kp) (cm/hr)	B[1] (dimensionless)	Lag Time[1] (τ_{event}) (hr)	t*[1] (hr)	Fraction Absorbed Water[1] (FA) (dimensionless)	Duration of Event (tevent) (hr)	DAevent (mg/cm^2-event)	Eq
Aluminum	5.6E+03	1.0E-03	NA	NA	NA	NA	1	5.6E-06	1
Beryllium	5.0E-01	1.0E-03	NA	NA	NA	NA	1	5.0E-10	1
Iron	3.4E+03	1.0E-03	NA	NA	NA	NA	1	3.4E-06	1
Mercury	3.2E+00	1.0E-03	NA	NA	NA	NA	1	3.2E-09	1
Thallium	1.7E+01	1.0E-03	NA	NA	NA	NA	1	1.7E-08	1

Inorganics: DAevent (mg/cm2-event) =
Kp x CW x tevent x 0.001 mg/ug x 0.001 l/cm^3 (eq 1)

Organics: DAevent (mg/cm2-event) =
If t_{event} < t* then

$$DA_{event} = 2 \times FA \times K_p \times C_w \times 0.001 \quad mg/ug \times 0.001 \quad l/cm^3 \sqrt{\frac{6 \times \tau_{event} \times t_{event}}{\pi}} \quad \text{(eq 2)}$$

If t_{event} > t* then

$$DA_{event} = FA \times K_p \times C_w \times 0.001 \quad mg/ug \times 0.001 \quad l/cm^3 \left[\frac{t_{event}}{1+B} + 2 \times \tau_{event} \left(\frac{1+3B+3B^2}{(1+B)^2} \right) \right] \quad \text{(eq 3)}$$

Notes:
[1] Values from EPA 2004, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment - Final).* EPA/540/R/99/005. The default value of 0.001 was assigned to inorganics not listed in this document.
[2] Used physical chemical parameters for Lindane (gamma-BHC) as a surrogate.
NA - not applicable.

TABLE 7.7

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

MCB CAMP LEJEUNE

NORTH CAROLINA

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water	Surface Water	Brinson Creek	Ingestion	Aluminum	5.6E+03	ug/L	1.8E-05	mg/kg/day	NA		NA	2.1E-04	mg/kg/day	1.0E+00	mg/kg/day	2.1E-04
				Beryllium	5.0E-01	ug/L	1.6E-09	mg/kg/day	NA		NA	1.8E-08	mg/kg/day	2.0E-03	mg/kg/day	9.1E-06
				Iron	3.4E+03	ug/L	1.1E-05	mg/kg/day	NA		NA	1.2E-04	mg/kg/day	7.0E-01	mg/kg/day	1.8E-04
				Mercury	3.2E+00	ug/L	1.0E-08	mg/kg/day	NA		NA	1.2E-07	mg/kg/day	3.0E-04	mg/kg/day	3.9E-04
				Thallium	1.7E+01	ug/L	5.3E-08	mg/kg/day	NA		NA	6.2E-07	mg/kg/day	6.5E-05	mg/kg/day	9.6E-03
			Exp. Route Total								0.0E+00					1.0E-02
			Dermal	Aluminum	5.6E+03	ug/L	3.5E-06	mg/kg/day	NA		NA	4.1E-05	mg/kg/day	1.0E+00	mg/kg/day	4.1E-05
				Arsenic	5.0E-01	ug/L	3.1E-10	mg/kg/day	NA		NA	3.6E-09	mg/kg/day	1.4E-05	mg/kg/day	2.6E-04
				Iron	3.4E+03	ug/L	2.1E-06	mg/kg/day	NA		NA	2.5E-05	mg/kg/day	7.0E-01	mg/kg/day	3.5E-05
				Manganese	3.2E+00	ug/L	2.0E-09	mg/kg/day	NA		NA	2.3E-08	mg/kg/day	2.1E-05	mg/kg/day	1.1E-03
				Thallium	1.7E+01	ug/L	1.1E-08	mg/kg/day	NA		NA	1.2E-07	mg/kg/day	6.5E-05	mg/kg/day	1.9E-03
			Exp. Route Total								0.0E+00					3.3E-03
		Exposure Point Total									0.0E+00					1.4E-02
	Exposure Medium Total										0.0E+00					1.4E-02
Surface Water Total											0.0E+00					1.4E-02
Sediment	Sediment	Brinson Creek	Ingestion	Arsenic	3.1E+00	mg/kg	9.6E-08	mg/kg/day	1.5E+00	1/mg/kg-day	1.4E-07	1.1E-06	mg/kg/day	3.0E-04	mg/kg/day	3.7E-03
			Exp. Route Total								1.4E-07					3.7E-03
			Dermal Absorption[3]	Arsenic	3.1E+00	mg/kg	4.9E-08	mg/kg/day	1.5E+00	1/mg/kg-day	7.4E-08	5.7E-07	mg/kg/day	3.0E-04	mg/kg/day	1.9E-03
			Exp. Route Total								2.2E-07					1.9E-03
		Exposure Point Total									2.2E-07					1.9E-03
	Exposure Medium Total										2.2E-07					5.6E-03
Sediment Total											2.2E-07					5.6E-03
Brinson Creek Total											2.2E-07					1.9E-02
										Total of Receptor Risks Across All Media	2.2E-07				Total of Receptor Hazards Across All Media	1.9E-02

Notes:
1. DAevent calculated on Table 7.6 Supplement A.
2. Dermal absorption factors (DABS) used to calculated dermal absorption intake from soil and sediment are chemical specific. DABS of 0.03 used for arsenic.

Appendix I
Ecological Risk Assessment Tables and Figures

Tables from 1995 Remedial Investigation

Table 8-1. 1995 ERA Initial COPC Summary

Camp Lejeune Site 35 (Operable Unit # 10)

Jacksonville, North Carolina

Analyte	Surface Water COPCs	Sediment COPCs	Surface Soil COPCs	Whole Body Tissue COPCs	Fillet Tissue COPCs
Aluminum	X	X		X	X
Barium		X		X	X
Beryllium		X			
Cadmium			X		
Chromium			X	X	
Cobalt	X	X	X		
Copper			X	X	X
Iron	X	X	X	X	X
Lead	X	X	X	X	X
Manganese	X	X	X	X	X
Mercury	X			X	X
Nickel			X		
Selenium			X	X	X
Vanadium	X	X	X		
Zinc	X		X	X	X
Acetone				X	X
Diethylphthalate		X			
Carbon disulfide			X		
Toluene			X	X	
Xylenes			X		
Benzo(b)fluoranthene			X		
Benzo(g.h,i)perylene			X		
Benzo(b)fluoranthene			X		
Chysene			X		
Fluoranthene			X		
Phenanthrene			X		
Phenol			X		
Pyrene			X		
Alpha chlordane		X	X	X	X
Gamma chlordane		X	X	X	
Beta-BHC			X	X	X
4,4'-DDD		X	X	X	X
4,4'-DDE		X	X	X	X
4,4'-DDT		X	X	X	X
Dieldrin		X		X	X
Endrin		X		X	X
Endrin aldehyde		X		X	X
endrin ketone				X	X
Endosulfan II		X		X	X
Heptachlor epoxide		X			
Methoxychlor		X			

Notes: X – Selected as COPC

TABLE 7-2

PHYSICAL/CHEMICAL CHARACTERISTICS OF THE COPCs
OPERABLE UNIT NO. 10 (SITE 35)
REMEDIAL INVESTIGATION, CTO-0232
MCB CAMP LEJEUNE, NORTH CAROLINA

