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FINAL

REMEDIAL INVESTIGATION REPORT
OPERABLE UNIT NO. 9 (SITE 65)

MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

VOLUME II

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Prepared For:

DEPARTMENT OF THE NAVY
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Norfolk, Virginia

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APPENDIX K
DATA VALIDATION REPORTS

HEARTLAND ENVIRONMENTAL
SERVICES, INC.

SDG# 65MW05

SAMPLES AND FRACTIONS REVIEWED

Sample Identifications			Analytical Fractions			
BAKER ID	**RFW ID**	**Matrix**	**VOA**	**SV**	**P/P**	**TAL**
65-MW05A-00	AE9046	SOIL	X	X	X	X
65-MW05A-04	AE9043	SOIL	X	X	X	X
65-MW07A-00	AE9040	SOIL	X	X	X	X
65-MW07A-05	AE9038	SOIL	X	X	X	X
Total Number of Samples (Water/Soil)			**0/4**	**0/4**	**0/4**	**0/4**

MS - Matrix Spike MD - Matrix Spike/Matrix Duplicate

Individual fractions were reviewed as follows:

	Primary	Secondary
VOA - Volatiles (CLP, OLM01.8)	Dan Heil	Gene Watson
SV - Semivolatiles (CLP, OLM01.8)	Dan Heil	Gene Watson
P/P - Pesticide\PCBs (CLP, OLM01.8)	Jackie Cleveland	Gene Watson
TAL - Total Metals (CLP, ILM02.1)	Paul Humburg	

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 3/90 SOW; Region III Modifications to the National Functional Guidelines for Organic Data Review, and DQO Level III. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # 65MW05

Holding Times

The holding times for all of the samples were not met per the Organic Functional Guidelines and the CLP SOW (fourteen (14) days from collection date). No qualifications are required.

Tuning

All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibration that was analyzed by the laboratory for these samples was acceptable for all compound %RSDs and average RRFs. No qualifications are required.

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds that were not within %D continuing calibration criteria. All RRFs were within calibration criteria.

Continuing calibrations (continued)

Specific Finding:

1. The continuing calibration, QS0407, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify ~~all~~ positive results as estimated (J).

VBLKAE603	bromomethane
65MW07A05	vinyl chloride
65MW05A04	2-butanone
65MW05A00	

2. The continuing calibration, QS0411, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

VBLKAE9707	chloromethane
65MW07A00	vinyl chloride
	chloroform
	2-butanone

Internal Standards

All internal standard EICP areas met the internal standard EICP area QA/QC criteria. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for methylene chloride, acetone, 2-butanone, 2-hexanone, 1,1,2,2-tetrachloroethane and xylene. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Method Blanks (continued)

Specific findings:

3 The following samples have been qualified for method blank contamination. The qualifications are for all the method blanks.

65MW05A00 65MW05A04 65MW07A05	methylene chloride	CRQL
65MW07A00	acetone	CRQL
65MW05A00	xylene (total)	CRQL

Trip Blanks

The associate trip blank was not identified for this SDG. No qualifications are required.

Rinseate Blanks

The associate rinseate blank was not identified for this SDG. No qualifications are required.

Field Blanks

The associate field blank was not identified for this SDG. No qualifications are required.

Surrogates

All of the surrogate recoveries for the all blanks and samples were within QA/QC limits. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The associated MS/MSD was not identified for this SDG. No qualifications are required.

Field Duplicate

No qualifications are required.

Compound Identification/Quantitation

No qualifications are required.

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
VBLKAE603 65MW07A05 65MW05A04 65MW05A00	bromomethane vinyl chloride 2-butanone	+	J	1
VBLKAE9707 65MW07A00	chloromethane vinyl chloride chloroform 2-butanone	+	J	2
65MW05A00 65MW05A04 65MW07A05	methylene chloride	+	CRQL	3
65MW07A00	acetone	+	CRQL	3
65MW05A00	xylene (total)	+	CRQL	3

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 3/90 SOW; Region III Modifications to the National Functional Guidelines for Organic Data Review, and DQO Level III. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # 65MW05

Holding Times

All extraction and analysis holding times for all samples were met for all samples per the SOW and National Functional Guidelines. No qualifications are required.

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were not acceptable for all compound %RSDs and the average RRFs for all of the criteria compounds did not meet the initial calibration criteria.

Specific Finding:

1. The initial calibration analyzed on, 04/13/95, contained compounds with %RSDs greater than 30%. No qualifications are required, because no samples were analyzed following the calibration.

carbazole

Continuing Calibrations

The continuing calibrations that were analyzed all of the criteria and non criteria compounds met requirements for RRFs. Qualifications are required for compounds with non compliant %Ds.

Specific Findings:

2. The continuing calibration, BCC0414, contained compounds with %Ds greater than 25% D but less than 50% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J).

SBLKAE9132B	hexachlorocyclopentadiene
65MW07A05	2,4-dinitrophenol
65MW07A00	
65MW05A04	
65MW05A00	

Internal Standards

All internal standard EICP areas met the internal standard EICP area QA/QC criteria. No qualifications are required.

Method Blanks

The method blank that was analyzed exhibited contamination for di-n-butylphthalate and TICs. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific Finding:

3. The samples listed below have been qualified for method blank contamination. The qualification are for all method blanks.

65MW05A00	di-n-butylphthalate	CRQL
65MW05A04		
65MW07A00		
65MW07A05		

RESUB

Method Blanks (continued)

Specific Finding:

4. Reject all TICs flagged with the laboratory qualifier "B", due to method blank contamination.

Rinseate Blanks

The associated rinseate blank was not identified for this SDG. No qualifications are required.

Field Blanks

The associated field blank was not identified for this SDG. No qualifications are required.

Surrogates

Surrogate recoveries for all samples and blanks met QA/QC criteria. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate

The associated MS/MSD was not identified for this SDG. No qualifications are required.

Field Duplicates

No qualifications are required.

Compound Identification/Quantitation

No qualifications are required.

System Performance and Overall Assessment

Overall performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates less than 10% of data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
SBLKAE9132B	hexachlorocyclo-pentadiene	+	J	2
65MW07A05 65MW07A00 65MW05A04 65MW05A00	2,4-dinitrophenol			
65MW05A00 65MW05A04 65MW07A00 65MW07A05	di-n-butylphthalate	+	CRQL	3
All samples	"B" flagged TICs	+	R	4

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\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLOR ANALYSIS

General

The organic findings offered in this screening report assume that all analytical results are correct as reported and are based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form Is). Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # 05A-00

Holding Times

All extraction and analysis holding times were met based on extraction and analysis information in the data package and the chain of custody records.

GC Instrument Performance

The resolution requirements were met on both columns in the sequence. The analytical sequence was acceptable. All 4,4'-DDT and endrin breakdowns were within QC limits. All surrogate retention times were within the established retention time windows (RTWs). All PEM standard RPDs were within the 25% QC limit.

Initial Calibrations

The initial calibrations were not acceptable for the linearity of all compounds. Raw data was not required in this Level E data package.

Specific Finding

1. The initial calibration on 05/18/95 contained a compound with a %RSD greater than 20%. For the samples and non compliant compound listed below, qualify all positive and non-detect results as estimated J/UJ.

   65MW-07A00DL 4,4'-DDD

RESUB

Continuing Calibrations

All compounds in the calibration standards were within the laboratory reported Retention Time Windows (RTWs) for all columns. All continuing calibration standard associated with the reported samples exhibited relative percent differences, RPDs, within the QC limits. Raw data was not required in this Level E data package. No qualifications are required.

Method Blanks

The associated method blanks did not exhibit contamination for target compounds.

Instrument Blanks

The instrument blanks were free of target compound contamination.

QC Blanks

There were no QC blanks in this SDG.

Florisil/GPC Checks

The GPC clean-up check standard exhibited acceptable recoveries for all compounds. The Florisil cartridge check exhibited acceptable spike recoveries for all compounds. Raw data was not required in the Level E data package.

Surrogate Recoveries

The surrogate recoveries in the field samples were within QC limits in all samples with the exception of the 1:2 dilution of sample 65MW07A00DL. A dilution of 1:2 should not affect surrogate recoveries so the data was qualified.

Specific Finding

2. The positive and non-detect results in the following sample are qualified as estimated, J/UJ, due to TCMX and DCB recoveries which were below the QC limits, but above 10%.

   65MW07A00DL

Matrix Spike/Matrix Spike Duplicate

There was no MS/MSD pair in this SDG. The LCS exhibited acceptable recoveries for spiked compounds. No qualifications were required.

Field Duplicates

There was no field duplicate pair in this SDG.

Analyte Identification/Quantitation

Some positive results were reported in the samples. Identification and quantitation appear reasonable based on sample and standard review. Quantitation calculations were not verified because raw data is not a required deliverable for NEESA Level E QC. Some of the reported results exhibited column quantitation differences which were greater than 25%. One sample required a dilution to bring detected target compound within the calibration range.

Specific Finding

3. All positive results which exhibited column quantitation %Ds which are greater than 25% but less than 100% are qualified as estimated, J.

4. For sample 65-MW-07A-00, reject all Z flagged results and report all D flagged results for those compounds from the dilution analysis.

5. All positive results which exhibited column quantitation %Ds which are greater than or equal to 100%are qualified as presumptively present at an estimated concentration, NJ.

Overall Assessment

The overall quality of the data package is good. The reported results are accepted as reported by the laboratory with the noted qualifications based on the limited deliverables in a Level E data package.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

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UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
65-MW-07A-00DL	4,4'-DDD	+/U	J/UJ	1
65-MW-07A-00DL	All	+/U	J/UJ	2
ALL SAMPLES	ALL P >25%, But <100%	+	J	3
65-MW-07A00 65-MW-07A-00DL	ALL Z flagged ALL but D flagged	+ +/U	R	4
ALL SAMPLES	All P ≥ 100%	+	NJ	5

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QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
Metals

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations are recalculated by the reviewer. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **CTO-312, SDG# N\A,** the analysis of four (4) field soil samples and no Matrix Spike and Duplicate pair for TAL Metals and Cyanide. Overall, the inorganic data quality was fair. All protocol requirements were followed with the exception of the following problems.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blank

1. The preparation blanks exhibited contamination for the following elements.

Calcium	8.94	mg/kg
Cobalt	5.09	mg/kg
Zinc	3.57	mg/kg

The USEPA requires that all sample values below five times the preparation or calibration blank contamination be qualified as non-detect, "U".

Interferences

No significant interferences were observed.

Spike Recovery

No spike for this SDG.

Duplicate

No duplicate for this SDG.

LCS

No deficiencies in this section.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING
All soil samples	Ca, Co and Zn.	+	U	1

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

RESUB

HEARTLAND ENVIRONMENTAL
SERVICES, INC.

SDG# 65DW04

SAMPLES AND FRACTIONS REVIEWED

Sample Identifications			Analytical Fractions			
BAKER ID	**QUANT ID**	**Matrix**	**VOA**	**SV**	**P/P**	**TAL**
65-DW04-05	AE9158	SOIL	X	X	X	X
65-DW04-00	AE9167	SOIL	X	X	X	X
Total Number of Samples (Water/Soil)			**0/2**	**0/2**	**0/2**	**0/2**

Individual fractions were reviewed as follows:

	Primary	Secondary
VOA - Volatiles (CLP, OLM01.8)	Dan Heil	Gene Watson
SV - Semivolatiles (CLP, OLM01.8)	Dan Heil	Gene Watson
P/P - Pesticide/PCBs (CLP, OLM01.8)	Jackie Cleveland	Gene Watson
TAL - Total Metals (CLP, ILM02.1)	Paul Humburg	

DATA ASSESSMENT NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP SOW; the National Functional Guidelines for Organic Data Review, June, 1991; NEESA Level C requirements, and good professional judgement. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # 65DW04

Holding Times

All of the analyses were performed within fourteen (14) days from date of collection. No qualifications are required.

Tuning

All the BFB tunes met the tuning criteria set forth by the method and the Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibration exhibited acceptable %RSDs and RRFs. No qualifications are required.

Continuing Calibrations

The continuing calibrations exhibited %Ds that were non compliant. All RRFs were acceptable.

Continuing Calibrations - continued

Specific findings:

1. The continuing calibration QS0411 contained compounds with %Ds greater than 25%, but less than 50%. For the samples listed below, qualify all positive results as estimated (J).

All samples	chloromethane
	vinyl chloride
	chloroform
	2-butanone

Internal Standards

All of the internal standard EICP areas are within the QA/QC limits of the continuing calibration EICP internal standard areas. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for acetone, 2-butanone, 2-hexanone, and 1,1,2,2-tetrachloroethane. All samples will be qualified based on their associated method blank.

Specific findings:

2. The following samples have been qualified for method blank contamination.

65DW0400	acetone	+BJ	CRQL	2
65DW0405	acetone	+B	NA	2

Trip Blanks

A trip blank was not identified in this SDG.

System Monitoring Compounds

All of the surrogate recoveries for the samples were acceptable. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate

A MS/MSD was not identified in this SDG.

Field Duplicates

A field duplicate pair was not identified.

Compound Identification/Quantitation

No qualifications are required.

System Performance and Overall Assessment

The overall performance of the GC/MS system was acceptable. The overall quality of the data package is acceptable. The data validator estimates that less than 5% of the data is qualified or rejected.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

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J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
All samples	chloromethane vinyl chloride chloroform 2-butanone	+	J	1
65DW0400	acetone	+BJ	CRQL	2
65DW0405	acetone	+B	NA	2

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 3/90 SOW; Region III Modifications to the National Functional Guidelines for Organic Data Review, and DQO Level III. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # 65DW04

Holding Times

All extraction and analysis holding times for all samples were met for all samples per the SOW and National Functional Guidelines. No qualifications are required.

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were not acceptable for all compound %RSDs and the average RRFs for all of the criteria compounds did not meet the initial calibration criteria.

Specific Finding:

1. The initial calibration analyzed on, 03/31/95, contained compounds with %RSDs greater than 30%. No qualifications are required, because no samples were analyzed following the calibration.

2,4-dinitrophenol

Continuing Calibrations

The continuing calibrations that were analyzed all of the criteria and non criteria compounds met requirements for RRFs. Qualifications are required for compounds with non compliant %Ds.

Specific Findings:

2. The continuing calibration, CCA0413, contained compounds with %Ds greater than 25% D but less than 50% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J).

65DW0400	2-nitrophenol
SBLKAE9260A	4-chloroaniline

3. The continuing calibration, CCA0413, contained compounds with %Ds greater than 50% D but less than 90% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

65DW0400	4,6-dinitro-2-methylphenol
SBLKAE9260A	

4. The continuing calibration, CCA0413, contained compounds with %Ds greater than 90% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J) and reject all non detects (R).

65DW0400	2,4-dinitrophenol
SBLKAE9260A	

5. The continuing calibration, CCA0417, contained compounds with %Ds greater than 25% D but less than 50% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J).

65DW0405	2-nitroaniline
	2,4-dinitrophenol

Continuing Calibrations (continued)

Specific Finding:

6. The continuing calibration, CCA0417, contained compounds with %Ds greater than 90% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J) and reject all non detects (R).

65DW0405	4-nitroaniline

Internal Standards

All internal standard EICP areas met the internal standard EICP area QA/QC criteria. No qualifications are required.

Method Blanks

The method blank that was analyzed exhibited contamination for di-n-butylphthalate, bis(2-ethylhexyl)phthalate and TICs. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific Finding:

7. The samples listed below have been qualified for method blank contamination. The qualification are for all method blanks.

65DW0400 65DW0405	di-n-butylphthalate	CRQL
65DW0400	bis(2-ethylhexyl) phthalate	CRQL

8. Reject all TICs flagged with the laboratory qualifier "B", due to method blank contamination.

Rinseate Blanks

The associated rinseate blank was not identified for this SDG. No qualifications are required.

Field Blanks

The associated field blank was not identified for this SDG. No qualifications are required.

Surrogates

Surrogate recoveries for all samples and blanks met QA/QC criteria. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate

The associated MS/MSD was not identified. No qualifications are required.

Field Duplicates

No qualifications are required.

Compound Identification/Quantitation

No qualifications are required.

System Performance and Overall Assessment

Overall performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates less than 10% of data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
65DW0400 SBLKAE9260A	2-nitrophenol 4-chloroaniline	+	J	2
65DW0400 SBLKAE9260A	4,6-dinitro-2-methylphenol	+/-	J/UJ	3
65DW0400 SBLKAE9260A	2,4-dinitrophenol	+/-	J/R	4
65DW0405	2-nitroaniline 2,4-dinitrophenol	+	J	5
65DW0405	4-nitroaniline	+/-	J/R	6
65DW0400 65DW0405	di-n-butylphthalate	+	CRQL	7
65DW0400	bis(2-ethylhexyl) phthalate	+	CRQL	7
All samples	"B" flagged TICs	+	R	8

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

RESUB

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLOR ANALYSIS

General

The organic findings offered in this screening report assume that all analytical results are correct as reported and are based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form Is). Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # 65DW04

Holding Times

All extraction and analysis holding times were met based on extraction and analysis information in the data package and the chain of custody records.

GC Instrument Performance

The resolution requirements were met on both columns in the sequence. The analytical sequence was acceptable. All 4,4'-DDT and endrin breakdowns were within QC limits. All surrogate retention times were within the established retention time windows (RTWs). All PEM standard RPDs were within the 25% QC limit.

Initial Calibrations

The initial calibrations were not acceptable for the linearity of all compounds. Raw data was not required in this Level C data package.

Specific Finding

1. The initial calibration on instrument 5890K, 4/18/95, exhibited a compound with a %RSD greater than 20%. All positive and non-detect results in the following samples for the non-compliant compound noted below associated with the ICAL are qualified as estimated, J/UJ.

   All Samples 4,4'-DDD

results

D17

Continuing Calibrations

All compounds in the calibration standards were within the laboratory reported Retention Time Windows (RTWs) for all columns. All continuing calibration standard associated with the reported samples exhibited relative percent differences, RPDs, within the QC limits. Raw data was not required in this Level C data package. No qualifications are required.

Method Blanks

The associated method blank did not exhibit contamination for target compounds.

Instrument Blanks

The instrument blanks were free of target compound contamination.

QC Blanks

There were no field QC blanks in this SDG.

Florisil/GPC Checks

The GPC clean-up check standard exhibited acceptable recoveries for all compounds. The Florisil cartridge check exhibited acceptable spike recoveries for all compounds. Raw data was not required in the Level C data package.

Surrogate Recoveries

The surrogate recoveries in the field samples were within QC limits in all soil samples with the exception of DCB on one (1) column in sample 65DW0400. The recovery was above the QC limits and there were no positive results in the sample. Qualifications were not required.

Matrix Spike/Matrix Spike Duplicate

There was no MS/MSD pair in this SDG. The LCS sample exhibited acceptable recoveries for spiked compounds. No qualifications were required.

resub

Field Duplicates

There was no field duplicate pair in this SDG.

Analyte Identification/Quantitation

No positive results were reported in the samples. Identification and quantitation appear reasonable based on sample and standard review. Quantitation calculations were not verified because raw data is not a required deliverable for NEESA Level C QC. No further qualifications were required.

Overall Assessment

The overall quality of the data package is good. The reported results are accepted as reported by the laboratory with the noted qualifications based on the limited deliverables in a Level C data package.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
All	4,4'-DDD	+/U	J/UJ	1

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

resub

DATA ASSESSMENT NARRATIVE
Metals

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations are recalculated by the reviewer. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **CTO-312, SDG# DW0400,** the analysis of two (2) field soil samples and no Matrix Spike and Duplicate pair for TAL Metals. Overall, the inorganic data quality was fair. All protocol requirements were followed with the exception of the following problems.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blank

1. The preparation blanks exhibited contamination for the following elements.

PBS		
Calcium	8.94	mg/kg
Cobalt	5.09	mg/kg
Zinc	3.57	mg/kg

The calibration blanks exhibited contamination for the following elements.

Cobalt	44.6	ug/l

The USEPA requires that all sample values below five times the preparation or calibration blank contamination be qualified as non-detect, "U".

results

Interferences

No significant interferences were observed.

Spike Recovery

No deficiencies in this section.

Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

rcsub

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING
All soil samples	Ca, Co and Zn.	+	U	1

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

HEARTLAND ENVIRONMENTAL SERVICES, INC.

JOB# 3318

SAMPLES AND FRACTIONS REVIEWED

Sample Identifications			Analytical Fractions			
BAKER ID	QUANT ID	Matrix	VOA	SV	P/P	TAL
65RB01	AE9413	WATER	X	X	X	X
65TB01	AE9419	WATER	X			
65DW0100	AE9458	SOIL	X	X	X	X
64DW0104	AE9428	SOIL	X	X	X	X
65DW0104D	AE9430	SOIL	X	X	X	X
65DW0200	AE9424	SOIL	X	X	X	X
65DW0202	AE9426	SOIL	X	X	X	X
65MW06A00	AE9456	SOIL	X	X	X	X
65MW06A00MS	AE9456MS	SOIL	X	X	X	X
65MW06A00MD	AE9456MD	SOIL	X	X	X	X
65MW06A00D	AE9422	SOIL	X	X	X	X
65MW06A03	AE9454	SOIL	X	X	X	X
65SB0700	AE9448	SOIL	X	X	X	X
65SB0700D	AE9450	SOIL	X	X	X	X
65SB0704	AE9452	SOIL	X	X	X	X
65SB0900	AE9444	SOIL	X	X	X	X
65SB0902	AE9446	SOIL	X	X	X	X
65SB1000	AE9440	SOIL	X	X	X	X
65SB1001	AE9442	SOIL	X	X	X	X
65SB1100	AE9436	SOIL	X	X	X	X
65SB1104	AE9432	SOIL	X	X	X	X
65SB1104MS	AE9432MS	SOIL	X	X	X	X
65SB1104MD	AE9432MD	SOIL	X	X	X	X
65SB1104D	AE9434D	SOIL	X	X	X	X
Total Number of Samples (Water/Soil)			2/22	1/22	1/22	1/22

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 3/90 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # DW01; CASE # 3318

Holding Times

The holding times for all of the samples were not met per the Organic Functional Guidelines and the CLP SOW (fourteen (14) days from collection date). No qualifications are required.

Tuning

All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were not acceptable for all compound %RSDs and the average RRFs for all of the criteria compounds did not meet the initial calibration criteria.

Specific Finding:

1. The initial calibration analyzed on, 04/03/95, contained compounds with %RSDs greater than 30%. No qualifications are required, because no samples were analyzed following the calibration.

acetone

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds that were not within %D continuing calibration criteria. All RRFs were within calibration criteria.

Specific Finding:

2. The continuing calibration, WS0412, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

VBLKAE9691	bromoform
65RB01	

3. The continuing calibration, WS0417, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

VBLKAE9942	bromoform
65TB01	2-hexanone

4. The continuing calibration, QS0412, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

VBLKAE9715	chloroethane
65MW06A00MS	2-hexanone
65MW06A00MSD	
65MW06A00D	
65DW0200	
65DW0202	
65DW0104	
65DW0104D	
65SB1100	
65SB1104MS	
65SB1104MSD	
65SB1104	
65SB1104D	

Continuing calibrations (continued)

Specific Finding:

5. The continuing calibration, QS0413, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

VBLKAE9944	chloroethane
65DW0202DL	
65SB1000	
65SB1001	
65SB0900	
65SB0902	
65SB0700	
65SB0704	
65MW06A00	
65DW0100	

6. The continuing calibration, QS0414, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

VBLKAE9945	chloroethane
65SB0700D	4-methyl-2-pentanone
65SMW06A03	2-hexanone

Internal Standards

All internal standard EICP areas met the internal standard EICP area QA/QC criteria. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for methylene chloride, acetone, 2-butanone, 2-hexanone, 1,1,2,2-tetrachloroethane and xylene. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Method Blanks (continued)

Specific findings:

7. The following samples have been qualified for method blank contamination. The qualifications are for all the method blanks.

65TB01	toluene	CRQL:
65DW0104 65DW0200	acetone	U
65MW06A00D 65MW06A00MS 65MW06A00MSD 65DW0100 65SB0700 65SB0900 65SB1000 65MW06A03	acetone	CRQL
65MW06A03 65SB0700D	methylene chloride	CRQL

Trip Blanks

The trip blank that was analyzed exhibited contamination for toluene. however, the contamination was attributed to the associated method blank. No qualifications are required.

Rinseate Blanks

The rinseate blank that was analyzed exhibited contamination for methylene chloride acetone and 1,2-dichloroethane. However, the contamination found in the samples was attributed to the associated method blank. No qualifications are required.

Field Blanks

The associate field blank was not identified for this SDG. No qualifications are required.

Surrogates

All of the surrogate recoveries for the all blanks and samples were within QA/QC limits. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All spike and RPD recoveries were within advisory limits for MS/MSD 65MW06A00 and MS/MSD 65SB1104. No qualifications are required.

Field Duplicate

No qualifications are required.

Compound Identification/Quantitation

Specific Finding:

8. For sample 65DW0202, reject all E-flagged results in favor of the D-flagged results in the diluted sample. For the diluted sample 65DW0202DL, reject all results except for the D-flagged results with corresponding E-flagged results in the original sample analysis.

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
VBLKAE9691 65RB01	bromoform	+	J	2
VBLKAE9942 65TB01	bromoform 2-hexanone	+	J	3
VBLKAE9715 65MW06A00MS 65MW06A00MSD 65MW06A00D 65DW0200 65DW0202 65DW0104 65DW0104D 65SB1100 65SB1104MS 65SB1104MSD 65SB1104 65SB1104D	chloroethane 2-hexanone	+	J	4
VBLKAE9944 65DW0202DL 65SB1000 65SB1001 65SB0900 65SB0902 65SB0700 65SB0704 65MW06A00 65DW0100	chloroethane	+	J	5
VBLKAE9945 65SB0700D 65SMW06A03	chloroethane 4-methyl-2-pentanone 2-hexanone	+	J	6

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QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
65TB01	toluene	+	CRQL:	7
65DW0104 65DW0200	acetone	+	U	7
65MW06A00D 65MW06A00MS 65MW06A00MSD 65DW0100 65SB0700 65SB0900 65SB1000 65MW06A03	acetone	+	CRQL	7
65MW06A03 65SB0700D	methylene chloride	+	CRQL	7
65DW0202	All E-flagged results	+	R	8
65DW0202DL	All results except D-flagged results	+/-	R	8

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QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 3/90 SOW; to the National Functional Guidelines for Organic Data Review, and NEESA Level C. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # DW01; CASE # 3318

Holding Times

All extraction and analysis holding times for all samples were met for all samples per the SOW and National Functional Guidelines. No qualifications are required.

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were not acceptable for all compound %RSDs and the average RRFs for all of the criteria compounds did not meet the initial calibration criteria.

Specific Finding:

1. The initial calibration analyzed on, 04/13/95, contained compounds with %RSDs greater than 30%. No qualifications are required, because no samples were analyzed following the calibration.

carbazole

Continuing Calibrations

The continuing calibrations that were analyzed all of the criteria and non criteria compounds met requirements for RRFs. Qualifications are required for compounds with non compliant %Ds.

Specific Findings:

2. The continuing calibration, BCC0419, contained compounds with %Ds greater than 25% D but less than 50% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J).

SBLKAE9604B	2,2'-oxybis(1-chloropropane)
65MW06A00MS	2-nitroaniline
65MW06A00MSD	4-nitrophenol
65MW06A00D	4-nitroaniline
65DW0200	pentachlorophenol
65DW0104	carbazole
65DW0104D	di-n-butylphthalate
65DW0202	bis(2-ethylhexyl)phthalate
65SB1104	di-n-octylphthalate
65SB1104D	
65SB1100	
65SB1104MS	
65SB1104MSD	
65SB1000	
65SB1001	

Continuing Calibrations (continued)

Specific Findings:

3. The continuing calibration, BCC0419, contained compounds with %Ds greater than 50% D but less than 90% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

SBLKAE9604B	hexachlorocyclopentadiene
65MW06A00MS	
65MW06A00MSD	
65MW06A00D	
65DW0200	
65DW0104	
65DW0104D	
65DW0202	
65SB1104	
65SB1104D	
65SB1100	
65SB1104MS	
65SB1104MSD	
65SB1000	
65SB1001	

4. The continuing calibration, BCC0422, contained compounds with %Ds greater than 25% D but less than 50% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J).

65RB01	2,4-dinitrophenol
	4-nitrophenol

5. The continuing calibration, BCC0425, contained compounds with %Ds greater than 25% D but less than 50% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J).

65MW06A00	4-nitrophenol
65DW0100	4,6-dinitro-2-methylphenol
SBLKAE9763B	

Continuing Calibrations (continued)

Specific Findings:

6. The continuing calibration, BCC0425, contained compounds with %Ds greater than 50% D but less than 90% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

65MW06A00	2,4-dinitrophenol
65DW0100	
SBLKAE9763B	

Internal Standards

All internal standard EICP areas met the internal standard EICP area QA/QC criteria. No qualifications are required.

Method Blanks

The method blank that was analyzed exhibited contamination for di-n-butylphthalate and TICs. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific Finding:

7. The samples listed below have been qualified for method blank contamination. The qualification are for all method blanks.

All samples	di-n-butylphthalate	CRQL

8. Reject all TICs flagged with the laboratory qualifier "B", due to method blank contamination.

Rinseate Blanks

The rinseate blank that was analyzed did not exhibited any contamination. No qualifications are required.

Field Blanks

The associated field blank was not identified for this SDG. No qualifications are required.

Surrogates

Surrogate recoveries for all samples and blanks met QA/QC criteria. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate

All spike and RPD recoveries were within advisory limits the MS/MSD 65MW06A00. However, all spike and RPD recoveries were within advisory limits the MS/MSD 65SB1104. The MS/MSD samples exhibited high RPDs for 1,4-dichlorobenzene, 1,2,4-trichlorobenzene and acenaphthene. No qualifications are required.

Field Duplicates

No qualifications are required.

Compound Identification/Quantitation

No qualifications are required.

System Performance and Overall Assessment

Overall performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates less than 10% of data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
SBLKAE9604B	2,2'-oxybis (1-chloropropane)	+	J	2
65MW06A00MS	2-nitroaniline			
65MW06A00MSD	4-nitrophenol			
65MW06A00D	4-nitroaniline			
65DW0200	pentachlorophenol			
65DW0104	carbazole			
65DW0104D	di-n-butylphthalate			
65DW0202	bis(2-ethylhexyl)phthalate			
65SB1104	di-n-octylphthalate			
65SB1104D				
65SB1100				
65SB1104MS				
65SB1104MSD				
65SB1000				
65SB1001				
SBLKAE9604B	hexachlorocyclo-pentadiene	+/-	J/UJ	3
65MW06A00MS				
65MW06A00MSD				
65MW06A00D				
65DW0200				
65DW0104				
65DW0104D				
65DW0202				
65SB1104				
65SB1104D				
65SB1100				
65SB1104MS				
65SB1104MSD				
65SB1000				
65SB1001				
65RB01	2,4-dinitrophenol 4-nitrophenol	+	J	4

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
65MW06A00 65DW0100 SBLKAE9763B	4-nitrophenol 4,6-dinitro-2-methylphenol	+	J	5
65MW06A00 65DW0100 SBLKAE9763B	2,4-dinitrophenol	+/-	J/UJ	6
All samples	di-n-butylphthalate	+	CRQL	7
All samples	"B" flagged TICs	+	R	8

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLOR ANALYSIS

General

The organic findings offered in this screening report assume that all analytical results are correct as reported and are based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form Is). Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # 65DW01

Holding Times

All extraction and analysis holding times were met based on extraction and analysis information in the data package and the chain of custody records.

GC Instrument Performance

The resolution requirements were met on both columns in the sequence. The analytical sequence was acceptable. All 4,4'-DDT and endrin breakdowns were within QC limits. All surrogate retention times were within the established retention time windows (RTWs). All PEM standard RPDs were within the 25% QC limit.

Initial Calibrations

The initial calibrations were not acceptable for the linearity of all compounds. Raw data was not required in this Level C data package.

Specific Finding

1. The initial calibration on instrument 5890K, 4/18/95, exhibited a compound with a %RSD greater than 20%. All positive and non-detect results in the following samples for the non-compliant compound noted below associated with the ICAL are qualified as estimated, J/UJ.

   All Samples 4,4'-DDD

Continuing Calibrations

All compounds in the calibration standards were within the laboratory reported Retention Time Windows (RTWs) for all columns. All continuing calibration standard associated with the reported samples exhibited relative percent differences, RPDs, within the QC limits. Raw data was not required in this Level C data package. No qualifications are required.

Method Blanks

The associated method blank did not exhibit contamination for target compounds.

Instrument Blanks

The instrument blank data was not present in this NEESA Level C data package.

QC Blanks

The field rinseate blank analzyed in this SDG exhibited contamination for the compound 4,4'-DDT at 0.24 ug/L. This concentration corresponds to a soil contamination level of 8.0 ug/Kg. The samples exhibiting positive results for 4,4'-DDT were compared to the rinseate blank contamination level for qualifications.

Specific Finding

2.	Compound	Concentration	Action Level
	4,4'-DDT	0.24ug/L ↔ 8.0 ug/Kg	40 ug/Kg
	U		

65DW0100
65DW0104
65SB0700D
65SB0900

Florisil/GPC Checks

The GPC clean-up check standard exhibited acceptable recoveries for all compounds. The Florisil cartridge check exhibited acceptable spike recoveries for all compounds. Raw data was not required in the Level C data package.

Surrogate Recoveries

The surrogate recoveries in the field samples were within QC limits in all soil samples with the exception sample 65SB1104D. The recoveries for TCMX and DCB were below the QC limits.

Specific Finding

3. The reported positive and non-detect results in the following sample are qualified as estimated, J/UJ, due to TCMX and DCB recoveries below the QC limits on one (1) or both columns.

   65SB1104D

Matrix Spike/Matrix Spike Duplicate

The MS/MSD pairs of samples 65SB01104 and 65MW06A00 exhibited acceptable recoveries and RPDs for all spike compounds. The LCS samples exhibited acceptable recoveries for spiked compounds. No qualifications were required.

Field Duplicates

The field duplicate pair of sample 65DW0104 exhibited positive results with poor precision results for three (3) compounds. The compounds were detected in the original sample but not the field duplicate sample. The field duplicate pair of sample 65SB0700 exhibited positive results with poor precision for two (2) compounds. The compound 4,4'-DDT was negated in the field duplicate sample due to rinseate blank contamination, but the concentration in the original sample was above the action limit for qualification. The field duplicate pairs of samples 65SB1104 and 65MW06A00 did not exhibit positive results for target compounds. Positive results reported in the field duplicate pairs for compounds exhibiting poor precision were qualified as estimated, J.

Field Duplicates, continued

Specific Finding

4. The positive results reported in the following samples for the noted compounds are qualified as estimated, J, due to poor duplicate precision.

65DW0104	4,4'-DDE
65DW0104D	4,4'-DDD
	ENDRIN ALDEHYDE
65SB0700	4,4'-DDE
65SB0700D	4,4'-DDT

Analyte Identification/Quantitation

Positive results were reported in the samples. Identification and quantitation appear reasonable based on sample and standard review. Quantitation calculations were not verified because sample chromatograms were not included in the NEESA Level C data package. Several reported compounds exhibited column quantitations greater than 25%. Three sample required dilution to bring target compounds within the calibration range.

Specific Findings

5. Results reported with a Z flag indicating that the compound is outside the linear range of the calibration range are rejected and replaced with the D flagged result from the dilution analysis of the sample. All other results reported from the dilution analysis are rejected in favor of the results reported from the undiluted analysis of the sample.