Contaminant	BCF (L/kg)	Water Solubility (mg/L)	Organic Carbon Partition Coefficient (mL/g)	Vapor Pressure (mm Hg)	Log Octanol/ Water Coefficient
Inorganics					
Aluminum	ND[1,3]	ND[1,3]	ND[1]	[1,2,3]	ND[1,3,4]
Antimony	1[8]	ND[1,3]	ND[1]	[1,2,3]	ND[1,3,4]
Arsenic	44[8]	ND[1,3]	ND[1]	[1,2,3]	ND[1,3,4]
Barium	ND[1,3]	ND[1,3]	ND[1]	[1,2,3]	ND[1,3,4]
Beryllium	19[8]	ND[1,3]	ND[1]	[1,2,3]	ND[1,3,4]
Cadmium	64[8]	ND[1,3]	ND[1]	[1,2,3]	ND[1,3,4]
Chromium	16[8]	ND[1,3]	ND[1]	[1,2,3]	ND[1,3,4]
Cobalt	ND[3]	ND[1,3]	ND[1]	[2]	ND[1,3,4]
Copper	36[8]	ND[1,3]	ND[1]	[1,2,3]	ND[1,3,4]
Iron	ND[3]	ND[1,3]	ND[1]	[1,2,3]	ND[1,3,4]
Lead	49[8]	ND[1,3]	ND[1]	[1,2,3]	ND[1,3,4]
Manganese	35[9]	ND[1,3]	ND[1]	[1,2,3]	ND[1,3,4]
Mercury	4,000[3]	ND[1,3]	ND[1]	[2,3]	ND[1,3,4]
Nickel	47[8]	ND[1,3]	ND[1]	ND[1,2,3]	ND[1,3,4]
Selenium	6[8]	ND[1,2]	ND[1]	[1,2,3]	ND[1,3,4]
Thallium	18[3]	ND[1,3]	ND[1]	ND[2]	ND[1,3,4]
Vanadium	ND[3]	ND[1,3]	ND[1]	[2,3]	ND[1,3,4]
Zinc	1[8]	ND[1,3]	ND[1]	[1,2,3]	ND[1,3,4]
VOCs					
Acetone	0.69[9]	1,000,000[1]	2.2[1]	270[1]	-0.24[1]
Carbon Disulfide	ND[1]	2,940[1]	54[1]	360[1]	2.0[1]
Toluene	10.7[8]	535[1]	300[1]	28.1[1]	2.73[1]
Xylene	2.2[9]	198[1]	240[1]	10[1]	3.26[1]
Pesticides					
beta-BHC	130[8]	2.0[3]	3,800[1]	[2,3]	3.9[1]
Chlordane, total	14,100[8]	0.056[3]	140,000[1]	[2,3]	5.5[7]
4,4-DDE	53,600[8]	0.12[3]	4,400,000[1]	[1,2,3]	5.7[3]
4,4-DDD	53,600[8]	0.09[3]	770,000[1]	[1,2,3]	0.60[3]
4,4-DDT	53,600[8]	0.025[3]	243,000[1]	[1,2,3]	6.4[3]
Dieldrin	4,670[8]	0.2[3]	1,700[1]	[1,2,3]	4.3[7]
Endosulfan II *	270[5]	0.51[5]	2,042[5]	[2,5]	3.8[5]
Endrin	3,970[8]	0.23[3]	ND [1,2,3,4,5,6,7]	[2,3]	4.6[7]

TABLE 7-2 (Continued)

PHYSICAL/CHEMICAL CHARACTERISTICS OF COPCs
OPERABLE UNIT NO. 10 (SITE 35)
REMEDIAL INVESTIGATION, CTO-232
MCB LEJEUNE, NORTH CAROLINA

Contaminant	BCF (L/kg)	Water Solubility (mg/L)	Organic Carbon Partition Coefficient (mL/g)	Vapor Pressure (mm Hg)	Log Octanol/ Water Coefficient
Endrin Aldehyde	3,970[8]	50[9]	670[9]	[2,9]	3.2[9]
Endrin Ketone	ND[7,8]	ND[7]	ND[7]	ND[7]	ND[7]
Heptachlor Epoxide	11,200[8]	0.2[5]	ND[5]	[2,5]	5.40[5]
Methoxychlor	40,000[3]	0.1[3]	ND[3]	[2,3]	4.8[3]
SVOCs					
Diethylphthlate	73[8]	896[1]	142[1]	[1,2]	2.5[1]
Bis(2-ethylhexylphthlate)	130[8]	0.34[3]	ND[3]	[2,3]	5.1[3]
Benzo(b)fluorenthen	30[8]	[1,2]	550,000[1]	[1,2]	6.06[1]
Benzo(g,h,i)perylene	30[8]	[1,2]	1,600,000[1]	[1,2]	6.51[1]
Chrysene	30[8]	[1,2]	200,000[1]	[1,2]	5.61[1]
Fluoranthene	1,150[8]	0.2[1]	38,000[1]	[1,2]	4.9[1]
Phenanthrene	30[8]	1.0[1]	14,000[1]	[1,2]	4.5[1]
Pyrene	30[8]	0.13[1]	38,000[1]	[1,2]	4.88[1]
Phenol					1.5[1]

Notes:
(1) USEPA, 1986.
(2) Negligible (less than 0.1).
(3) SCDM, 1991.
(4) USEPA, 1985.
(5) Howard, 1989.
(6) Howard, 1990.
(7) Howard, 1991.
(8) USEPA, 1995a.
(9) USEPA Region III 1995b.

COPCs = Contaminants of Potential Concern
BCF = Bioconcentration Factor
L/kg = liters per kilogram
mg/L = milligrams per liter
mL/g = milliliters per gram
mm Hg = millimeters of mercury
ND = No data
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
* Values for Endosulfan were used.

TABLE 7-9

FREQUENCY AND RANGE OF DETECTION COMPARED TO SEDIMENT SCREENING VALUES
OPERABLE UNIT NO. 10 (SITE 35)
REMEDIAL INVESTIGATION, CTO-0232
MCB CAMP LEJEUNE, NORTH CAROLINA

Contaminant	Sediment Screening Values (SSVs)[1]		Contaminant Frequency/Range		Comparison to SSVs	
	ER-L	ER-M	No. of Positive Detects/No. of Samples	Range of Positive Detections	No. of Positive Detects Above ER-L	No. of Positive Detects Above ER-M
Pesticides/PCBs (μg/kg)						
Dieldrin	0.02	8	7/20	1.4J - 52	7/7	2/7
4,4'-DDD	2	20	17/20	1.1J - 1,140	16/17	14/17
4,4'-DDT	1	7	15/20	0.66J - 46J	13/15	4/15
4,4'-DDE	2	15	17/20	1J - 1,200	15/17	14/17
Endrin	0.02	45	5/20	0.44J - 0.85J	5/5	0/5
alpha-Chlordane	0.5[2]	6[2]	10/20	0.51J - 13J	10/10	5/10
gamma-Chlordane	0.5[2]	6[2]	6/20	3.6 - 9.7	6/6	4/6
Metals (mg/kg)						
Lead	35	110	18/20	4.7 - 15,100	9/18	2/18

Notes: ER-L = Effects Range-Low
ER-M = Effects Range-Medium
NE = Not Established
NA = Not Applicable
[1] Long and Morgan, 1991
[2] Values for Total Chlordane

TABLE 7-10

COMPARISON OF BIOTA TISSUE DATA COLLECTED IN BRINSON CREEK
TO BIOTA TISSUE COLLECTED IN OTHER STUDIES
OPERABLE UNIT NO. 10 (SITE 35)
REMEDIAL INVESTIGATION, CTO-0232
MCB CAMP LEJEUNE, NORTH CAROLINA

Contaminant	Brinson Creek Concentration Range(1) (Whole Body)	Pamlico Sound Study Concentration Range(2) (Whole Body)	Brinson Creek Concentration Range(1) (Fillet)	Hadnot Creek Background Samples Concentration Range (Fillets)	Brinson Creek Concentration Range (Crab Tissue)	Hadnot Creek Concentration Range (Crab Tissue)
Pesticides (µg/kg)						
Beta-BHC	4.8 - 8.3 (WC)	20	4.2 - 11 (WM)	NC	6.8 - 8.9	ND
Alpha-Chlordane	2.9 - 60 (SM)	NA	3.5 - 46 (SM)	0.17	3.6 - 8.8	1.2 - 1.8
Gamma-Chlordane	12 - 22 (SM)	NA	ND	ND	ND	ND
Dieldrin	3.2 - 59 (AE)	ND - 30	4.3 - 48 (SM)	ND	6 - 9.4	ND
4,4'-DDD	5.2 - 319 (AE)	20 - 160	22 - 256 (SM)	ND	19 - 49	5.6 - 6.6
4,4'-DDE	27 - 434 (AE)	30 - 850	39 - 572 (LG)	9.7 - 12	42 - 101	4.6 - 8.7
4,4'-DDT	5.8 - 58 (AE)	ND - 30	2.5 - 15 (WM)	ND	2.5	ND
Endrin	3 - 27 (SM)	ND	2.5 - 52 (LG)	ND	ND	ND
Endrin Aldehyde	3.3 - 6.5 (LG)	NA	2.8 - 13 (SM)	ND	ND	ND
Endrin Ketone	3.1 - 14 (AE)	NA	3.6 - 3.8 (WM)	ND	ND	ND
Endosulfan IV	3.4 - 3.4 (SM)	NA	3.6 - 9.6 (LG)	ND	ND	ND
VOCs (µg/kg)						
Acetone	39 - 24,684 (MC)	NA	58 - 2,788 (LMB)	13-28	54,320 - 372,323	99 - 111
Toluene	33 (WC)	NA	NR	ND	ND	ND
Inorganics (µg/kg)						
Aluminum	23.7 - 53.2 (CF)	NA	19.3 - 27.3 (SM)	36.5	19.3	ND
Barium	0.89 - 5.0 (SM)	NA	0.4 - 2.2 (SM)	ND	ND	10.1
Chromium	2.3 - 3.6 (WC)	0.45 - 9.73	NR	0.21 - 0.68	ND	0.52

TABLE 7-10 (Continued)

COMPARISON OF BIOTA TISSUE DATA COLLECTED IN BRINSON CREEK TO BIOTA TISSUE COLLECTED IN OTHER STUDIES OPERABLE UNIT NO. 10 (SITE 35) REMEDIAL INVESTIGATION, CTO-0232 MCB CAMP LEJEUNE, NORTH CAROLINA

Contaminant	Brinson Creek Concentration Range(1) (Whole Body)	Pamlico Sound Study Concentration Range(2) (Whole Body)	Brinson Creek Concentration Range(1) (Fillet)	Hadnot Creek Background Samples Concentration Range (Fillets)	Brinson Creek Concentration Range (Crab Tissue)	Hadnot Creek Concentration Range (Crab Tissue)
Copper	3.2 - 70.3 (CF)	1.43 - 5.33	2.3 - 5.6 (SM)	0.18 - 0.46	22.3 - 27.5	5.8 - 7.9
Iron	60.9 - 392 (LG)	NA	28 - 53.6 (WC)	ND	20.4 - 40.2	ND
Lead	2.5 (AE)	0.04 - 1.15	ND	ND	0.51 - 0.61	ND
Manganese	1.6 - 11.2 (CF)	NA	0.86 - 3.10 (MC)	0.8 - 0.38	1.7	1.8 - 13.6
Mercury	0.68 - 0.7 (CF)	0.04 - 1.26	0.29 - 1.3 (LMB)	0.05 - 0.24	ND	0.02 - 0.08
Selenium	0.43 - 1.0 (WC)	NA	0.6 - 5.8 (LMB)	ND	0.72 - 0.8	ND
Zinc	42.3 - 102 (CF)	44.9 - 67.7	18.2 - 58.3 (WC)	3.9 - 5	93.8 - 130	17.9 - 25

AE - American Eel
CF - Crayfish
LG - Longnosed Gar
LMB - Large Mouth Bass
MC - Mud Catfish
SM - Stripped Mullet
WC - White Catfish
NA - Not Analyzed
ND - Not Detected
NR - Not Retained as a COPC

(1) Species in parenthesis is sample with the highest detection
(2) Benkert, 1992

TABLE 7-11

FREQUENCY AND RANGE OF DETECTION COMPARED TO SEDIMENT SCREENING VALUES
OPERABLE UNIT NO. 10 (SITE 35)
REMEDIAL INVESTIGATION, CTO-0232
MCB CAMP LEJEUNE, NORTH CAROLINA

Contaminant	Sediment Screening Values (SSVs)[1]		Contaminant Frequency/Range		Comparison to SSVs	
	ER-L	ER-M	No. of Positive Detects/No. of Samples	Range of Positive Detections	No. of Positive Detects Above ER-L	No. of Positive Detects Above ER-M
Pesticides/PCBs (μg/kg)						
Dieldrin	0.02	8	7/20	1.4J - 52	7/7	2/7
4,4'-DDD	2	20	17/20	1.1J - 1,140	16/17	14/17
4,4'-DDT	1	7	15/20	0.66J - 46J	13/15	4/15
4,4'-DDE	2	15	17/20	1J - 1,200	15/17	14/17
Endrin	0.02	45	5/20	0.44J - 0.85J	5/5	0/5
alpha-Chlordane	0.5[2]	6[2]	10/20	0.51J - 13J	10/10	5/10
gamma-Chlordane	0.5[2]	6[2]	6/20	3.6 - 9.7	6/6	4/6
Metals (mg/kg)						
Lead	35	110	18/20	4.7 - 15,100	9/18	2/18

Notes: ER-L = Effects Range-Low
ER-M = Effects Range-Medium
NE = Not Established
NA = Not Applicable
[1] Long and Morgan, 1991
[2] Values for Total Chlordane

TABLE 7-12

**RESULTS OF THE JACCARD COEFFICIENT (Sj)
OF COMMUNITY SIMILARITY AND
SΦRENSON INDEX (Ss) OF COMMUNITY SIMILARITY
BETWEEN BENTHIC MACROINVERTEBRATE STATIONS
BRINSON CREEK AND HADNOT CREEK
OPERABLE UNIT NO. 10 (SITE 35)
REMEDIAL INVESTIGATION, CTO-0232
MCB CAMP LEJEUNE, NORTH CAROLINA**

Sj

	STATION	35-BN01	HC01	HC04
	35-BN01	NA	0.20	0.14
Ss	HC01	0.33	NA	0.18
	HC04	0.25	0.31	NA

Notes: 35-BN01 = Brinson Creek Station
HC01, HC04 = Hadnot Creek Stations

TABLE 7-13

RESULTS OF THE JACCARD COEFFICIENT (Sj) OF COMMUNITY SIMILARITY AND SØRENSON INDEX (Ss) OF COMMUNITY SIMILARITY BETWEEN BENTHIC MACROINVERTEBRATE STATIONS BRINSON CREEK AND WEBB CREEK OPERABLE UNIT NO. 10 (SITE 35) REMEDIAL INVESTIGATION, CTO-0232 MCB CAMP LEJEUNE, NORTH CAROLINA

Sj

	STATION	35-BN02	35-BN03	35-BN04	36-BN01	36-BN02	36-BN03	WC02
	35-BN02	NA	0.21	0.43	0.07	0.07	0.06	0.09
	35-BN03	0.35	NA	0.31	0.16	0.29	0.19	0.19
	35-BN04	0.60	0.47	NA	0.07	0.15	0.13	0.09
	36-BN01	0.13	0.27	0.13	NA	0.43	0.35	0.31
Ss	36-BN02	0.13	0.45	0.27	0.60	NA	0.53	0.42
	36-BN03	0.11	0.32	0.22	0.52	0.70	NA	0.43
	WC02	0.17	0.32	0.17	0.47	0.59	0.60	NA