6. Positive results exhibited column quantitation %Ds greater than 25% but less than or equal to 100% are qualified as estimated, J.

7. Positive results exhibited column quantitation %Ds greater than 100% are qualified as presumptively present at an estimated concentration, NJ.

Overall Assessment

The overall quality of the data package is good. The reported results are accepted as reported by the laboratory with the noted qualifications based on the limited deliverables in a Level C data package. Sample chromatograms should have been included in the Level C package, but were not.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
All	4,4'-DDD	+/U	J/UJ	1
65DW0100 65DW0104 65SB0700D 65SB0900	4,4'-DDT	+	U	2
65SB1104D	All	+/U	J/UJ	3
65DW0104 65DW0104D	4,4'-DDE 4,4'-DDD ENDRIN ALDEHYDE	+	J	4
65SB0700 65SB0700D	4,4'-DDE 4,4'-DDT			
All	All Z flagged	+	R	5
ALL	ALL P >25%, BUT ≤ 100%	+	J	6
ALL	ALL P > 100%	+	NJ	7

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
Metals

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations are recalculated by the reviewer. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **CTO-312, SDG# DW0104**, the analysis of eighteen (18) field soil samples and one Matrix Spike and Duplicate pair and one water QC sample for TAL Metals. Overall, the inorganic data quality was fair. All protocol requirements were followed with the exception of the following problems.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blank

1. The calibration blanks exhibited contamination for the following elements.

Beryllium	1.4	ug/l

   The USEPA requires that all sample values below five times the preparation or calibration blank contamination be qualified as non-detect, "U".

2. The preparation blanks exhibited negative bias for the following elements.

PBS			PBW		
Cobalt	-6.1	mg/kg	Cobalt	-42.7	ug/l
Iron	-3.13	mg/kg			

   All positive and non-detect results below ten times the negative bias will be qualified as estimated, "J" or "UJ".

Interferences

No significant interferences were observed.

Spike Recovery

3. The Matrix Spike recovery for Zinc was below the lower control limits. All positive and non-detect results are qualified as estimated, "J' or "UJ".

Duplicate

4. The Duplicate analyses for Iron, Lead, Manganese and Zinc were outside the control limits. All positive results are qualified as estimated, "J". The RPD for Aluminum was not greater than 35% and will not be qualified.

LCS

No deficiencies in this section.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING
All samples	Be.	+	U	1
All soil samples All water samples	Co and Fe. Co.	+/U	J/UJ	2
All soil samples	Zn.	+/U	J/UJ	3
All soil samples	Fe, Pb, Mn and Zn.	+	J	4

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

Inorganics
Major and Minor findings

1. Holding times
   No major or minor findings for this section.

2. Calibration
   No major or minor findings for this section.

3. Blanks
   Minor findings for Beryllium, Cobalt and Iron for this section.

4. Interferences
   No major or minor findings for this section.

5. Matrix Spikes
   Minor findings for Zinc for this section.

6. Duplicates
   Minor findings for Iron, Lead, Manganese and Zinc for this section.

7. LCS
   No major or minor findings for this section.

8. Serial Dilutions
   No major or minor findings for this section.

HEARTLAND ENVIRONMENTAL
SERVICES, INC.

JOB# 3333

SAMPLES AND FRACTIONS REVIEWED

Sample Identifications			Analytical Fractions			
BAKER ID	**QUANT ID**	**Matrix**	**VOA**	**SV**	**P/P**	**TAL**
65RB03	AE9667	WATER	X	X	X	X
65TB02	AE9673	WATER	X			
65SB0600	AE9659	SOIL	X	X	X	X
65SB0602	AE9661	SOIL	X	X	X	X
65SB0800	AE9665	SOIL	X	X	X	X
65SB0804	AE9663	SOIL	X	X	X	X
Total Number of Samples (Water/Soil)			**2/4**	**1/4**	**1/4**	**1/4**

MS - Matrix Spike MD - Matrix Spike Duplicate

Individual fractions were reviewed as follows:

	Primary	Secondary
VOA - Volatiles (CLP, OLM01.8)	Dan Heil	Gene Watson
SV - Semivolatiles (CLP, OLM01.8)	Dan Heil	Gene Watson
P/P - Pesticide/PCBs (CLP, OLM01.8)	Jackie Cleveland	Gene Watson
TAL - Total Metals (CLP, ILM02.1)	Paul Humburg	Jackie Cleveland

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 3/90 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # 65RB0; CASE # 3333

Holding Times

The holding times for all of the samples were not met per the Organic Functional Guidelines and the CLP SOW (fourteen (14) days from collection date). No qualifications are required.

Tuning

All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were not acceptable for all compound %RSDs and the average RRFs for all of the criteria compounds did not meet the initial calibration criteria.

Specific Finding:

1. The initial calibration analyzed on, 04/03/95, contained compounds with %RSDs greater than 30%. No qualifications are required, because no samples were analyzed following the calibration.

acetone

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds that were not within %D continuing calibration criteria. All RRFs were within calibration criteria.

Specific Finding:

2. The continuing calibration, WS0412, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

VBLKAE9691	bromoform
65TB02	
65RB03	

3. The continuing calibration, WS0414, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

VBLKAE9945	chloroethane
65SB0600	
65SB0602	
65SB0800	

4. The continuing calibration, QS0420B, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

VBLKAF0294	chloromethane
65SB0804	carbon tetrachloride

Internal Standards

All internal standard EICP areas met the internal standard EICP area QA/QC criteria. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for methylene chloride, acetone, 2-butanone, 2-hexanone, 1,1,2,2-tetrachloroethane and xylene. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific findings:

5. The following samples have been qualified for method blank contamination. The qualifications are for all the method blanks.

65SB0602	acetone	U
65SB0600 65SB0800 65SB0804	acetone	CRQL
65SB0600 65SB0602 65SB0800	methylene chloride	CRQL
65SB0602	2-butanone	CRQL

Trip Blanks

The trip blank that was analyzed exhibited contamination for methylene chloride, acetone, 1,2-dichloroethane and toluene. The trip blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific findings:

6. The following samples have been qualified for blank contamination. The qualifications are for all the blanks.

65SB0804	methylene chloride	CRQL

Rinseate Blanks

The rinseate blank that was analyzed exhibited contamination for methylene chloride acetone, 1,2-dichloroethane and 2-butanone. However, the contamination found in the samples was attributed to the associated method blank and/or trip blank. No qualifications are required.

Field Blanks

The associate field blank was not identified for this SDG. No qualifications are required.

Surrogates

All of the surrogate recoveries for the all blanks and samples were within QA/QC limits. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The associated MS/MSD was not identified for this SDG. No qualifications are required.

Field Duplicate

No qualifications are required.

Compound Identification/Quantitation

No qualifications are required.

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
VBLKAE9691 65TB02 65RB03	bromoform	+	J	2
VBLKAE9945 65SB0600 65SB0602 65SB0800	chloroethane	+	J	3
VBLKAF0294 65SB0804	chloromethane carbon tetrachloride	+	J	4
65SB0602	acetone	+	U	5
65SB0600 65SB0800 65SB0804	acetone	+	CRQL	5
65SB0600 65SB0602 65SB0800	methylene chloride	+	CRQL	5
65SB0602	2-butanone	+	CRQL	5
65SB0804	methylene chloride	+	CRQL	6

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 3/90 SOW; to the National Functional Guidelines for Organic Data Review, and NEESA Level C. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # 65RB0; CASE # 3333

Holding Times

All extraction and analysis holding times for all samples were met for all samples per the SOW and National Functional Guidelines. No qualifications are required.

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibration that was analyzed by the laboratory for these samples was acceptable for all compound %RSDs and the average RRFs. No qualifications are required.

Continuing Calibrations

The continuing calibrations that were analyzed all of the criteria and non criteria compounds met requirements for RRFs. Qualifications are required for compounds with non compliant %Ds.

Continuing Calibrations (continued)

Specific Findings:

1. The continuing calibration, BCC0422, contained compounds with %Ds greater than 25% D but less than 50% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J).

65RB03	2,4-dinitrophenol
SBLKAE9812B	4-nitrophenol

2. The continuing calibration, BCC0426, contained compounds with %Ds greater than 25% D but less than 50% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J).

65SB0600	hexachlorocyclopentadiene
65SB0602	4-nitrophenol
65SB0804	anthracene
65SB0800	di-n-octylphthalate
	indeno(1,2,3-cd)pyrene
	dibenzo(a,h)anthracene
	benzo(g,h,i)perylene

3. The continuing calibration, BCC0426, contained compounds with %Ds greater than 50% D but less than 90% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

65SB0600	2,4-dinitrophenol
65SB0602	
65SB0804	
65SB0800	

Internal Standards

All internal standard EICP areas met the internal standard EICP area QA/QC criteria. No qualifications are required.

Method Blanks

The method blank that was analyzed exhibited contamination for TICs. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific Finding:

4. Reject all TICs flagged with the laboratory qualifier "B", due to method blank contamination.

Rinseate Blanks

The rinseate blank that was analyzed did not exhibited any contamination. No qualifications are required.

Field Blanks

The associated field blank was not identified for this SDG. No qualifications are required.

Surrogates

Surrogate recoveries for all samples and blanks met QA/QC criteria. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate

The associated MS/MSD was not identified for this SDG. No qualifications are required.

Field Duplicates

No qualifications are required.

Compound Identification/Quantitation

No qualifications are required.

System Performance and Overall Assessment

Overall performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates less than 10% of data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
65RB03 SBLKAE9812B	2,4-dinitrophenol 4-nitrophenol	+	J	1
65SB0600	hexachlorocyclo-pentadiene	+	J	2
65SB0602	4-nitrophenol			
65SB0804	anthracene			
65SB0800	di-n-octylphthalate indeno(1,2,3-cd)pyrene dibenzo(a,h)anthracene benzo(g,h,i)perylene			
65SB0600 65SB0602 65SB0804 65SB0800	2,4-dinitrophenol	+/-	J/UJ	3
All samples	"B" flagged TICs	+	R	4

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLOR ANALYSIS

General

The organic findings offered in this screening report assume that all analytical results are correct as reported and are based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form Is). Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # 65RB03

Holding Times

All extraction and analysis holding times were met based on extraction and analysis information in the data package and the chain of custody records.

GC Instrument Performance

The resolution requirements were met on both columns in the sequence. The analytical sequence was acceptable. All 4,4'-DDT and endrin breakdowns were within QC limits. All surrogate retention times were within the established retention time windows (RTWs). All PEM standard RPDs were within the 25% QC limit.

Initial Calibrations

The initial calibrations were not acceptable for the linearity of all compounds. Raw data was not required in this Level C data package.

Specific Finding

1. The initial calibration on instrument 5890K, 4/18/95, exhibited a compound with a %RSD greater than 20%. All positive and non-detect results in the following samples for the non-compliant compound noted below associated with the ICAL are qualified as estimated, J/UJ.

   All Samples 4,4'-DDD

Continuing Calibrations

All compounds in the calibration standards were within the laboratory reported Retention Time Windows (RTWs) for all columns. All continuing calibration standard associated with the reported samples exhibited relative percent differences, RPDs, within the QC limits. Raw data was not required in this Level C data package. No qualifications are required.

Method Blanks

The associated method blank did not exhibit contamination for target compounds.

Instrument Blanks

The instrument blanks were free of target compound contamination.

QC Blanks

The field rinseate blank analyzed in this SDG exhibited contamination for the compound 4,4'-DDT at 0.30 µg/L. This concentration corresponds to a soil contamination level of 10.0 ug/Kg. The samples exhibiting positive results for 4,4'-DDT were compared to the rinseate blank contamination level for qualifications.

Specific Finding

2.	Compound	Concentration	Action Level
	4,4'-DDT	0.30µg/L ↔ 10.0 µg/Kg	50 µg/Kg
	U		
	65SB0600 65SB0602		

Florisil/GPC Checks

The GPC clean-up check standard exhibited acceptable recoveries for all compounds. The Florisil cartridge check exhibited acceptable spike recoveries for all compounds. Raw data was not required in the Level C data package.

Surrogate Recoveries

The surrogate recoveries were within QC limits in all the samples and blanks. No qualifications were required.

Matrix Spike/Matrix Spike Duplicate

There was no MS/MSD pair in this SDG. The LCS samples exhibited acceptable recoveries for spiked compounds. No qualifications were required.

Field Duplicates

There was no field duplicate pair in this SDG.

Analyte Identification/Quantitation

Positive result were reported in the samples. Identification and quantitation appear reasonable based on sample and standard review. Quantitation calculations were not verified because raw data is not a required deliverable for NEESA Level C QC. Results in one (1) sample exhibited column quantitation %Ds greater than 25%.

Specific Finding

3. Positive results reported with column quantitation %Ds greater than 25% but less than or equal to 100% are qualified as estimated, J.

4. Positive results reported with column quantitation %Ds greater than 100% are qualified as presumptively present at an estimated concentration, NJ.

Overall Assessment

The overall quality of the data package is good. The reported results are accepted as reported by the laboratory with the noted qualifications based on the limited deliverables in a Level C data package.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
All	4,4'-DDD	+/U	J/UJ	1
65SB0600 65SB0602	4,4'-DDT	+	U	2
All	All P >25%, But ≤ 100%	+	J	3
All	All P > 100%	+	NJ	4

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
Metals

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations are recalculated by the reviewer. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **CTO-312, SDG# N/A,** the analysis of four (4) field soil samples and no Matrix Spike and Duplicate pair and one water QC sample for TAL Metals. Overall, the inorganic data quality was fair. All protocol requirements were followed with the exception of the following problems.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blank

1. The calibration blanks exhibited contamination for the following elements.

   Beryllium 1.4 ug/l

   The USEPA requires that all sample values below five times the preparation or calibration blank contamination be qualified as non-detect, "U".

2. The preparation blanks exhibited negative bias for the following elements.

PBS		PBW	
Cobalt	-6.1 mg/kg	Cobalt	-42.7 ug/l
Iron	-2.42 mg/kg		

   All positive and non-detect results below ten times the negative bias will be qualified as estimated, "J" or "UJ".

Interferences

No significant interferences were observed.

Spike Recovery

No deficiencies in this section.

Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING
All soil samples	Be.	+	U	1
All soil samples	Co and Fe.	+/U	J/UJ	2
All water samples	Co.			

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

HEARTLAND ENVIRONMENTAL SERVICES, INC.

JOB# 3374 & 3375

SAMPLES AND FRACTIONS REVIEWED

Sample Identifications			Analytical Fractions			
BAKER ID	**QUANT ID**	**Matrix**	**VOA**	**SV**	**P/P**	**TAL**
73TB04	AF0177	WATER	X			
73RB04 5	AF0178	WATER	X	X	X	X
73SB0100	AF0173	SOIL	X	X	X	X
73SB0101	AF0175	SOIL	X	X	X	X
Total Number of Samples (Water/Soil)			2/2	1/2	1/2	1/2

Individual fractions were reviewed as follows:

	Primary	Secondary
VOA - Volatiles (CLP, OLM01.8)	Dan Heil	Gene Watson
SV - Semivolatiles (CLP, OLM01.8)	Dan Heil	Gene Watson
P/P - Pesticide/PCBs (CLP, OLM01.8)	Jackie Cleveland	Gene Watson
TAL - Total Metals (CLP, ILM02.1)	Paul Humburg	Jackie Cleveland

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 3/90 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # SB01; CASE # 3375

Holding Times

The holding times for all of the samples were not met per the Organic Functional Guidelines and the CLP SOW (fourteen (14) days from collection date). No qualifications are required.

Tuning

All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were not acceptable for all compound %RSDs and the average RRFs for all of the criteria compounds did not meet the initial calibration criteria.

Specific Finding:

1. The initial calibration analyzed on, 04/03/95, contained compounds with %RSDs greater than 30%. No qualifications are required, because no samples were analyzed following the calibration.

acetone

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds that were not within %D continuing calibration criteria. All RRFs were within calibration criteria.

Specific Finding:

2. The continuing calibration, WS0421, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

VBLKAF0412	acetone
73RB05	1,1-dichloroethane
	2-butanone

3. The continuing calibration, WS0426, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

VBLKAF1097	bromomethane
73TB04	1,1-dichloroethane

4. The continuing calibration, QS0420B, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

VBLKAF0294	chloromethane
73SB0100	carbon tetrachloride
73SB0101	

Internal Standards

All internal standard EICP areas met the internal standard EICP area QA/QC criteria. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for methylene chloride, acetone, 2-butanone, 2-hexanone, 1,1,2,2-tetrachloroethane and xylene. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific findings:

5. The following samples have been qualified for method blank contamination. The qualifications are for all the method blanks.

73SB0101	2-butanone	CRQL

Trip Blanks

The trip blank that was analyzed exhibited contamination for methylene chloride, acetone, 1,2-dichloroethane and toluene. The trip blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific findings:

6. The following samples have been qualified for blank contamination. The qualifications are for all the blanks.

73SB0101	methylene chloride	CRQL

Rinseate Blanks

The rinseate blank that was analyzed exhibited contamination for methylene chloride acetone, 1,2-dichloroethane and 2-butanone. However, the contamination found in the samples was attributed to the associated method blank and/or trip blank. No qualifications are required.

Field Blanks

The associate field blank was not identified for this SDG. No qualifications are required.

Surrogates

All of the surrogate recoveries for the all blanks a limits. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The associated MS/MSD was not identified for t required.

Field Duplicate

No qualifications are required.

Compound Identification/Quantitation

No qualifications are required.

System Performance and Overall Assessment

The overall system performance was fair. The labora problems. The data reviewer estimates that less th

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
VBLKAF0412 73RB05	acetone 1,1-dichloroethane 2-butanone	+	J	2
VBLKAF1097 73TB04	bromomethane 1,1-dichloroethane	+	J	3
VBLKAF0294 73SB0100 73SB0101	chloromethane carbon tetrachloride	+	J	4
73SB0101	2-butanone	+	CRQL	5
73SB0101	methylene chloride	+	CRQL	6

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QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 3/90 SOW; to the National Functional Guidelines for Organic Data Review, and NEESA Level C. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # SB01; CASE # 3375

Holding Times

All extraction and analysis holding times for all samples were met for all samples per the SOW and National Functional Guidelines. No qualifications are required.

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were not acceptable for all compound %RSDs and the average RRFs for all of the criteria compounds did not meet the initial calibration criteria.

Specific Finding:

1. The initial calibration analyzed on, 04/13/95, contained compounds with %RSDs greater than 30%. No qualifications are required, because no samples were analyzed following the calibration.

pentachlorophenol

Continuing Calibrations

The continuing calibrations that were analyzed all of the criteria and non criteria compounds met requirements for RRFs and %Ds. No qualifications are requried.

Internal Standards

All internal standard EICP areas met the internal standard EICP area QA/QC criteria. No qualifications are required.

Method Blanks

The method blank that was analyzed exhibited contamination for di-n-butylphthalate, bis(2-ethylhexyl)phthalate and TICs. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific Finding:

1. The samples listed below have been qualified for method blank contamination. The qualification are for all method blanks.

73SB0100	di-n-butylphthalate	CRQL

2. Reject all TICs flagged with the laboratory qualifier "B", due to method blank contamination.

Rinseate Blanks

The rinseate blank that was analyzed did not exhibited any contamination. No qualifications are required.

Field Blanks

The associated field blank was not identified for this SDG. No qualifications are required.

Surrogates

Surrogate recoveries for all samples and blanks met QA/QC criteria. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate

The associated MS/MSD was not identified for this SDG. No qualifications are required.

Field Duplicates

No qualifications are required.

Compound Identification/Quantitation

No qualifications are required.

System Performance and Overall Assessment

Overall performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates less than 10% of data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
73SB0100	di-n-butylphthalate	+	CRQL	1
All samples	"B" flagged TICs	+	R	2

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+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLOR ANALYSIS

General

The organic findings offered in this screening report assume that all analytical results are correct as reported and are based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form Is). Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # SB0100

Holding Times

All extraction and analysis holding times were met based on extraction and analysis information in the data package and the chain of custody records.

GC Instrument Performance

The resolution requirements were met on both columns in the sequence. The analytical sequence was acceptable. All 4,4'-DDT and endrin breakdowns were within QC limits. All surrogate retention times were within the established retention time windows (RTWs). All PEM standard RPDs were within the 25% QC limit.

Initial Calibrations

The initial calibrations were acceptable for the linearity of all compounds. Raw data was not required in this Level C data package. No qualifications were required.

Continuing Calibrations

All compounds in the calibration standards were within the laboratory reported Retention Time Windows (RTWs) for all columns. All continuing calibration standard associated with the reported samples exhibited relative percent differences, RPDs, within the QC limits. Raw data was not required in this Level C data package. No qualifications are required.

Method Blanks

The associated method blank did not exhibit contamination for target compounds.

Instrument Blanks

The instrument blanks were free of target compound contamination.

QC Blanks

The field rinseate blank analyzed in this SDG did not exhibit contamination for target compounds.

Florisil/GPC Checks

The GPC clean-up check standard exhibited acceptable recoveries for all compounds. The Florisil cartridge check exhibited acceptable spike recoveries for all compounds. Raw data was not required in the Level C data package.

Surrogate Recoveries

The surrogate recoveries were within QC limits in all the samples and blanks. No qualifications were required.

Matrix Spike/Matrix Spike Duplicate

There was no MS/MSD pair in this SDG. The LCS samples exhibited acceptable recoveries for spiked compounds. No qualifications were required.

Field Duplicates

There was no field duplicate pair in this SDG.

Analyte Identification/Quantitation

Positive result were reported in the samples. Identification and quantitation appear reasonable based on sample and standard review. Quantitation calculations were not verified because raw data is not a required deliverable for NEESA Level C QC.

Overall Assessment

The overall quality of the data package is good. The reported results are accepted as reported by the laboratory with the noted qualifications based on the limited deliverables in a Level C data package.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

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J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS

NO QUALIFICATIONS WERE REQUIRED

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* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
Metals

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations are recalculated by the reviewer. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **CTO-312, SDG# SB0100,** the analysis of two (2) field soil samples and no Matrix Spike and Duplicate pair and one water QC sample for TAL Metals. Overall, the inorganic data quality was fair. All protocol requirements were followed with the exception of the following problems.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blank

1. The preparation blanks exhibited contamination for the following elements.

   Zinc 7.52 ug/l

   The USEPA requires that all sample values below five times the preparation or calibration blank contamination be qualified as non-detect, "U".

Interferences

No significant interferences were observed.

Spike Recovery

No deficiencies in this section.

Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING
All water samples	Zn.	+	U	1

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

JOB# 3557 & 3558

SAMPLES AND FRACTIONS REVIEWED

Sample Identifications			Analytical Fractions			
BAKER ID	**QUANT ID**	**Matrix**	**VOA**	**SV**	**P/P**	**TAL**
65TP01	AF2841	SOIL	X	X	X	X
65TP02	AF2843	SOIL	X	X	X	X
65TP04	AF2845	SOIL	X	X	X	X
65TP05	AF2847	SOIL	X	X	X	X
65TP06	AF2849	SOIL	X	X	X	X
65TP07	AF2851	SOIL	X	X	X	X
65MW01A01MD	AF2853MD	WATER	X	X	X	X
65MW01A01MS	AF2857MS	WATER	X	X	X	X
65MW01A01D	AF2861	WATER	X	X	X	X
65MW01A01	AF2865	WATER	X	X	X	X
65DW0101	AF2869	WATER	X	X	X	X
65MW01AF01MD	AF2873MD	WATER				X
65MW01AF01MS	AF2874MS	WATER				X
65MW01AFDD	AF2875	WATER				X
65-MW01AF-01	AF2876	WATER				X
Total Number of Samples (Water/Soil)			5/6	5/6	5/6	9/6

MS - Matrix Spike MD - Matrix Spike Duplicate/Matrix Duplicate

Individual fractions were reviewed as follows:

	Primary	Secondary
VOA - Volatiles (CLP, OLM01.8)	Dan Heil	Gene Watson
SV - Semivolatiles (CLP, OLM01.8)	Dan Heil	Gene Watson
P/P - Pesticides/PCB's (CLP, OLM01.8)	Jackie Cleveland	Gene Watson
TAL - Total Metals (CLP, ILM02.1)	Paul Humburg	Jackie Cleveland

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 3/90 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level E. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # 65DW01; CASE # 3558

Holding Times

The holding times for all of the samples were not met per the Organic Functional Guidelines and the CLP SOW (fourteen (14) days from collection date). No qualifications are required.

Tuning

All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were not acceptable for all compound %RSDs and the average RRFs for all of the criteria compounds did not meet the initial calibration criteria.

Specific Finding:

1. The initial calibration analyzed on, 05/05/95, contained compounds with %RSDs greater than 30%. No qualifications are required because, no samples were analyzed following the calibration.

chloroethane

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds that were not within %D continuing calibration criteria. All RRFs were within calibration criteria.

Specific Finding:

2. The continuing calibration, WS0517, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

VBLKAF4632	acetone
65TP01	carbon disulfide
65TP02	2-butanone
65TP04	4-methyl-2-pentanone
65TP05	2-hexanone
65TP06	
65TP07	

3. The continuing calibration, QS0522, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J), and all non detects as estimated (UJ).

VBLKAF4684	chloroethane
65DW0101	
65MW01A01	
65MW01A01D	
65MW01A01MS	
65MW01A01MSD	

Internal Standards

All internal standard EICP areas met the internal standard EICP area QA/QC criteria. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for methylene chloride, acetone, 1,2-dichloroethane, 2-butanone, 2-hexanone, 1,1,2,2-tetrachloroethane and xylene. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific findings:

4. The following samples have been qualified for method blank contamination. The qualifications are for all the method blanks.

65DW0101 65MW01A01 65MW01A01D 65MW01A01MS 65MW01A01MSD	methylene chloride	CRQL
65DW0101 65MW01A01 65MW01A01MSD	acetone	CRQL
65MW01A01 65MW01A01D 65MW01A01MS 65MW01A01MSD	2-butanone	CRQL
65TP04 65TP06	xylene	CRQL
65TP02 65TP06	1,2-dichloroethane	CRQL

Trip Blanks

The associated trip blank was not identified for this SDG. No qualifications are required.

Rinseate Blanks

The associated rinseate blank was not identified for this SDG. No qualifications are required.

Field Blanks

The associated field blank was not identified for this SDG. No qualifications are required.

Surrogates

All of the surrogate recoveries for the all blanks and samples were within QA/QC limits. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All spike and RPD recoveries were within advisory limit for MS/MSD, 65MW01A01. No qualifications are required.

Field Duplicate

No qualifications are required.

Compound Identification/Quantitation

No qualifications are required.

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
VBLKAF4632 65TP01 65TP02 65TP04 65TP05 65TP06 65TP07	acetone carbon disulfide 2-butanone 4-methyl-2-pentanone 2-hexanone	+	J	2
VBLKAF4684 65DW0101 65MW01A01 65MW01A01D 65MW01A01MS 65MW01A01MSD	chloroethane	+/-	J/UJ	3
65DW0101 65MW01A01 65MW01A01D 65MW01A01MS 65MW01A01MSD	methylene chloride	+	CRQL	4
65DW0101 65MW01A01 65MW01A01MSD	acetone	+	CRQL	4
65MW01A01 65MW01A01D 65MW01A01MS 65MW01A01MSD	2-butanone	+	CRQL	4
65TP04 65TP06	xylene	+	CRQL	4
65TP02 65TP06	1,2-dichloroethane	+	CRQL	4

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QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 3/90 SOW; to the National Functional Guidelines for Organic Data Review, and NEESA Level E. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # 65DW01; CASE # 3558

Holding Times

All extraction and analysis holding times for all samples were met for all samples per the SOW and National Functional Guidelines. No qualifications are required.

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were not acceptable for all compound %RSDs and the average RRFs for all of the criteria compounds did not meet the initial calibration criteria.

Specific Finding:

1. The initial calibration analyzed on, 05/22/95, contained compounds with %RSDs greater than 30%. No qualifications are required, because no samples were analyzed following the calibration.

hexachlorocyclopentadiene

Continuing Calibrations

The continuing calibrations that were analyzed all of the criteria and non criteria compounds met requirements for RRFs. Qualifications are required for compounds with non compliant %Ds.

Specific Findings:

2. The continuing calibration, BCC05262, contained compounds with %Ds greater than 25% D but less than 50% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J).

SBLKAF3171B	hexachlorocyclopentadiene
65MW01A01D	4,6-dinitro-2-methylphenol
65MW01A01MS	
65MW01A01MSDD	
65MW01A01	
SBLKAF3740B	
65TP01	
65TP02	
65TP04	
65TP05	
65TP06	
65TP07	

Continuing Calibrations (continued)

Specific Finding;

3. The continuing calibration, BCC05262, contained compounds with %Ds greater than 50% D but less than 90% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J), and all non detects as estimated (UJ).

SBLKAF3171B	2,4-dinitrophenol
65MW01A01D	
65MW01A01MS	
65MW01A01MSDD	
65MW01A01	
SBLKAF3740B	
65TP01	
65TP02	
65TP04	
65TP05	
65TP06	
65TP07	

Internal Standards

All internal standard EICP areas met the internal standard EICP area QA/QC criteria. No qualifications are required.

Method Blanks

The method blank that was analyzed exhibited contamination for TICs. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific Finding:

4. Reject all results for the "B" flagged TICs due to method blank contamination.

Rinseate Blanks

The associated rinseate blank was not identified for this SDG. No qualifications are required.

Field Blanks

The associated field blank was not identified for this SDG. No qualifications are required.

Surrogates

Surrogate recoveries for all samples and blanks met QA/QC criteria. No qualifications are required.

Matrix Spike

All spike recoveries were not within advisory limits the MS/MSD 65MW01A01. The MS sample exhibited a high recovery for 4-nitrophenol. No qualifications are required.

Field Duplicates

No qualifications are required.

Compound Identification/Quantitation

No qualifications are required.

System Performance and Overall Assessment

Overall performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates less than 10% of data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

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METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
SBLKAF3171B	hexachlorocyclo-pentadiene	+	J	2
65MW01A01D	4,6-dinitro-2-methylphenol			
65MW01A01MS				
65MW01A01MSDD				
65MW01A01				
SBLKAF3740B				
65TP01				
65TP02				
65TP04				
65TP05				
65TP06				
65TP07				
SBLKAF3171B	2,4-dinitrophenol	+/-	J/UJ	3
65MW01A01D				
65MW01A01MS				
65MW01A01MSDD				
65MW01A01				
SBLKAF3740B				
65TP01				
65TP02				
65TP04				
65TP05				
65TP06				
65TP07				
All samples	"B" flagged TICs	+	R	4

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm.
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLOR ANALYSIS

General

The organic findings offered in this screening report assume that all analytical results are correct as reported and are based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form Is). Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # 65DW01

Holding Times

All extraction and analysis holding times were met based on extraction and analysis information in the data package and the chain of custody records.

GC Instrument Performance

The resolution requirements were met on both columns in the sequence. The analytical sequence was acceptable. All 4,4'-DDT and endrin breakdowns were within QC limits. All surrogate retention times were within the established retention time windows (RTWs). All PEM standard RPDs were within the 25% QC limit.

Initial Calibrations

The initial calibrations were not acceptable for the linearity of all compounds. Raw data was not required in this Level C data package.

Specific Findings

1. The initial calibration on instrument 5890L, 5/30/95, exhibited compounds with %RSDs greater than 20%. All positive and non-detect results in the following samples for the non-compliant compounds noted below associated with the ICAL are qualified as estimated, J/UJ.

65TP01	65TP07	Methoxychlor
65TP02	65TP04DL	
65TP04	65TP05DL	
65TP05	65TP07DL	
65TP06	65DW0101	

Continuing Calibrations

All compounds in the calibration standards were within the laboratory reported Retention Time Windows (RTWs) for all columns. All continuing calibration standard associated with the reported samples exhibited relative percent differences, RPDs, within the QC limits. Raw data was not required in this Level C data package. No qualifications are required.

Method Blanks

The associated method blanks did not exhibit contamination for target compounds.

Instrument Blanks

The instrument blanks were free of target compound contamination.

QC Blanks

There were no QC blanks in this SDG.

Florisil/GPC Checks

The GPC clean-up check standard exhibited acceptable spike recoveries for all compounds. The Florisil cartridge check exhibited acceptable spike recoveries for all compounds. Raw data was not required in the Level C data package.

Surrogate Recoveries

Two samples exhibited non-compliant DCB recoveries.

Specific Finding

2. The positive and non-detect results for the following samples are qualified as estimated, J/UJ, due to DCB recoveries below the QC limits.

   650W0101
   65MW01A01

Matrix Spike/Matrix Spike Duplicate

The MS/MSD pair of sample 65MW01A01 exhibited acceptable recoveries for all compounds. The LCS sample exhibited acceptable recoveries for spiked compounds. No qualifications were required.

Field Duplicates

The field duplicate pair of sample 65MW01A01 did not exhibit positive results for target compounds. No qualifications were required.

Analyte Identification/Quantitation

Positive results were reported in the samples. Identification and quantitation appear reasonable based on sample and standard review. Quantitation calculations were not verified because raw data is not a required deliverable for NEESA Level C QC. Sample data chromatograms were not provided although they are required with a NEESA Level C data package. Dilutions were required for some samples. Some reported positive results exhibited column quantitation %Ds greater than 25%.

Specific Findings

3. For the following samples reject the Z flagged compounds and replace them with the D flagged compounds from the dilution analysis of the sample. For the DL samples reject all other compounds.

   65TP04
   65TP05
   65TP07

4. Positive results exhibited column quantitation %Ds greater than 25% but less than or equal to 100% are qualified as estimated, J.

5. Positive results exhibited column quantitation %Ds greater than 100% are qualified as presumptively present at an estimated concentration, NJ.

Overall Assessment

The overall quality of the data package is good. The reported results are accepted as reported by the laboratory with the noted qualifications based on the limited deliverables in a Level C data package.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific Findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
65TP01 65TP07 65TP02 65TP04DL 65TP04 65TP05DL 65TP05 65TP07DL 65TP06 65DW0101	Methoxychlor	+/U	J/UJ	1
65DW0101 65MW01A01	ALL	+/U	J/UJ	2
65TP04 65TP05 65TP07	All Z flagged	+	R	3
All	All P >25% But ≤ 100%	+	J	4
All	All P >100%	+	NJ	5

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
Metals

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations are recalculated by the reviewer. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Lejuene, SDG# N/A**, the analysis of five (5) field water samples and two Matrix Spike and Duplicate pairs and six (6) field soil samples and no Matrix Spike and Duplicate pair for TAL Metals. Overall, the inorganic data quality was fair. All protocol requirements were followed with the exception of the following problems.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blank

No deficiencies in this section.

Interferences

No significant interferences were observed.

Spike Recovery

No deficiencies in this section.

Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING

Data stands as reported without qualification.

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

JOB# 3565

SAMPLES AND FRACTIONS REVIEWED

Sample Identifications			Analytical Fractions			
BAKER ID	**QUANT ID**	**Matrix**	**VOA**	**SV**	**P/P**	**TAL**
65MW07A-01	AF3027	WATER	X	X	X	X
65DW02-01	AF3031	WATER	X	X	X	X
65MW05A-01	AF3044	WATER	X	X	X	X
65MW02A-01	AF3048	WATER	X	X	X	X
65MW03-01	AF3052	WATER	X	X	X	X
65MW06A-01	AF3056	WATER	X	X	X	X
Total Number of Samples (Water/Soil)			**6/0**	**6/0**	**6/0**	**6/0**

Individual fractions were reviewed as follows:

	Primary	Secondary
VOA - Volatiles (CLP, OLM01.8)	Dan Heil	Gene Watson
SV - Semivolatiles (CLP, OLM01.8)	Dan Heil	Gene Watson
P/P - Pesticides/PCB's (CLP, OLM01.8)	Jackie Cleveland	Gene Watson
TAL - Total Metals (CLP, ILM02.1)	Paul Humburg	Jackie Cleveland

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 3/90 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # 65DW02; CASE # 3565

Holding Times

The holding times for all of the samples were not met per the Organic Functional Guidelines and the CLP SOW (fourteen (14) days from collection date). No qualifications are required.

Tuning

All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were not acceptable for all compound %RSDs and the average RRFs for all of the criteria compounds did not meet the initial calibration criteria.

Specific Finding:

1. The initial calibration analyzed on, 05/05/95, contained compounds with %RSDs greater than 30%. No qualifications are required because, no samples were analyzed following the calibration.

chloroethane

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds that were not within %D continuing calibration criteria. All RRFs were within calibration criteria.

Specific Finding:

2. The continuing calibration, QS0522, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

VBLKAF4684	chloroethane
65MW06A01	
65MW02A01	
65MW05A01	
65DW0201	
65MW07A01	

3. The continuing calibration, QS0523, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

VBLKAF4675	bromomethane
65MW0301	

4. The continuing calibration, QS0523, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

VBLKAF4675	chloroethane
65MW0301	

Internal Standards

All internal standard EICP areas met the internal standard EICP area QA/QC criteria. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for methylene chloride, acetone, 2-butanone, 2-hexanone, 1,1,2,2-tetrachloroethane, xylenes (total) and TICs. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific findings:

5. The following samples have been qualified for method blank contamination. The qualifications are for all the method blanks.

65DW0201 65MW02A01 65MW05A01 65MW06A01 65MW07A01 65MW0301	methylene chloride	CRQL
65DW0201 65MW02A01 65MW05A01 65MW06A01 65MW07A01 65MW0301	acetone	CRQL
65MW05A01 65MW06A01 65MW0301	2-butanone	CRQL

6. Reject all "B" flagged TICs due to method blank contamination.

Trip Blanks

The trip blank that was analyzed exhibited contamination for methylene chloride, acetone, 1,2-dichloroethane and toluene. The rinseate blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Trip Blanks (continued)

Specific findings:

7. The following samples have been qualified for blank contamination. The qualifications are for all the blanks.

65DW0201	1,2-dichloroethane	CRQL
65MW0301		
65MW05A01		
65MW06A01		
65MW07A01		

Rinseate Blanks

The rinseate blanks that were analyzed exhibited contamination for methylene chloride, acetone, 2-butanone and 1,2-dichloroethane. However, the contamination was attributed to the associated method blank and trip blank. No qualifications are required.

Field Blanks

The associated field blank was not identified for this SDG. No qualifications are required.

Surrogates

All of the surrogate recoveries for the all blanks and samples were within QA/QC limits. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The associated MS/MSD was not identified for this SDG. No qualifications are required.

Field Duplicate

No qualifications are required.

Compound Identification/Quantitation

No qualifications are required.

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
VBLKAF4684 65MW06A01 65MW02A01 65MW05A01 65DW0201 65MW07A01	chloroethane	+/-	J/UJ	2
VBLKAF4675 65MW0301	bromomethane	+	J	3
VBLKAF4675 65MW0301	chloroethane	+/-	J/UJ	4
65DW0201 65MW02A01 65MW05A01 65MW06A01 65MW07A01 65MW0301	methylene chloride	+	CRQL	5
65DW0201 65MW02A01 65MW05A01 65MW06A01 65MW07A01 65MW0301	acetone	+	CRQL	5
65MW05A01 65MW06A01 65MW0301	2-butanone	+	CRQL	5
All samples	"B" flagged TICs	+	R	6

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
65DW0201 65MW0301 65MW05A01 65MW06A01 65MW07A01	1,2-dichloroethane	+	CRQL 7	

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 3/90 SOW; to the National Functional Guidelines for Organic Data Review, and NEESA Level C. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # 65DW02; CASE # 3565

Holding Times

All extraction and analysis holding times for all samples were met for all samples per the SOW and National Functional Guidelines. No qualifications are required.

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibration that was analyzed by the laboratory for these samples was acceptable for all compound %RSDs and the average RRFs. No qualifications are required.

Continuing Calibrations

The continuing calibrations that were analyzed all of the criteria and non criteria compounds met requirements for RRFs. Qualifications are required for compounds with non compliant %Ds.

Continuing Calibrations (continued)

Specific Findings:

1. The continuing calibration, BCC0610, contained compounds with %Ds greater than 25% D but less than 50% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J).

65MW07A01	4-nitrophenol
65DW0201	di-n-octylphthalate
65MW05A01	

2. The continuing calibration, BCC0610, contained compounds with %Ds greater than 50% D but less than 90% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

65MW07A01	carbazole
65DW0201	
65MW05A01	

3. The continuing calibration, BCC0611, contained compounds with %Ds greater than 25% D but less than 50% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J).

65MW02A01	n-nitrosodi-n-propylamine
65MW0301	2,4-dinitrophenol
65MW06A01	4-nitrophenol
	4-nitroaniline
	di-n-octylphthalate

4. The continuing calibration, BCC0611, contained compounds with %Ds greater than 50% D but less than 90% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

65MW02A01	carbazole
65MW0301	
65MW06A01	

Internal Standards

All internal standard EICP areas met the internal standard EICP area QA/QC criteria. No qualifications are required.

Method Blanks

The method blank that was analyzed exhibited contamination for bis(2-ethylhexyl)phthalate, di-n-butylphthalate, butylbenzylphthalate and TICs. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific Finding:

5. The samples listed below have been qualified for method blank contamination. The qualification are for all method blanks.

65DW0201 65MW0301 65MW07A01	bis(2-ethylhexyl) phthalate	CRQL
65DW0201 65MW0301 65MW07A01	di-n-butylphthalate	CRQL

6. Reject all results for the "B" flagged TICs due to method blank contamination.

Rinseate Blanks

The rinseate blanks that were analyzed exhibited contamination for di-n-butylphthalate, butylbenzylphthalate and bis(2-ethylhexyl)phthalate. However, the contaminations was attributed to the associated method blanks. No qualifications are required.

Field Blanks

The associated field blank was not identified for this SDG. No qualifications are required.

Surrogates

Surrogate recoveries for all samples and blanks met QA/QC criteria. No qualifications are required.

Matrix Spike

The associated MS/MSD was not identified for this SDG. No qualifications are required.

Field Duplicates

No qualifications are required.

Compound Identification/Quantitation

No qualifications are required.

System Performance and Overall Assessment

Overall performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates less than 10% of data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
65MW07A01 65DW0201 65MW05A01	4-nitrophenol di-n-octylphthalate	+	J	1
65MW07A01 65DW0201 65MW05A01	carbazole	+/-	J/UJ	2
65MW02A01 65MW0301 65MW06A01	n-nitrosodi-n- propylamine 2,4-dinitrophenol 4-nitrophenol 4-nitroaniline di-n-octylphthalate	+	J	3
65MW02A01 65MW0301 65MW06A01	carbazole	+/-	J/UJ	4
65DW0201 65MW0301 65MW07A01	bis(2-ethylhexyl) phthalate	+	CRQL	5
65DW0201 65MW0301 65MW07A01	di-n-butylphthalate	+	CRQL	5
All samples	"B" flagged TICs	+	R	6

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLOR ANALYSIS

General

The organic findings offered in this screening report assume that all analytical results are correct as reported and are based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form Is). Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # DW0201

Holding Times

All extraction and analysis holding times were met based on extraction and analysis information in the data package and the chain of custody records.

GC Instrument Performance

The resolution requirements were met on both columns in the sequence. The analytical sequence was acceptable. All 4,4'-DDT and endrin breakdowns were within QC limits. All surrogate retention times were within the established retention time windows (RTWs). All PEM standard RPDs were within the 25% QC limit.

Initial Calibrations

The initial calibrations were not acceptable for the linearity of all compounds. Raw data was not required in this Level C data package.

1. The initial calibration on instrument 5890K, 5/23/95, exhibited compounds with %RSDs greater than 20%. All positive and non-detect results in the following samples for the non-compliant compounds noted below associated with the ICAL are qualified as estimated, J/UJ.

   All Samples , δ-BHC
   Methoxychlor

Continuing Calibrations

All compounds in the calibration standards were within the laboratory reported Retention Time Windows (RTWs) for all columns. All continuing calibration standard associated with the reported samples exhibited relative percent differences, RPDs, within the QC limits. Raw data was not required in this Level C data package. No qualifications are required.

Method Blanks

The associated method blanks did not exhibit contamination for target compounds.

Instrument Blanks

The instrument blanks were free of target compound contamination.

QC Blanks

There were no QC blanks in this SDG.

Florisil/GPC Checks

The GPC clean-up check standard exhibited acceptable spike recoveries for all compounds. The Florisil cartridge check exhibited acceptable spike recoveries for all compounds. Raw data was not required in the Level C data package.

Surrogate Recoveries

Three (3) field samples exhibited non-compliant DCB recoveries.

Specific Finding

2. The positive and non-detect results for the following samples are qualified as estimated, J/UJ, due to DCB recoveries below the QC limits.

   65DW0201
   65MW02A01
   65MW06A01

Matrix Spike/Matrix Spike Duplicate

There was no MS/MSD pair in this SDG. The LCS sample exhibited acceptable recoveries for spiked compounds. No qualifications were required.

Field Duplicates

There was no field duplicate pair in this SDG.

Analyte Identification/Quantitation

No positive results were reported in the samples. Identification and quantitation appear reasonable based on sample and standard review. Quantitation calculations were not verified because raw data is not a required deliverable for NEESA Level C QC. Sample data chromatograms were not provided although they are required with a NEESA Level C data package.

Overall Assessment

The overall quality of the data package is good. The reported results are accepted as reported by the laboratory with the noted qualifications based on the limited deliverables in a Level C data package.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific Findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
All Samples	δ-BHC Methoxychlor	+/U	J/UJ	1
65DW0201 65MW02A01 65MW06A01	ALL	+/U	J/UJ	2

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
Metals

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations are recalculated by the reviewer. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Lejuene, SDG# N/A,** the analysis of six (6) field water samples and no Matrix Spike and Duplicate pairs for TAL Metals. Overall, the inorganic data quality was fair. All protocol requirements were followed with the exception of the following problems.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blank

No deficiencies in this section. The Calcium contamination had not impact on the data.

Interferences

No significant interferences were observed.

Spike Recovery

No deficiencies in this section.

Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING

Data stands as reported without qualification.

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

JOB# 3631

SAMPLES AND FRACTIONS REVIEWED

Sample Identifications			Analytical Fractions			
BAKER ID	**QUANT ID**	**Matrix**	**VOA**	**SV**	**P/P**	**TAL**
65SW04-01	AF3866	WATER	X	X	X	X
65SW04-01D	AF3869	WATER	X	X	X	X
65SW04-01MS	AF3872	WATER	X	X	X	X
65SW04-01MD	AF3875	WATER	X	X	X	X
65TB-03	AF3878	WATER	X			
Total Number of Samples (Water/Soil)			**5/0**	**4/0**	**4/0**	**4/0**

Individual fractions were reviewed as follows:

	Primary	Secondary
VOA - Volatiles (CLP, OLM01.8)	Dan Heil	Gene Watson
SV - Semivolatiles (CLP, OLM01.8)	Dan Heil	Gene Watson
P/P - Pesticides/PCB's (CLP, OLM01.8)	Jackie Cleveland	Gene Watson
TAL - Total Metals (CLP, ILM02.1)	Paul Humburg	Jackie Cleveland

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 3/90 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # 65SW04; CASE # 3631

Holding Times

The holding times for all of the samples were not met per the Organic Functional Guidelines and the CLP SOW (fourteen (14) days from collection date). No qualifications are required.

Tuning

All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were not acceptable for all compound %RSDs and the average RRFs for all of the criteria compounds did not meet the initial calibration criteria.

Specific Finding:

1. The initial calibration analyzed on, 05/05/95, contained compounds with %RSDs greater than 30%. No qualifications are required because, no samples were analyzed following the calibration.

chloroethane

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds that were not within %D continuing calibration criteria. All RRFs were within calibration criteria.

Specific Finding:

2. The continuing calibration, QS0523, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

VBLKAF4675	bromomethane
65SW0401	
65SW0401D	
65SW0401MS	
65SW0401MSD	
65TB03	

3. The continuing calibration, QS0523, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

VBLKAF4675	chloroethane
65SW0401	
65SW0401D	
65SW0401MS	
65SW0401MSD	
65TB03	

Internal Standards

All internal standard EICP areas met the internal standard EICP area QA/QC criteria. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for methylene chloride, acetone, 2-butanone, 2-hexanone, 1,1,2,2-tetrachloroethane, xylenes (total) and TICs. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific findings:

4. The following samples have been qualified for method blank contamination. The qualifications are for all the method blanks.

65TB03	methylene chloride	CRQL
65SW0401 65SW0401D 65SW0401MS 65SW0401MSD 65TB03	acetone	CRQL

Trip Blanks

The trip blank that was analyzed exhibited contamination for methylene chloride, acetone, 1,1-dichloroethene, 1,2-dichloroethane, trichloroethene and toluene. The trip blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific findings:

5. The following samples have been qualified for blank contamination. The qualifications are for all the blanks.

65SW0401 65SW0401D 65SW0401MS 65SW0401MSD	1,2-dichloroethane	CRQL

Rinseate Blanks

The associated rinseate blank was not identified for this SDG. No qualifications are required.

Field Blanks

The associated field blank was not identified for this SDG. No qualifications are required.

Surrogates

All of the surrogate recoveries for the all blanks and samples were within QA/QC limits. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All spike and RPD recoveries were within advisory limits for MS/MSD 65SW0401. No qualifications are required.

Field Duplicate

No qualifications are required.

Compound Identification/Quantitation

No qualifications are required.

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
VBLKAF4675 65SW0401 65SW0401D 65SW0401MS 65SW0401MSD 65TB03	bromomethane	+	J	2
VBLKAF4675 65SW0401 65SW0401D 65SW0401MS 65SW0401MSD 65TB03	chloroethane	+/-	J/UJ	3
65TB03	methylene chloride	+	CRQL	4
65SW0401 65SW0401D 65SW0401MS 65SW0401MSD 65TB03	acetone	+	CRQL	4
65SW0401 65SW0401D 65SW0401MS 65SW0401MSD	1,2-dichloroethane	+	CRQL	5

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA, Method 625 modified; to the National Functional Guidelines for Organic Data Review, and NEESA Level C. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # 65SW04; CASE # 3631

Holding Times

All extraction and analysis holding times for all samples were met for all samples per the SOW and National Functional Guidelines. No qualifications are required.

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were acceptable for all compound %RSDs and average RRFs. No qualifications are required.

Continuing Calibrations

The continuing calibrations that were analyzed all of the criteria and non criteria compounds met requirements for RRFs. Qualifications are required for compounds with non compliant %Ds.

Continuing Calibrations (continued)

Specific Findings:

1. The continuing calibration, BCC0609, contained compounds with %Ds greater than 25% D but less than 50% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J).

SBLKAF4006B	n-nitrosodi-n-propylamine
65SW0401	2,4-dinitrophenol
	4-nitrophenol
	4-nitroaniline
	di-n-octylphthalate
	benzo(k)fluoranthene

2. The continuing calibration, BCC0609, contained compounds with %Ds greater than 50% D but less than 90% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

SBLKAF4006B	carbazole
65SW0401	

3. The continuing calibration, BCC0610, contained compounds with %Ds greater than 25% D but less than 50% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J).

65SW0401D	4-nitrophenol
65SW0401MS	carbazole
65SW0401MSD	di-octylphthalate

Internal Standards

All of the internal standard EICP areas, that were submitted with this package, met the internal standard EICP area QA/QC criteria. However, the laboratory did not submit internal standard areas for the samples that were analyzed following an initial calibration. In a phone conversation with Baker Environmental, the data reviewer was informed that the internal standard area forms for the above mention samples would not be re-submitted. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for phenol. However, the positive results found in associated samples exceeded 5x the method blank concentration. No qualifications are required.

Rinseate Blanks

The rinseate blanks that were analyzed did not exhibit contamination. No qualifications are required.

Field Blanks

The associated field blank was not identified for this SDG. No qualifications are required.

Surrogates

Surrogate recoveries for all samples and blanks did not meet QA/QC criteria. The SOW and the National Functional Guidelines allow one surrogate for each fraction to fall out side the QA/QC criteria as long as the recovery is greater than 10%. No qualifications are required.

Matrix Spike

All spike and RPD recoveries were within advisory limits for MS/MSD 65SW0401. No qualifications are required.

Field Duplicates

No qualifications are required.

Compound Identification/Quantitation

No qualifications are required.

System Performance and Overall Assessment

Overall performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates less than 10% of data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
SBLKAF4006B	n-nitrosodi-n-propylamine	+	J -	1
65SW0401	2,4-dinitrophenol 4-nitrophenol 4-nitroaniline di-n-octylphthalate benzo(k)fluoranthene			
SBLKAF4006B 65SW0401	carbazole	+/-	J/UJ	2
65SW0401D 65SW0401MS 65SW0401MSD	4-nitrophenol carbazole di-octylphthalate	+	J	3

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLOR ANALYSIS

General

The organic findings offered in this screening report assume that all analytical results are correct as reported and are based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form Is). Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # SW0401

Holding Times

All extraction and analysis holding times were met based on extraction and analysis information in the data package and the chain of custody records. No qualifications are required.

GC Instrument Performance

The resolution requirements were met on both columns in the sequence. The analytical sequence was acceptable. All 4,4'-DDT and endrin breakdowns were within QC limits. All surrogate retention times were within the established retention time windows (RTWs). All PEM standard RPDs were within the 25% QC limit. No qualifications are required.

Initial Calibrations

The initial calibrations were not acceptable for the linearity of all compounds. Raw data was not required in this Level C data package.

Initial Calibrations, continued

Specific Findings

1. The initial calibration on instrument 5890K, 5/23/95-5/27/95, exhibited a %RSD greater than 20% for delta-BHC. The initial calibration on instrument 5890L, 5/23/95-5/27/95, exhibited a %RSD greater than 20% for Methoxychlor. All positive and non-detect results in the following samples for the non-compliant compounds noted below associated with the ICAL are qualified as estimated, J/UJ.

All Samples	delta-BHC Methoxychlor

Continuing Calibrations

All compounds in the calibration standards were within the laboratory reported Retention Time Windows (RTWs) for all columns. All continuing calibration standards associated with the reported samples exhibited relative percent differences, RPDs, within the QC limits. Raw data was not required in this Level C data package. No qualifications are required.

Method Blanks

The associated method blank did not exhibit contamination for target compounds.

Instrument Blanks

The instrument blanks were free of target compound contamination.

QC Blanks

QC blanks were not included in this data package.

Florisil/GPC Checks

The Florisil cartridge check exhibited acceptable spike recoveries for all compounds. The GPC clean-up check standard was not required as the data package included only water samples. Raw data was not required in the Level C data package.

Surrogate Recoveries

Several samples exhibited non-compliant DCB recoveries.

Specific Finding

2. The positive and non-detect results for the following samples are qualified as estimated, J/UJ, due to DCB recoveries below the QC limits.

   65SW0401
   65SW0401D
   65SW0401MS
   65SW0401MSD

Matrix Spike/Matrix Spike Duplicate

The MS/MSD pair exhibited acceptable recoveries for all spiked compounds. The LCS sample exhibited acceptable recoveries for spiked compounds. No qualifications were required.

Field Duplicates

The field duplicate pair of sample 65SW0401 did not exhibit positive results of target compounds. No qualifications were required.

Analyte Identification/Quantitation

Positive results were reported in the MS/MSD pair and LCS sample. Identification and quantitation appear reasonable based on sample and standard review. Quantitation calculations were not verified because raw data is not a required deliverable for NEESA Level C QC. Sample data chromatograms were not provided although they are required with a NEESA Level C data package. Dilutions were not required.

Overall Assessment

The overall quality of the data package is good. The reported results are accepted as reported by the laboratory with the noted qualifications based on the limited deliverables in a Level C data package.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific Findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
65SW0401 65SW0401D 65SW0401MS 65SW0401MSD	delta-BHC Methoxychlor	+/U	J/UJ	1
65SW0401 65SW0401D 65SW0401MS 65SW0401MSD	ALL	+/U	J/UJ	2

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
Metals

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations are recalculated by the reviewer. All comments made within this report should be considered when examining the analytical results.(Form Is).

This data package consisted of results from Lejuene, SDG# N/A, the analysis of two (2) field water samples and one Matrix Spike and Duplicate pairs for TAL Metals. Overall, the inorganic data quality was fair. All protocol requirements were followed with the exception of the following problems.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blank

No deficiencies in this section. The Calcium contamination had not impact on the data.

Interferences

No significant interferences were observed.

Spike Recovery

No deficiencies in this section.

Duplicate

1. The Duplicate analysis for Manganese was outside the control limits. All positive results are qualified as estimated, "J".

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING
All water samples	Mn.	+	J	1

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

JOB# 3651 and 3653

SAMPLES AND FRACTIONS REVIEWED

Sample Identifications			Analytical Fractions			
BAKER ID	**QUANT ID**	**Matrix**	**VOA**	**SV**	**P/A**	**TAL**
65DW0401	AF4024	WATER	X	X	X	X
65MW04A01	AF4023	WATER	X	X	X	X
65RB23	AF4066	WATER	X	X	X	X
65SW0501	AF4061	WATER	X	X	X	X
65SD0406	AF4033	SOIL	X	X	X	X
65SD0406MS	AF4033	SOIL	X	X	X	X
65SD0406MSD	AF4033	SOIL	X	X	X	X
65SD0406D	AF4040	SOIL	X	X	X	X
65SD04612	AF4028	SOIL	X	X	X	X
Total Number of Samples (Water/Soil)			**4/5**	**4/5**	**4/5**	**4/5**

Individual fractions were reviewed as follows:

	Primary	Secondary
VOA - Volatiles (CLP, OLMo1.8)	Dan Heil	Gene Watson
SV - Semivolatiles (CLP, OLM01.8)	Dan Heil	Gene Watson
P/A - Pesticide/PCBs (CLP, OLMO1.8)	Jackie Cleveland	Gene Watson
TAL - Total Metals (CLP, ILM02.1)	Paul Humburg	Jackie Cleveland

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 3/90 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # 65DW04; CASE # 3651

Holding Times

The holding times for all of the samples were not met per the Organic Functional Guidelines and the CLP SOW (fourteen (14) days from collection date). No qualifications are required.

Tuning

All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were not acceptable for all compound %RSDs and the average RRFs for all of the criteria compounds did not meet the initial calibration criteria.

Specific Finding:

1. The initial calibration analyzed on, 05/05/95, contained compounds with %RSDs greater than 30%. No qualifications are required because, no samples were analyzed following the calibration.

chloroethane

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds that were not within %D continuing calibration criteria. All RRFs were within calibration criteria.

Specific Finding:

2. The continuing calibration, QS0523, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

VBLKAF4675	bromomethane
65MW04A01	
65DW0401	
65SW0501	
65RB23	

3. The continuing calibration, WS0530, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

VBLKAF5330	chloromethane
65SD04612	acetone
65SD0406	
65SD0406D	
65SD0406MS	
65SD0406MSD	
65SD04612RE	

Continuing calibrations (continued)

Specific Finding:

4. The continuing calibration, WS0530, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

VBLKAF5330	carbon disulfide
65SD04612	
65SD0406	
65SD0406D	
65SD0406MS	
65SD0406MSD	
65SD04612RE	

Internal Standards

All internal standard EICP areas did not meet the internal standard EICP area QA/QC criteria.

Specific Finding:

5. The samples listed below exhibited low internal standard areas. Qualify all positive results associated with the non compliant internal standard areas as estimated (J) and all non detected results as estimated (UJ).

65SD0406	chlorobenzene-d_5
65SD04612	
65SD0406MSD	
65SD04612RE	1,4-difluorobenzene
	chlorobenzene-d_5

Method Blanks

The method blanks that were analyzed exhibited contamination for methylene chloride, acetone, 2-butanone, 2-hexanone, 4-methyl-2-pentanone, 1,1,2,2-tetrachloroethane, xylenes and TICs. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific findings:

6. The following samples have been qualified for method blank contamination. The qualifications are for all the method blanks.

65RB23 65SD0406 65SD0406D 65SD04612 65SD04612RE 65SD0406MS 65SD0406MSD	methylene chloride	CRQL
65SD0406 65SD0406D 65SD04612 65SD04612RE 65DW04A01	acetone	U
65DW0401 65SW0501	acetone	CRQL
65RB23	2-butanone	CRQL

Trip Blanks

The associated trip blank was not identified for this SDG No qualifications are required.

Rinseate Blanks

The rinseate blank that was analyzed exhibited contamination for methylene chloride, acetone, 2-butanone and 1,2-dichloroethane. The rinseate blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific findings:

7. The following samples have been qualified for blank contamination. The qualifications are for all the blanks.

65SD0406MS 65SD0406MSD	acetone	U
65SD0406MS 65DW0401 65DW04A01 65SW0501	1,2-dichloroethane	CRQL

Field Blanks

The associated field blank was not identified for this SDG. No qualifications are required.

Surrogates

All of the surrogate recoveries for the all blanks and samples were not within QA/QC limits.

Specific Finding:

8. Samples 65SD0406 and 65sd0406MS, exhibited high surrogate recoveries for toluene-d_8 and 1,2-dichloroethane-d_4. Qualify all positive results as estimated (J).

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All spike and RPD recoveries were not within advisory limits for MS/MSD 65SD0406. The MS/MSD samples exhibited high spike and RPD recoveries for benzene and toluene. No qualifications are required.

Field Duplicate

No qualifications are required.

Compound Identification/Quantitation

Specific Finding:

9. Reject all results for sample 65SD04612RE, in favor of the original sample analysis due to non compliant internal standard areas.

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
VBLKAF4675 65MW04A01 65DW0401 65SW0501 65RB23	bromomethane	+	J	2
VBLKAF5330 65SD04612 65SD0406 65SD0406D 65SD0406MS 65SD0406MSD 65SD04612RE	chloromethane acetone	+	J	3
VBLKAF5330 65SD04612 65SD0406 65SD0406D 65SD0406MS 65SD0406MSD 65SD04612RE	carbon disulfide	+/-	J/UJ	4
65SD0406 65SD04612 65SD0406MSD	All associated analytes chlorobenzene-d_5	+/-	J/UJ	5
65SD04612RE	1,4-difluorobenzene chlorobenzene-d_5			

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
]65RB23 65SD0406 65SD0406D 65SD04612 65SD04612RE 65SD0406MS 65SD0406MSD	methylene chloride	+	CRQL	6
65SD0406 65SD0406D 65SD04612 65SD04612RE 65DW04A01	acetone	+	U	6
65DW0401 65SW0501	acetone	+	CRQL	6
65RB23	2-butanone	+	CRQL	6
65SD0406MS 65SD0406MSD	acetone	+	U	7
65SD0406MS 65DW0401 65DW04A01 65SW0501	1,2-dichloroethane	+	CRQL	7
65SD0406 65SD0406MS	All analytes	+	J	8
65SD04612RE	All analytes	+/-	R	9

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 3/90 SOW; to the National Functional Guidelines for Organic Data Review, and NEESA Level E. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # 65DW04; CASE # 3653

Holding Times

All extraction and analysis holding times for all samples were met for all samples per the SOW and National Functional Guidelines. No qualifications are required.

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were not acceptable for all compound %RSDs and the average RRFs for all of the criteria compounds did not meet the initial calibration criteria.

Specific Finding:

1. The initial calibration analyzed on, 05/22/95, contained compounds with %RSDs greater than 30%. No qualifications are required, because no samples were analyzed following the calibration.

hexachlorocyclopentadiene

Continuing Calibrations

The continuing calibrations that were analyzed all of the criteria and non criteria compounds met requirements for RRFs. Qualifications are required for compounds with non compliant %Ds.

Specific Findings:

2. The continuing calibration, BCC0531, contained compounds with %Ds greater than 25% D but less than 50% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J).

SBLKAF4450	4-methylphenol
65MW04A01	4,6-dinitro-2-methylphenol
65DW0401	carbazole
65SW0501	3,3'-dichlorobenzidine
65RB23	

3. The continuing calibration, BCC0531, contained compounds with RRFs less than 0.05. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J) and reject all non detects (R).

SBLKAF4450	hexachlorocyclopentadiene
65MW04A01	2,4-dinitrophenol
65DW0401	
65SW0501	
65RB23	

4. The continuing calibration, BCC06052, contained compounds with %Ds greater than 25% D but less than 50% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J).

SBLKAF5197B	hexachlorocyclopentadiene
65SD04612	2,4-dinitrophenol
65SD0406	
65SD0406D	
65SD0406MS	
65SD0406MSD	

Continuing Calibrations (continued)

Specific Finding;

5. The continuing calibration, BCC06052, contained compounds with %Ds greater than 50% D but less than 90% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J), and all non detects as estimated (UJ).

SBLKAF5197B	carbazole
65SD04612	
65SD0406	
65SD0406D	
65SD0406MS	
65SD0406MSD	

Internal Standards

All internal standard EICP areas met the internal standard EICP area QA/QC criteria. No qualifications are required.

Method Blanks

The method blank that was analyzed exhibited contamination for bis(2-ethylhexyl)phthalate and TICs. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific Finding:

6. The samples listed below have been qualified for method blank contamination. The qualification are for all method blanks.

65DW0401	bis(2-ethylhexyl) phthalate	CRQL

7. Reject all results for the "B" flagged TICs due to method blank contamination.

Rinseate Blanks

The rinseate blank that was analyzed did not exhibit contamination. No qualifications are required.

Field Blanks

The associated field blank was not identified for this SDG. No qualifications are required.

Surrogates

Surrogate recoveries for all samples and blanks did not meet QA/QC criteria. The SOW and the National Functional Guidelines allow one surrogate for each fraction to fall out side the QA/QC criteria as long as the recovery is greater than 10%. No qualifications are required.

Matrix Spike

All spike recoveries were within advisory limits the MS/MSD 65SD0406. No qualifications are required.

Field Duplicates

No qualifications are required.

Compound Identification/Quantitation

No qualifications are required.

System Performance and Overall Assessment

Overall performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates less than 10% of data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
SBLKAF4450 65MW04A01 65DW0401 65SW0501 65RB23	4-methylphenol 4,6-dinitro-2-methylphenol carbazole 3,3'-dichlorobenzidine	+	J	2
SBLKAF4450 65MW04A01 65DW0401 65SW0501 65RB23	hexachlorocyclo- pentadiene 2,4-dinitrophenol	+/-	J/R	3
SBLKAF5197B 65SD04612 65SD0406 65SD0406D 65SD0406MS 65SD0406MSD	hexachlorocyclo- pentadiene 2,4-dinitrophenol	+	J	4
SBLKAF5197B 65SD04612 65SD0406 65SD0406D 65SD0406MS 65SD0406MSD	carbazole	+/-	J/UJ	5
65DW0401	bis(2-ethylhexyl) phthalate	+	CRQL	6
All samples	"B" flagged TICs	+	R	7

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLOR ANALYSIS

General

The organic findings offered in this screening report assume that all analytical results are correct as reported and are based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form Is). Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # DW0401

Holding Times

All extraction and analysis holding times were met based on extraction and analysis information in the data package and the chain of custody records. No qualifications are required.

GC Instrument Performance

The resolution requirements were met on both columns in the sequence. The analytical sequence was acceptable. All 4,4'-DDT and endrin breakdowns were within QC limits. All surrogate retention times were within the established retention time windows (RTWs). All PEM standard RPDs were within the 25% QC limit. No qualifications are required.

Initial Calibrations

The initial calibrations were not acceptable for the linearity of all compounds. Raw data was not required in this Level C data package.

Specific Findings

1. The initial calibration on instrument 5890L, 5/30/95, exhibited a %RSD greater than 20% for Methoxychlor. All positive and non-detect results in the following samples are qualified as estimated, J/UJ, for the non-compliant compounds noted below.

65MW04A01	65RB23	Methoxychlor
65DW0401		
65SW0501		

Specific Findings, continued

2. The initial calibration on instrument 5890K, 6/12/95, exhibited a %RSD greater than 20% for 4,4'-DDD. All positive and non-detect results in the following samples are qualified as estimated, J/UJ, for the non-compliant compounds noted below.

65SD04612	4,4'-DDD
65SD0406	
65SD0406D	

Continuing Calibrations

All compounds in the calibration standards were within the laboratory reported Retention Time Windows (RTWs) for all columns. All continuing calibration standards associated with the reported samples exhibited relative percent differences, RPDs, within the QC limits. Raw data was not required in this Level C data package. No qualifications are required.

Method Blanks

The associated method blanks did not exhibit contamination for target compounds.

Instrument Blanks

The instrument blanks were free of target compound contamination.

QC Blanks

The associated rinseate blank did not exhibit contamination for target compounds.

Florisil/GPC Checks

The GPC clean-up check standard exhibited acceptable spike recoveries for all compounds. The Florisil cartridge check exhibited acceptable spike recoveries for all compounds. Raw data was not required in the Level C data package.

Surrogate Recoveries

Two samples exhibited non-compliant DCB recoveries and one method blank exhibited non-compliant TCX recoveries.

Specific Finding

3. The positive and non-detect results for the following samples are qualified as estimated, J/UJ, due to DCB recoveries below the QC limits.

   65DW0401
   65SW0501

Matrix Spike/Matrix Spike Duplicate

The MS/MSD pair exhibited acceptable recoveries for spiked compounds. The LCS samples exhibited acceptable recoveries for spiked compounds. No qualifications were required.

Field Duplicates

The field duplicate pair of sample 65SD0406 exhibited non-compliant RPDs for 4,4'-DDE and 4,4'-DDD.

Specific Finding

4. All positive results for the following samples are qualified as estimated, J, due to poor duplicate precision, for the non-compliant compounds noted below.

65SD0406	4,4'-DDE
65SD0406D	4,4'-DDD

Analyte Identification/Quantitation

Positive results were reported in several samples. Identification and quantitation appear reasonable based on sample and standard review. Quantitation calculations were not verified because raw data is not a required deliverable for NEESA Level C QC. Sample data chromatograms were not provided although they are required with a NEESA Level C data package. Some reported positive results exhibited column quantitation %Ds greater than 25%.

Specific Findings

5. Positive results exhibited column quantitation %Ds greater than 25% but less than or equal to 100% are qualified as estimated, J.

6. Positive results exhibited column quantitation %Ds greater than 100% are qualified as presumptively present at an estimated concentration, NJ.

Overall Assessment

The overall quality of the data package is good. The reported results are accepted as reported by the laboratory with the noted qualifications based on the limited deliverables in a Level C data package.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific Findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
65MW04A01 65DW0401 65SW0501 65RB23	Methoxychlor	+/U	J/UJ	1
65SD04612 65SD0406 65SD0406D	4,4'-DDD	+/U	J/UJ	2
65DW0401 65SW0501	All	+/U	J/UJ	3
65SD0406 65SD0406D	4,4'-DDE 4,4'-DDD	+	J	4
All	All P >25% But ≤ 100%	+	J	5
All	All P >100%	+	NJ	6

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
Metals

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations are recalculated by the reviewer. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from Lejuene, SDG# N/A, the analysis of three (3) field soil samples and one Matrix Spike and Duplicate pair and four (4) field water samples for TAL Metals. Overall, the inorganic data quality was fair. All protocol requirements were followed with the exception of the following problems.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blank

1. The preparation blank exhibited contamination for the following elements.

PBW			PBS		
Calcium	44.1	ug/l	Iron	3.17	mg/kg
Iron	18.5	ug/l			
Zinc	5.36	ug/l			

The USEPA requires that all sample values below five times the preparation or calibration blank contamination be qualified as estimated, "U".