Notes: 35-BN02 - 35-BN04 = Brinson Creek Stations
36-BN01 - 36-BN03 = Brinson Creek Stations
WC02 = Webb Creek Station

TABLE 7-14

TERRESTRIAL REFERENCE VALUES
OPERABLE UNIT NO. 10 (SITE 35)
REMEDIAL INVESTIGATION, CTO-0232
MCB CAMP LEJEUNE, NORTH CAROLINA

Contaminant	Whitetailed Deer (mg/kg/day)	Bobwhite Quail (mg/kg/day)	Eastern Cottontail (mg/kg/day)	Red Fox (mg/kg/day)	Racoon (mg/kg/day)
Aluminum	6.51E+00 (c)	1.41E+01 (p)	1.16E+01 (rb)	2.11E+01 (d)	6.78E+00 (rb)
Antimony	6.91E-03 (rt)	4.39E-02 (rt)	4.06E+00 (rb)	1.49E-02 (rt)	1.36E-02 (rt)
Arsenic	3.25E-01 (c)	3.53E+00 (p)	2.90E+00 (rb)	1.31E-01 (m)	1.20E-01 (m)
Barium	1.30E-01 (c)	1.41E+00 (p)	1.16E+00 (rb)	1.06E-01 (rt)	9.72E-02 (rt)
Cadmium	3.25E-03 (c)	3.53E-02 (p)	2.90E-02 (rb)	1.06E-01 (d)	1.55E-03 (rt)
Chromium	6.51E+00 (c)	7.07E+01 (p)	5.80E+01 (rb)	1.03E+00 (rt)	9.37E-01 (rt)
Cobalt	6.51E-02 (c)	7.07E-01 (p)	5.80E-01 (rb)	3.71E-01 (rb)	3.39E-01 (rb)
Copper	6.51E-01 (c)	2.12+01 (p)	1.16E+01 (rb)	2.11E-02 (mk)	1.93E-02 (mk)
Iron	6.51E+00 (c)	7.07E+01 (p)	2.90E+01 (rb)	1.86E-01 (rb)	1.69E+01 (rb)
Lead	1.95E-01 (c)	2.12E+00 (p)	1.74E+00 (rb)	2.13E-00 (rt)	1.94E+00 (rt)
Manganese	6.51E+00 (c)	1.41E+02 (p)	2.32E+01 (rb)	1.49E+01 (rb)	1.36E+01 (rb)
Mercury	1.30E-02 (c)	1.41E-01 (p)	1.20E-01 (rb)	1.36E-01 (rt)	1.24E-01 (rt)
Nickel	3.25E-01 (c)	2.12E+01 (p)	2.90E+00 (rb)	3.52E+01 (d)	1.94E+00 (rt)
Selenium	1.30E-02 (c)	1.41E-01 (p)	1.20E-01 (rb)	1.07E-02 (rt)	1.55E-02 (rt)
Thallium	4.94E-03 (rt)	3.14E-02 (rt)	1.66E-02 (rt)	1.06E-02 (rt)	9.71E-03 (rt)
Vanadium	3.25E-01 (c)	7.07E-01 (p)	5.80E02 (rb)	3.71E-02 (rb)	3.39E-02 (rb)
Zinc	3.25E+00 (c)	7.07E+01 (p)	2.90E+01 (rb)	1.41E+00 (d)	1.69E+01 (rb)

TABLE 7-14 (Continued)

TERRESTRIAL REFERENCE VALUES
OPERABLE UNIT NO. 10 (SITE 35)
REMEDIAL INVESTIGATION, CTO-0232
MCB CAMP LEJEUNE, NORTH CAROLINA

Contaminant	Whitetailed Deer (mg/kg/day)	Bobwhite Quail (mg/kg/day)	Eastern Cottontail (mg/kg/day)	Red Fox (mg/kg/day)	Racoon (mg/kg/day)
Benzo(b)fluoranthene	8.71E-03 (m)	5.53E-02 (m)	2.93E-02 (m)	1.88E-02 (m)	1.71E-02 (m)
Benzo(ghi)perylene	8.71E-03 (m)	5.53E-02 (m)	2.93E-02 (m)	1.88E-02 (m)	1.71E-02 (m)
Chrysene	8.71E-03 (m)	5.53E-02 (m)	2.93E-02 (m)	1.88E-02 (m)	1.71E-02 (m)
Fluoranthene	1.09E+00 (m)	6.92E+00 (m)	3.67E+00 (m)	2.35E+00 (m)	2.14E+00 (m)
Phenanthrene	8.10E+00 (rt)	5.15E+01 (rt)	2.73E+01 (rt)	1.74E+01 (rt)	1.59E+01 (rt)
Phenol	1.19E+00 (rt)	7.53E+00 (rt)	3.99E+00 (rt)	2.55E+00 (rt)	2.33E+00 (rt)
Pyrene	6.53E-01 (m)	4.15E+00 (m)	2.20E+00 (m)	1.41E+00 (m)	1.28E+00 (m)
Beta-BHC	9.88E-01 (rt)	6.28E+00 (rt)	3.33E+00 (rt)	2.13E+00 (rt)	1.94E+00 (rt)
Alpha-chlordane	1.30E+00 (c)	6.28E-03 (rt)	3.66E-02 (rt)	1.06E-01 (d)	2.14E-02 (rt)
Gamma-chlordane	1.30E+00 (c)	6.28E-03 (rt)	3.66E-02 (rt)	1.06E-01 (d)	2.14E-02 (rt)
4,4'-DDD	9.88E-04 (c)	3.56E-01 (rt)	3.33E-03 (rt)	2.13E-03 (d)	1.94E-03 (rt)
4,4'-DDE	9.88E-04 (c)	3.56E-01 (rt)	3.33E-03 (rt)	2.13E-03 (d)	1.94E-03 (rt)
4,4'-DDT	9.88E-04 (c)	3.56E-01 (rt)	3.33E-03 (rt)	2.13E-03 (d)	1.94E-03 (rt)
Dieldrin	6.51E-01 (c)	6.28E-03 (rt)	3.33E-03 (rt)	7.04E-03 (d)	1.94E-03 (rt)
Endosulfan II	1.19E-01 (rt)	6.28E-03 (rt)	3.99E-01 (rt)	2.82E-01 (d)	2.33E-01 (rt)
Endrin	1.64E-02 (d)	5.34E-02 (p)	5.51E-02 (d)	3.52E-02 (d)	3.21E-02 (d)
Endrin aldehyde	1.64E-02 (d)	5.34E-02 (p)	5.51E-02 (d)	3.52E-02 (d)	3.21E-02 (d)

TABLE 7-14 (Continued)

TERRESTRIAL REFERENCE VALUES
OPERABLE UNIT NO. 10 (SITE 35)
REMEDIAL INVESTIGATION, CTO-0232
MCB CAMP LEJEUNE, NORTH CAROLINA

Contaminant	Whitetailed Deer (mg/kg/day)	Bobwhite Quail (mg/kg/day)	Eastern Cottontail (mg/kg/day)	Red Fox (mg/kg/day)	Racoon (mg/kg/day)
Endrin ketone	1.64E-02 (d)	5.34E-02 (p)	5.51E-02 (d)	3.52E-02 (d)	3.21E-02 (d)
Acetone	1.98E+00 (rt)	1.26E+00 (rt)	6.65E+00 (rt)	4.26E+00 (rt)	3.88E+00 (rt)
Carbon disulfide	3.27E+00 (rb)	2.08E+01 (rb)	1.10E+01 (rb)	7.04E+00 (rb)	6.42E+00 (rb)
Toluene	4.41E+00 (rt)	2.80E+01 (rt)	1.48E+01 (rt)	9.49E+00 (rt)	8.66E+00 (rt)
Xylenes	3.54E+01 (rt)	2.25E+02 (rt)	1.19E+02 (rt)	7.62E+01 (rt)	6.95E+01 (rt)