Interferences

No significant interferences were observed.

Spike Recovery

2. The Matrix Spike recovery for soils for Antimony was below the lower control limits. All positive and non-detect results are qualified as estimated, "J" or "UJ".

3. The Matrix Spike recovery for soils for Lead was above the upper control limits. All positive results are qualified as estimated, "J".

Duplicate

4. The Duplicate analyses for soils for Aluminum, Chromium, Copper, Lead, Manganese and Zinc were outside the control limits. All positive results are qualified as estimated, "J".

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING
All water samples	Ca, Fe and Zn.	+	U	1
All soil samples	Fe.			
All soil samples	Sb.	+/U	J/UJ	2
All soil samples	Pb.	+	J	3
All soil samples	Al, Cr, Cu, Fe, Pb, Mn and Zn.	+	J	4

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

JOB# 3666

SAMPLES AND FRACTIONS REVIEWED

Sample Identifications			Analytical Fractions			
BAKER ID	QUANT ID	Matrix	VOA	SV	P/A	TAL
65SD0506	AF4240	SOIL	X	X	X	X
65SD05612	AF4233	SOIL	X	X	X	X
Total Number of Samples (Water/Soil)			0/2	0/2	0/2	0/2

Individual fractions were reviewed as follows:

	Primary	Secondary
VOA - Volatiles (CLP, OLMo1.8)	Dan Heil	Gene Watson
SV - Semivolatiles (CLP, OLM01.8)	Dan Heil	Gene Watson
P/A - Pesticide/PCBs (CLP, OLMO1.8)	Jackie Cleveland	Gene Watson
TAL - Total Metals (CLP, ILM02.1)	Paul Humburg	Jackie Cleveland

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 3/90 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # 65sd05; CASE # 3666

Holding Times

The holding times for all of the samples were not met per the Organic Functional Guidelines and the CLP SOW (fourteen (14) days from collection date). No qualifications are required.

Tuning

All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibration that was analyzed by the laboratory for these samples was acceptable for all compound %RSDs and average RRFs. No qualifications are required.

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds that were not within %D continuing calibration criteria. All RRFs were within calibration criteria.

Continuing calibrations (continued)

Specific Finding:

1. The continuing calibration, WS0530, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

VBLKAF5330	chloromethane
65SD0506	acetone

2. The continuing calibration, WS0530, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

VBLKAF5330	carbon disulfide
65SD0506	

3. The continuing calibration, WS0531, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

VBLKAF6082	vinyl chloride
65SD0506RE	cis-1,3-dichloropropene
65SD05612	

4. The continuing calibration, WS0531, contained compounds with %Ds greater than 50%, but less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and all non detects as estimated (UJ).

VBLKAF6082	acetone
65SD0506RE	carbon disulfide
65SD05612	

Internal Standards

All internal standard EICP areas did not meet the internal standard EICP area QA/QC criteria.

Specific Finding:

5. The samples listed below exhibited low internal standard areas. Qualify all positive results associated with the non compliant internal standard areas as estimated (J) and all non detected results as estimated (UJ).

65SD0506	chlorobenzene-d_5
65SD0506RE	bromochloromethane 1,4-difluorobenzene chlorobenzene-d_5

Method Blanks

The method blanks that were analyzed exhibited contamination for chloromethane methylene chloride, acetone and TICs. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific findings:

6. The following samples have been qualified for method blank contamination. The qualifications are for all the method blanks.

65SD0506	methylene chloride	U
65SD05612	methylene chloride	CRQL

Trip Blanks

The associated trip blank was not identified for this SDG No qualifications are required.

Rinseate Blanks

The associated rinseate blank was not identified for this SDG. No qualifications are required.

Field Blanks

The associated field blank was not identified for this SDG. No qualifications are required.

Surrogates

All of the surrogate recoveries for the all blanks and samples were not within QA/QC limits.

Specific Finding:

7. Sample 65SD0506, exhibited high surrogate recoveries for toluene-d_8 and 1,2-dichloroethane-d_4. Qualify all positive results as estimated (J).

8. Sample 65SD0506RE, exhibited high surrogate recoveries for BFB and low recoveries for toluene-d_8 and 1,2-dichloroethane-d_4. Qualify all positive results as estimated (J) and all non detects as estimated (UJ).

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The associated MS/MSD was not identified for this SDG. No qualifications are required.

Field Duplicate

No qualifications are required.

Compound Identification/Quantitation

Specific Finding:

9. reject all results for sample 65SD0506RE, in favor of the original sample analysis due to non compliant surrogate recoveries and internal standard areas.

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
VBLKAF5330 65SD0506	chloromethane acetone	+	J	1
VBLKAF5330 65SD0506	carbon disulfide	+/-	J/UJ	2
VBLKAF6082 65SD0506RE 65SD05612	vinyl chloride cis-1,3-dichloropropene	+	J	3
VBLKAF6082 65SD0506RE 65SD05612	acetone carbon disulfide	+/-	J/UJ	4
65SD0506	All associated analytes chlorobenzene-d_5	+/-	J/UJ	5
65SD0506RE	bromochloromethane 1,4-difluorobenzene chlorobenzene-d_5			
65SD0506	methylene chloride	+	U	6
65SD05612	methylene chloride	+	CRQL	6
65SD0506	All analytes	+	J	7
65SD0506RE	All analytes	+/-	J/UJ	8
65SD0506RE	All analytes	+/-	R	9

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 3/90 SOW; to the National Functional Guidelines for Organic Data Review, and NEESA Level E. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # 65SD05; CASE # 3666

Holding Times

All extraction and analysis holding times for all samples were met for all samples per the SOW and National Functional Guidelines. No qualifications are required.

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibration that was analyzed by the laboratory for these samples was acceptable for all compound %RSDs and average RRFs. No qualifications are required.

Continuing Calibrations

The continuing calibrations that were analyzed all of the criteria and non criteria compounds met requirements for RRFs. Qualifications are required for compounds with non compliant %Ds.

Continuing Calibrations (continued)

Specific Findings:

1. The continuing calibration, BCC06052, contained compounds with %Ds greater than 25% D but less than 50% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J).

SBLKAF5197B	hexachlorocyclopentadiene
65SD05612	2,4-dinitrophenol
65SD0506	

2. The continuing calibration, BCC06052, contained compounds with %Ds greater than 50% D but less than 90% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J), and all non detects as estimated (UJ).

SBLKAF5197B	carbazole
65SD05612	
65SD0506	

Internal Standards

All internal standard EICP areas met the internal standard EICP area QA/QC criteria. No qualifications are required.

Method Blanks

The method blank that was analyzed exhibited contamination for TICs. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific Finding:

3. Reject all results for the "B" flagged TICs due to method blank contamination.

Rinseate Blanks

The associated rinseate blank was not identified for this SDG. No qualifications are required.

Field Blanks

The associated field blank was not identified for this SDG. No qualifications are required.

Surrogates

Surrogate recoveries for all samples and blanks met QA/QC criteria. No qualifications are required.

Matrix Spike

The associated MS/MSD was not identified for this SDG. No qualifications are required.

Field Duplicates

No qualifications are required.

Compound Identification/Quantitation

No qualifications are required.

System Performance and Overall Assessment

Overall performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates less than 10% of data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
SBLKAF5197B	hexachlorocyclo-pentadiene	+	J	1
65SD05612 65SD0506	2,4-dinitrophenol			
SBLKAF5197B 65SD05612 65SD0506	carbazole	+/-	J/UJ	2
All samples	"B" flagged TICs	+	R	3

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLOR ANALYSIS

General

The organic findings offered in this screening report assume that all analytical results are correct as reported and are based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form Is). Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # SD0506

Holding Times

All extraction and analysis holding times were met based on extraction and analysis information in the data package and the chain of custody records. No qualifications are required.

GC Instrument Performance

The resolution requirements were met on both columns in the sequence. The analytical sequence was acceptable. All 4,4'-DDT and endrin breakdowns were within QC limits. All surrogate retention times were within the established retention time windows (RTWs). All PEM standard RPDs were within the 25% QC limit. No qualifications are required.

Initial Calibrations

The initial calibrations were not acceptable for the linearity of all compounds. Raw data was not required in this Level C data package.

Specific Findings

1. The initial calibration on instrument 5890K, 6/12/95, exhibited a %RSD greater than 20% for 4,4'-DDD. All positive and non-detect results in the following samples are qualified as estimated, J/UJ, for the non-compliant compounds noted below.

65SD0506	4,4'-DDD
65SD05612	

Continuing Calibrations

All compounds in the calibration standards were within the laboratory reported Retention Time Windows (RTWs) for all columns. All continuing calibration standards associated with the reported samples exhibited relative percent differences, RPDs, within the QC limits. Raw data was not required in this Level C data package. No qualifications are required.

Method Blanks

The associated method blank did not exhibit contamination for target compounds.

Instrument Blanks

The instrument blanks were free of target compound contamination.

QC Blanks

QC Blanks were not included with this SDG.

Florisil/GPC Checks

The GPC clean-up check standard exhibited acceptable spike recoveries for all compounds. The Florisil cartridge check exhibited acceptable spike recoveries for all compounds. Raw data was not required in the Level C data package.

Surrogate Recoveries

All samples exhibited compliant TCX and DCB recoveries. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate

A MS/MSD pair was not included with this SGD.

Field Duplicates

A field duplicate pair was not included with this SGD.

Analyte Identification/Quantitation

Positive results were reported in one sample. Identification and quantitation appear reasonable based on sample and standard review. Quantitation calculations were not verified because raw data is not a required deliverable for NEESA Level C QC. Sample data chromatograms were not provided although they are required with a NEESA Level C data package. Some reported positive results exhibited column quantitation %Ds greater than 25%.

Specific Findings

2. Positive results exhibited column quantitation %Ds greater than 100% are qualified as presumptively present at an estimated concentration, NJ.

Overall Assessment

The overall quality of the data package is good. The reported results are accepted as reported by the laboratory with the noted qualifications based on the limited deliverables in a Level C data package.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific Findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
65SD0506 65SD05612	4,4'-DDD	+/U	J/UJ	1
All	All P >100%	+	NJ	2

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
Metals

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations are recalculated by the reviewer. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Lejuene, SDG# N/A,** the analysis of two (2) field soil samples and no Matrix Spike and Duplicate pair for TAL Metals. Overall, the inorganic data quality was fair. All protocol requirements were followed with the exception of the following problems.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blank

1. The preparation blank exhibited contamination for the following elements.

Calcium	11.4	mg/kg
Zinc	1.29	mg/kg

The USEPA requires that all sample values below five times the preparation or calibration blank contamination be qualified as estimated, "U".

Interferences

No significant interferences were observed.

Spike Recovery

No deficiencies in this section.

Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING
All soil samples	Ca and Zn.	+	U	1

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

JOB# 3681

SAMPLES AND FRACTIONS REVIEWED

Sample Identifications			Analytical Fractions			
BAKER ID	**QUANT ID**	**Matrix**	**VOA**	**SV**	**P/A**	**TAL**
65DW0201	AF4532	WATER	X	X	X	X
Total Number of Samples (Water/Soil)			**1/0**	**1/0**	**1/0**	**1/0**

Individual fractions were reviewed as follows:

	Primary	Secondary
VOA - Volatiles (CLP, OLMo1.8)	Dan Heil	Gene Watson
SV - Semivolatiles (CLP, OLM01.8)	Dan Heil	Gene Watson
P/A - Pesticide/PCBs (CLP, OLMO1.8)	Jackie Cleveland	Gene Watson
TAL - Total Metals (CLP, ILM02.1)	Paul Humburg	Jackie Cleveland

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 3/90 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # 65DW02; CASE # 3681

Holding Times

The holding times for all of the samples were not met per the Organic Functional Guidelines and the CLP SOW (fourteen (14) days from collection date). No qualifications are required.

Tuning

All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were not acceptable for all compound %RSDs and the average RRFs for all of the criteria compounds did not meet the initial calibration criteria.

Specific Finding:

1. The initial calibration analyzed on, 05/05/95, contained compounds with %RSDs greater than 30%. No qualifications are required because, no samples were analyzed following the calibration.

chloroethane

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds that were not within %D continuing calibration criteria. All RRFs were within calibration criteria.

Specific Finding:

2. The continuing calibration, QS0531, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

VBLKAF5431	styrene
65DW0201	

Internal Standards

All internal standard EICP areas met the internal standard EICP area QA/QC criteria. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for methylene chloride, acetone, xylene and TICs. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific findings:

3. The following samples have been qualified for method blank contamination. The qualifications are for all the method blanks.

65DW0201	methylene chloride	CRQL

4. Reject all "B" flagged TICs due to method blank contamination.

Trip Blanks

The associated trip blank was not identified for this SDG. No qualifications are required.

Rinseate Blanks

The associated rinseate blank was not identified for this SDG. No qualifications are required.

Field Blanks

The associated field blank was not identified for this SDG. No qualifications are required.

Surrogates

All of the surrogate recoveries for the all blanks and samples were within QA/QC limits. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The associated MS/MSD was not identified for this SDG. No qualifications are required.

Field Duplicate

No qualifications are required.

Compound Identification/Quantitation

No qualifications are required.

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
VBLKAF5431 65DW0201	styrene	+	J	2
65DW0201	methylene chloride	+	CRQL	3
65DW0201	"B" flagged TICs	+	R	4

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 3/90 SOW; to the National Functional Guidelines for Organic Data Review, and NEESA Level E. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # 65DW02; CASE # 3681

Holding Times

All extraction and analysis holding times for all samples were met for all samples per the SOW and National Functional Guidelines. No qualifications are required.

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibration that was analyzed by the laboratory for these samples was acceptable for all compound %RSDs and average RRFs. No qualifications are required.

Continuing Calibrations

The continuing calibration that was analyzed all of the criteria and non criteria compounds met requirements for RRFs and %Ds. No qualifications are required.

Internal Standards

All internal standard EICP areas met the internal standard EICP area QA/QC criteria. No qualifications are required.

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ANALYSIS

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Method Blanks

The method blank that was analyzed exhibited contamination for bis(2-ethylhexyl)phthalate. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific Finding:

1. The samples listed below have been qualified for method blank contamination. The qualification are for all method blanks.

65DW0201	bis(2-ethylhexyl) phthalate	CRQL

Rinseate Blanks

The associated rinseate blank was not identified for this SDG. No qualifications are required.

Field Blanks

The associated field blank was not identified for this SDG. No qualifications are required.

Surrogates

Surrogate recoveries for all samples and blanks met QA/QC criteria. No qualifications are required.

Matrix Spike

The associated MS/MSD was not identified for this SDG. No qualifications are required.

Field Duplicates

No qualifications are required.

Compound Identification/Quantitation

No qualifications are required.

System Performance and Overall Assessment

Overall performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates less than 10% of data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
65DW0201	bis(2-ethylhexyl) phthalate	+	CRQL 1	

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLOR ANALYSIS

General

The organic findings offered in this screening report assume that all analytical results are correct as reported and are based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form Is). Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # DW0201

Holding Times

All extraction and analysis holding times were met based on extraction and analysis information in the data package and the chain of custody records. No qualifications are required.

GC Instrument Performance

The resolution requirements were met on both columns in the sequence. The analytical sequence was acceptable. All 4,4'-DDT and endrin breakdowns were within QC limits. All surrogate retention times were within the established retention time windows (RTWs). All PEM standard RPDs were within the 25% QC limit. No qualifications are required.

Initial Calibrations

The initial calibrations were acceptable for the linearity of all compounds. Raw data was not required in this Level C data package. No qualifications are required.

Continuing Calibrations

All compounds in the calibration standards were within the laboratory reported Retention Time Windows (RTWs) for all columns. All continuing calibration standards associated with the reported samples exhibited relative percent differences, RPDs, within the QC limits. Raw data was not required in this Level C data package. No qualifications are required.

Method Blanks

The associated method blank did not exhibit contamination for target compounds.

Instrument Blanks

The instrument blanks were free of target compound contamination.

QC Blanks

QC Blanks were not included with this SDG.

Florisil/GPC Checks

The Florisil cartridge check exhibited acceptable spike recoveries for all compounds. A GPC clean-up check standard was not required as only water samples were included in this data package. Raw data was not required in the Level C data package.

Surrogate Recoveries

All samples exhibited compliant TCX and DCB recoveries. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate

A MS/MSD pair was not included with this SGD.

Field Duplicates

A field duplicate pair was not included with this SGD.

Analyte Identification/Quantitation

No positive results were reported. Identification and quantitation appear reasonable based on sample and standard review. Quantitation calculations were not verified because raw data is not a required deliverable for NEESA Level C QC. Sample data chromatograms were not provided although they are required with a NEESA Level C data package.

Overall Assessment

The overall quality of the data package is good. The reported results are accepted as reported by the laboratory with the noted qualifications based on the limited deliverables in a Level C data package.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific Findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS

NO QUALIFICATIONS ARE REQUIRED.

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* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
Metals

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations are recalculated by the reviewer. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **Lejuene, SDG# N/A,** the analysis of one (1) field water sample and no Matrix Spike and Duplicate pair for TAL Metals. Overall, the inorganic data quality was fair. All protocol requirements were followed with the exception of the following problems.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

The holding times were met as specified in Section 3 of the NEESA (20.2-047B) QA protocol.

Calibration

No deficiencies in this section.

Preparation and Field Blank

No deficiencies in this section.

Interferences

No significant interferences were observed.

Spike Recovery

No deficiencies in this section.

Duplicate

No deficiencies in this section.

LCS

No deficiencies in this section.

Serial Dilution

No deficiencies in this section.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING

Data stands as reported without qualification.

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

SDG# AC01F (Case # 82295)

SAMPLES AND FRACTIONS REVIEWED

Sample Identifications			Analytical Fractions			
BAKER ID	QUANT ID	Matrix	VOA	SV	P/P	M&C
73-FS01-BC01F	082295-0001	TISSUE	X	X	X	X
73-FS01-BC01FDUP	082295-0001DUP	TISSUE	X	X	X	X
73-FS01-BC02F	082295-0002	TISSUE	X	X	X	X
73-FS01-BF01F	082295-0003	TISSUE	X	X	X	X
73-FS01-PF01F	082295-0004	TISSUE	X	X	X	X
73-FS01-SF01W	082295-0005	TISSUE	X	X	X	X
73-FS01-SF01F	082295-0006	TISSUE	X	X	X	X
73-FS02-BC01F	082295-0007	TISSUE	X	X	X	X
73-FS02-BC02F	082295-0008	TISSUE	X	X	X	X
73-FS02-YM01W	082295-0009	TISSUE	X	X	X	X
73-FS02-SF01W	082295-0010	TISSUE	X	X	X	X
73-FS02-SF01WMS	082295-0010MS	TISSUE	X	X	X	X
73-FS02-SF01WMD	082295-0010MD	TISSUE	X	X	X	X
73-FS02-SF01WDUP	082295-0010DUP	TISSUE	X	X	X	X
73-FS02-SF01F	082295-0011	TISSUE	X	X	X	X
73-FS02-SS01F	082295-0012	TISSUE	X	X	X	X
73-FS02-SPM01F	082295-0013	TISSUE	X	X	X	X
73-FS02-PF01W	082295-0014	TISSUE	X	X	X	X
73-FS03-BC01F	082295-0015	TISSUE	X	X	X	X
73-FS03-BC02F	082295-0016	TISSUE	X	X	X	X
73-FS03-AC01F	082295-0017	TISSUE	X	X	X	X
73-FS03-SF01F	082295-0018	TISSUE	X	X	X	X
73-FS03-SM01F	082295-0019	TISSUE	X	X	X	X
73-FS03-YM01W	082295-0020	TISSUE	X	X	X	X
65-FS04-BG01W	082295-0021	TISSUE	X	X	X	X
65-FS04-BG01WMS	082295-0021MS	TISSUE	X		X	X
65-FS04-BG01WMD	082295-0021MD	TISSUE	X		X	X
65-FS04-BG01WDUP	082295-0021DUP	TISSUE	X	X	X	
65-FS04-BG01F	082295-0022	TISSUE	X	X	X	X
65-FS04-RS01W	082295-0023	TISSUE	X	X	X	X
65-FS05-LB01W	082295-0024	TISSUE	X	X	X	X
65-FS05-LB01F	082295-0025	TISSUE	X	X	X	X
65-FS05-RS01W	082295-0026	TISSUE	X	X	X	X
65-FS05-RS01F	082295-0027	TISSUE	X	X	X	X
65-FS05-BG01W	082295-0028	TISSUE	X	X	X	X
65-FS05-BG01F	082295-0029	TISSUE	X	X	X	X
Total Number of Samples (Soil/Tissue)			0/36	0/34	0/36	0/35

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 3/90 SOW; the National Functional Guidelines for Organic Data Review, and NEESA Level C. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # AC01F; CASE # 82295

Holding Times

The holding times for all of the samples were not met per the Organic Functional Guidelines and the CLP SOW (fourteen (14) days from collection date). However, there is no established holding time for tissue samples, and the data reviewer is assuming that the samples remained frozen until analysis. No qualifications are required.

Tuning

All of the BFB tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibrations that were analyzed by the laboratory for these samples were not acceptable for all compound %RSDs and the average RRFs for all of the criteria compounds did not meet the initial calibration criteria.

Specific Finding:

1. The initial calibration analyzed on, 06/21/95, contained compounds with %RSDs greater than 30%. No qualifications are required because, no samples were analyzed following the calibration.

acetone

Continuing calibrations

The continuing calibrations that were analyzed with this data package exhibited %Ds that were not within %D continuing calibration criteria. All RRFs were within calibration criteria.

Specific Finding:

2. The continuing calibration, V2872, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

VBLK20	acetone
3BC01F	
3BC02F	
3AC01F	
3SF01F	
4RS01W	
5LB01W	
5LB01F	
5BG01W	
5BG01F	

3. The continuing calibration, V4380, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

VBLK49	bromomethane
1BF01F	chloroethane
2BC01F	1,1-dichloroethene
2BC02F	
2YM01W	
2SF01W	
2SF01WDUP	
2SF01WMS	
2SF01WMSD	
2SPM01F	
2PF01W	

Continuing calibrations (continued)

Specific Finding:

4. The continuing calibration, V4381, contained compounds with %Ds greater than 25%, but less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

VBLK51	chloromethane
2SS01F	acetone
5RS01F	2-butanone

Internal Standards

All internal standard EICP areas met the internal standard EICP area QA/QC criteria. No qualifications are required.

Method Blanks

The method blanks that were analyzed exhibited contamination for methylene chloride, acetone, chlorobenzene and TICs. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific findings:

5. The following samples have been qualified for method blank contamination. The qualifications are for all the method blanks.

3SM01F	methylene chloride	CRQL
4BG01W		
4BG01WDUP		
4BG01WMS		
1BF01F		
2BC01F		
2BC02F		
2SF01W		
2SF01WDUP		
2SPM01F		

Method Blanks (continued)

Specific findings:

5. The following samples have been qualified for method blank contamination. The qualifications are for all the method blanks.

2YM01W	methylene chloride	CRQL
2SF01WMS		
2SF01WMSD		
2SS01F		

6. Reject all "B" flagged TICs due to method blank contamination.

Trip Blanks

The associated trip blank was not identified for this SDG. No qualifications are required.

Rinseate Blanks

The associated rinseate blank was not identified for this SDG. No qualifications are required.

Field Blanks

The associated field blank was not identified for this SDG. No qualifications are required.

Surrogates

All of the surrogate recoveries for the all blanks and samples were not within QA/QC limits. Several samples exhibited surrogates that were diluted out. No qualifications are required.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All spike and RPD recoveries were within advisory limit for MS/MSD 2SF01W and MS/MSD 4BGw01W. No qualifications are required.

Field Duplicate

No qualifications are required.

Compound Identification/Quantitation

No qualifications are required.

System Performance and Overall Assessment

The overall system performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates that less than 5% of the data is qualified.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
VBLK20 3BC01F 3BC02F 3AC01F 3SF01F 4RS01W 5LB01W 5LB01F 5BG01W 5BG01F	acetone	+	J	2
VBLK49 1BF01F 2BC01F 2BC02F 2YM01W 2SF01W 2SF01WDUP 2SF01WMS 2SF01WMSD 2SPM01F 2PF01W	bromomethane chloroethane 1,1-dichloroethene	+	J	3
VBLK51 2SS01F 5RS01F	chloromethane acetone 2-butanone	+	J	4
3SM01F 4BG01W 4BG01WDUP 4BG01WMS 1BF01F 2BC01F 2BC02F 2SF01W	methylene chloride	+	CRQL	5

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
2YM01W 2SF01WMS 2SF01WMSD 2SS01F 2SF01WDUP 2SPM01F	methylene chloride	+	CRQL	5
All samples	"B" flagged TICs	+	R	6

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the U.S. EPA CLP, 3/90 SOW; to the National Functional Guidelines for Organic Data Review, and NEESA Level C. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # AC01F; CASE # 82295

Holding Times

The holding times for all of the samples were not met per the Organic Functional Guidelines and the CLP SOW. However, there is no established holding time for tissue samples, and the data reviewer is assuming that the samples remained frozen until extraction. No qualifications are required.

Tuning

All of the DFTPP tunes in the initial and continuing calibrations met the percent relative abundance criteria of the SOW and the Organic Functional Guidelines. No qualifications are required.

Initial Calibrations

The initial calibration that was analyzed by the laboratory for these samples was acceptable for all compound %RSDs and average RRFs. No qualifications are required.

Continuing Calibrations

The continuing calibrations that were analyzed all of the criteria and non criteria compounds met requirements for RRFs. Qualifications are required for compounds with non compliant %Ds.

Continuing Calibrations (continued)

Specific Findings:

1. The continuing calibration, ST20950725A, contained compounds with %Ds greater than 25% D but less than 50% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J).

SBLK1A	3-nitroaniline
3YM01W	
4BG01W	
1BC01FDUP	
1BC02F	
1BF01F	
1PF01F	
1SF01W	
1SF01F	
2BC01F	
2BC02F	

2. The continuing calibration, ST20950726, contained compounds with %Ds greater than 25% D but less than 50% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J).

SBLK20	3,3'-dichlorobenzidine
4BG01WMSD	
4BG01WMS	
2SF01F	

Continuing Calibrations (continued)

Specific Finding;

3. The continuing calibration, ST20950728, contained compounds with %Ds greater than 25% D but less than 50% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J).

2PF01W	4-chloroaniline
3SF01F	4-nitroaniline
3SM01F	3,3'-dichlorobenzidine
5LB01W	
5RS01W	
5BG01W	
5BG01F	
SBLK10	
2SF01W	

4. The continuing calibration, ST20950728, contained compounds with %Ds greater than 50% D but less than 90% D. For the samples and non compliant compounds listed below, qualify all positive results as estimated (J), and all non detects as estimated (UJ).

2PF01W	3-nitroaniline
3SF01F	
3SM01F	
5LB01W	
5RS01W	
5BG01W	
5BG01F	
SBLK10	
2SF01W	

Internal Standards

All internal standard EICP areas met the internal standard EICP area QA/QC criteria. No qualifications are required.

Method Blanks

The method blank that was analyzed exhibited contamination for phenol, di-n-butylphthalate and TICs. The method blank results will be compared to their associated samples. Refer to the glossary of data qualifiers for a list and definition of the method blank qualifiers: CRQL, U and No Action.

Specific Finding:

5. The following samples have been qualified for method blank contamination. The qualifications are for all the method blanks.

1BC01F	di-n-butylphthalate	CRQL
2SPM01F		
2SS01F		
4BG01F		
4RS01W		
5LB01F		
2SF01WMS		
2SF01WMSD		
1BC02F		
1BF01F		
1SF01F		
2BC01F		
2BC02F		
2PF01W		
2SF01F		
5BG01F		

6. Reject all results for the "B" flagged TICs due to method blank contamination.

Rinseate Blanks

The rinseate blank that was analyzed did not exhibit contamination. No qualifications are required.

Field Blanks

The associated field blank was not identified for this SDG. No qualifications are required.

Surrogates

Surrogate recoveries for all samples and blanks did not meet QA/QC criteria. The SOW and the National Functional Guidelines allow one surrogate for each fraction to fall out side the QA/QC criteria as long as the recovery is greater than 10%. No qualifications are required.

Matrix Spike

All spike and RPD recoveries were not within advisory limits for MS/MSD 4BG01W. The MS sample exhibited a low spike recovery for pyrene. No qualifications are required.

Field Duplicates

No qualifications are required.

Compound Identification/Quantitation

No qualifications are required.

System Performance and Overall Assessment

Overall performance was fair. The laboratory did not encounter any large problems. The data reviewer estimates less than 10% of data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
SBLK1A	3-nitroaniline	+	J	1
3YM01W				
4BG01W				
1BC01FDUP				
1BC02F				
1BF01F				
1PF01F				
1SF01W				
1SF01F				
2BC01F				
2BC02F				
SBLK20	3,3'-dichlorobenzidine	+	J	2
4BG01WMSD				
4BG01WMS				
2SF01F				
2PF01W	4-chloroaniline	+	J	3
3SF01F	4-nitroaniline			
3SM01F	3,3'-dichlorobenzidine			
5LB01W				
5RS01W				
5BG01W				
5BG01F				
SBLK10				
2SF01W				
2PF01W	3-nitroaniline	+/-	J/UJ	4
3SF01F				
3SM01F				
5LB01W				
5RS01W				
5BG01W				
5BG01F				
SBLK10				
2SF01W				

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
1BC01F 2SPM01F 2SS01F 4BG01F 4RS01W 5LB01F 2SF01WMS 2SF01WMSD 1BC02F 1BF01F 1SF01F 2BC01F 2BC02F 2PF01W 2SF01F 5BG01F	di-n-butylphthalate	+	CRQL	5
All samples	"B" flagged TICs	+	R	6

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

PESTICIDE/AROCLOR ANALYSIS

General

The organic findings offered in this screening report assume that all analytical results are correct as reported and are based upon the examination of the reported holding times, GC instrument performance, initial and continuing calibrations, analytical sequence, blank analysis results, surrogate recoveries, and MS/MSD results. All comments made within this report should be considered when examining the analytical results (Form Is). Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # AC01F

Holding Times

All extraction and analysis holding times were met based on extraction and analysis information, chain of custody records, and the assumption that the tissue samples were frozen upon receipt. No qualifications are required.

GC Instrument Performance

The resolution requirements were met on both columns in the sequence. The analytical sequence was acceptable. All 4,4'-DDT and endrin breakdowns were within QC limits. All surrogate retention times were within the established retention time windows (RTWs). All PEM standard RPDs were within the 25% QC limit. No qualifications are required.

Initial Calibrations

The initial calibrations were not acceptable for the linearity of all compounds. Raw data was not required in this Level C data package.

Specific Findings

1. The initial calibration analyzed on instrument GC42A, 07/28/95, on the DB-608 and DB-1701 columns exhibited three (3) compounds with %RSDs outside the criteria. All positive and non-detect results for the noted compounds, in the following samples are qualified as estimated, J/UJ.

All Samples	Dieldrin 4,4'-DDE Endosulfan sulfate

Continuing Calibrations

All compounds in the calibration standards were within the laboratory reported Retention Time Windows (RTWs) for all columns. All continuing calibration standards associated with the reported samples exhibited relative percent differences, RPDs, within the QC limits with the exception of several compounds in the CCAL INDAMA%, 7/30/95, 1512, on the DB-608 column. Raw data was not required in this Level C data package.

Specific Finding

2. The continuing calibration standard INDAMA analyzed on 07/30/95 at 1512 exhibited non-compliant %Ds for all compounds on the DB-608 column. All positive and non-detect results for the noted compounds in the following samples are qualified as estimated, J/UJ.

3-SM01F	α-BHC
3-YM01W	γ-BHC
4-BG01W	Heptachlor
4-BG01WDU	Endosulfan I
4-BG01F	Dieldrin
4-RS01W	Endrin
5-LB01W	4,4'-DDD
5-LB01F	4,4'-DDT
5-RS01W	Methoxychlor
5-RS01F	
5-BG01W	
5-BG01F	

Method Blanks

The associated method blank did not exhibit contamination for target compounds.

Instrument Blanks

One (1) instrument blank exhibited contamination for three (3) target compounds. All compounds detected were less than the CRQLs. Qualifications were not required because the contamination was not noted in the associated field samples. The laboratory noted that a contaminated syringe caused the problem.

QC Blanks

QC blanks were not included in this data package.

Florisil/GPC Checks

The Florisil cartridge check and the GPC clean-up check standard exhibited acceptable spike recoveries for all compounds. Raw data was not required in the Level C data package.

Surrogate Recoveries

Many samples exhibited non-compliant DCB recoveries.

Specific Finding

3. The positive and non-detect results for the following samples are qualified as estimated, J/UJ, due to DCB recoveries below the QC limits.

1-BF01F
1-PF01F
1-SF01W
2-BC01F
2-PF01W
2-SF01W
2-SF01WDU
2-SP01F
2-SS01F
2-YM01W
2-AC01F
3-SM01F
3-YM01W
4-BG01F
4-BG01W
4-BG01WDU
4-RS01W
5-BG01W
5-LB01W
5-RS01W

Matrix Spike/Matrix Spike Duplicate

The MS/MSD pair of sample 2-SF01W exhibited acceptable recoveries for all compounds except γ-BHC in the MS and endrin in the MS and MSD. The MS/MSD pair of sample 4-BG01W exhibited non-compliant recoveries for the compounds dieldrin, endrin, and 4,4'-DDT in the MS and the MSD, and γ-BHC in the MS. All RPDs were acceptable. No qualifications were required.

Field Duplicates

Three (3) pairs of duplicates were present in this SDG. The duplicate pairs are assumed to be laboratory duplicates because there was no indication on the sample chain of custody that they were field duplicates. Two (2) of the duplicate pairs, 1-BC01F and 2-SF01W did not exhibit positive results for target compounds. The pair of sample 4-BG01W exhibited positive results for two (2) compounds, 4,4'-DDE and 4,4'-DDD. The precision results were greater that 35%. However, standard criteria has not been established for tissue samples. The RPDs for the compounds were 40% and 50%, respectively. No qualifications were required.

Analyte Identification/Quantitation

Positive results were reported in some samples. Identification and quantitation appear reasonable based provided deliverables. Quantitation calculations were not verified because raw data is not a required deliverable for NEESA Level C QC. Sample data chromatograms were not provided although they are required with a NEESA Level C data package. Dilutions were not required. Some results exhibited P flags due to column quantitation %Ds.

Specific Finding

4. All reported positive results exhibited P flags are qualified as estimated, J, due to column quantitation %Ds >25% but <100%.