(c) - Derived from cattle
(p) - Derived from poultry
(rb) - Derived from rabbit
(rt) - Derived from rat
(m) - Derived from mouse
(d) - Derived from dog
(mk) - Derived from mink

TABLE 7-15

SOIL TO PLANT TRANSFER COEFFICIENTS
AND BEEF BIOCONCENTRATION FACTORS
OPERABLE UNIT NO. 10 (SITE 35)
REMEDIAL INVESTIGATION, CTO-0232
MCB CAMP LEJEUNE, NORTH CAROLINA

Contaminant	Bv	Br*	Bb
Dieldrin	0.097(1)	0.097	1.00E-03(1)
4,4'-DDE	0.019(1)	0.019	1.26E-02(1)
4,4'-DDD	0.013(1)	0.013	2.51E-02(1)
4,4'-DDT	0.008(1)	0.008	6.31E-02(1)
Endrin	0.09(1)	0.09	1.00E-02(1)
Endrin Aldehyde **	0.09(1)	0.09	1.00E-02(1)
Endrin Ketone **	0.09(1)	0.09	1.00E-02(1)
Alpha-Chlordane	0.026(1)	0.026	7.94E-03(1)
gamma-Chlordane	0.026(1,3)	0.026	7.94E-03(1)
Beta-BHC	0.216(1)	0.216	2.00E-04(1)
Endosulfan II	0.322(1)	0.322	1.00E-04(1)
Benzo(b)fluranthene	0.006(1)	0.006(1)	1.00E-01(1)
Benzo(g,h,i)perylene	0.007(1)	0.007(1)	7.94E-02(1)
Chrysene	0.020(1)	0.020(1)	1.26E-02(1)
Fluoranthene	0.057(1)	0.057(1)	2.00E-03(1)
Phenanthene	0.097(1)	0.097(1)	7.94E-04(1)
Phenol	5.26(1)	5.26	7.94E-07(1)
Pyrene	0.033(1)	0.033(1)	2.51E-08(1)
Acetone	53.30(1)	53.30(1)	1.45E-08(1)
Carbon Disulfide	38.73	38.73	2.51E-08(1)
Toluene	1.065(1)	1.065	1.26E-05(1)
Xylenes	0.548(1)	0.548	3.98E-05(1)
Aluminum	0.004(2)	0.00065(2)	1.53E-03(4)
Antimony	0.2(2)	0.03(2)	1.00E-03(4)
Arsenic	0.040(2)	0.006(2)	2.00E-03(4)
Barium	0.150(2)	0.015(2)	1.50E-04(4)
Cadmium	0.550(2)	0.150(2)	5.40E-04(4)
Chromium	0.008(2)	0.005(2)	5.50E-03(4)
Cobalt	0.02(2)	0.007(2)	2.00E-02(4)
Copper	0.400(2)	0.250(2)	1.00E-02(4)
Iron	0.004(2)	0.00(2)	2.00E-02(4)
Lead	0.045(2)	0.009(2)	3.00E-04(4)
Manganese	0.250(2)	0.050(2)	4.00E-04(4)
Mercury	0.900(6)	0.200(2)	2.50E-01(2)
Nickel	0.060(2)	0.060(2)	6.00E-03(2)

TABLE 7-15 (continued)

SOIL TO PLANT TRANSFER COEFFICIENTS AND BEEF BIOCONCENTRATION FACTORS OPERABLE UNIT NO. 10 (SITE 35) REMEDIAL INVESTIGATION, CTO-0232 MCB CAMP LEJEUNE, NORTH CAROLINA

Contaminant	Bv	Br*	Bb
Selenium	0.025[2]	0.025[2]	1.50E-02[2]
Thallium	0.004[2]	0.0004[2]	4.00E-02[2]
Vanadium	0.006[2]	0.003[2]	2.50E-03[2]
Zinc	1.500[2]	0.900[2]	1.00E-01[2]

Notes: NA - Information not available
* - Br is assumed to be the same as Bv for organics
** - Value is for endrin

Bv - Soil-to-plant concentration factor which is associated with reproductive or storage functions of the plant

Br - Soil-to-plant concentration factor which is associated with the vegetative functions

Bb - Beef bioconcentration factor

[1] Travis, 1988
[2] Baes, 1984

TABLE 7-16

TERRESTRIAL CHRONIC DAILY INTAKE MODEL EXPOSURE PARAMETERS[1]
OPERABLE UNIT NO. 10 (SITE 35)
REMEDIAL INVESTIGATION, CTO-0232
MCB CAMP LEJEUNE, NORTH CAROLINA

Exposure Parameter	Units	White-Tailed Deer	Eastern Cottontail Rabbit	Bobwhite Quail	Red Fox	Raccoon	Small Mammal (Meadow Vole)
Food Source Ingestion	NA	Vegetation 100%	Vegetation 100%	Vegetation 100%	Small Mammals 80% Vegetation 20%	Vegetation 40% Fish 60%	Vegetation 1008
Feeding Rate	kg/d	1.6[2]	0.1[3]	0.014[4]	0.446[4]	0.319[4]	0.112[4]
Incident Soil Ingestion	kg/d	0.019[1]	0.002[5]	0.001[5]	0.012[5]	0.030[5]	0.003[5]
Rate of Drinking Water Ingestion	L/d	1.1[2]	0.119[4]	0.019[4]	0.399[4]	0.331[4]	0.0652[4]
Rate of Vegetation Ingestion	kg/d	1.6	0.1	0.014	0.089	0.128	0.112
Body Weight	kg	45.4[2]	1.229[4]	0.177[4]	4.69[4]	3.99[4]	0.3725[4]
Rate of Small Mammal Ingestion	kg/d	NA	NA	NA	0.356	NA	NA
Rate of Fish Ingestion	kg/d	NA	NA	NA	NA	0.192	NA
Home Range Size	acres	454[2]	9.29[4]	8.89[4]	1,771[4]	385[4]	0.032[4]

NA - Not Applicable
(1) Scarano, 1993
(2) Dee, 1991
(3) Newell, 1987
(4) USEPA, 1993c
(5) Beyer, 1993

TABLE 7-17

SURFACE WATER QUOTIENT INDEX
OPERABLE UNIT NO. 10 (SITE 35)
REMEDIAL INVESTIGATION, CTO-0232
MCB CAMP LEJEUNE, NORTH CAROLINA

Contaminant	Sample Number	Sample Concentration (µg/L)	North Carolina (WQS)[1] Quotient Ratio	Region IV Screening Values (WQSV)[2] Quotient Ratio	
				Acute	Chronic
Lead	35-SW07	97J	3.9	0.44	11.4
Mercury	35-SW01	3J	125	1.4	120
	35-SW04	3.2J	128	1.5	128
Zinc	35-SW07	129J	1.5	1.4	1.5

Notes: (1) WQS = North Carolina Water Quality Standards
(2) WQSV = USEPA Region IV Water Quality Screening Values

µg/L = micrograms per liter
NA = Not Available
J = Result is quantitatively estimated

TABLE 7-18

SEDIMENT SCREENING VALUES QUOTIENT INDEX
OPERABLE UNIT NO. 10 (SITE 35)
REMEDIAL INVESTIGATION, CTO-0232
MCB CAMP LEJEUNE, NORTH CAROLINA