Overall Assessment

The overall quality of the data package is fair. The reported results are accepted as reported by the laboratory with the noted qualifications based on the limited deliverables in a Level C data package.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

R = Result is rejected and unusable

NJ = Presumptive evidence for the presence of the material at an estimated value

K = Result is biased high

L = Result is biased low

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that analyte is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the analyte value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

The specific Findings will be noted in numerical form on the Form Is in this data validation report. These specific finding footnotes will reflect the conclusions found in the data validation process that resulted in the qualification of the data.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
All Samples	Dieldrin 4,4'-DDE Endosulfan sulfate	+/U	J/UJ	1
3-SM01F 3-YM01W 4-BG01W 4-BG01WDU 4-BG01F 4-RS01W 5-LB01W 5-LB01F 5-RS01W 5-RS01F 5-BG01W 5-BG01F	α-BHC γ-BHC Heptachlor Endosulfan I Dieldrin Endrin 4,4'-DDD 4,4'-DDT Methoxychlor	+/U	J/UJ	2
1-BF01F 1-PF01F 1-SF01W 2-BC01F 2-PF01W 2-SF01W 2-SF01WDU 2-SP01F 2-SS01F 2-YM01W 2-AC01F 3-SM01F 3-YM01W 4-BG01F 4-BG01W 4-BG01WDU 4-RS01W 5-BG01W 5-LB01W 5-RS01W	All	+/U	J/UJ	3

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE ID	DL	QL	SPECIFIC FINDINGS
All	All P	+	J	4

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
Metals

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, calibration standards, blank analysis results and MS/MSD results. A minimum of ten percent of all laboratory calculations are recalculated by the reviewer. All comments made within this report should be considered when examining the analytical results (Form Is).

This data package consisted of results from **CTO-312, SDG# AC01F,** the analysis of twenty-eight (28) field tissue samples and two Matrix Spike and Duplicate pairs for TAL Metals. Overall, the inorganic data quality was fair. All protocol requirements were followed with the exception of the following problems.

Specific QA/QC deficiency Findings are listed numerically in the following categories:

Holding Times

No holding times for tissues. The reviewer assumes that the tissues were kept frozen until analysis.

Calibration

No deficiencies in this section.

Preparation and Field Blank

1. The preparation blank exhibited contamination for the following elements.

Aluminum	1.52	mg/kg
Barium	0.04	mg/kg
Calcium	1.51	mg/kg
Chromium	0.18	mg/kg
Copper	0.15	mg/kg
Iron	0.80	mg/kg
Magnesium	2.00	mg/kg
Potassium	25.1	mg/kg
Zinc	0.09	mg/kg
Boron	0.72	mg/kg

The USEPA requires that all sample values below five times the preparation or calibration blank contamination be qualified as estimated, "U".

Interferences

No significant interferences were observed.

Spike Recovery

2. The Matrix Spike recoveries for Arsenic, Mercury and Zinc were below the lower control limits. All positive and non-detect results are qualified as estimated, "J" or "UJ".

Duplicate

3. The Duplicate analyses for Aluminum and Calcium were outside the control limits. All positive results are qualified as estimated, "J". The RPDs for Iron, Arsenic, Manganese and Zinc were not greater than 35% and will not be qualified.

LCS

No deficiencies in this section.

Serial Dilution

4. The Serial dilutions for Barium, Calcium, Iron, Magnesium, Manganese, Potassium and Zinc were outside the control limits. All positive results are qualified as estimated, "J".

MSA

5. The following analytes exhibited low recovery during the GFAA spiking procedure. All positive and non-detect results are qualified as estimated, "J" or "UJ".

Analytes	Samples
Arsenic	BG01F, BG01W, LB01W, PF01W, RS01W, YM01W, 1SF01W and 2SS01F.
Selenium	SM01F.

6. The following analytes exhibited high recovery during the GFAA spiking procedure. All positive results are qualified as estimated, "J".

Analytes	Samples
Thallium	BG01F, BG01W, LB01F, LB01W, RS01F, RS01W and YM01W.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	ANALYTE	DL	QL	SPECIFIC FINDING
All tissue samples	Al, Ba, Ca, Cr, Cu, Fe, Mg, K, Zn and B.	+	U	1
All tissue samples	As, Hg and Zn.	+/U	J/UJ	2
All tissue samples	Al and Ca.	+	J	3
All tissue samples	Ba, Ca, Fe, Mg, Mn, K and Zn.	+	J	4
BG01F, BG01W, LB01W, PF01W, RS01W, YM01W, 1SF01W and 2SS01F. SM01F.	As. Se.	+/U	J/UJ	5
BG01F, BG01W, LB01F, LB01W, RS01F, RS01W and YM01W.	Tl.	+	J	6

DL - denotes laboratory qualifier/reported value
+ denotes positive values
U denotes non-detect values

QL - denotes data validation qualifier

APPENDIX L
BACKGROUND METALS CONCENTRATIONS

APPENDIX L.1
BASE BACKGROUND METALS CONCENTRATIONS IN SURFACE SOIL

BASE BACKGROUND
SURFACE SOILS
TAL INORGANICS
MCB CAMP LEJEUNE, NORTH CAROLINA

	6-201N-SB11-00	6-201N-SB12-00	6-201C-SB38-00	6-201C-SB39-00	78-BB-SB-00	41-BB-SB01-00	41-BB-SB02-00
Aluminum	1120	45.25	748	245	1490	528	1430
Antimony	4.7	4.8	1.4	1.3	0.33	2.07	0.865
Arsenic	0.28	0.29	0.91	0.28	0.22	0.356	0.317
Barium	2	2.05	16.5	3.5	8.6	1.525	4.06
Beryllium	0.095	0.1	0.03	0.03	0.11	0.1	0.09
Cadmium	0.285	0.295	0.58	0.175	0.55	0.392	0.349
Calcium	178	108	10700	402	941	18.3	54.6
Chromium	0.475	0.49	1.6	0.33	2.2	1.02	0.91
Cobalt	0.85	0.9	0.195	0.185	1.8	1.965	1.75
Copper	0.55	0.6	3.1	0.75	2	2	87.2
Iron	525	160	684	238	1020	83	970
Lead	2	3	62.9	25.1	20.4	2.59	10.9
Magnesium	11.65	10.1	200	26	118	8.85	39.1
Manganese	3.1	1	16	4.5	11.1	0.87	10.2
Mercury	0.01	0.01	0.05	0.06	0.05	0.0305	0.078
Nickel	1.6	1.65	0.8	0.75	2.2	3.55	3.15
Potassium	36.55	37.5	54.5	30.6	102	91.5	81.5
Selenium	0.47	0.485	0.5	0.465	0.31	0.311	0.277
Silver	0.95	1	0.195	0.185	0.33	0.1965	0.175
Sodium	19.65	15.85	14	4.7	67.5	44.1	39.3
Thallium	0.19	0.195	0.205	0.185	0.11	0.565	0.505
Vanadium	1.05	0.8	2.8	1.6	5.3	2.505	2.23
Zinc	0.55	0.8	23.1	4.6	28.3	2.66	6.11
Cyanide					0.265	1.23	1.09

Concentrations are in millograms per kilogram (mg/kg).
Qualifiers have been removed per Baker's standards.
Qualifiers R, U, and UJ have been given one-half the detection value.
Qualifiers J, NJ, and B have been removed with no detection value change.

BASE BACKGROUND
SURFACE SOILS
TAL INORGANICS
MCB CAMP LEJEUNE, NORTH CAROLINA

	41-BB-SB03-00	41-BB-SB04-00	69-BB-SB01-00	69-BB-SB02-00	69-BB-SB03-00	69-BB-SB04-00	74-BB-SB01-00
Aluminum	2100	5370	1310	4150	9570	5360	3110
Antimony	0.87	0.94	0.85	0.95	0.95	0.95	0.905
Arsenic	0.3205	0.345	0.31	0.345	0.79	0.35	0.3325
Barium	4.53	13.4	5.6	15.4	19.6	20.8	11.1
Beryllium	0.09	0.095	0.14	0.155	0.155	0.155	0.148
Cadmium	0.3525	0.38	0.26	0.285	0.29	0.29	0.2695
Calcium	79.2	46.3	28.2	43.6	282	53	181
Chromium	2.64	3.24	0.75	4	12.5	5.8	0.84
Cobalt	1.77	1.905	2.1	2.3	2.35	2.35	2.225
Copper	1.8	1.94	1.75	1.9	1.95	1.95	4.56
Iron	1120	2160	425	1430	9640	3890	1740
Lead	9.98	6.61	2.8	6	5.3	5.6	5.19
Magnesium	74	144	37.3	91.8	610	247	70
Manganese	11.6	11.8	15.1	12.7	12.3	8.3	9.44
Mercury	0.057	0.08	0.015	0.06	0.045	0.025	0.04
Nickel	3.2	3.45	2.9	1.6	1.65	1.65	1.56
Potassium	190	177	32.25	35.5	361	106	87.5
Selenium	0.2795	0.301	0.27	0.295	0.3	0.3	0.29
Silver	0.177	0.1905	0.045	0.045	4.3	0.39	0.046
Sodium	39.65	42.75	20	22	22.4	22.3	70.4
Thallium	0.51	0.55	0.495	0.55	0.55	0.55	0.53
Vanadium	2.255	2.43	1.8	1.95	13.5	5.6	5.21
Zinc	5.97	7.15	3.1	5.2	10.8	7.9	1.27
Cyanide	1.1	1.19	2.2	2.4	2.4	2.4	1.15

Concentrations are in millograms per kilogram (mg/kg).
Qualifiers have been removed per Baker's standards.
Qualifiers R, U, and UJ have been given one-half the detection value.
Qualifiers J, NJ, and B have been removed with no detection value change.

BASE BACKGROUND
SURFACE SOILS
TAL INORGANICS
MCB CAMP LEJEUNE, NORTH CAROLINA

	74-BB-SB02-00	74-BB-SB03-00	74-BB-SB04-00	1-BB-SB38-00	1-BB-SB39-00	1-GW13-00	28-BB-SB37-00	28-BB-SB38-00
Aluminum	1730	1000	2100	3920	4930	1600	2840	379
Antimony	0.925	0.855	0.96	3.6	3.15	8.0	3.55	2.9
Arsenic	0.339	0.314	0.352	0.315	0.28	0.29	0.31	0.255
Barium	1.6	3.12	16	9.6	9.3	2.8	5.1	1.8
Beryllium	0.151	0.14	0.1565	0.105	0.10	0.095	0.105	0.085
Cadmium	0.275	0.2545	0.285	0.315	0.28	0.285	0.31	0.255
Calcium	46.9	43.9	377	538	353	248	114	13.10
Chromium	2.7	0.795	1.98	3.5	4.7	4.1	2.0	0.60
Cobalt	2.27	2.1	2.355	0.42	0.375	0.38	0.415	0.34
Copper	3.92	1.755	1.965	1.6	0.6	1.9	0.6	0.50
Iron	401	787	1640	2270	1470	1000	1210	444
Lead	3.79	1.14	142	5.9	4.5	4.2	2.8	1.7
Magnesium	37.5	16.1	52.5	152	183	47.2	68.8	12.9
Manganese	3.13	7.37	4.61	10.6	4.2	5.9	2.7	3.3
Mercury	0.048	0.0305	0.05	0.03	0.025	0.03	0.025	0.025
Nickel	1.59	1.475	1.65	0.8	0.65	0.65	0.750	0.6
Potassium	89	82.5	92.5	149	153	20.650	29.75	8.35
Selenium	0.296	0.274	0.307	0.42	0.375	0.38	0.415	0.34
Silver	0.047	0.0435	0.0485	0.5	0.465	0.475	0.5	0.425
Sodium	71.8	87.6	122	11.0	17.2	7.25	28.5	18.2
Thallium	0.54	0.4985	0.56	0.42	0.38	0.38	0.415	0.34
Vanadium	1.94	1.8	4.69	7.9	6.1	3.5	3.6	2.1
Zinc	1.15	1.97	2.87	7.2	4.0	1.4	0.9	0.71
Cyanide	1.17	1.08	1.21					

Concentrations are in millograms per kilogram (mg/kg).
Qualifiers have been removed per Baker's standards.
Qualifiers R, U, and UJ have been given one-half the detection value.

Qualifiers J, NJ, and B have been removed with no detection value change.

BASE BACKGROUND
SURFACE SOILS
TAL INORGANICS
MCB CAMP LEJEUNE, NORTH CAROLINA

	28-GW09DW-00	30-BB-SB12-00	30-BB-SB13-00	30-BB-SB14-00	30-BB-SB15-00	30-BB-SB16-00	30-GW03-00	35-SS01-00
Aluminum	5460	54.6	24.9	49.2	37.5	196	17.7	2220.0
Antimony	3.35	3.2	3.2	3.3	3.5	3.650	3.9	2.45
Arsenic	1.8	0.28	0.29	0.29	0.31	0.325	0.34	0.065
Barium	11.6	1.8	0.7	0.7	0.7	3.100	0.8	15.6
Beryllium	0.10	0.095	0.10	0.10	0.10	0.110	0.12	0.11
Cadmium	0.295	0.28	0.29	0.29	0.31	0.325	0.34	0.04
Calcium	368	11.45	4.3	9.9	9.0	172	5.2	605.0
Chromium	6.0	1.6	0.7	1.9	0.7	0.75	0.8	1.9
Cobalt	0.91	0.375	0.38	0.38	0.41	0.43	0.45	0.60
Copper	2.9	0.55	0.6	0.6	0.6	0.65	0.7	3.9
Iron	2250	276	102	218	69.7	167	80.4	1250.0
Lead	11.6	3.3	0.47	2.4	0.73	4.4	0.86	3.60
Magnesium	157	6.5	2.6	2.6	2.8	37.1	3.1	71.6
Manganese	4.1	11.9	4.4	9.5	1.3	2.5	2.3	5.5
Mercury	0.025	0.06	0.02	0.03	0.05	0.03	0.03	0.065
Nickel	1.9	0.65	0.7	0.7	1.7	0.9	0.8	1.3
Potassium	158	8.25	11.1	3.8	1.0	29.6	1.2	129.5
Selenium	0.94	0.375	0.38	0.38	0.41	0.43	0.45	0.075
Silver	0.49	0.47	0.47	0.48	0.5	0.6	0.6	0.16
Sodium	15.0	14.8	26.0	4.9	5.2	18.2	5.8	126.00
Thallium	0.395	0.375	0.38	0.38	0.41	0.43	0.45	0.06
Vanadium	8.3	1.7	0.75	1.7	0.31	0.76	0.34	3.60
Zinc	6.6	0.35	0.30	0.48	1.7	2.0	1.2	7.4
Cyanide								

Concentrations are in millograms per kilogram (mg/kg).
Qualifiers have been removed per Baker's standards.
Qualifiers R, U, and UJ have been given one-half the detection value.
Qualifiers J, NJ, and B have been removed with no detection value change.

BASE BACKGROUND
SURFACE SOILS
TAL INORGANICS
MCB CAMP LEJEUNE, NORTH CAROLINA

	BB-SB02-00	BB-SB03-00	16-BB-SB01-00	16-BB-SB02-00	16-BB-SB03-00	80-BB-SB01-00	80-BB-SB02-00	80-BB-SB03-00
Aluminum	3630.0	1950.0	1710.0	3630	1950	2240.0	7770.0	2850.0
Antimony	5.00	5.55	5.05	5	5.55	1.35	1.40	1.40
Arsenic	1.000	1.100	1.000	1	1.1	0.250	3.200	0.265
Barium	7.4	7.0	4.1	7.4	7	9.9	13.0	11.6
Beryllium	0.10	0.11	0.23	0.1	0.11	0.020	0.10	0.06
Cadmium	0.50	0.55	1.00	0.5	0.55	0.165	0.175	0.175
Calcium	113.0	227.0	96.8	113	227	505	997.0	239.0
Chromium	3.3	2.5	1.0	3.3	2.5	1.200	10.0	2.0
Cobalt	1.00	1.10	1.00	1	1.1	0.205	1.30	0.45
Copper	1.0	1.1	1.0	1	1.1	1.3	2.2	0.92
Iron	2150.0	1610.0	1260.0	2150	1610	604.0	5550.0	1450.0
Lead	5.20	10.20	7.40	5.2	10.2	7.5	8.90	8.30
Magnesium	99.1	69.4	42.9	99.1	69.4	94.8	289.0	94.2
Manganese	7.4	5.5	6.9	7.4	5.5	66.0	30.7	12.8
Mercury	0.055	0.055	0.055	0.055	0.055	0.050	0.050	0.060
Nickel	2.0	2.25	2.00	2	2.25	1.4	2.70	1.40
Potassium	1.0	111.5	101.0	100	111.5	163.0	416.0	90.9
Selenium	0.500	0.550	0.500	0.5	0.55	0.285	0.300	0.300
Silver	0.50	0.55	0.50	0.5	0.55	0.220	0.23	0.23
Sodium	25.20	26.20	35.90	25.2	26.2	24.1	77.10	72.70
Thallium	1.00	1.10	1.00	1	1.1	0.435	0.46	0.465
Vanadium	5.40	3.10	4.50	5.4	3.1	2.3	14.70	4.30
Zinc	8.7	22.1	9.2	4.35	22.1	6.1	12.9	3.5
Cyanide								

Concentrations are in millograms per kilogram (mg/kg).
Qualifiers have been removed per Baker's standards.
Qualifiers R, U, and UJ have been given one-half the detection value.
Qualifiers J, NJ, and B have been removed with no detection value change.

BASE BACKGROUND
SURFACE SOILS
TAL INORGANICS
MCB CAMP LEJEUNE, NORTH CAROLINA

	7-BB-SB01-00	7-BB-SB02-00	7-BB-SB03-00	36-BB-SB01-00	36-BB-SB02-00	36-BB-SB03-00	43-BB-SB01-00	43-BB-SB02-00
Aluminum	7180.0	3770.0	5800.0	6950	2300	2380	3520	2510
Antimony	6.05	5.50	5.60	1.15	1.2	1.75	2.35	2.3
Arsenic	1.200	1.100	3.900	0.42	0.205	0.17	0.51	0.55
Barium	12.0	10.2	9.7	13.2	12.4	14	6.3	10.8
Beryllium	0.26	0.11	0.11	0.03	0.035	0.075	0.105	0.1
Cadmium	0.600	0.550	0.550	0.31	0.3	0.235	0.335	0.31
Calcium	397.0	69.5	615.0	462	897	1690	1180	908
Chromium	8.4	3.8	10.6	7.9	2.7	3.1	2.8	2.8
Cobalt	1.20	1.10	1.10	0.245	0.255	0.255	0.345	0.335
Copper	1.20	1.10	2.30	2.8	2.8	4.9	0.7	11.2
Iron	3050.0	2170.0	7510.0	6670	1750	1560	1050	2050
Lead	7.10	6.40	8.70	10.3	17.5	39.6	6.6	13.6
Magnesium	104.0	50.5	79.5	185	105	86	68.9	56.4
Manganese	3.25	3.1	1.8	6.9	14.3	21.4	3	5
Mercury	0.060	0.060	0.060	0.045	0.05	0.045	0.13	0.12
Nickel	2.40	2.20	2.25	0.45	1.6	0.9	1.25	1.2
Potassium	121.0	110.0	111.5	138	60.2	58	78.5	76
Selenium	0.600	0.550	1.300	0.12	0.16	0.135	0.195	0.17
Silver	0.60	0.55	0.55	0.265	0.275	0.255	0.345	0.335
Sodium	15.80	15.25	17.30	13.1	14.1	14.05	14.45	9.9
Thallium	1.200	1.100	1.100	0.055	0.075	0.1	0.12	0.105
Vanadium	9.70	5.40	18.20	15.4	8.3	6.4	1.6	3.7
Zinc	5.3	2.9	3.8	6	12.7	20.8	2.6	16.7
Cyanide								

Concentrations are in millograms per kilogram (mg/kg).
Qualifiers have been removed per Baker's standards.
Qualifiers R, U, and UJ have been given one-half the detection value.
Qualifiers J, NJ, and B have been removed with no detection value change.

BASE BACKGROUND
SURFACE SOILS
TAL INORGANICS
MCB CAMP LEJEUNE, NORTH CAROLINA

	43-BB-SB03-00	44-BB-SB01-00	54-BB-SB01-00	54-BB-SB02-00	86-BB-SB01-00	MIN	MAX	AVG	2Xaverage
Aluminum	2730	4950	8990	4950	6590	17.7	9570	2970.297	5940.594
Antimony	2.2	1.2	1.25	1.3	1.95	0.33	8	2.672	5.344
Arsenic	0.67	1.3	1.1	1.2	0.45	0.065	3.9	0.652	1.305
Barium	13	14.9	18.7	13.3	13.9	0.65	20.8	8.680	17.360
Beryllium	0.095	0.08	0.0345	0.0375	0.085	0.02	0.26	0.103	0.205
Cadmium	0.3	0.325	0.335	0.34	0.265	0.04	1	0.344	0.688
Calcium	1610	668	1020	3590	3960	4.25	10700	698.394	1396.788
Chromium	2.9	5.9	9.2	6.8	6.5	0.33	12.5	3.346	6.693
Cobalt	0.32	0.43	0.375	0.41	0.285	0.185	2.355	0.961	1.923
Copper	0.75	2.5	2.1	4.2	2.2	0.5	87.2	3.600	7.200
Iron	1110	3220	4700	2780	4030	69.7	9640	1877.531	3755.063
Lead	13.8	19.6	3.95	12.3	21.5	0.47	142	11.875	23.749
Magnesium	60.5	189	371	259	233	2.55	610	102.875	205.751
Manganese	6.5	6.7	14.8	19.9	11.5	0.87	66	9.248	18.497
Mercury	0.05	0.06	0.041	0.04	0.04	0.01	0.13	0.047	0.094
Nickel	1.15	1.7	1.3	1.6	7.2	0.45	7.2	1.717	3.434
Potassium	73.5	220	223	175	160	1	416	99.805	199.610
Selenium	0.185	0.34	0.145	0.13	0.43	0.075	1.3	0.373	0.746
Silver	0.32	0.28	0.285	0.295	0.285	0.0435	4.3	0.438	0.875
Sodium	12.7	12.75	8.3	9.55	18.3	4.7	126	29.649	59.298
Thallium	0.11	0.065	0.065	0.06	0.13	0.055	1.2	0.450	0.899
Vanadium	4	11.8	13.4	9.1	48.6	0.305	48.6	5.814	11.628
Zinc	4.5	7.4	7.2	9.1	18.4	0.3	28.3	6.940	13.880
Cyanide						0.265	2.4	1.453	2.905

Concentrations are in millograms per kilogram (mg/kg).
Qualifiers have been removed per Baker's standards.
Qualifiers R, U, and UJ have been given one-half the detection value.
Qualifiers J, NJ, and B have been removed with no detection value change.

APPENDIX L.2
BASE BACKGROUND METALS CONCENTRATIONS IN SUBSURFACE SOIL

APPENDIX
BASE BACKGROUND METALS CONCENTRATIONS IN SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

	6-201N-SB11-07	6-201N-SB12-02	6-201C-SB38-01	6-201C-SB39-04	78-BB-SB-01	2-GW09-01	1-BB-SB38-05
Aluminum	672	857	3620	2970	10200	8520	4580
Antimony	4.7	4.85	1.4	1.25	0.355	1.6	4.2
Arsenic	0.31	0.315	0.033	0.305	0.24	0.47	1.1
Barium	2	2.05	7.6	6.5	10.9	6.6	7.5
Beryllium	0.095	0.1	0.03	0.025	0.12	0.23	0.125
Cadmium	0.285	0.295	0.57	0.17	0.6	1.2	0.370
Calcium	5.35	5.4	4410	12.1	81.3	10.6	35.600
Chromium	1.6	1.85	6	2.2	5.7	8.7	10.5
Cobalt	0.65	0.9	0.235	0.175	0.95	1.9	0.495
Copper	0.475	0.6	1.7	0.65	0.95	0.47	6.6
Iron	257	126	456	833	822	2840	4940
Lead	1.2	1.6	11.5	2.7	6.1	4.3	5.1
Magnesium	13.1	12.7	133	86.8	188	260	222
Manganese	0.475	0.395	7.5	2.6	2.4	5.2	4.1
Mercury	0.01	0.01	0.04	0.015	0.045	0.11	0.025
Nickel	1.6	1.7	0.8	0.7	2.4	4.7	0.850
Potassium	48.9	40.8	84.7	187	123	184	409
Selenium	0.5	0.5	0.55	0.5	0.29	0.115	0.495
Silver	0.95	1	0.195	0.175	0.355	0.7	0.600
Sodium	12.7	12.15	13.25	7.25	44.9	31.5	12.850
Thallium	0.205	0.21	0.22	0.2	0.12	0.23	0.495
Vanadium	0.75	1	3	4.7	7.4	13.4	12.200
Zinc	0.475	0.395	11.6	0.9	2.1	1.4	4.700

Concentrations are in millogrms per kilogram (mg/Kg).
Qualifiers have been removed per Baker's standards.
Qualifiers R, U, and UJ have been given one-half the detection value.
Qualifiers J, NJ, and B have been removed with no detection value change.

APPENDIX
BASE BACKGROUND METALS CONCENTRATIONS IN SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

	1-BB-SB39-04	1-BB-SB39-06	1-GW13-04	1-GW13-08	28-BB-SB37-03	28-BB-SB38-04	28-GW09DW-01
Aluminum	6180	5980	4160	6600	5170	2830	5730
Antimony	3.25	2.95	6.9	3.2	3.55	3.55	3.75
Arsenic	0.29	0.26	0.285	0.280	0.315	0.315	1.500
Barium	11.800	8.600	7.500	8.400	9.700	5.000	11.700
Beryllium	0.095	0.085	0.095	0.095	0.105	0.105	0.110
Cadmium	0.290	0.260	0.285	0.280	0.315	0.315	0.330
Calcium	12.250	19.700	52.400	92.600	23.450	6.850	441.000
Chromium	5.5	5.3	7.1	8.3	7.3	3.4	4.7
Cobalt	0.385	0.350	0.380	0.375	0.42	0.42	0.93
Copper	0.6	0.5	2.1	1.6	0.65	0.65	0.65
Iron	1510	1210	567	959	2090	749	2780
Lead	3.8	3.1	3.3	4.0	4.1	2.3	7.4
Magnesium	189	217	131	262	153	66	157
Manganese	4.9	5.4	2.0	4.5	3.2	1.5	5.3
Mercury	0.025	0.020	0.050	0.025	0.025	0.025	0.025
Nickel	2.300	0.600	0.650	0.650	0.750	0.750	1
Potassium	191	268	98	308	122	91.3	136
Selenium	0.385	0.350	0.380	0.375	0.420	0.420	0.440
Silver	0.480	0.435	0.475	0.470	0.500	0.550	0.550
Sodium	21.6	9.2	9.6	10.9	33.8	28.6	20.3
Thallium	0.385	0.350	0.380	0.375	0.420	0.420	0.440
Vanadium	6.500	6.100	3.500	10.100	6.4	2.8	8.5
Zinc	2.900	2.400	1.000	2.700	1.9	1.0	4.2

Concentrations are in millogrms per kilogram (mg/Kg).
Qualifiers have been removed per Baker's standards.
Qualifiers R, U, and UJ have been given one-half the detection value.
Qualifiers J, NJ, and B have been removed with no detection value change.

APPENDIX
BASE BACKGROUND METALS CONCENTRATIONS IN SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

	30-BB-SB12-03	30-BB-SB13-01	30-BB-SB14-01	30-BB-SB15-01	30-BB-SB16-02	30-GW03-01	35-GWDS01-03
Aluminum	2970	17.1	25.7	42.6	777	16.9	2910
Antimony	3.9	3.1	3.6	3.6	3.4	3.9	2.750
Arsenic	0.34	0.28	0.32	0.32	0.30	0.34	0.12
Barium	0.8	0.7	0.8	0.8	3.5	0.8	5.5
Beryllium	0.12	0.09	0.11	0.11	0.10	0.12	0.06
Cadmium	0.34	0.28	0.32	0.32	0.30	0.34	0.30
Calcium	7.0	6.9	4.8	6.3	116	6.6	456.0
Chromium	3.9	0.7	0.8	0.8	0.7	0.8	2.2
Cobalt	0.45	0.37	0.42	0.43	0.40	0.46	0.65
Copper	0.7	0.6	0.7	0.7	0.6	0.7	0.550
Iron	908	95.9	155	63.3	514	74.5	442
Lead	0.7	0.47	1.9	0.91	3.2	0.59	8.1
Magnesium	24.7	7.5	2.9	2.9	30.2	3.1	63.5
Manganese	1.7	4.3	6.7	1.1	3.7	1.7	5.6
Mercury	0.03	0.03	0.08	0.25	0.03	0.68	0.03
Nickel	0.8	0.7	0.8	2.2	1.7	0.8	1.050
Potassium	13.2	6.3	1.1	21.3	21.9	1.2	145
Selenium	0.45	0.37	0.42	0.43	0.40	0.46	0.085
Silver	0.6	0.46	0.6	0.6	0.50	0.6	0.39
Sodium	12.5	11.1	19.3	5.4	14.4	5.8	141.0
Thallium	0.45	0.37	0.42	0.43	0.40	0.46	0.06
Vanadium	6.2	0.73	1.0	0.84	1.6	0.34	3.0
Zinc	0.35	0.32	0.39	1.2	1.7	1.3	2.6

Concentrations are in millogrms per kilogram (mg/Kg).
Qualifiers have been removed per Baker's standards.
Qualifiers R, U, and UJ have been given one-half the detection value.
Qualifiers J, NJ, and B have been removed with no detection value change.

APPENDIX
BASE BACKGROUND METALS CONCENTRATIONS IN SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

	BB-SB02-07	BB-SB03-05	80-BB-SB01-06	80-SS-SB01-03	80-BB-SB2-03	80-BB-SB02-06	80-BB-SB03-03
Aluminum	888	2330	11000	2520	5950	9600	9500
Antimony	5.000	5.600	6.200	1.300	1.350	1.650	3.500
Arsenic	1.00	1.10	15.40	0.245	1.60	4.70	1.80
Barium	1.6	3.8	22.3	4.5	9.9	13.5	10.9
Beryllium	0.10	0.11	0.31	0.01	0.04	0.20	0.09
Cadmium	0.50	0.55	0.205	0.16	0.165	0.205	0.16
Calcium	74.2	290.0	257.0	105.0	323.0	210.0	142.0
Chromium	2.4	4.2	66.4	2.1	10.0	22.0	12.0
Cobalt	1	1.1	7	0.42	0.71	1.40	0.75
Copper	1	1.1	9.5	0.670	1.6	4.4	2.2
Iron	1220	1870	90500	795	2920	12800	3350
Lead	2.4	3.8	21.4	2.9	5	11.7	7.8
Magnesium	35.7	115.0	852.0	76.0	282.0	455.0	357.0
Manganese	2.7	2.4	14.9	1.8	19.9	7.4	6.2
Mercury	0.055	0.06	0.07	0.045	0.055	0.07	0.045
Nickel	2	2.250	0.600	0.455	1.4	0.6	2.2
Potassium	100.5	228	1250	161	297	1020	458
Selenium	0.500	0.550	2.400	0.275	0.285	0.355	0.275
Silver	0.50	0.55	0.275	0.21	0.22	0.275	0.21
Sodium	20.6	28.2	124.0	63.4	25.5	47.1	73.2
Thallium	1.00	1.10	2.70	0.425	0.44	0.55	0.42
Vanadium	3.9	4.9	69.4	2.3	10.8	18.4	13.5
Zinc	8.7	4.9	26.6	2.0	3.5	8.1	4.8

Concentrations are in millogrms per kilogram (mg/Kg).
Qualifiers have been removed per Baker's standards.
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Qualifiers J, NJ, and B have been removed with no detection value change.

APPENDIX
BASE BACKGROUND METALS CONCENTRATIONS IN SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

	80-BB-SB03-06	7-BB-SB01-05	7-BB-SB02-05	7-BB-SB03-09	16-BB-SB01-07	16-BB-SB02-07	16-BB-SB03-05
Aluminum	1060	1400	1700	581	1940	888	2330
Antimony	1.300	5.150	5.150	5.750	5.8	5	5.6
Arsenic	0.24	1.05	1.05	1.15	1.15	1	1.1
Barium	4.3	16.1	22.6	10.8	3.7	0.8	3.8
Beryllium	0.01	0.105	0.105	0.115	0.115	0.1	0.11
Cadmium	0.155	0.50	0.50	0.550	0.6	0.5	0.55
Calcium	34.2	38.95	41.55	32.15	135	74.2	290
Chromium	2.9	5.0	6.2	3.9	4.7	2.4	4.2
Cobalt	0.20	1.05	1.05	1.15	1.15	1	1.1
Copper	0.630	1.05	1.05	1.15	1.15	1	1.1
Iron	557	571	709	1620	1150	1220	1870
Lead	5.4	3	1.8	1.1	2.9	2.4	3.8
Magnesium	50.7	30.6	44.1	12.25	104	35.7	115
Manganese	5.4	1.95	2.65	2.1	5	2.7	2.4
Mercury	0.045	0.055	0.050	0.060	0.06	0.055	0.06
Nickel	0.450	2.050	2.050	2.300	2.3	2	2.25
Potassium	130	103	102.5	114.5	116	100.5	228
Selenium	0.275	0.50	0.50	0.55	0.6	0.5	0.55
Silver	0.21	0.50	0.50	0.55	0.6	0.5	0.55
Sodium	18.3	16.85	13.6	15.65	29.8	10.3	28.2
Thallium	0.42	1.05	1.05	1.15	1.15	1	1.1
Vanadium	2.4	2.3	3.1	2.5	4	3.9	4.9
Zinc	1.7	3.1	2.1	3.15	15	4.35	2.45

Concentrations are in millogrms per kilogram (mg/Kg).
Qualifiers have been removed per Baker's standards.
Qualifiers R, U, and UJ have been given one-half the detection value.
Qualifiers J, NJ, and B have been removed with no detection value change.

APPENDIX
BASE BACKGROUND METALS CONCENTRATIONS IN SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

	36-BB-SB01-02	36-BB-SB02-02	36-BB-SB03-03	43-BB-SB01-02	43-BB-SB02-01	43-BB-SB03-02	44-BB-SB01-03
Aluminum	4480	8700	3810	4320	959	2260	10300
Antimony	1.15	1.2	1.9	2.3	1.75	2.25	1.15
Arsenic	0.155	0.69	0.185	0.44	0.115	0.31	1.2
Barium	13.9	13.7	5.5	8.9	2.2	9.1	12.5
Beryllium	0.032	0.035	0.08	0.1	0.075	0.1	0.065
Cadmium	0.31	0.315	0.255	0.31	0.235	0.305	0.305
Calcium	116	225	48.2	76.9	77.6	295	20.9
Chromium	4.2	13.5	3.7	5.5	1.2	2	11
Cobalt	0.245	0.25	0.275	0.335	0.255	0.33	0.495
Copper	0.43	0.98	0.175	0.21	0.16	0.265	0.86
Iron	2690	4080	976	2370	414	507	4720
Lead	5.4	6.6	4	6.1	1.6	2.8	4.15
Magnesium	78.6	292	110	121	17.9	49.3	302
Manganese	2.5	6.7	3.6	3	1.3	2.5	3.9
Mercury	0.06	0.06	0.045	0.045	0.05	0.055	0.0425
Nickel	1	9.1	1	1.2	0.9	1.2	0.92
Potassium	91.3	222	62.5	76	57.5	75	207
Selenium	0.12	0.175	0.145	0.185	0.155	0.17	0.155
Silver	0.27	0.27	0.275	0.335	0.255	0.33	0.26
Sodium	11.3	25.6	6.1	36.65	4.2	8.75	86.4
Thallium	0.055	0.085	0.105	0.11	0.095	0.105	0.07
Vanadium	8.2	17	2.05	5.9	0.9	1.7	17.1
Zinc	0.82	2.6	0.89	2.3	0.76	1.6	2.5

Concentrations are in millogrms per kilogram (mg/Kg).
Qualifiers have been removed per Baker's standards.
Qualifiers R, U, and UJ have been given one-half the detection value.
Qualifiers J, NJ, and B have been removed with no detection value change.

APPENDIX
BASE BACKGROUND METALS CONCENTRATIONS IN SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

	54-BB-SB01-04	54-BB-SB02-04	86-BB-SB01-02	65-DW04-05	MIN	MAX	AVG
Aluminum	1100	1040	2460	4560	16.900	11000.000	3706.615
Antimony	1.25	1.25	2	5.25	0.355	6.900	3.249
Arsenic	0.16	0.195	0.22	1.05	0.033	15.400	0.985
Barium	1.15	1.05	4.4	10.9	0.650	22.600	7.185
Beryllium	0.06	0.0345	0.09	0.105	0.010	0.310	0.096
Cadmium	0.325	0.335	0.275	0.5	0.155	1.200	0.359
Calcium	24.6	14.7	50.8	111	4.750	4410.000	193.912
Chromium	1.15	1	3.1	5.7	0.650	66.400	6.268
Cobalt	0.26	0.305	0.29	3.2	0.175	7.000	0.805
Copper	0.45	0.46	0.185	1.05	0.160	9.500	1.205
Iron	392	319	3160	925	63.300	90500.000	3567.320
Lead	0.8	1.75	2.4	2.7	0.465	21.400	4.132
Magnesium	16.4	17.35	71.3	192	2.850	852.000	131.699
Manganese	0.5	0.6	1.8	5.6	0.395	19.900	3.995
Mercury	0.11	0.05	0.055	0.05	0.010	0.680	0.065
Nickel	9.2	7.7	1.05	2.1	0.450	9.200	1.863
Potassium	29.9	14.45	66.5	105	1.050	1250.000	172.126
Selenium	0.145	0.17	0.175	0.5	0.085	2.400	0.403
Silver	0.28	0.29	0.29	0.5	0.175	1.000	0.434
Sodium	4.4	2.2	6.8	69.9	2.200	141.000	27.285
Thallium	0.065	0.08	0.13	1.05	0.055	2.700	0.490
Vanadium	0.85	0.8	1.85	4.1	0.340	69.400	6.670
Zinc	0.92	1.3	0.37	3.45	0.320	26.600	3.334

Concentrations are in millogrms per kilogram (mg/Kg).
Qualifiers have been removed per Baker's standards.
Qualifiers R, U, and UJ have been given one-half the detection value.
Qualifiers J, NJ, and B have been removed with no detection value change.

APPENDIX
BASE BACKGROUND METALS CONCENTRATIONS IN SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

	2Xaverage
Aluminum	7413.230
Antimony	6.498
Arsenic	1.971
Barium	14.370
Beryllium	0.191
Cadmium	0.718
Calcium	387.824
Chromium	12.537
Cobalt	1.611
Copper	2.410
Iron	7134.639
Lead	8.264
Magnesium	263.398
Manganese	7.990
Mercury	0.129
Nickel	3.725
Potassium	344.252
Selenium	0.806
Silver	0.869
Sodium	54.570
Thallium	0.980
Vanadium	13.340
Zinc	6.668

Concentrations are in millogrms per kilogram (mg/Kg).
Qualifiers have been removed per Baker's standards.
Qualifiers R, U, and UJ have been given one-half the detection value.
Qualifiers J, NJ, and B have been removed with no detection value change.

APPENDIX M
EVALUATION OF METALS IN GROUNDWATER

DRAFT

EVALUATION OF METALS IN GROUNDWATER

MARINE CORPS BASE, CAMP LEJEUNE, NORTH CAROLINA

CONTRACT TASK ORDER 0177

JUNE 3, 1994

Prepared for:

DEPARTMENT OF THE NAVY
ATLANTIC DIVISION
NAVAL FACILITIES
ENGINEERING COMMAND
Norfolk, Virginia

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TABLE OF CONTENTS

1.0 INTRODUCTION

Numerous groundwater investigations have been conducted at Marine Corps Base (MCB), Camp Lejeune under the Department of the Navy (DON) Installation Restoration Program (IRP). These studies have identified elevated levels of total metals in shallow groundwater at almost every site. The degree of contamination, based on dissolved metals analysis of groundwater samples, is limited. It is believed that the presence of elevated metals are not always related to past disposal activities for several reasons, which is the basis of this study.

Currently, Records of Decision (ROD) are being prepared for Operable Units No. 1 (Sites 21, 24, and 78) and No. 5 (Site 2). Both RODs are proposing to not remediate shallow groundwater which contains elevated levels of total metals above State groundwater standards (i.e., North Carolina Water Quality Standards) and/or Federal drinking water standards (i.e., Maximum Contaminant Levels). Specifically, remediation of shallow groundwater due to elevated total metals is not cost effective, or practical, due to the following: (1) the shallow aquifer is not used for potable supply; (2) the source of metals in groundwater cannot be correlated with soil data or previous disposal practices; (3) the extent of shallow groundwater contamination (based on total metals analysis) is widespread and in many cases undefinable, since there are no apparent contaminant plumes or patterns associated with the metals; and (4) deep groundwater, which is the source of potable water, is not significantly contaminated with metals above the standards.

2.0 STUDY OBJECTIVES

The DON/Marine Corps initiated a study on inorganics in groundwater throughout MCB Camp Lejeune to assess whether total metals in groundwater are related to disposal practices or to other factors. The overall goal of this study is to provide information that would be used in consideration of not remediating shallow groundwater at Operable Units No. 1 and No. 5, and possibly other operable units where total metals are elevated without cause. The following study objectives were identified:

(1) Determine whether the elevated total metals detected in the shallow aquifer are related to past disposal practices, well construction factors, sampling techniques, or suspended particulates in the samples;

(2) Determine whether total metals in shallow groundwater are elevated throughout the region or MCB Camp Lejeune;

(3) Determine whether there is a correlation between elevated total metals in groundwater and metals in soil; and

(4) Determine whether the concentrations of total metals (i.e., low versus high) is related to shallow and deep aquifer characteristics.

3.0 SCOPE OF WORK

Groundwater and soil data from a total of 21 sites were compiled as part of the overall study. Three of the 21 sites are located outside the boundary of the base. These sites include the ABC Cleaners Superfund Site, located along Route 24 in Jacksonville, and two sites located along Highway 17 (Off-site Properties No. 1 and No. 2). The two sites along Route 17 were investigated by the DON/Marine Corps as part of a real estate survey. The other 18 sites are located throughout various portions of MCB Camp Lejeune (see Figure 1).

Information from studies conducted by Baker and other consultants were obtained to evaluate metal concentrations in groundwater. The study focused on 14 metals of potential concern to human health and the environment. Some of the information was collected under the IR Program whereas other information was obtained during other investigations (e.g., ABC Cleaners RI/FS). The following data tables were then prepared to determine why total metals are generally elevated in shallow groundwater.

Table 1 - Total Metal Concentrations in Shallow Groundwater by Site

Table 2 - Summary of Repeat Sampling of Shallow Wells (Sites 2 and 78)

Table 3 - Dissolved Metal Concentrations in Shallow Groundwater by Site

Table 4 - Summary of Total Metal Concentrations in Upgradient Wells

Table 5 - Comparison of Subsurface Metal Concentrations in Uncontaminated and Contaminated Wells

Table 6 - Total Metal Concentrations in Deep Groundwater by Site

Table 7 - Summary of Field Parameters in Shallow Monitoring Wells, Deep Monitoring Wells, and Supply Wells

The tables are presented at the end of this report.

4.0 DATA ANALYSIS

The following discussion represents an analysis of the information contained in each of the previously mentioned tables.

Table 1 (Total Metal Concentrations in Shallow Groundwater)

All of the sites had at least one (and in most cases several) metal which exceeded either State water quality standards or Federal drinking water standards. The most frequently detected metals included chromium, lead, and manganese, which were detected at almost every site above drinking water standards. Other frequently detected metals which exceeded drinking water standards included arsenic, beryllium, cadmium, and nickel.

An analysis of the data from Table 1 indicates that elevated total metals are present in shallow groundwater at every site, including the three sites which are located off base. The two sites which did not exhibit significant contamination include the ABC Cleaners site (only chromium exceeded the standards) and Site 48 (only manganese exceeded the standards).

Total metals detected in shallow groundwater at Site 2 exceeded State and/or Federal standards in seven of the 11 shallow monitoring wells. Manganese was the most frequently detected metal (7/11). Lead (3/11), chromium (2/11), and cadmium (1/11) were also detected above the standards,, but less frequently (see Figure 2).

With the exception of Wells 78GW03 and 78GW19, total metals were detected at Site 78 (Hadnot Point Industrial Area) above Federal MCLs or NCWQS in every shallow well (see Figure 3). The extent of elevated total metals in groundwater is widespread, encompassing approximately one square mile (or approximately 660 acres) in total area. The distribution and concentration of total metals in shallow groundwater makes it virtually impossible to identify or illustrate contaminant plumes (see Figure 3).

An analysis of the total metals results indicates the following pattern. Samples exhibiting elevated levels of lead, chromium, or other contaminants of concern, also exhibited elevated levels of other metals such as aluminum, antimony, iron, and zinc. Samples which did not exhibit elevated levels of lead, chromium, or manganese also did not exhibit elevated levels of other metals. This pattern indicates that the elevated total metals are not limited to one or

two contaminants, which would be the case if a lead or chromium plume in the groundwater truly existed. In other words, if a site is impacted by a particular metal due to disposal activities (say chromium for example), then other metals such as aluminum, lead, or zinc should not be consistently elevated as in the case of samples collected from the shallow aquifer at MCB Camp Lejeune. This point is depicted in the data summary tables provided in Appendix A for Sites 2 and 78. These tables were taken from the Remedial Investigation Reports for Operable Units No. 1 and No. 5. As an example, note that sample numbers 78-MW08, 78-MW10, 78-MW11, and 78-MW12 all had elevated levels of total metals when compared to samples 78-MW09-2 and 78-MW09-3. It is clear that most of the metal concentrations in a particular sample follow a consistent pattern throughout.

Table 2 (Comparison of Repeat Sampling of Shallow Wells

Five wells from Sites 2 and 78 were randomly chosen to evaluate total metals concentrations between sampling rounds. The comparison was limited to only chromium, lead, and manganese since these contaminants were frequently detected throughout MCB Camp Lejeune. In several cases, metal concentrations were significantly different between the sampling rounds. If the shallow aquifer was impacted due to former disposal activities, a contaminant plume would be present and concentrations would not significantly deviate. The deviation in metal concentrations may indicate that sampling results are biased due to suspended particulates in the samples.

Table 3 (Dissolved Metal Concentration in Shallow Groundwater by Site)

The data base for Table 3 was limited to 12 sites since many of the previous investigations (i.e., prior to Navy CLEAN) did not analyze for dissolved metals. Nevertheless, an analysis of the 12 sites revealed that elevated levels of dissolved metals in groundwater is limited. Manganese was the most frequently detected metal above drinking water standards (10 of 12 sites exhibited elevated levels). Lead was detected at only one site (Site 21) above drinking water standards. Chromium was also detected at only one site (Site 78) above drinking water standards. No other metal was detected above the standards.

Literature searches have indicated that manganese is a naturally occurring metal in North Carolina. Therefore, the presence of manganese may not be attributable to site-related activities (Greenhorne & O'Mara, 1992).

An analysis of the data from Table 3 clearly shows a significant reduction in metal concentrations when compared to Table 1 (total metals in shallow groundwater). One possible reason for this reduction is that suspended solids or particles are not being introduced into the analysis of the sample due to filtering. A second possibility is that the metals are not significantly present in a dissolved state in shallow groundwater due to the species of metals under site conditions. It should be noted that calcium and sodium did not exhibit such a pattern since the salts of these metals are more soluble in water. For example, the concentrations of total calcium and total sodium versus dissolved calcium and dissolved sodium are similar and are not affected by the removal of the particulates during filtering. The fact that these salts do not exhibit the pattern that the other metals show supports the possibility that total metal concentrations are influenced by particulates in the sample.

Table 4 (Total Metals in Upgradient Shallow Wells)

The data base for Table 4 consists of groundwater results from 14 upgradient shallow monitoring wells (i.e., one well per site). These wells were installed to determine baseline groundwater quality to which on-site groundwater conditions could be compared. In some cases, the upgradient wells were located in areas where other base activities may have influenced groundwater quality.

The analysis of this data shows that manganese was the most frequently detected metal above Federal or State standards in upgradient shallow wells. Manganese was detected in 7 of the 14 upgradient wells above drinking water standards. Chromium and lead were also frequently detected above drinking water standards in upgradient (background) wells. These contaminants were detected in 6 of the 14 upgradient wells. At Site 2, samples collected from an upgradient well (2GW9) exhibited elevated levels of chromium (83µ/l), lead (27.2µ/l) and manganese (747µ/l). At Site 78, samples collected from upgradient wells 96W4 and 78GW26 did not exhibit elevated levels of total metals. The concentration range for metals detected above NC WQS and/of Federal MCLs in upgradient wells is provided below:

- beryllium (ND-46.5 µ/l)
- cadmium (ND-10 µ/l)
- chromium (ND-198 µ/l)
- lead (ND-78.8 µ/l)
- manganese (ND-747 µ/l)
- mercury (ND-1.6J µ/l)

Based on the above range representing upgradient wells, none of the on-site wells at Site 2 exhibited total metals above the maximum background concentrations. However, at Site 78, lead and chromium were detected above the maximum background in several on-site wells.

An analysis of the data from Table 4 indicates that shallow groundwater upgradient of some sites contains total metals above drinking water standards. A comparison of Table 4 data against Table 1 data indicates that shallow groundwater samples from upgradient wells are less contaminated than samples collected from on-site monitoring wells. However, it should be noted that the data base for Table 4 consists of only 14 wells whereas the data base for Table 1 consists of over 130 wells. Therefore, to assume that upgradient groundwater quality is better than on-site groundwater quality may not be justified due to the different data bases.

Table 5 (Comparison of Subsurface Metal Concentrations in Uncontaminated and Contaminated Wells)

The purpose of this table is to determine whether metal concentrations in soils correlate with the elevated levels of metals in shallow groundwater.

To evaluate this, metals in subsurface soils, representing an area of groundwater contamination, were compared to metals in subsurface soil in areas which did not exhibit groundwater contamination. If the elevated total metals in shallow groundwater are present due to former disposal activities, subsurface metals in soil representing an area of groundwater contamination would be expected to be elevated or higher than metals in subsurface soil representing a non-contaminated area. This evaluation assumes that the well exhibiting elevated total metals is within a source area and that the soil sample is representative of soil impacted by metal contamination.

As shown on Table 5, there is no clear pattern or correlation which indicates that elevated total metals are due to soil contamination. Note that in many cases, the concentration of metals which represent "non-contaminated" areas are greater than the metals which represent "contaminated" areas. Also note that the metals in subsurface soil are within or close to background subsurface metal concentrations. Therefore, this supports the possibility that in many cases at MCB Camp Lejeune, the elevated total metals in shallow groundwater cannot be attributable to a source or to past disposal practices.

Table 6 (Total Metals in Deep Monitoring Wells)

Table 6 presents total metal concentrations in deep groundwater for each site. The data base is limited to only 8 sites. Metal concentrations in supply wells were also included for comparison purposes.

As shown on Table 6, total metals in deep groundwater are below drinking water standards with a few exceptions. Arsenic and cadmium were detected above the standards in one deep monitoring well at Site 78 (see Figure 4). Manganese was detected in deep groundwater at three sites and a few of the supply wells. Lead was detected in one supply well at 16 µ/l, which is slightly above the drinking water standard of 15 µ/l.

Elevated total metals are not widespread in deep groundwater for two possible reasons. First, most metals are not very mobile in the environment. Second, deep groundwater samples may not have significant amounts of suspended particulates due to different geologic conditions. Soils in the deeper aquifer are more compacted and consist primarily of calcareous sands, clays, and limestone fragments. Soils in the shallow aquifer are loosely compacted and consist primarily of fine-grained sands, silts, and clays. This classification may support the possibility that suspended solids are collected during sampling, thereby influencing the analysis for total metals.

Table 7 (Summary of Field Parameters in Shallow, Deep, and Supply Wells)

Table 7 provides a range of pH and specific conductivity values representative of shallow and deep groundwater. In general, lower pH values were noted more often in shallow wells than in deep wells (including the supply wells). This condition may influence the leachability and speciation of metals in groundwater.

Deep groundwater usually exhibited higher specific conductivity values. High specific conductivity values are representative of high dissolved conditions. The fact that deep groundwater generally exhibited higher specific conductivity values indicates that most of the metals, if present, are in a dissolved state. The high specific conductivity values could also indicate less suspended particulates due to the geologic conditions of the deep aquifer. The lower specific conductivity values observed in shallow wells indicates that the metals in the shallow aquifer are not in a dissolved state. This also supports the possibility that suspended particulates in the shallow aquifer are influencing the analysis of total metals.

5.0 ANALYSIS OF THE STUDY OBJECTIVES

Each of the objectives identified for this study are analyzed below based on the information collected.

Objective No. 1 (Determine whether the elevated total metals in the shallow aquifer are related to past disposal practices, well construction factors, sampling techniques, or suspended particulates in the samples)

Based on the analysis of information provided in Tables 1 through 7 and Appendix A, it appears that suspended particulates in groundwater samples could influence the concentration of total metals in groundwater. Well construction factors and sampling techniques are probably not a significant factor since the data base is representative of data obtained by Baker, ESE (Site 28 and 30), Roy F. Weston (ABC Cleaners), and Halliburton NUS (Site 7). No particular pattern was noted between sites which Baker obtained the samples versus sites in which other consultants obtained the data. Sampling methods were also considered. For Sites 63 and 65 for example, samples were collected with a bailer. At Sites 2 and 78, samples were collected with a low flow pump. All four sites exhibited elevated levels of total metals in groundwater samples. In addition, due to the fact that deep groundwater quality is not significantly impacted with metals indicates that well construction or sampling techniques are probably not factors related to elevated total metals in groundwater.

With respect to past disposal practices, Table 5 clearly shows that soil concentrations do not correlate with elevated total metals in groundwater. Based on this analysis, and on many of the sites previously investigated, the source of total metals in groundwater cannot be attributable to soil contamination or disposal practices in many cases. This is based on both the history of the site as well as the analytical soil results. In some cases, total metals were detected at elevated levels even when the site history did not correlate with the contaminants found. For example, Sites 2 and 21 have a history of pesticide storage and handling, and there are no known disposal areas (i.e., buried debris) within the site boundary. Nevertheless, both of these sites exhibited several metals above drinking water standards that would not be expected to be present at high concentrations based on the historical use of the site. These metals included lead, chromium, beryllium, cadmium, and manganese.

Objective No. 2 (Determine whether total metals in shallow groundwater are elevated throughout the region or MCB Camp Lejeune)

Based on groundwater data obtained from both upgradient wells and off base wells, total metals were detected above drinking water standards in shallow groundwater in areas that would not be influenced by former disposal activities at the sites. Given that some of the upgradient wells are contaminated, it is apparent that total metals in shallow groundwater are elevated in certain areas of the base outside of the influence of site-related disposal activities. However, it is unknown whether the shallow aquifer upgradient of the sites is contaminated due to other base-related activities or whether the levels in groundwater samples are also elevated due to the influence of suspended fines in the samples.

Objective No. 3 (Determine whether there is a correlation between elevated total metals in groundwater and metals in soil)

An evaluation of the data presented in Table 5 shows that metals in soil samples collected in areas of groundwater contamination are not elevated when compared to metals in soil samples collected in areas that did not exhibit groundwater contamination. This supports the possibility that in many cases, elevated levels of total metals in shallow groundwater are not related to the disposal history at the site. As previously mentioned, sites which did not exhibit soil contamination (when compared to background soil levels) or did not have a history of disposal indicative of metals contamination still exhibited elevated levels of total metals in groundwater. Since there is no apparent correlation between metals in soil and total metals in groundwater, then the possibility exists that the elevated total metals in groundwater are biased high due to suspended particulates.

Objective No. 4 (Determine whether the concentrations of total metals in groundwater is related to shallow and deep aquifer characteristics)

There is some evidence that the geologic conditions of the shallow and deep aquifers influence the amount of total metals detected in groundwater samples. The fact that the deep aquifer generally exhibited higher specific conductivity values indicates that there is more dissolved constituents in the deep aquifer when compared to the shallow aquifer. This was evident when comparing Table 1 (total metals in shallow groundwater) to Table 6 (total metals in deep groundwater). Table 6 did not indicate significant levels of total metals in deep groundwater throughout MCB Camp Lejeune.

The geologic conditions of the shallow aquifer would tend to result in samples that may contain suspended particulates. The suspended particulates could influence the total metals concentrations in the samples.

6.0 CONCLUSIONS

1. Elevated levels of total metals in the shallow aquifer are probably influenced to some degree by the geologic conditions of the site.

2. There is no correlation between metal levels in soil and total metals in groundwater. Therefore, elevated total metals in groundwater cannot be attributable to soil contamination of past disposal practices.

3. Elevated levels of total metals in the shallow aquifer may be biased high due to suspended particulates in the samples.

4. Dissolved metals in groundwater were generally below Federal MCLs and NC WQS and therefore, do not present a significant problem at MCB Camp Lejeune.

5. Total and dissolved metal concentrations in the Castle Hayne aquifer were generally below drinking water standards and therefore, do not present a significant problem at MCB Camp Lejeune.

6. The presence of manganese in shallow and deep groundwater may be due to naturally occurring geologic conditions.

7.0 RECOMMENDATIONS

1. Remediation of total metals in the shallow aquifer at Operable Units 1 and 5 is not recommended based on the following:

   - Elevated metals in groundwater at both operable units does not appear to be related to soil contamination or past disposal practices;
   - The distribution of total metals in groundwater is not characteristic of a plume that would be present due to a source of contamination;
   - Remediation of total metals would not be practical from an engineering or cost standpoint; and
   - Currently, there is no human or environmental exposure to shallow groundwater.

2. Additional background wells should be installed at all sites in order to provide a baseline for comparing on-site groundwater quality.

Tables

TABLE 1
TOTAL METALS BY SITE
SHALLOW MONITORING WELLS
MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Number / Units	NCWQS ug/L	FEDERAL MCL ug/L	Site 1 ug/L	Site 2 ug/L	Site 6 ug/L	Site 7 ug/L	Site 9 ug/L	Site 21 ug/L	Site 24 ug/L	Site 28 ug/L	Site 30 ug/L	Site 41 ug/L	Site 43 ug/L	Site 44 ug/L
Arsenic	50	50	7.2 - 57.4	2.2 - 23.6	ND - 23.3	ND - 43.4J	ND	ND - 101	ND - 116J	5.4 - 13J	6.4 - 12J	2.4 - 36.3	ND - 23.4	ND - 570
Barium	2000	2000	335 - 833	46 - 1420	ND - 1020	427 - 641	ND - 1060	ND - 647	ND - 1120	78.8 - 576	60.1 - 396	55.2 - 999	220 - 745	315 - 3180
Beryllium	NE	4	2.7 J - 43.4	1 - 3	ND - 7.5	ND - 10.3J	ND	ND - 8	ND - 19	ND - 1.2J	ND - 2.4	0.80 - 42.8	1.5 - 4.2	1.4 - 36.6
Cadmium	5	5	ND - 12.9	7	ND	ND	ND	ND - 12	3.3J - 17.3J	ND - 10.7J	3.2 - 110	ND - 6.9	ND - 32	
Calcium	NA	NA	8850 - 726000	5710 - 450000	5430 - 64900	5050 - 51300	16100 - 90700	6130J - 63000J	ND - 151000	20200 - 160000	1730 - 11900	8750 - 828000	10300 - 91900	2430 - 191000
Chromium	50	100	172 - 627	11 - 117	ND - 201	47.8 - 220	ND - 214	ND - 348J	19 - 316	9.0J - 140	42.8 - 106J	10.5 - 244	161 - 249	126 - 895
Copper	1000	1300	44.6 - 117	3 - 23	ND - 175	17.7 - 36.4	ND - 39.7	ND - 84	ND - 52	18.8J - 75.4	15.8 - 42.5	16.3 - 1030	64.2 - 104	28.6 - 313
Lead	15	15	40.8J - 176J	2.7 - 44.8	ND - 200	23 - 37.3	ND - 127	ND - 2000J	5.1 - 89	20.3J - 234J	7.7J - 115J	4.8 - 9340	16.5 - 28.8	15.8 - 508
Manganese	50	50 (1)	125 - 1720	21 - 190	ND - 362	56.9 - 220	ND - 91.3	59 - 276J	29 - 518	82.2 - 304	78.5 - 578	56.6 - 2110	72.6 - 297	88 - 1730
Mercury	1.1	2	ND - 1.2J	ND	ND - .46	0.2 - 0.36	ND - 1.4	ND - 2.4J	ND - 3.2	ND - 1.4J	0.88J - 0.9J	0.13 - 0.92	ND - 0.24	ND - 1.1
Nickel	100	100	28.5 - 426	ND	ND - 41.9	ND	ND	ND - 123	ND - 140	ND - 59.8	17.1J - 52.6J	28.8 - 137	20.5 - 143	21.9 - 486
Sodium	NA	NA	9090 - 19000	ND - 103000	1110 - 68700	7040 - 156000	1390 - 4170	7950 - 15700	5230 - 19200	9480 - 74700	5320 - 8100	2080 - 40200	9160 - 22100	4060 - 12600
Vanadium	NE	NE	214 - 640	9 - 184	ND - 330	37.8 - 423	ND - 175	ND - 419	ND - 408	6.1 - 164	57 - 101	20.4 - 244	122 - 233	184 - 759
Zinc	2100	5000 (1)	ND - 1110	6 - 146	ND - 1620	83.6 - 133	ND - 118	27J - 487J	20 - 650	ND	79.2 - 104	25.7 - 5180	19 J - 661J	87.3 - 2800J

Site Number / Units	Site 48 ug/L	Site 63 ug/L	Site 65 ug/L	Site 69 ug/L	Site 78 ug/L	Site 82 ug/L	ABC Cleaners ug/L	Offsite Property #1 ug/L	Offsite Property #2 ug/L
Arsenic	ND	ND - 23.4	ND - 308	2.9 - 29.0	ND - 405J	ND - 67.8	ND - 12	10.3 - 160	ND
Barium	18 - 51.3	56.1 - 5410	105 - 638	46.5 - 850	ND - 1250	ND - 540	35 - 220	ND - 468	ND
Beryllium	ND	ND - 3.1	ND	1.3 - 10.6	ND - 19	ND	NA	ND - 8.5	ND
Cadmium	2.2 - 3.3	ND	ND	2.4 - 11.4	ND - 21	ND	NA	ND	ND
Calcium	30600 - 115000	2830 - 24300	33300 - 181000	2010 - 38700	ND - 642000	6580 - 60800	790 - 16000	ND - 22800	ND - 5200
Chromium	5.8 - 17.5	4.4 - 134	50.1 - 364	15.1 - 159	ND - 858J	ND - 174	ND - 57	52.8 - 636	ND - 94
Copper	3.1 - 13.5	10.7 - 126	28.2 - 127	16.2 - 70.8	ND - 699	ND - 29.3	ND - 89	ND - 140	ND
Lead	ND	4.3 J - 369	19.1 - 132	7.8 - 188	ND - 360J	ND - 89	ND - 10	12.3 - 345	6.3 - 62.3
Manganese	38.1 - 585	50.3 - 1020	56.2 - 474	13.0 - 912	26 - 714	26.9 - 283	4 - 44	56 - 973	ND - 60.1
Mercury	0.04 - 0.09	ND - 0.20	ND - 0.29	0.10 - 0.94	ND - 1.5	ND - 0.66	NA	ND	ND
Nickel	ND	19.8 - 54.2	19.4 - 84.3	13.6 - 99.8	ND - 234	ND - 34.6	ND - 77	40.2 - 380	ND
Sodium	5750 - 8760	3150 - 7100	3850 - 11700	4790 - 41300	ND - 42500	5670 - 36500	5800 - 33000	ND - 9390	ND - 7630
Vanadium	3.4 - 12.8	7.9 - 163	59.8 - 433	17.3 - 210	ND - 1700	ND - 256	ND - 45	70 - 739	ND - 64.7
Zinc	ND - 30.3	58.5J - 1110J	148J - 406J	36.2 - 12100	6J - 967J	ND - 204	14 - 220	ND - 736	ND - 40.8

NOTES:
J - Value is estimated.
JB - Value is estimated below the CRDL, but greater than the IDL.
NE - Not established.
NA - Not analyzed.
ND - Not detected.
NCWQS - North Carolina Water Quality Standard
MCL - Maximum Contaminant Level
(1) - Secondary MCL

TABLE 2
COMPARISON OF REPEAT SAMPLING OF SHALLOW WELLS
MCB, CAMP LEJEUNE, NORTH CAROLINA

Well	2GW01		2GW03		2GW06		2GW08		2GW09	
Date	5/1993	3/1994	5/1993	3/1994	5/1993	3/1994	5/1993	3/1994	5/1993	3/1994
Chromium	18	ND	11	ND	15	ND	ND	ND	25	83
Lead	15.5 J	ND	3.5 J	ND	6.7 J	ND	ND	3.4	27.2 J	23.6
Manganese	55	47	21	ND	79	140	53	415	290	747

Well	78GW05		78GW08		78GW15		78GW16		78GW19	
Date	1/1991	4/1994	1/1991	4/1994	1/1991	4/1994	1/1991	4/1994	1/1991	4/1994
Chromium	ND	17 J	91.8	491 J	21.4	215 J	209	353 J	13.8	ND
Lead	13.6	13.1 J	54.1	131 J	16.6	53	100	224	31.7	8.3
Manganese	162	161 J	46.5	213 J	18.3	115	98.3	150	79	26

NOTES:
J - Value is estimated..
ND - Not detected.

TABLE 3
DISSOLVED METALS BY SITE
SHALLOW MONITORING WELLS
MCB, CAMP LEJEUNE, NORTH CAROLINA

Site Number / Units	NCWQS ug/L	FEDERAL MCL ug/L	Site 1 ug/L	Site 2 ug/L	Site 6 ug/L	Site 7 ug/L	Site 9 ug/L	Site 21 ug/L	Site 24 ug/L	Site 28 ug/L	Site 30 ug/L	Site 41 ug/L	Site 43 ug/L	Site 44 ug/L
Arsenic	50	50	NA	2.2 - 7.1	ND	NA	ND	ND - 10.6	ND - 16.3	NA	NA	2.2 - 4.7	NA	NA
Barium	2000	2000	NA	25 - 149	ND	NA	ND	ND	ND	NA	NA	12.4 - 451	NA	NA
Beryllium	NE	4	NA	1	ND	NA	ND	ND	ND	NA	NA	0.80 - 3.2	NA	NA
Cadmium	5	5	NA	ND	ND	NA	ND	ND - 5	ND	NA	NA	3.2 - 4.2	NA	NA
Calcium	NA	NA	NA	5800 - 441000	6230 - 57400	NA	15800 - 82400	35900	ND - 113000	NA	NA	4710 - 138000	NA	NA
Chromium	50	100	NA	10	ND	NA	ND	ND	ND	NA	NA	8.3 - 9.6	NA	NA
Copper	1000	1300	NA	2 - 9	ND	NA	ND	ND	ND	NA	NA	16.3 - 23.9	NA	NA
Lead	15	15	NA	2.1	ND	NA	ND	ND - 94	ND	NA	NA	1.0	NA	NA
Manganese	50	50 (1)	NA	17 - 129	ND - 92.7	NA	ND	40 - 134	ND - 320	NA	NA	7.1 - 521	NA	NA
Mercury	1.1	2	NA	ND	ND	NA	ND	ND	ND - 0.5	NA	NA	0.13 - 0.20	NA	NA
Nickel	100	100	NA	ND	ND	NA	ND	ND	ND - 57	NA	NA	28.8 - 31.2	NA	NA
Sodium	NA	NA	NA	ND - 103000	1420 - 70500	NA	1280 - 3860	16200	ND - 183000	NA	NA	2500 - 34200	NA	NA
Vanadium	NE	NE	NA	43	ND	NA	ND	ND	ND	NA	NA	20.4	NA	NA
Zinc	2100	5000 (1)	NA	8 - 35	ND - 350	NA	ND	6B - 50	ND - 437	NA	NA	10.6 - 125	NA	NA

Site Number / Units	Site 48 ug/L	Site 63 ug/L	Site 65 ug/L	Site 69 ug/L	Site 78 ug/L	Site 82 ug/L	ABC Cleaners ug/L	Offsite Property #1 ug/L	Offsite Property #2 ug/L
Arsenic	ND	NA	NA	2.9	ND - 21.6	ND	NA	ND - 18.8	ND
Barium	16.8 - 27.6	NA	NA	13.7 - 35.8	ND	ND	NA	ND	ND
Beryllium	ND	NA	NA	1.3	ND	ND	NA	ND	ND
Cadmium	ND - 3.1	NA	NA	2.4	ND	ND	NA	ND	ND
Calcium	72600 - 80700	NA	NA	764 - 10600	ND - 296000	15200 - 58500	NA	ND - 7710	ND
Chromium	ND	NA	NA	7.2	ND - 59	ND	NA	ND - 30.0	ND
Copper	2.6 - 7.6	NA	NA	16.2	ND - 121	ND	NA	ND - 10.7	ND
Lead	ND	NA	NA	1	ND - 17.2	ND	NA	ND - 15.8	ND
Manganese	39.7 - 539	NA	NA	8.5 - 139	ND - 152	21 - 127	NA	ND - 63.8	ND - 21.3
Mercury	0.05 - 0.09	NA	NA	0.1	ND - 0.6	ND	NA	ND	ND
Nickel	ND	NA	NA	13.6	ND	ND	NA	ND	ND
Sodium	6430 - 8920	NA	NA	5170 - 41100	ND - 42200	5980 - 36000	NA	ND - 9540	ND - 6750
Vanadium	ND	NA	NA	16.6	ND	ND	NA	ND	ND
Zinc	ND	NA	NA	7.0 - 7670	ND - 58	ND - 119	NA	ND - 468	ND - 222

NOTES:
J - Value is estimated.
JB - Value is estimated below the CRDL, but greater than the IDL.
NE - Not established.
NA - Not analyzed.
ND - Not detected.
NCWQS - North Carolina Water Quality Standard
MCL - Maximum Contaminant Level
(1) - Secondary MCL

TABLE 4
SUMMARY OF TOTAL METALS IN UPGRADIENT WELLS
SHALLOW MONITORING WELLS
MCB, CAMP LEJEUNE, NORTH CAROLINA

Well Number	NCWQS	FEDERAL MCL	Upgradient of Site 1	Upgradient of Site 2	Upgradient of Site 6	Upgradient of Site 7	Upgradient of Site 9	Upgradient of Sites 21 and 78	Upgradient of Site 24	Upgradient of Site 28	Upgradient of Site 30	Upgradient of Site 41	Upgradient of Site 43	Upgradient of Site 44
			1GW06	2GW09	6BP6S	7GW03	9GW4S	78GW26	24GW07	28GW04		41GW05		
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L		ug/L		
Arsenic	50	50	17.8 J	12.9	ND	ND	ND	ND	3.7 J	7.4 J		13.1		
Barium	2000	2000	548	328	257	428	71.3	ND	ND	576		55.7		
Beryllium	NE	4	3.2 J	3	ND	ND	ND	ND	ND	9.3 J		1.6		
Cadmium	5	5	ND	ND	ND	ND	ND	not reported	ND	3.3 J		10		
Chromium	50	100	193	75	198	124	ND	13	37	122		54.4		
Copper	1000	1300	64.8	25	35.6	36.4	ND	ND	ND	20.7 J		27		
Lead	15	15	78.8 J	27.2	64.4	30.3 J	ND	9	11.4	22.4 J		23.7		
Manganese	50	50 (1)	202	747	84.5	56.9 J	ND	ND	39	206		203		
Mercury	1.1	2	1.6 J	ND	ND	0.36	ND	ND	ND	ND		0.16		
Nickel	100	100	51.6	ND	ND	ND	ND	ND	ND	59.8		38		
Vanadium	NE	NE	214	86	209	152	ND	149	64	85.3		38.1		
Zinc	2100	5000 (1)	ND	103	56.6	86.4 J	ND	68.1	41	ND		173		