Contaminant	Sample Number	Sample Concentration	SSV[1] QUOTIENT RATIO	
			ER-L	ER-M
Pesticides/PCBs (μg/kg)				
Dieldrin	35-SD02-612	1.7J	85	0.21
	35-SD04-06	1.6J	80	0.20
	35-SD04-612	3.1J	155	0.39
	35-SD07-06	1.4J	70	0.18
	35-SD07-612	2.6J	130	0.33
	36-SD06-06	52	2,600	6.50
	36-SD07-612	14J	700	1.75
4,4'-DDD	35-SD02-06	2.3J	1.2	0.12
	35-SD02-612	40	20	2.00
	35-SD04-06	43	21.5	2.15
	35-SD04-612	111	55.5	5.55
	35-SD05-06	43	21.5	2.15
	35-SD05-612	28	14	1.40
	35-SD06-06	39	19.5	1.95
	35-SD06-612	5.9	3.0	0.30
	35-SD07-06	40	20	2.00
	35-SD07-612	60	30	3.00
	36-SD05-06	223J	111.5	11.15
	36-SD05-612	1,140	570	57.00
	36-SD06-06	221	110.5	11.05
	36-SD06-612	159	79.5	7.95
	36-SD07-06	74	37	3.70
	36-SD07-612	41	20.5	2.05
4,4'-DDT	35-SD02-612	1.6J	1.6	0.23
	35-SD04-06	4.9J	4.9	0.70
	35-SD04-612	5.2	5.2	0.74
	35-SD05-06	3.7J	3.7	0.53
	35-SD05-612	1.3J	1.3	0.19
	35-SD06-06	1.7J	1.7	0.24
	35-SD07-06	2.3J	2.3	0.33
	35-SD07-612	2.1J	2.1	0.30
	36-SD05-06	31J	31	4.43
	36-SD05-612	46J	46	6.57

TABLE 7-18 (Continued)

NOAA SEDIMENT SCREENING VALUES QUOTIENT INDEX
SITES 35 AND 36
REMEDIAL INVESTIGATION, CTO-0232
MCB CAMP LEJEUNE, NORTH CAROLINA

Contaminant	Sample Number	Sample Concentration	SSV[1] QUOTIENT RATIO	
			ER-L	ER-M
4,4'-DDT (Continued)	36-SD06-06	14J	14	2.00
	36-SD06-612	8J	8	1.14
	36-SD07-612	5.7J	5.7	0.81
4,4'-DDE	35-SD02-612	38	19	2.54
	35-SD04-06	31J	15.5	2.07
	35-SD04-612	82	41	5.47
	35-SD05-06	80	40	5.34
	35-SD05-612	46	23	3.07
	35-SD06-06	115	57.5	7.67
	35-SD06-612	7.7	3.9	0.51
	35-SD07-06	34	17	2.27
	35-SD07-612	57	28.5	3.80
	36-SD05-06	242J	121	16.14
	36-SD05-612	1,200	600	80.00
	36-SD06-06	249	124.5	16.60
	36-SD06-612	179	89.5	11.94
	36-SD07-06	51	25.5	3.40
	36-SD07-612	32J	16	2.14
Endrin	35-SD02-612	0.44J	22	0.01
	35-SD04-612	0.59J	29.5	0.01
	35-SD05-612	0.85J	42.5	0.02
	35-SD06-06	0.77J	38.5	0.02
	35-SD07-612	0.7J	35	0.02
alpha-Chlordane	35-SD02-06	0.51J	1.0	0.09
	35-SD02-612	6	12	1.00
	35-SD04-06	4	8	0.67
	35-SD04-612	5.6	11.2	0.94
	35-SDO5-06	9.3	18.6	1.55
	35-SD05-612	4.8	9.6	0.80
	35-SD07-06	7	14	1.17
	35-SDO7-612	8.5	17	1.42
	36-SD07-06	13J	26	2.17
	36-SD07-612	6.5J	13	1.08

TABLE 7-18 (Continued)

NOAA SEDIMENT SCREENING VALUES QUOTIENT INDEX
SITES 35 AND 36
REMEDIAL INVESTIGATION, CTO-0232
MCB CAMP LEJEUNE, NORTH CAROLINA

Contaminant	Sample Number	Sample Concentration	SSV[1] QUOTIENT RATIO	
			ER-L	ER-M
gamma-Chlordane	35-SD02-612	6.7	13.4	1.12
	35-SD04-06	3.6	7.2	0.60
	35-SD04-612	7.6	15.2	1.27
	35-SD05-612	5	10	0.84
	35-SD07-06	6.1	12.2	1.02
	35-SD07-612	9.7	19.4	1.62
Inorganics (mg/kg)				
Lead	35-SD03-612	77.9	2.2	0.71
	35-SD05-06	92	2.6	0.84
	35-SD05-612	54.2	1.5	0.49
	35-SD-SD06-06	82.6	2.4	0.75
	35-SD07-06	42J	1.2	0.38
	35-SD07-612	79J	2.3	0.72
	36-SD05-06	115	3.3	1.05
	36-SD06-06	15,100	431.4	137.27
	36-SD07-06	44.9	1.3	0.41

Notes: [1] SSVs = Sediment Screening Values
ER-L = Effects Range-Low
ER-M = Effects Range-Median
μg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram

TABLE 7-19

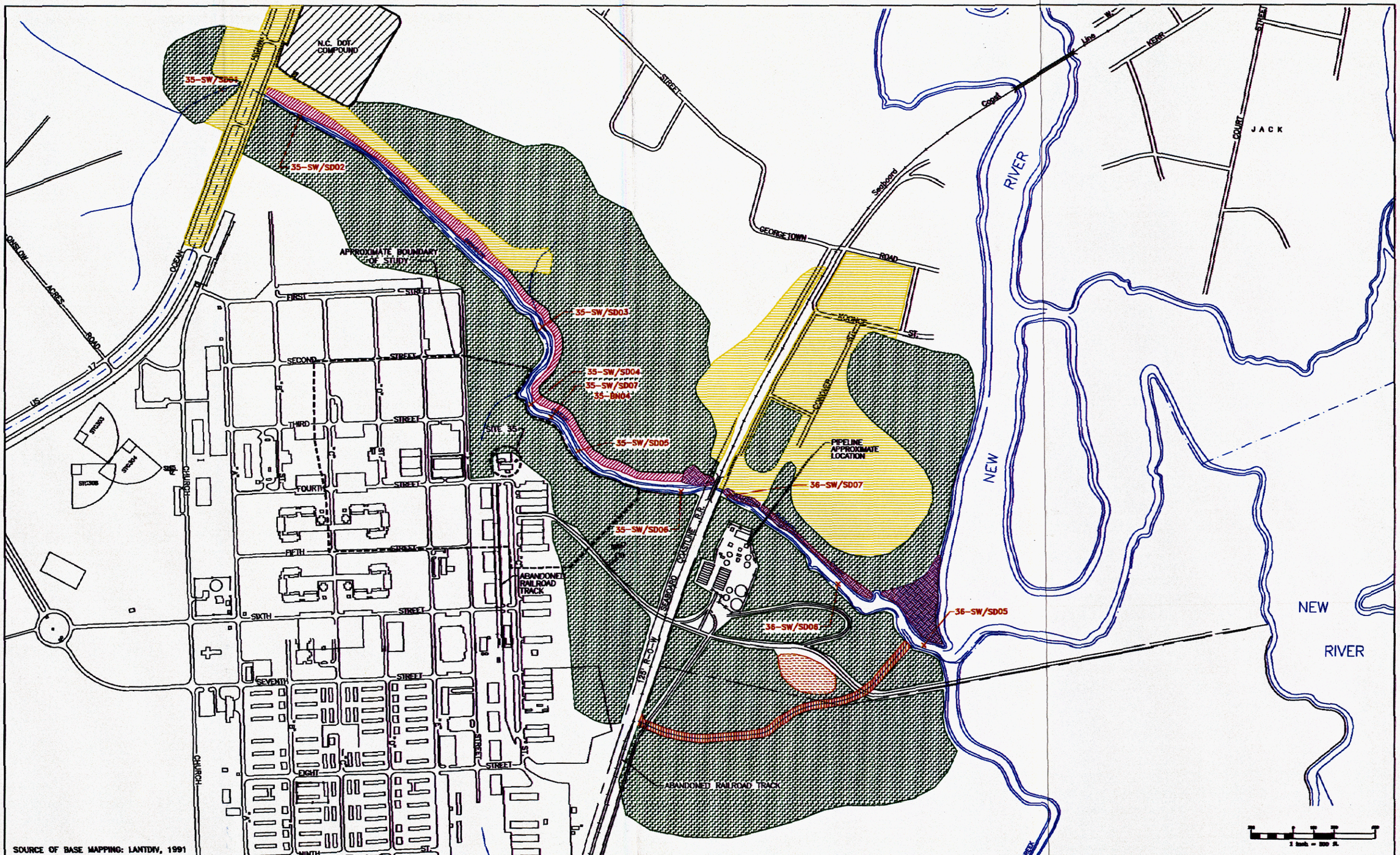
TERRESTRIAL QUOTIENT INDEX
OPERABLE UNIT NO. 10 (SITE 35)
REMEDIAL INVESTIGATION, CTO-0232
MCB CAMP LEJEUNE, NORTH CAROLINA