No Upgradient Well Sites

No Upgradient Well Sites

No Upgradient Well Sites

Well Number	Upgradient of Site 48	Upgradient of Site 63	Upgradient of Site 65	Upgradient of Site 69	Upgradient of Site 78	Upgradient of Site 82	Upgradient of ABC Cleaners	Upgradient of Offsite Property #1	Upgradient of Offsite Property #2
	48GW1			69GW07	9GW04	6MW3S	MW-S01		
Units	ug/L			ug/L	ug/L	ug/L	ug/L		
Arsenic	ND			2.9	ND	ND	ND		
Barium	29.4 J			46.5	ND	ND	35		
Beryllium	ND			1.3	ND	ND	NA		
Cadmium	2.5 J			2.4	ND	ND	NA		
Chromium	ND			15.8	ND	ND	ND		
Copper	ND			16.2	ND	ND	ND		
Lead	ND			7.8	ND	ND	3		
Manganese	70.6			13	ND	ND	10		
Mercury	ND			0.1	ND	ND	NA		
Nickel	ND			13.6	ND	ND	ND		
Vanadium	3.4 J			17.3	ND	ND	9		
Zinc	ND			36.2	ND	ND	23		

No Upgradient Well Sites

No Upgradient Well Sites

No Upgradient Well Sites

NOTES:
J - Value is estimated.
JB - Value is estimated below the CRDL, but greater than the IDL.
NE - Not established.
NA - Not analyzed.
ND - Not detected.
NCWQS - North Carolina Water Quality Standard
MCL - Maximum Contaminant Level
(1) - Secondary MCL

TABLE 5
COMPARISON OF INORGANIC SUBSURFACE SOIL CONCENTRATIONS IN "CLEAN" AND "CONTAMINATED" WELLS
MCB, CAMP LEJEUNE, NORTH CAROLINA

	Camp Lejeune Background Subsurface Soil Data	Site 1		Site 2		Site 6		Site 7		Site 9		Site 21	
Units	mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg
Well Number		--	--	2GW07	2GW09	6GW18	6GW15	7GW03	7GW02	9GW5	9GW1	21GW03	21GW02
Soil Sample Number		--	--	2-GW07-01	2 - GW09-02	6-GW18-0303	6-GW15-03	GW03-002	GW02-7595	9-GW5-03	9-SB35-03	21-GW03	21-GW02
Arsenic	0.03 - 0.47	NA	NA	1.7 J	ND	ND	ND	1.5	ND	ND	ND	ND	0.55 J
Barium	2 - 11	NA	NA	12.5 J	ND	ND	ND	6.6	71	ND	ND	ND	4.4 J
Beryllium	0.03 - 0.23	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	0.17 - 1.2	NA	NA	ND	ND	ND	ND	1.3	4.5	ND	ND	ND	ND
Chromium	2 - 9	NA	NA	10.9 J	4.6	ND	3.9	5.2	6	ND	2.6 J	15.2	3.2 J
Copper	0.47 - 2	NA	NA	0.97 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead	1 - 12	NA	NA	8 J	4.3	3.3 J	3.2	2.5	34.4	1.6	5.3	7.1	6.9 J
Manganese	0.40 - 8	NA	NA	4.3 J	4.1	ND	1.8 B	3	11.5	ND	3.7 J	9.8	3.4 J
Mercury	0.01 - 0.11	NA	NA	0.3 J	ND	ND	ND	10.13	0.48	ND	ND	ND	ND
Nickel	0.70 - 5.0	NA	NA	ND	ND	ND	ND	3.4	11.8	ND	ND	ND	ND
Vanadium	0.75 - 13	NA	NA	13.8 J	ND	ND	2.9 B	5.5	4.5	ND	ND	15.5	4.4 J
Zinc	0.40 - 12	NA	NA	ND	ND	ND	ND	1.3	ND	ND	6.1 J	5.7	3 J

NOTES:
Shaded area indicates inorganic which exceeded a MCL and/or NCWQS in groundwater sample.
J - Value is estimated.
JB - Value is estimated below the CRDL, but greater than the IDL.
NA - No available wells to compare OR compound was not analyzed.
ND - Not detected.
NCWQS - North Carolina Water Quality Standard
MCL - Maximum Contaminant Level
(1) - Secondary MCL

TABLE 5
COMPARISON OF INORGANIC SUBSURFACE SOIL CONCENTRATIONS IN "CLEAN" AND "CONTAMINATED" WELLS
MCB, CAMP LEJEUNE, NORTH CAROLINA

	Site 24		Site 28		Site 30		Site 41		Site 43		Site 44	
Units	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg
Well Number	24GW10	24GW02	--	--	--	--	41GW04	41-GW11	43GW01	43GW02	44GW02	44GW01
Soil Sample Number	24-GW10	24-BDA-SB09	--	--	--	--	41-GW04-DW	41-GW11-01	43-GW01-00	43-GW02-00	44-GW02-035	--
Arsenic	ND	ND	NA	NA	NA	NA	0.51	1.6	ND	ND	ND	1.7
Barium	ND	ND	NA	NA	NA	NA	9.4	22.6	ND	ND	ND	17.9
Beryllium	ND	ND	NA	NA	NA	NA	0.18	0.18	ND	ND	ND	ND
Cadmium	ND	ND	NA	NA	NA	NA	0.73	0.73	8.3	ND	ND	ND
Chromium	11.2	9.1	NA	NA	NA	NA	3.6	11.2	8.3	6.7	3.6 J	10 J
Copper	ND	ND	NA	NA	NA	NA	3.7	22.5	3.4	ND	6.2 J	25.4 J
Lead	4.6 J	6.2 J	NA	NA	NA	NA	4.8	110	9.8	6.1	5.5	10.7
Manganese	4.7	8.4 J	NA	NA	NA	NA	3.7	75.6	31.2	8.2	3.8	20.4
Mercury	ND	ND	NA	NA	NA	NA	0.06	0.31	ND	ND	ND	ND
Nickel	ND	ND	NA	NA	NA	NA	6.6	6.6	7.6	7.4	3.1	5.4
Vanadium	18.4	10	NA	NA	NA	NA	6.8	9.3	7.2	5.8	5	14.7
Zinc	ND	7.8	NA	NA	NA	NA	7.7	130	20.1	3	3.2	34.9

NOTES:
Shaded area indicates inorganic which exceeded a MCL and/or NCWQS in groundwater sample.
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JB - Value is estimated below the CRDL, but greater than the IDL.
NA - No available wells to compare OR compound was not analyzed.
ND - Not detected.
NCWQS - North Carolina Water Quality Standard
MCL - Maximum Contaminant Level
(1) - Secondary MCL

TABLE 5
COMPARISON OF INORGANIC SUBSURFACE SOIL CONCENTRATIONS IN "CLEAN" AND "CONTAMINATED" WELLS
MCB, CAMP LEJEUNE, NORTH CAROLINA

	Site 48		Site 63		Site 65		Site 69		Site 78		Site 82	
Units	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg
Well Number	48-GW01	48-GW03	63MW03	63MW02	65MW03	65MW02	69-GW11	69-GW03	78GW34	78GW24-1	6-GW28	82MW3
Soil Sample Number	48-GW1A-01	48-C3-03	63-MW03-04	63-MW02-06	65-MW03-11	65-MW02-06	69-GW11-04	69-CSA-SB23-00	78-GW34	78-B903-SB03	6-GW28-09	6-GW27D-06
Arsenic	1.3	0.77 J	ND	ND	ND	1.3	0.68	0.63	ND	ND	0.31	15.9
Barium	21.1	15	ND	ND	3.4	6.8	5.6	3	ND	ND	ND	ND
Beryllium	0.2	0.19	ND	ND	ND	ND	0.3	0.28	ND	ND	ND	ND
Cadmium	1.4	1.8 J	ND	ND	NA	NA	0.56	0.52	ND	ND	ND	ND
Chromium	18.2	18.6	7.7	ND	3.9	4.7	6.8	1.7	18.5	9 J	2.6	1
Copper	3.5	3.8	ND	ND	1.5	3.1	3.8	3.5	3.4 B	ND	ND	ND
Lead	32.3	14.3	4.2	2.6	1.7	3.7	4.3	1.1	4.5 J	2.6 J	2.7	4.3
Manganese	411	7	4.9	18.8	3.5	6.9	4	1.2	9.2	ND	ND	ND
Mercury	ND	ND	ND	ND	NA	NA	0.06	0.05	ND	ND	ND	ND
Nickel	2.2	1.9 J	ND	ND	ND	ND	3.2	3	ND	ND	ND	ND
Vanadium	28.3	20.8 J	ND	ND	4.4	3	4.4	3.6	18.7	19.2	ND	ND
Zinc	ND	ND	ND	ND	2.7	5	3.2	1.3	7.9	ND	ND	ND

NOTES:
Shaded area indicates inorganic which exceeded a MCL and/or NCWQS in groundwater sample.
J - Value is estimated.
JB - Value is estimated below the CRDL, but greater than the IDL.
NA - No available wells to compare OR compound was not analyzed.
ND - Not detected.
NCWQS - North Carolina Water Quality Standard
MCL - Maximum Contaminant Level
(1) - Secondary MCL

TABLE 5
COMPARISON OF INORGANIC SUBSURFACE SOIL CONCENTRATIONS IN "CLEAN" AND "CONTAMINATED" WELLS
MCB, CAMP LEJEUNE, NORTH CAROLINA

	ABC Cleaners		Offsite Property #1		Offsite Property #2	
Units	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg	"Clean" mg/kg	"Contaminated" mg/kg
Well Number	--	--	--	--	--	--
Soil Sample Number	--	--	--	--	--	--
Arsenic	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA

NOTES:
Shaded area indicates inorganic which exceeded a MCL and/or NCWQS in groundwater sample.
J - Value is estimated.
JB - Value is estimated below the CRDL, but greater than the IDL.
NA - No available wells to compare OR compound was not analyzed.
ND - Not detected.
NCWQS - North Carolina Water Quality Standard
MCL - Maximum Contaminant Level
(1) - Secondary MCL

TABLE 6
TOTAL METALS BY SITE
DEEP MONITORING WELLS
MCB, CAMP LEJEUNE, NORTH CAROLINA

	Site 1	Site 2	Site 6	Site 7	Site 9	Site 21	Site 24	Site 28	Site 30	Site 41	Site 43	Site 44	Site 48	Site 63	Site 65	Site 69	Site 78	Site 82	ABC Cleaners	Base Supply Wells (1)
Arsenic	No Deep Wells	ND	ND	No Deep Wells	ND	No Deep Wells	No Deep Wells	No Deep Wells	No Deep Wells	2.2 - 9.6	No Deep Wells	No Deep Wells	No Deep Wells	No Deep Wells	No Deep Wells	2.2 - 3.5	2 - 118 J	ND	ND - 14	ND
Barium		1420	ND		ND					22.6 - 186						42.3 - 58.0	ND - 547	ND	4 - 36	ND
Beryllium		ND	ND		ND					3.2						0.80 - 0.89	ND	ND	NA	NA
Cadmium		ND	ND		ND					4.2 - 4.7						3.2	ND - 21	ND	NA	ND
Chromium		16	ND		ND					9.6 - 40.5						8.3 - 20.7	ND - 10	ND	ND - 32	ND
Copper		ND	ND		ND					23.9						16.3	ND	ND	ND - 41	ND - 130
Lead		ND	ND		ND					1.0 - 11.1						3.1 - 6.8	ND	ND	ND - 10	ND - 16
Manganese		ND	ND - 33.5		ND					16.9 - 101						53.7 - 114	ND - 591	ND - 21.6	ND - 45	10 - 120
Mercury		ND	ND		ND					0.15 - 0.17						0.16 - 0.17	ND - 0.3	ND	NA	ND
Nickel		ND	ND		ND					31.2						28.8	ND	ND	ND - 14	NA
Vanadium		ND	ND		ND					20.4 - 49.8						20.4	ND - 24 J	ND	ND - 15	NA
Zinc		ND	ND		ND					17.8 - 83.8						31.1 - 48.7	ND - 181 J	ND	58 - 390	ND - 120

NOTES:
J - Value is estimated..
NA - Not analyzed.
ND - Not detected.
(1) - Range is based on 67 supply wells located throughout MCB, Camp Lejeune, NC.

TABLE 7
SUMMARY OF FIELD PARAMETERS IN SHALLOW, DEEP, AND SUPPLY WELLS MCB, CAMP LEJEUNE, NORTH CAROLINA

	Shallow Wells		Deep Wells		Supply Wells	
	Range (1)	Average Maximum	Range (2)	Average Maximum	Range (3)	Average Maximum
pH (standard units)	4.5 - 7.28	6.08	7.52 - 11.34	8.88	6.91 - 7.45	7.32
Specific Conductivity (micromhos/cm)	40 - 580	267	149 - 525	350	212 - 511	353

(1) - Based on data from 11 sites.
(2) - Based on data from 6 sites.
(3) - Based on data from 9 supply wells.

Figures

00146001Z

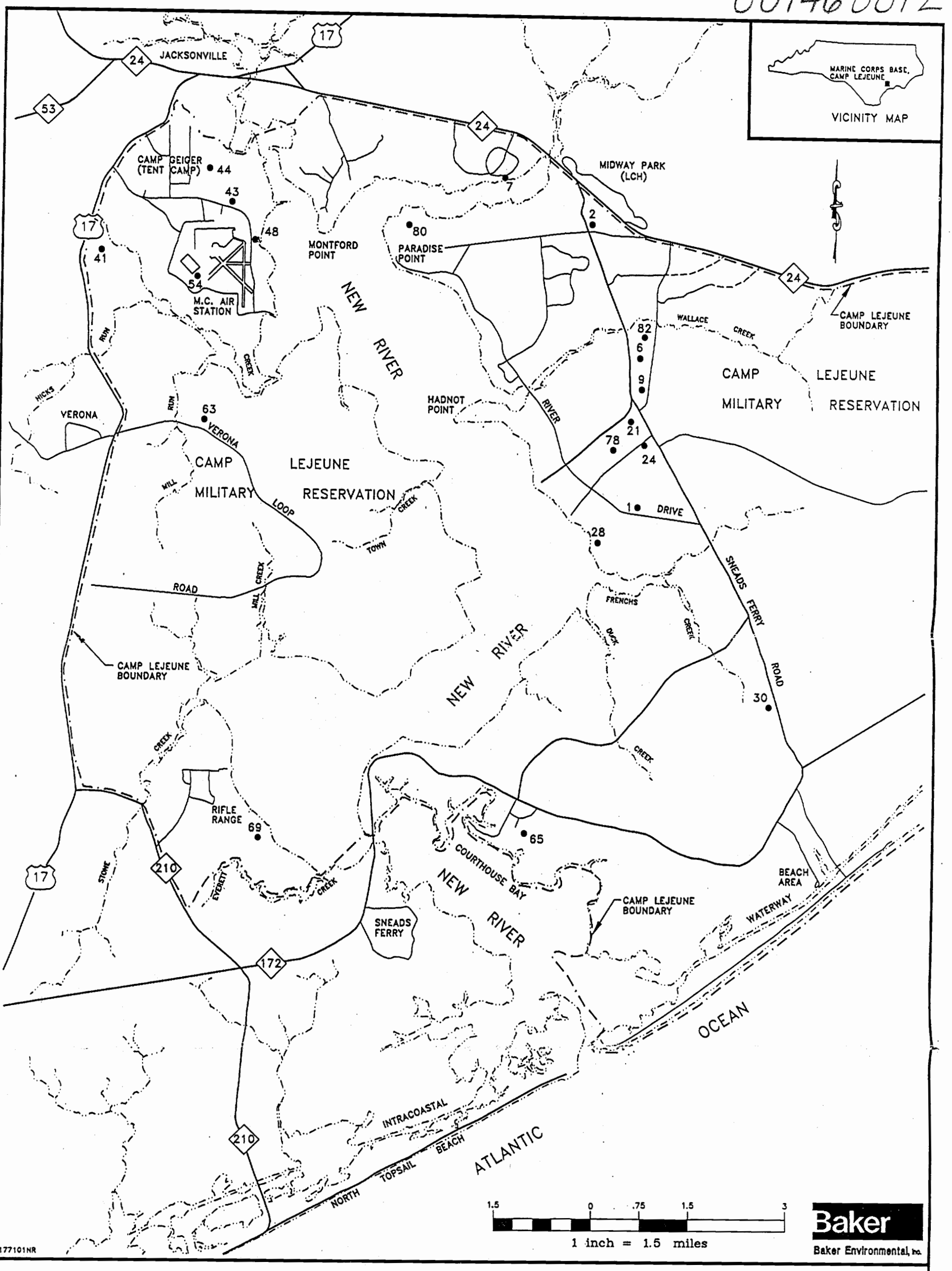
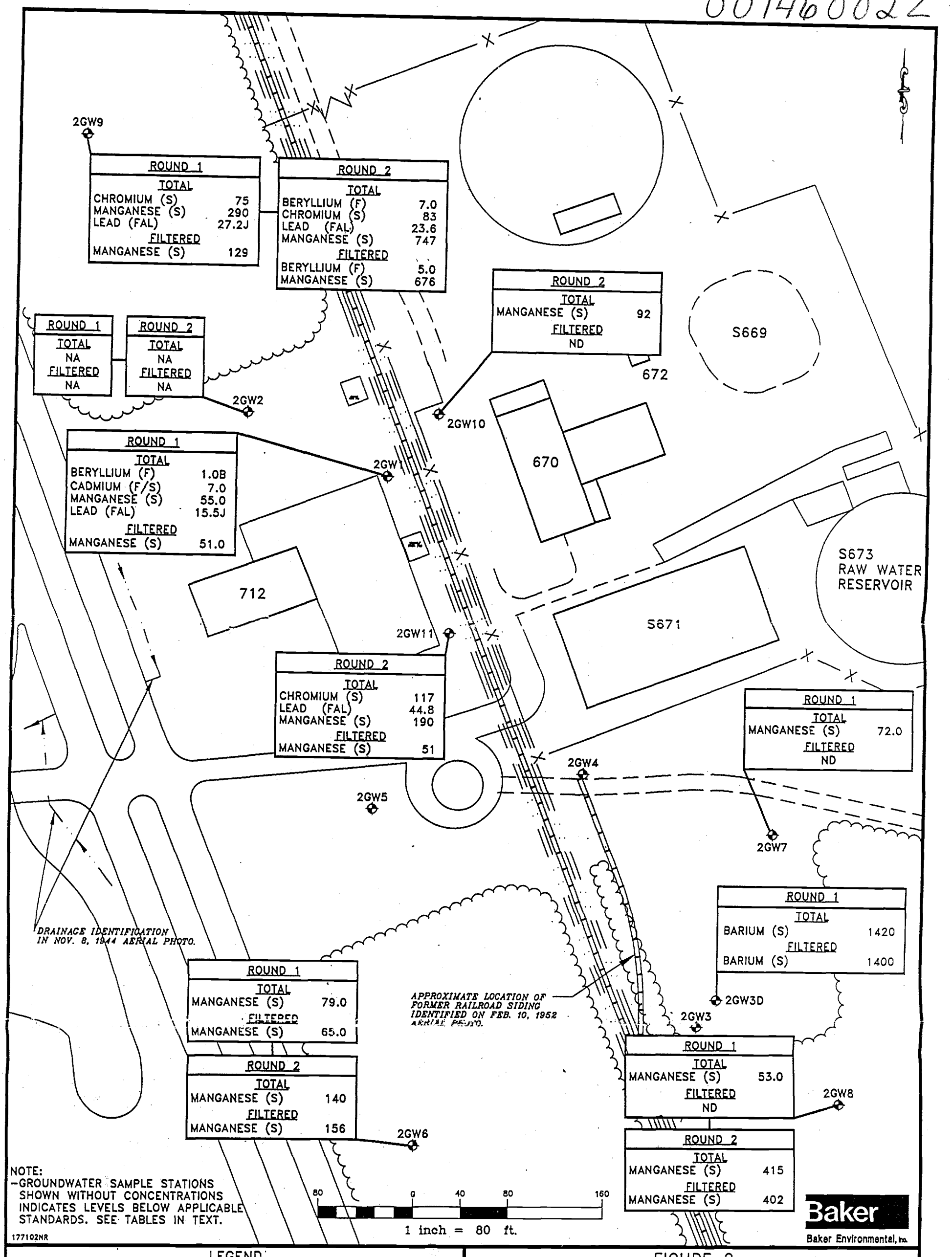


FIGURE 1
SITE LOCATION MAP
INORGANIC GROUNDWATER STUDY

MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA



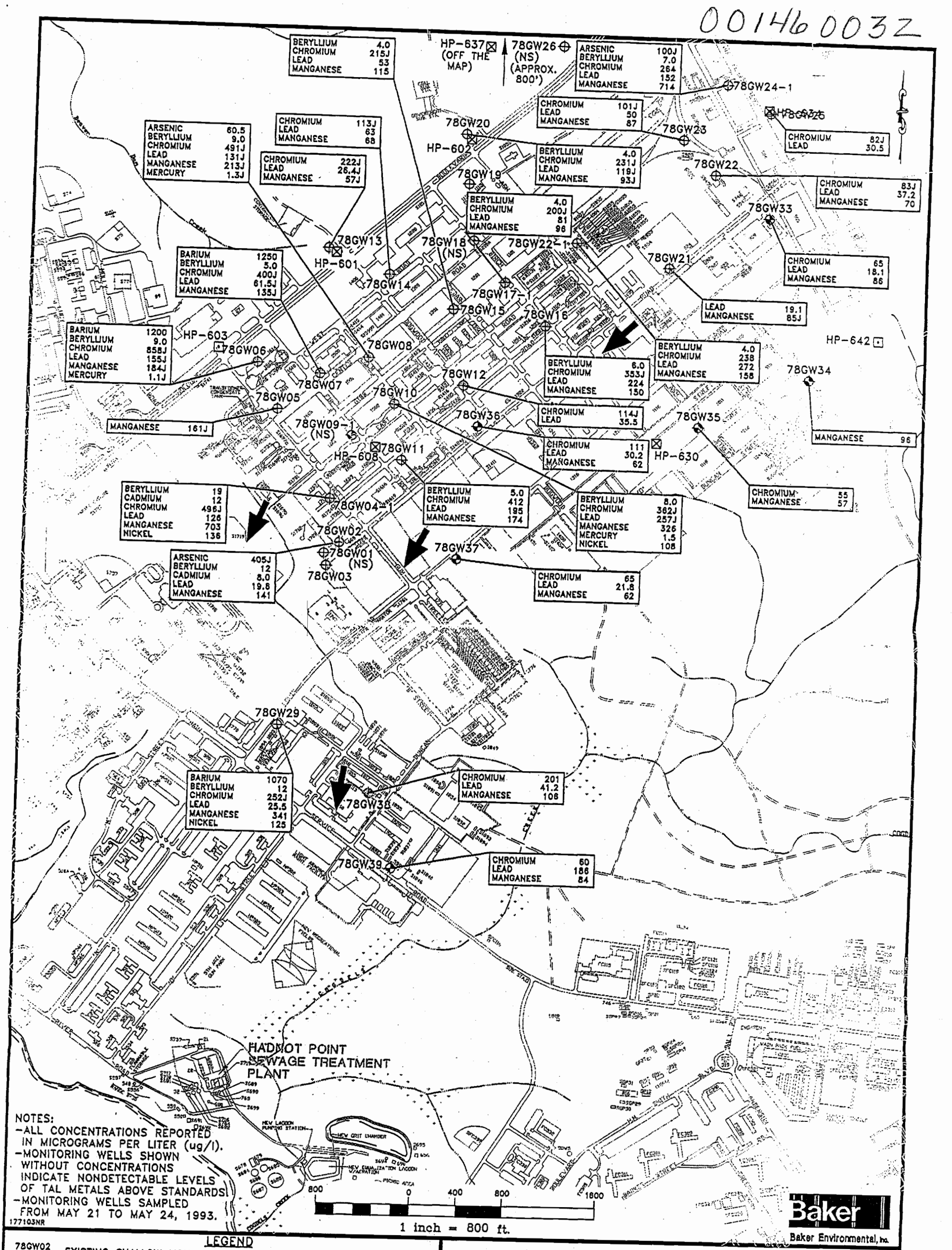
LEGEND

- 2GW1 ◆ GROUNDWATER WELL
- (F) EXCEEDS FEDERAL STANDARD
- (S) EXCEEDS STATE STANDARD
- (FAL) FEDERAL ACTION LEVEL
- ND NOT DETECTED ABOVE APPLICABLE STANDARDS
- NA NOT ANALYZED
- J ESTIMATED CONCENTRATIONS

CONCENTRATIONS EXPRESSED IN ug/l(ppb)
SOURCE: LANTDIV, FEB. 1992

FIGURE 2
POSITIVE DETECTIONS ABOVE APPLICABLE FEDERAL AND STATE STANDARDS FOR TOTAL AND FILTERED INORGANIC ANALYTES IN GROUNDWATER
SITE 2
REMEDIAL INVESTIGATION CTO-0174
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

00146003Z

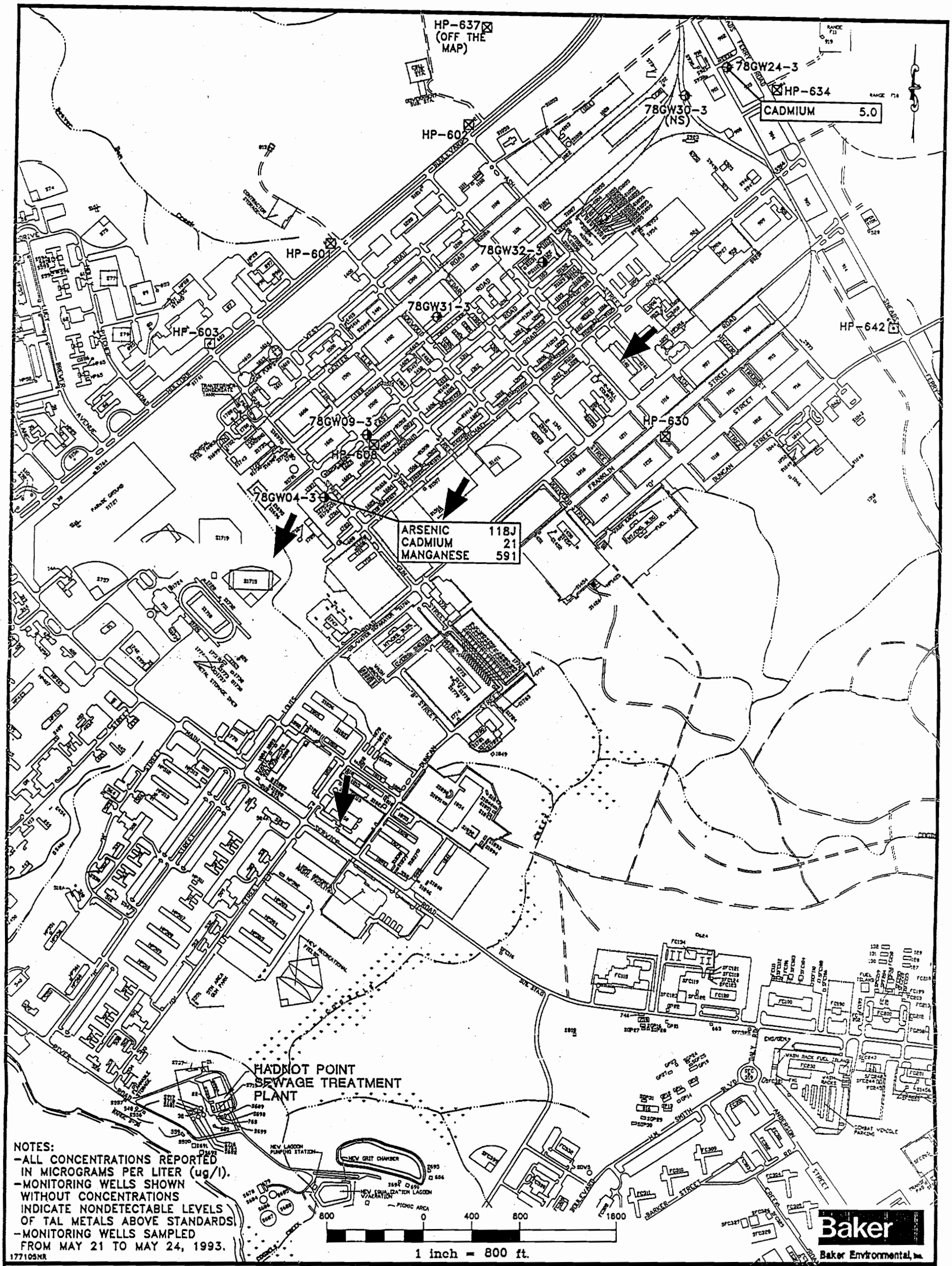


LEGEND

- 78GW02 ⊕ EXISTING SHALLOW MONITORING WELL INSTALLED BY ESE, 1984-1991
- 78GW33 ⊕ SHALLOW MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., 1993
- → APPROXIMATE DIRECTION OF GROUNDWATER FLOW
- (NS) NOT SAMPLED FOR TAL METALS
- HP-603 ⊡ WATER SUPPLY WELL (ACTIVE)-NOT SAMPLED
- HP-601 ⊠ WATER SUPPLY WELL (INACTIVE)-NOT SAMPLED

SOURCE: LANTDIV, FEBRUARY 1992

FIGURE 3
POSITIVE DETECTIONS OF TAL METALS ABOVE FEDERAL MCLs AND/OR NCWQS IN SHALLOW WELLS
SITE 78
REMEDIAL INVESTIGATION CTO-0177
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA



LEGEND

78GW04-3 ⊕	EXISTING DEEP MONITORING WELL INSTALLED BY ESE, 1991
→	APPROXIMATE DIRECTION OF GROUNDWATER FLOW
(NS)	NOT SAMPLED FOR TAL METALS
HP-603 ⊡	WATER SUPPLY WELL (ACTIVE)-NOT SAMPLED
HP-601 ⊠	WATER SUPPLY WELL (INACTIVE)-NOT SAMPLED

SOURCE: LANTDIV, FEBRUARY 1992

FIGURE 4
POSITIVE DETECTIONS OF TAL METALS ABOVE FEDERAL MCLs AND/OR NCWQS IN DEEP WELLS
SITE 78
REMEDIAL INVESTIGATION CTO-0177
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

001460042

Appendix A
Data Summary Tables for Sites 2 and 78

OPERABLE UNIT NO. 1 - SITES 21, 24, 78
SHALLOW, INTERMEDIATE AND DEEP MONITORING WELLS
GROUNDWATER DATA AND FREQUENCY SUMMARY
REMEDIAL INVESTIGATION CTO - 19177
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL METALS AND CYANIDE

	MINIMUM NONDETECTED UG/L	MAXIMUM NONDETECTED UG/L	MINIMUM DETECTED UG/L	MAXIMUM DETECTED UG/L	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
ALUMINUM	NA	NA	68 J	542000 J	78-GW06-01	59 / 59
ANTIMONY	3 U	20 U	3.3 B	169 J	78-GW02-01	7 / 33
ARSENIC	2 U	10 U	2.3 J	405 J	78-GW02-01	44 / 48
BARIUM	NA	NA	17 B	1250	78-GW07-01	59 / 59
BERYLLIUM	1 U	4 U	1 B	19	24-GW02-01	52 / 59
CADMIUM	5 U	25 U	5	21	78-GW04-3-01	9 / 59
CALCIUM	NA	NA	2420 B	642000	78-GW04-1-01	59 / 59
CHROMIUM	10 U	50 U	10	858 J	78-GW06-01	46 / 59
COBALT	8 U	8 U	8 B	170	78-GW22-2-01	25 / 59
COPPER	2 U	2 U	3 B	699	78-GW39-01	58 / 59
IRON	NA	NA	32 B	523000	78-GW04-3-01	59 / 59
LEAD	1.8 U	4.9 U	2.9 B	2000 J	21-GW0B-01	50 / 59
MAGNESIUM	NA	NA	88 B	37100	24-GW03-01	59 / 59
MANGANESE	2 U	2 U	2 B	714	78-GW24-1-01	57 / 59
MERCURY	0.2 U	0.2 U	0.23 J	3.2	24-GW06-01	24 / 52
NICKEL	20 U	20 U	20 B	234	78-GW22-2-01	31 / 59
POTASSIUM	NA	NA	982 B	67300	78-GW32-3-01	59 / 59
SELENIUM	1 U	5 U	1.1 J	99.5 J	78-GW32-2-01	41 / 54
SILVER	3 U	15 U	5 J	5 J	78-GW09-3-01	1 / 59
SODIUM	NA	NA	2450 B	42500	78-GW32-3-01	59 / 59
THALLIUM	1 U	1 U	1 B	7.3 J	78-GW32-2-01	16 / 59
VANADIUM	4 U	4 U	4 J	1700	78-GW08-01	55 / 59
ZINC	6 U	6 U	6 J	967 J	78-GW22-2-01	57 / 59
CYANIDE	10 U	10 U	ND	ND	ND	0 / 54

OPERABLE UNIT NO. 1 - SITES 21, 24, 78
SHALLOW, INTERMEDIATE AND DEEP MONITORING WELLS
GROUNDWATER DATA AND FREQUENCY SUMMARY
REMEDIAL INVESTIGATION CTO - 19177
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL METALS AND CYANIDE

SAMPLE NO.	21-GW01-01	21-GW02-01	21-GW03-01	21-GW04-01	21-GW0A-01	21-GW0B-01
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
ALUMINUM	4910 J	319000 J	4820 J	20100 J	16900 J	118000 J
ANTIMONY	7 UJ	7 U	7 U	7 U	7 R	7 U
ARSENIC	15	10	2 U	11.8	45.2 J	30.4
BARIUM	32 B	647	51 B	119 B	100 B	386
BERYLLIUM	1 B	5	1 B	1 B	1 B	6
CADMIUM	5 U	10 U	5 U	5 U	5 U	10 U
CALCIUM	63000 J	24100 J	6130 J	21700 J	23800	6250 J
CHROMIUM	10 UJ	348 J	10 UJ	33 J	21 J	192 J
COBALT	8 U	18 B	8 U	10 B	8 U	36 B
COPPER	4 B	79	7 B	28	24 B	38
IRON	9920 J	122000 J	13400 J	24900 J	38900 J	72900 J
LEAD	1.8 UJ	214 J	4.9 UJ	33 J	29	2000 J
MAGNESIUM	5070	15400	4550 B	5490	4850 B	11600
MANGANESE	64 J	179 J	134 J	193 J	59	276 J
MERCURY	0.2 R	2.4 J	0.2 R	0.2 R	0.2 U	0.2 R
NICKEL	20 U	86	20 U	20 U	20 U	60
POTASSIUM	2390 B	10500	2240 B	3800 B	2360 B	9520
SELENIUM	1 U	11 J	1 U	1 U	1 UJ	3.7 J
SILVER	3 U	3 U	3 U	3 U	3 UJ	3 U
SODIUM	15700	12600	7950	14400	12600	14400
THALLIUM	1 U	1 UJ	1 U	1 UJ	1 UJ	1 U
VANADIUM	30 B	281	11 B	42 B	48 B	243
ZINC	65 J	136 J	27 J	57 J	41 J	175 J
CYANIDE	10 U	10 U	10 U	10 U	10 U	10 U