Contaminant	Red Fox	Bobwhite Quail	Cottontail Rabbit	Raccoon	Whitetail Deer
Aluminum	4.35E-02	2.01E+00	7.38E-01	8.52E-01	5.90E-02
Antimony	5.57E-02	3.44E+00	3.10E-02	4.84E-01	6.88E-01
Arsenic	1.03E-02	4.48E-02	2.89E-02	1.22E-01	9.06E-03
Barium	2.26E-02	5.06E-01	4.83E-01	1.51E+00	1.59E-01
Cadmium	9.21E-03	2.06E+01	2.39E+01	1.23E+01	8.04E+00
Chromium	1.70E-03	2.32E-03	9.05E-04	1.49E-01	2.44E-04
Cobalt	3.34E-03	2.11E-02	1.17E-02	7.23E-03	7.00E-03
Copper	1.94E-01	4.59E-02	7.72E-02	5.51E+01	5.19E-02
Iron	5.84E-02	9.04E-01	6.39E-01	1.06E+00	9.17E-02
Lead	3.62E-03	2.34E-01	1.58E-01	5.11E-02	5.41E-02
Manganese	5.62E-04	5.87E-03	3.09E-02	2.97E-02	4.32E-03
Mercury	2.31E-03	2.49E-03	2.58E-03	2.49E-01	5.96E-03
Nickel	1.14E-05	2.83E-03	1.25E-02	2.93E-03	3.96E-03
Selenium	2.19E-03	2.69E-02	1.42E-02	2.50E+00	4.36E-03
Silver	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vanadium	5.43E-02	1.28E-01	4.83E-01	3.72E-01	3.26E-03
Thallium	5.55E-03	2.10E-03	3.49E-03	5.13E-03	2.94E-03
Zinc	1.09E+00	7.46E-01	1.83E+00	3.22E-01	6.21E-01
beta-BHC	4.43E-08	5.73E-06	9.11E-06	1.62E-04	1.14E-06
Alpha-chlordane	2.28E-05	4.39E-02	3.41E-03	6.73E-02	3.20E-06
Gamma-chlordane	1.71E-05	3.29E-02	2.56E-03	2.32E-02	2.40E-06
4,4'-DDD	1.21E-01	6.08E-02	2.39E+00	4.37E+00	2.50E-01
4,4'-DDE	5.19E-02	3.17E-02	1.41E+00	6.65E+00	1.54E-01
4,4'-DDT	1.28E-02	4.60E-03	1.59E-01	6.56E-01	1.59E-02
Dieldrin	1.81E-03	4.15E-01	5.29E-01	8.61E-01	9.77E-05
Endrin	1.53E-05	1.09E-03	4.61E-04	2.26E-02	5.10E-05
Endrin ketone	2.33E-06	1.66E-04	7.00E-05	1.87E-02	7.75E-06

TABLE 7-19 (Contineued)

TERRESTRIAL QUOTIENT INDEX
OPERABLE UNIT NO. 10 (SITE 35)
REMEDIAL INVESTIGATION, CTO-0232
MCB CAMP LEJEUNE, NORTH CAROLINA

Contaminant	Red Fox	Bobwhite Quail	Cottontail Rabbit	Raccoon	Whitetail Deer
Endrin aldehyde	3.11E-06	2.22E-04	9.33E-05	9.75E-03	1.03E-05
Endosulfan II	6.03E-07	1.42E-02	2.00E-04	7.23E-04	2.53E-05
Benzo(b)fluoranthene	7.36E-03	1.21E-01	6.96E-02	5.11E-02	6.82E-03
Benzo(ghi)perylene	2.22E-03	4.09E-02	2.41E-02	1.72E-02	2.39E-03
Chrysene	2.56E-03	8.86E-02	6.94E-02	3.38E-02	7.60E-03
Fluoranthene	3.66E-05	2.04E-03	2.29E-03	6.33E-04	2.73E-04
Phenanthrene	3.65E-06	2.72E-04	3.61E-04	7.35E-05	4.42E-05
Phenol	3.90E-05	9.50E-02	1.85E-01	1.35E-02	2.38E-02
Pyrene	4.93E-05	2.15E-03	2.01E-03	7.49E-04	2.31E-04
Carbon disulfide	1.47E-07	2.61E-03	5.13E-03	3.61E-04	6.59E-04
Acetone	0.00E+00	0.00E+00	0.00E+00	1.35E-01	0.00E+00
Toluene	6.80E-08	3.52E-05	6.59E-05	1.52E-04	8.42E-06
Xylenes	8.96E-09	2.52E-06	4.51E-06	4.38E-07	5.74E-07
TOTAL QI	1.76E+00	2.97E+01	3.33E+01	8.81E+01	1.03E+01



LEGEND

35-SW/SD01 – SAMPLE LOCATION FOR SURFACE WATER AND SEDIMENT
– LOBLOLLY PINE/HARDWOOD FOREST
– PALUSTRINE FORESTED DECIDUOUS WETLAND (PF06)
– OPEN FIELD
– PALUSTRINE FORESTED EVERGREEN WETLAND (PF07118)
– OPEN BARREN AREA
– PALUSTRINE FORESTED WETLAND (PF01)
– INDUSTRIAL AREA, RAIL LINE
– WATER BOUNDARY

DATE	OCT. 1994
SCALE	1" = 300'
DRAWN	WJH
REVIEWED	JSC
S.O.#	62470-252-0000-07000
CADD#	232524R

NORTH

SITE 35, CAMP GEIGER AREA FUEL FARM RI/FS
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

BAKER ENVIRONMENTAL, Inc.
Coraopolis, Pennsylvania

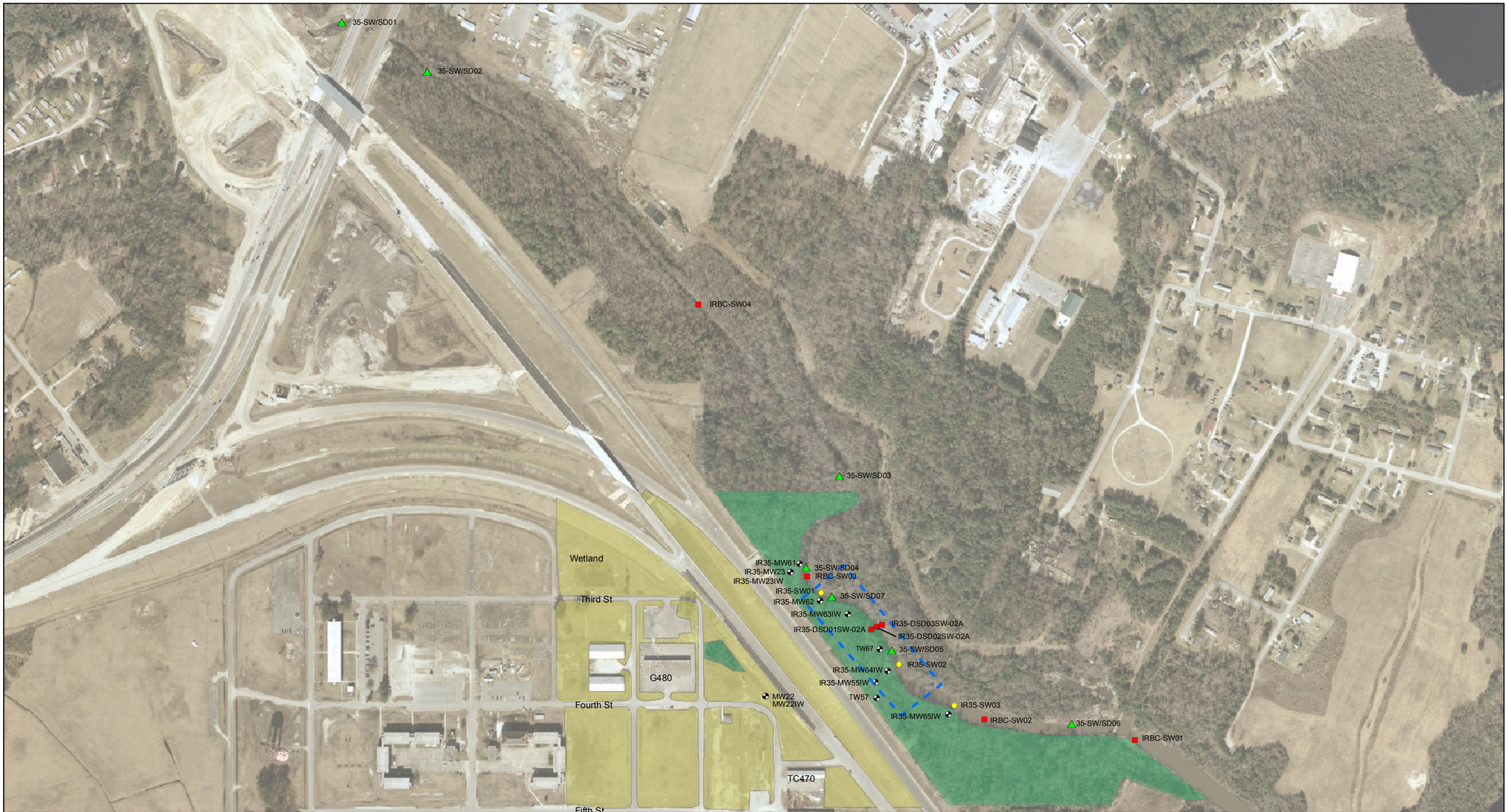
Baker
Baker Environmental, Inc.

BIOHABITAT MAP
SITE 35 AND VICINITY
CONTRACT TASK ORDER – 0232

SCALE 1" = 300'
DATE OCT. 1994

SHEET NO.
3-9

Tables from Addendum to the Ecological Risk Assessment



Maintained Grass at Site 35

Mixed Forest at Site 35

Surface water locations sampled July 2001 and February 2002

Surface water locations sampled as part of LTM monitoring 1999-2004

Monitoring Well adjacent to Brinson Creek

Baker SW/SD Locations sampled for 1995 RI Report

Wetland investigation area from NAE Report 2002
Location of Surface Soil Samples IR35-SS01 & IR35-SS02

N
W E
S

0 250 500
Feet

Figure 1
Habitat Map
OU No. 10 Site 35
Marine Corps Base, Camp Lejeune
Camp Lejeune, North Carolina

CH2MHILL

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TABLE 8-2
Comparison of Detected Surface Water VOC Concentrations to WQS and ESV
Site 35 Ecological Risk Assessment Addendum
MCB Camp Lejeune, North Carolina

Analyte	Frequency of Detection 1999-2003	1999-2003 Maximum (mg/L)	Maximum Sample ID	WQS or ESV (mg/L)	Source of WQS or ESV
Volatile Organic Compounds					
1,2-Dichloroethene (total)	7/23	0.002	IR35-SW02-03D-10222003	1.35	Freshwater (USEPA, 2001)
Acetone	3/18	0.011	IR35-SW01-02B-04202002	1.5	Freshwater (USEPA, 2006(a))
Benzene	1/23	0.0001	IR35-SW03-04B-04212004	0.053	Freshwater (USEPA, 2001)
Bromoform	10/23	0.0022	IRBC-SW04-02A-02162002	0.293	Freshwater (USEPA, 2001)
Chloroform	1/23	0.0003	IRBC-SW04-02A-02162002	0.289	Freshwater (USEPA, 2001)
Dibromochloromethane	9/23	0.0019	IRBC-SW04-02A-02162002	0.129	Chronic Freshwater (TCEQ, 2005)
MTBE	3/12	0.0003	IR35-SW02-02B-04182002	11.07	Freshwater (USEPA, 2006(a))
Toluene	2/23	0.0040	IR35-SW03-04B-04212004	0.175	Freshwater (USEPA, 2001)
Vinyl chloride	5/23	0.0020	IR35-SW02-03D-10222003	0.93	Freshwater (USEPA, 2006(a))
cis-1,2-Dichloroethene	9/23	0.0020	IR35-SW02-03D-10222003	1.35	Freshwater (USEPA, 2001)

WQS - The lower of the two, National Recommended Water Quality Standard or North Carolina Water Quality Standard
ESV - Ecological Screening Value (benchmark)

TABLE 8-3
Comparison of Detected Surface Water Totals Metals Concentrations to WQS
Site 35 Ecological Risk Assessment Addendum
MCB Camp Lejeune, North Carolina

Analyte	Frequency of Detection 1999-2002	1995 Maximum (mg/L)	2002 Maximum (mg/L)	Maximum Sample ID	WQS (mg/L)	Source of WQS
Inorganics						
Arsenic	6/12	0.0027	0.0046	IR35-SW02-02C-07132002	0.05	NC WQS Freshwater (NCDENR, 2003)
Chromium	5/12	0.0012	0.012	IR35-DS03SW-02A	0.02	NC WQS Saltwater (NCDENR, 2003)
Lead	3/12	**0.0970**	**0.0084**	IR35-DS03SW-02A	0.002	AWQS Freshwater (USEPA, 2006)
Mercury	2/12	**0.0032**	**0.00024**	IRBC-SW04-02A-02162002	0.000012	NC WQS Freshwater (NCDENR, 2003)
Zinc	5/12	**0.1290**	**0.073**	IR35-SW02-02B-04182002	0.05	NC WQS Freshwater (NCDENR, 2003)

WQS - The lower of the two, National Recommended Water Quality Standard or North Carolina Water Quality Standard

TABLE 8-4
Comparison of Detected Surface Soil Concentrations
Site 35 Ecological Risk Assessment Addendum
MCB Camp Lejeune, North Carolina

Station ID **Sample ID** **Sample Date**	**IR35-SS01** **IR35-SS01-02D-10232002** **10/23/02**	**IR35-SS02** **IR35-SS02-02D-10232002** **10/23/02**	**ESV (ug/Kg)**	**Source of ESV**
Chemical Name				
Volatile Organic Compounds (UG/KG)				
2-Butanone	85.0 J	85.0 J	35000	Target Value (MHSPE, February 4, 2000)
Styrene	41.0 U	4.50 J	100	EPA Region IV (USEPA, 2001)
Toluene	3.20 J	2.80 J	50	EPA Region IV (USEPA, 2001)
Xylene, total	41.0 U	20.0 J	50	EPA Region IV (USEPA, 2001)
Other Parameters (MG/KG)				
% Solids	19.1 J	23.7 J		
Carbon	340 J	370 J		

ESV - Ecological Screening Value (benchmark)
J - Estimated
U - Undetected
EPA Region IV = Based on US EPA's Region 4 Water Management Division, Water Quality Standards Unit's Screening List.