OPERABLE UNIT NO. 1 - SITES 21, 24, 78
SHALLOW, INTERMEDIATE AND DEEP MONITORING WELLS
GROUNDWATER DATA AND FREQUENCY SUMMARY
REMEDIAL INVESTIGATION CTO - 19177
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL METALS AND CYANIDE

SAMPLE NO.	21-GW0C-01	24-GW01-01	24-GW02-01	24-GW03-01	24-GW04-01	24-GW06-01
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
ALUMINUM	209000 J	262000	93700	50200	58900	19800
ANTIMONY	7 U	3 U	3 UJ	3 U	4.6 B	3.5 B
ARSENIC	101	10 UJ	2.3 J	4.7 J	116 J	10.1 J
BARIUM	467	380	1120	480	290	159 B
BERYLLIUM	8	3 B	19	5	2 B	9
CADMIUM	10 U	5 U	12	5 U	5 U	5
CALCIUM	35200 J	4120 B	2420 B	124000	65600	151000
CHROMIUM	291 J	296	316	110	153	78
COBALT	60	8 U	41 B	66	8 U	35 B
COPPER	84	49	52	22 B	31	15 B
IRON	106000 J	58600	395000	16300	70500	69500
LEAD	92.5 J	89	17.9	21.6	23.6	7.4
MAGNESIUM	16300	12200	7240	37100	7690	4320 B
MANGANESE	273 J	117	518	393	66	431
MERCURY	0.23 J	0.23	2.6	0.2 U	0.2 U	3.2
NICKEL	123	38 B	140	85	20 U	93
POTASSIUM	11800	12000	7550	15400	6130	3370 B
SELENIUM	4.3 B	1.3 J	1.1 J	16.2 J	4.3 J	1 UJ
SILVER	3 U	3 UJ	15 UJ	3 UJ	3 UJ	3 UJ
SODIUM	15200	6030	11600	19200	5230	7280
THALLIUM	1 U	1 U	1 U	2.4 B	1 U	1 B
VANADIUM	419	304	408	92	202	83
ZINC	487 J	118	461	650	80	489
CYANIDE	10 U					

OPERABLE UNIT NO. 1 - SITES 21, 24, 78
SHALLOW, INTERMEDIATE AND DEEP MONITORING WELLS
GROUNDWATER DATA AND FREQUENCY SUMMARY
REMEDIAL INVESTIGATION CTO - 19177
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL METALS AND CYANIDE

SAMPLE NO.	24-GW07-01	24-GW08-01	24-GW09-01	24-GW10-01	78-GW02-01	78-GW03-01
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
ALUMINUM	36000	61100	12800	23300	29200 J	23900 J
ANTIMONY	3 U	3 U	3.3 B	5.7 B	169 J	38.5 J
ARSENIC	3.7 J	8 J	4.3 J	2.5 J	405 J	5.7 J
BARIUM	85 B	112 B	164 B	59 B	109 B	36 B
BERYLLIUM	1 B	2 B	1 B	1 U	12	2 B
CADMIUM	5 U	5 U	5 U	5 U	8	5 U
CALCIUM	4960 B	27000	9530	3820 B	37000	32900
CHROMIUM	37	85	19	21	18 J	10 UJ
COBALT	8 U	8 U	11 B	8 U	8 U	8 U
COPPER	19 B	24 B	11 B	13 B	20 B	8 B
IRON	13700	27500	13100	7010	427000 J	5020 J
LEAD	11.4	23.8	5.1	7.3	19.6	3.4
MAGNESIUM	2670 B	5050	7630	1760 B	3650 B	2210 B
MANGANESE	39	47	180	29	141	27
MERCURY	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
NICKEL	20 U	20 U	20 U	20 U	20 U	20 U
POTASSIUM	3870 B	5580	4280 B	2620 B	2770 B	1320 B
SELENIUM	2.1 J	1.9 J	2.6 J	1 UJ	19.8 J	2.4 J
SILVER	3 UJ	3 UJ	3 UJ	3 UJ	15 UJ	3 UJ
SODIUM	6520	6550	6010	6650	5120	4270 B
THALLIUM	1 U	1 U	1 U	1 U	1 UJ	1 UJ
VANADIUM	64	129	26 B	34 B	1660	50
ZINC	41	47	50	20	58 J	12 J
CYANIDE	10 U	10 U	10 U	10 U	10 U	10 U

OPERABLE UNIT NO. 1 - SITES 21, 24, 78
SHALLOW, INTERMEDIATE AND DEEP MONITORING WELLS
GROUNDWATER DATA AND FREQUENCY SUMMARY
REMEDIAL INVESTIGATION CTO - 19177
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL METALS AND CYANIDE

SAMPLE NO.	78-GW04-1-01	78-GW04-2-01	78-GW04-3-01	78-GW05-01	78-GW06-01	78-GW07-01
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
ALUMINUM	297000 J	286	115 B	23000 J	542000 J	207000 J
ANTIMONY	7 R	7 R	7 R	7 U	7 U	7 U
ARSENIC	18.6 J	2 R	118 J	5.2 J	26 B	16.2
BARIUM	728	519	547	54 B	1200	1250
BERYLLIUM	19	1 B	1 B	2 B	9	5
CADMIUM	12	5 U	21	5 U	5 U	5 U
CALCIUM	642000	170000	105000	90200 J	7180 J	18700 J
CHROMIUM	496 J	10 U	50 U	17 J	858 J	400 J
COBALT	28 B	8 U	8 U	8 U	11 B	20 B
COPPER	87	4 B	7 B	8 B	127	53
IRON	267000 J	32 B	523000	14900 J	142000 J	96700 J
LEAD	126	2 U	2 U	13.1 J	155 J	61.5 J
MAGNESIUM	25500	88 B	3210 B	12700	24000	20000
MANGANESE	703	51	591	161 J	184 J	135 J
MERCURY	0.75	0.2 U	0.3	0.2 R	1.1 J	0.44 J
NICKEL	136	20 B	20 U	20 U	86	54
POTASSIUM	18800	21800	11300	4770 B	25600	13200
SELENIUM	9 J	1 R	1 R	6.4	5.5 B	9.1
SILVER	6 UJ	3 U	15 U	3 U	3 U	3 U
SODIUM	8870	11500	9290	23900	5090	9260
THALLIUM	1.2 J	1 U	1 U	1 UJ	1.1 B	1 UJ
VANADIUM	591	4 UJ	24 J	28 B	811	406
ZINC	373 J	7 J	79 J	32 J	223 J	158 J
CYANIDE	10 U	10 U	10 U	10 U	10 U	10 U

OPERABLE UNIT NO. 1 - SITES 21, 24, 78
SHALLOW, INTERMEDIATE AND DEEP MONITORING WELLS
GROUNDWATER DATA AND FREQUENCY SUMMARY
REMEDIAL INVESTIGATION CTO - 19177
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL METALS AND CYANIDE

SAMPLE NO.	78-GW08-01	78-GW09-2-01	78-GW09-3-01	78-GW10-01	78-GW11-01	78-GW12-01
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
ALUMINUM	483000 J	68 J	2710 J	404000 J	332000	108000 J
ANTIMONY	7 U	7 R	7 R	7 R	7 R	7 R
ARSENIC	60.5	2 R	2 R	43 J	10 R	9.6 J
BARIUM	740	27 B	41 B	582	631	155 B
BERYLLIUM	9	1 U	1 B	8	5	2 B
CADMIUM	25 U	5 U	5 U	10 U	25 U	10 U
CALCIUM	28200 J	114000	99100	54400	9130	31200
CHROMIUM	491 J	10 UJ	10 UJ	362 J	412	114 J
COBALT	29 B	8 U	8 U	31 B	8 U	8 U
COPPER	86	4 B	4 B	91	84	30
IRON	138000 J	955 J	99 J	157000 J	120000	26400 J
LEAD	131 J	2 U	2 U	257	195	35.5
MAGNESIUM	18500	2550 B	249 B	17400	15400	7220
MANGANESE	213 J	19	2 U	326	174	47
MERCURY	1.3 J	0.2 U	0.2 U	1.5	0.75	0.2 U
NICKEL	89	20 U	20 U	108	79	20 U
POTASSIUM	14700	1220 B	7820	15800	13000	6090
SELENIUM	25.3	1 UJ	1 UJ	18 J	12 J	3.6 J
SILVER	3 U	3 UJ	5 J	3 UJ	3 U	3 UJ
SODIUM	4710 B	5820	7280	3340 B	3490 B	5420
THALLIUM	1.3 J	1 UJ	1 UJ	1 UJ	1 U	1 UJ
VANADIUM	1700	4 U	9 B	499	526	145
ZINC	200 J	11 J	181 J	217 J	120 J	64 J
CYANIDE	10 U	10 U	10 U	10 U	10 U	10 U

OPERABLE UNIT NO. 1 - SITES 21, 24, 78
SHALLOW, INTERMEDIATE AND DEEP MONITORING WELLS
GROUNDWATER DATA AND FREQUENCY SUMMARY
REMEDIAL INVESTIGATION CTO - 19177
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL METALS AND CYANIDE

SAMPLE NO.	78-GW13-01	78-GW14-01	78-GW15-01	78-GW16-01	78-GW17-1-01	78-GW17-2-01
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
ALUMINUM	61800 J	103000 J	205000 J	341000 J	168000 J	541 J
ANTIMONY	7 U	7 R	7 R	7 R	7 R	7 R
ARSENIC	38.3	18.4 J	4 R	19 J	11.6 J	2 R
BARIUM	236	321	469	511	261	57 B
BERYLLIUM	3 B	1 B	4 B	6	4 B	1 B
CADMIUM	5 U	10 U	5 U	5 U	10 U	5 U
CALCIUM	4040 J	5300	29100	62700	86900	144000
CHROMIUM	222 J	113 J	215 J	353 J	200 J	10 UJ
COBALT	20 B	8 U	9 B	13 B	9 B	8 U
COPPER	18 B	33	49	80	40	5 B
IRON	61800 J	49600 J	43300 J	80900 J	48700 J	2120 J
LEAD	26.4 J	63	53	224	81	5.9
MAGNESIUM	11800	10600	13400	10800	9940	2570 B
MANGANESE	57 J	68	115	150	96	33
MERCURY	0.3 J	0.38	0.2 U	0.38	0.2 U	0.2 U
NICKEL	40	34 B	29 B	61	30 B	20 U
POTASSIUM	8210	6460	12000	14000	11600	1630 B
SELENIUM	4.7 B	12.4 J	2.1 J	14.5 J	5 UJ	1 UJ
SILVER	3 U	3 UJ	3 UJ	3 UJ	3 UJ	3 UJ
SODIUM	15000	15400	6410	4120 B	3180 B	9480
THALLIUM	1 U	1 UJ	1 J	1.4 J	1 J	1 UJ
VANADIUM	158	122	248	371	289	4 U
ZINC	96 J	51 J	116 J	157 J	98 J	6 UJ
CYANIDE	10 U	10 U	10 U	10 U	10 U	10 U

OPERABLE UNIT NO. 1 - SITES 21, 24, 78
SHALLOW, INTERMEDIATE AND DEEP MONITORING WELLS
GROUNDWATER DATA AND FREQUENCY SUMMARY
REMEDIAL INVESTIGATION CTO - 19177
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL METALS AND CYANIDE

SAMPLE NO.	78-GW19-01	78-GW20-01	78-GW21-01	78-GW22-01	78-GW22-1-01	78-GW22-2-01
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
ALUMINUM	4110 J	149000 J	23800 J	78900 J	257000	190000 J
ANTIMONY	7 R	7 U	7 U	14 J	7 R	7 UJ
ARSENIC	3.1 J	30.3	6.3 J	10 J	59.5 J	75.6
BARIUM	101 B	430	382	107 B	411	471
BERYLLIUM	1 B	4 B	2 B	1 B	4 B	12
CADMIUM	5 U	5 U	5 U	10 U	25 U	6
CALCIUM	3700 B	5450 J	32900 J	90100	44500	118000 J
CHROMIUM	10 UJ	231 J	22 J	83 J	238	389 J
COBALT	8 U	35 B	10 B	8 U	8 U	170
COPPER	3 B	61	11 B	34	54	92
IRON	8500 J	101000 J	26400 J	27600 J	62300	140000 J
LEAD	8.3	119 J	19.1 J	37.2	272	360 J
MAGNESIUM	5740	13100	9110	5500	12000	13000
MANGANESE	26	93 J	85 J	70	158	348 J
MERCURY	0.2 U	0.37 J	0.2 R	0.3	0.45	0.2 R
NICKEL	20 U	75	20 U	21 B	99	234
POTASSIUM	2130 B	9100	4100 B	6180	12000	10200
SELENIUM	1 UJ	4.2 B	1.1 B	4.2 J	7.5 J	45
SILVER	3 UJ	3 U	3 U	3 UJ	3 U	3 U
SODIUM	24000	11900	9480	12100	9910	8230
THALLIUM	1 UJ	1.8 B	1 U	1.7 J	1 U	3 B
VANADIUM	9 B	236	86	114	269	547
ZINC	6 J	250 J	108 J	50 J	150 J	967 J
CYANIDE	10 U	10 U	10 U	10 U	10 U	10 U

OPERABLE UNIT NO. 1 - SITES 21, 24, 78
SHALLOW, INTERMEDIATE AND DEEP MONITORING WELLS
GROUNDWATER DATA AND FREQUENCY SUMMARY
REMEDIAL INVESTIGATION CTO - 19177
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL METALS AND CYANIDE

SAMPLE NO.	78-GW23-01	78-GW24-1-01	78-GW24-2-01	78-GW24-3-01	78-GW25-01	78-GW29-01
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
ALUMINUM	111000 J	160000	1340	304	101000 J	78800 J
ANTIMONY	7 R	7 R	7 R	7 R	7 R	7 R
ARSENIC	7.6 J	100 J	2 R	2 R	11.4 J	19 J
BARIUM	230	396	34 B	17 B	119 B	1070
BERYLLIUM	2 B	7	1 B	1 U	2 B	12
CADMIUM	5 U	5 U	5	5	5 U	5 U
CALCIUM	10800	34400	107000	73400	37800	41600
CHROMIUM	101 J	264	10	10 U	82 J	252 J
COBALT	8 B	39 B	8 U	8 U	8 U	17 B
COPPER	25	71	6 B	5 B	26	34
IRON	30800 J	159000	2320	2370	26300 J	125000 J
LEAD	50	152	3.3	2.9 B	30.5	25.5
MAGNESIUM	7110	11600	1740 B	1500 B	4500 B	21900
MANGANESE	87	714	21	41	33	341
MERCURY	0.3	0.75	0.2 U	0.2 U	0.2 U	0.2 U
NICKEL	42	91	20 U	20 U	20 U	125
POTASSIUM	5450	9090	1050 B	982 B	4950 B	11600
SELENIUM	4.4 J	17.6 J	1 R	1 R	1.6 J	2.5 J
SILVER	3 UJ	3 U	3 U	3 U	3 UJ	3 UJ
SODIUM	7450	10800	8350	7050	16400	21200
THALLIUM	1.7 J	1.5 B	1 U	1 U	1.3 J	1 UJ
VANADIUM	108	436	4 J	4 UJ	144	183
ZINC	67 J	291 J	11 J	16 J	34 J	330 J
CYANIDE	10 U	10 U	10 U	10 U	10 U	10 U

OPERABLE UNIT NO. 1 - SITES 21, 24, 78
SHALLOW, INTERMEDIATE AND DEEP MONITORING WELLS
GROUNDWATER DATA AND FREQUENCY SUMMARY
REMEDIAL INVESTIGATION CTO - 19177
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL METALS AND CYANIDE

SAMPLE NO.	78-GW31-2-01	78-GW31-3-01	78-GW32-2-01	78-GW32-3-01	78-GW33-01	78-GW34-01
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
ALUMINUM	110 B	1200	112000 J	539 J	78200	6870
ANTIMONY	7 R	7 R	7 R	7 R	3 U	3 U
ARSENIC	2 R	2 R	21.6 J	2 R	5.6 J	4.4 J
BARIUM	17 B	415	476	42 B	162 B	173 B
BERYLLIUM	1 B	1 B	10	1 B	1 B	1 U
CADMIUM	5 U	5 U	10	5 U	5 U	5 U
CALCIUM	77600	308000	94600	5440	64800	10400
CHROMIUM	10 U	21	215 J	10 UJ	65	10 U
COBALT	8 U	8 U	84	8 U	8 U	8 U
COPPER	3 B	5 B	87	2 U	20 B	11 B
IRON	280	72 B	98500 J	112 J	14900	7250
LEAD	2 U	2 U	146	2 U	18.1	5.5
MAGNESIUM	2200 B	151 B	13700	319 B	7290	2880 B
MANGANESE	8 B	2 B	328	2 U	86	96
MERCURY	0.3	0.2 U	0.3	0.2 U	0.2 U	0.2 U
NICKEL	20 U	20 U	166	20 U	20 B	20 U
POTASSIUM	1640 B	61600	8460	67300	6900	2620 B
SELENIUM	1 R	1.7 J	99.5 J	1 UJ	12.8 J	1 UJ
SILVER	3 U	3 U	3 UJ	3 UJ	3 UJ	3 UJ
SODIUM	10400	26100	7510	42500	7030	4070 B
THALLIUM	1 U	1 UJ	7.3 J	1.3 J	1 U	1 U
VANADIUM	4 J	10 J	462	5 B	74	15 B
ZINC	23 J	10 J	826 J	6 UJ	37	59
CYANIDE	10 U	10 U	10 U	10 U	10 U	10 U

OPERABLE UNIT NO. 1 - SITES 21, 24, 78
SHALLOW, INTERMEDIATE AND DEEP MONITORING WELLS
GROUNDWATER DATA AND FREQUENCY SUMMARY
REMEDIAL INVESTIGATION CTO - 19177
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL METALS AND CYANIDE

SAMPLE NO.	78-GW35-01	78-GW36-01	78-GW37-01	78-GW38-01	78-GW39-01
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L
ALUMINUM	47100	120000	73500	102000	60000
ANTIMONY	3 U	20 U	3 U	20 U	20 U
ARSENIC	2 UJ	3.1 J	4 J	33.6 J	4 UJ
BARIUM	261	152 B	123 B	420	256
BERYLLIUM	1 B	2 U	2 B	4 U	1 U
CADMIUM	5 U	5 U	5 U	25 U	5 U
CALCIUM	7480	35400	10100	62200	16800
CHROMIUM	55	111	65	201	60
COBALT	8 U	8 U	8 U	8 U	10 B
COPPER	15 B	29	22 B	110	699
IRON	11800	21200	18800	67500	28800
LEAD	13.2	30.2	21.8	41.2	186
MAGNESIUM	5680	5740	4600 B	17500	14300
MANGANESE	57	62	62	106	84
MERCURY	0.2 U	0.3	0.2 U	0.2 U	0.52
NICKEL	20 U	24 B	20 U	32 B	32 B
POTASSIUM	6150	5820	5990	8180	3840 B
SELENIUM	3.5 J	1.7 J	1.1 J	1.3 J	4.3 J
SILVER	3 UJ	3 UJ	3 UJ	3 UJ	3 UJ
SODIUM	10300	2450 B	7270	10300	19500
THALLIUM	1 U	1 U	1 U	1 U	1 U
VANADIUM	59	98	106	235	67
ZINC	30	57	58	134	138
CYANIDE	10 U	10 U	10 U	10 U	10 U

OPERABLE UNIT NO. 5 - SITE 2
SHALLOW AND DEEP MONITORING WELLS
GROUNDWATER STATISTICAL SUMMARY
REMEDIAL INVESTIGATION CTO - 19174
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL METALS AND CYANIDE

SAMPLE NO.	2-GW01-01	2-GW02-01	2-GW03-01	2-GW03DW-01	2-GW04-01	2-GW05-01
UNITS	UG/L		UG/L	UG/L	UG/L	UG/L
ALUMINUM	36000		5200	269	16800	4050
ANTIMONY	10 U		10 U	3.5 U	10 U	10 U
ARSENIC	21.2		2.5 B	1 UJ	23.6	2.2 B
BARIUM	52 B		46 B	1420	95 B	100 B
BERYLLIUM	1 B		0.5 U	0.5 U	2 B	0.5 U
CADMIUM	7		2.5 U	2.5 U	2.5 U	2.5 U
CALCIUM	23700		8460	450000	11100	21000
CHROMIUM	18		11	16	5 U	5 U
COBALT	10 B		4 U	4 U	4 U	4 U
COPPER	10 B		4 B	8 B	5 B	3 B
IRON	10300		7190	127	28100	12700
LEAD	15.5 L		3.5 J	1.1 UJ	2.7 J	0.5 UJ
MAGNESIUM	5660		1600 B	75 B	1920 B	4800 B
MANGANESE	55		21	2 U	21	46
MERCURY	0.1 U		0.1 U	0.1 U	0.1 U	0.1 U
NICKEL	10 U		10 U	10 U	10 U	10 U
POTASSIUM	2560 B		1030 B	187000	1210 B	2130 B
SELENIUM	4.2 B		0.5 U	0.5 U	0.5 U	0.5 U
SILVER	1.5 U		1.5 U	1.5 U	1.5 U	1.5 U
SODIUM	4040 B		5490	103000	5560	10100
THALLIUM	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U
VANADIUM	72		10 B	2 U	89	9 B
ZINC	146		13 B	9 B	16 B	6 B
CYANIDE	5 U		5 U	5 U	5 U	5 U

OPERABLE UNIT NO. 5 - SITE 2
SHALLOW AND DEEP MONITORING WELLS
GROUNDWATER STATISTICAL SUMMARY
REMEDIAL INVESTIGATION CTO - 19174
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL METALS AND CYANIDE

SAMPLE NO.	2-GW06-01	2-GW07-01	2-GW08-01	2-GW09-01
UNITS	UG/L	UG/L	UG/L	UG/L
ALUMINUM	13600	8550	6380	56300
ANTIMONY	10 U	10 U	3.5 UJ	10 U
ARSENIC	5.4 B	5.7 B	9.2 B	12.9
BARIUM	173 B	98 B	98 B	328
BERYLLIUM	0.5 U	0.5 U	0.5 U	3 B
CADMIUM	2.5 U	2.5 U	2.5 U	2.5 U
CALCIUM	7940	9350	5710	22100
CHROMIUM	15	15	5 U	75
COBALT	12 B	4 U	4 U	10 B
COPPER	5 B	7 B	6 B	25
IRON	11700	12500	9150	42000
LEAD	6.7 J	8.3 J	1.8 UJ	27.2 J
MAGNESIUM	4120 B	3620 B	2020 B	9980
MANGANESE	79	72	53	290
MERCURY	0.1 U	0.1 U	0.1 U	0.1 U
NICKEL	10 U	10 U	10 U	25 B
POTASSIUM	2570 B	1940 B	1550 B	6610
SELENIUM	0.5 U	0.5 U	0.5 U	0.5 U
SILVER	1.5 U	1.5 U	1.5 U	1.5 U
SODIUM	21900	8180	11800	18300
THALLIUM	0.5 U	0.5 U	0.5 U	0.5 U
VANADIUM	15 B	18 B	12 B	86
ZINC	26	22	27	103
CYANIDE	5 U	5 U	5 U	5 U

OPERABLE UNIT NO. 5 - SITE 2
SHALLOW AND DEEP MONITORING WELLS
GROUNDWATER STATISTICAL SUMMARY
REMEDIAL INVESTIGATION CTO - 19174
MCB CAMP LEJEUNE, NORTH CAROLINA
DISSOLVED METALS

SAMPLE NO.	2-GW01D-01	2-GW02D-01	2-GW03D-01	2-GW03DWD-01	2-GW04D-01	2-GW05D-01
UNITS	UG/L		UG/L	UG/L	UG/L	UG/L
ALUMINUM	1930		66 B	89 B	60 B	1990
ANTIMONY	10 U		10 U	3.5 UJ	10 U	10 U
ARSENIC	2.2 B		1 U	1 UJ	6.1 B	1 U
BARIUM	42 B		25 B	1400	64 B	98 B
BERYLLIUM	1 B		0.5 U	0.5 U	0.5 U	1 B
CADMIUM	2.5 U		2.5 U	2.5 U	2.5 U	2.5 U
CALCIUM	24400		7100	441000	11300	21800
CHROMIUM	5 U		5 U	11	5 U	5 U
COBALT	4 U		4 U	4 U	4 U	4 U
COPPER	4 B		2 B	6 B	9 B	4 B
IRON	2560		2170	10 U	2720	7400
LEAD	2.1 J		0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
MAGNESIUM	5220		1030 B	26 B	1840 B	4900 B
MANGANESE	51		4.5 U	1 U	17	46
MERCURY	0.1 U		0.1 U	0.1 U	0.1 U	0.1 U
NICKEL	10 U		10 U	10 U	10 U	10 U
POTASSIUM	2140 B		589 B	188000	1130 B	2170 B
SELENIUM	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U
SILVER	1.5 U		1.5 U	1.5 U	1.5 U	1.5 U
SODIUM	3590 B		5400	103000	5710	9970
THALLIUM	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U
VANADIUM	2 U		2 U	2 U	2 U	2 U
ZINC	28		3 U	3 U	8 B	9 B
CYANIDE						

OPERABLE UNIT NO. 5 - SITE 2
SHALLOW AND DEEP MONITORING WELLS
GROUNDWATER STATISTICAL SUMMARY
REMEDIAL INVESTIGATION CTO - 19174
MCB CAMP LEJEUNE, NORTH CAROLINA
DISSOLVED METALS

SAMPLE NO.	2-GW06D-01	2-GW07D-01	2-GW08D-01	2-GW09D-01
UNITS	UG/L	UG/L	UG/L	UG/L
ALUMINUM	149 B	43 B	95 B	1230
ANTIMONY	10 U	10 U	3.5 U	10 U
ARSENIC	2.9 B	1 U	7.1 B	1 U
BARIUM	126 B	49 B	62 B	149 B
BERYLLIUM	0.5 U	0.5 U	0.5 U	1 B
CADMIUM	2.5 U	2.5 U	2.5 U	2.5 U
CALCIUM	8080	9590	5800	20800
CHROMIUM	5 U	5 U	5 U	10
COBALT	10 B	8 B	4 U	14 B
COPPER	2 B	5 B	4 B	5 B
IRON	7070	4660	6180	7040
LEAD	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
MAGNESIUM	3610 B	3060 B	1730 B	6890
MANGANESE	65	48	40	129
MERCURY	0.1 U	0.1 U	0.1 U	0.1 U
NICKEL	10 U	10 U	10 U	10 U
POTASSIUM	1970 B	1490 B	1150 B	2790
SELENIUM	0.5 U	0.5 U	0.5 U	0.5 U
SILVER	1.5 U	1.5 U	1.5 U	1.5 U
SODIUM	22600	8720	12100	17200
THALLIUM	0.5 U	0.5 U	0.5 U	0.5 U
VANADIUM	2 U	2 U	2 U	2 U
ZINC	12 B	13 B	19 B	35
CYANIDE				

APPENDIX N
WHITE OAK RIVER BASIN REFERENCE DATA

Statistical Summary of Analytical Results (Surface Water)

KEY TO STATISTICAL AND ANALYTICAL SUMMARY TABLES

U - Indicated analyte was analyzed for but not detected

J - Indicates an estimated value

UJ - Not detected, quantitation limit may be inaccurate or imprecise

R - Result is rejected and unusable

B - Not detected substantially above the level reported in laboratory or field blanks (organics)

P - There is greater than 25% difference for detected pesticide/PCB concentrations between the two GC columns, the lower of the two values is reported

L - Result is biased low

K - Result is biased high

ND - Analyte not detected

NZ - Analyte not analyzed

mg/L - Milligrams per liter

ug/L - Micrograms per liter

mg/kg - Milligrams per kilogram

ug/kg - Micrograms per kilogram

MARINE CORPS BASE CAMP LEJEUNE
STATISTICAL SUMMARY OF ANALYTICAL RESULTS
BACKGROUND - HADNOT CREEK
SURFACE WATER - METALS

PARAMETER	MINIMUM DETECTED VALUE (ug/L)	MAXIMUM DETECTED VALUE (ug/L)		SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/L)	RME (ug/L)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/L)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
Aluminum	692.00	692.00	+	HC-SW04	253.10	488.87	1019.72	1	5	20%
Arsenic	20.00	20.00	+	HC-SW03	5.30	13.35	3190.11	1	5	20%
Barium	9.00	26.00	+	HC-SW03	19.60	25.87	35.22	5	5	100%
Calcium	11600.00	107000.00	+	HC-SW03D	53760.00	92784.90	456379.04	5	5	100%
Chromium	125.00	130.00	+	HC-SW03	54.70	118.12	40374.07	2	5	40%
Iron	291.00	746.00	+	HC-SW01	492.00	666.33	793.41	5	5	100%
Magnesium	954.00	633000.00	+	HC-SW03	258640.80	576299.05	1.50E+16	5	5	100%
Potassium	14500.00	203000.00	+	HC-SW03	84234.00	187308.88	5.24E+12	3	5	60%
Selenium	6.00	6.00	+	HC-SW03	2.00	4.29	38.67	1	5	20%
Sodium	6090.00	2560000.00	+	HC-SW03D	1.01E+06	2.17E+06	4.80E+14	5	5	100%

* = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
+ = THE LOG NORMAL 95% UCL IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
*+ = BOTH THE RME AND LOG NORMAL 95% UCL ARE GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
RME = REASONABLE MAXIMUM EXPOSURE
NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
STATISTICAL SUMMARY OF ANALYTICAL RESULTS
BACKGROUND - HADNOT CREEK
SURFACE WATER - PESTICIDES/PCBs

PARAMETER	MINIMUM DETECTED VALUE (ug/L)	MAXIMUM DETECTED VALUE (ug/L)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/L)	RME (ug/L)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/L)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
NO PESTICIDES/PCBs WERE DETECTED									

* = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
+ = THE LOG NORMAL 95% UCL IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
*+ = BOTH THE RME AND LOG NORMAL 95% UCL ARE GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
RME = REASONABLE MAXIMUM EXPOSURE
NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
STATISTICAL SUMMARY OF ANALYTICAL RESULTS
BACKGROUND - HADNOT CREEK
SURFACE WATER - SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	MINIMUM DETECTED VALUE (ug/L)	MAXIMUM DETECTED VALUE (ug/L)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/L)	RME (ug/L)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/L)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
NO SEMIVOLATILE ORGANIC COMPOUNDS WERE DETECTED									

* = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
+ = THE LOG NORMAL 95% UCL IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
*+ = BOTH THE RME AND LOG NORMAL 95% UCL ARE GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
RME = REASONABLE MAXIMUM EXPOSURE
NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
STATISTICAL SUMMARY OF ANALYTICAL RESULTS
BACKGROUND - HADNOT CREEK
SURFACE WATER - VOLATILE ORGANIC COMPOUNDS

PARAMETER	MINIMUM DETECTED VALUE (ug/L)	MAXIMUM DETECTED VALUE (ug/L)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/L)	RME (ug/L)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/L)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
NO VOLATILE ORGANIC COMPOUNDS WERE DETECTED									

* = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
+ = THE LOG NORMAL 95% UCL IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
*+ = BOTH THE RME AND LOG NORMAL 95% UCL ARE GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
RME = REASONABLE MAXIMUM EXPOSURE
NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
STATISTICAL SUMMARY OF ANALYTICAL RESULTS
BACKGROUND - HOLLAND MILL CREEK
SURFACE WATER - METALS

PARAMETER	MINIMUM DETECTED VALUE (ug/L)	MAXIMUM DETECTED VALUE (ug/L)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/L)	RME (ug/L)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/L)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
Aluminum	535.00	535.00	*+ HM-SW02	269.50	657.32	48037.76	1	3	33%
Barium	20.00	49.00	*+ HM-SW01	35.67	60.35	204.30	3	3	100%
Calcium	14100.00	302000.00	*+ HM-SW03	118766.67	387190.45	4.42E+14	3	3	100%
Chromium	36.00	158.00	*+ HM-SW03	66.33	202.69	3.67E+12	2	3	67%
Iron	320.00	559.00	*+ HM-SW02	434.67	636.62	843.56	3	3	100%
Lead	58.10	58.10	*+ HM-SW03	19.95	75.65	1.70E+27	1	3	33%
Magnesium	2830.00	754000.00	*+ HM-SW03	288610.00	973947.76	1.02E+35	3	3	100%
Potassium	41100.00	288000.00	*+ HM-SW03	109978.33	372096.67	1.33E+36	2	3	67%
Selenium	1.50	41.00	*+ HM-SW03	15.00	52.97	8.42E+13	2	3	67%
Silver	37.00	37.00	*+ HM-SW03	16.83	46.42	284713.62	1	3	33%
Sodium	16500.00	6750000.00	*+ HM-SW03	2501833.33	8733985.25	1.96E+44	3	3	100%

* = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
+ = THE LOG NORMAL 95% UCL IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
*+ = BOTH THE RME AND LOG NORMAL 95% UCL ARE GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
RME = REASONABLE MAXIMUM EXPOSURE
NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
STATISTICAL SUMMARY OF ANALYTICAL RESULTS
BACKGROUND - HOLLAND MILL CREEK
SURFACE WATER - PESTICIDES/PCBs

PARAMETER	MINIMUM DETECTED VALUE (ug/L)	MAXIMUM DETECTED VALUE (ug/L)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/L)	RME (ug/L)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/L)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
NO PESTICIDES/PCBs WERE DETECTED									

* = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
+ = THE LOG NORMAL 95% UCL IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
*+ = BOTH THE RME AND LOG NORMAL 95% UCL ARE GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
RME = REASONABLE MAXIMUM EXPOSURE
NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
STATISTICAL SUMMARY OF ANALYTICAL RESULTS
BACKGROUND - HOLLAND MILL CREEK
SURFACE WATER - SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	MINIMUM DETECTED VALUE (ug/L)	MAXIMUM DETECTED VALUE (ug/L)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/L)	RME (ug/L)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/L)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
NO SEMIVOLATILE ORGANIC COMPOUNDS WERE DETECTED									

* = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
+ = THE LOG NORMAL 95% UCL IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
*+ = BOTH THE RME AND LOG NORMAL 95% UCL ARE GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
RME = REASONABLE MAXIMUM EXPOSURE
NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
STATISTICAL SUMMARY OF ANALYTICAL RESULTS
BACKGROUND - HOLLAND MILL CREEK
SURFACE WATER - VOLATILE ORGANIC COMPOUNDS

PARAMETER	MINIMUM DETECTED VALUE (ug/L)	MAXIMUM DETECTED VALUE (ug/L)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/L)	RME (ug/L)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/L)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
NO VOLATILE ORGANIC COMPOUNDS WERE DETECTED									

* = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
+ = THE LOG NORMAL 95% UCL IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
*+ = BOTH THE RME AND LOG NORMAL 95% UCL ARE GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
RME = REASONABLE MAXIMUM EXPOSURE
NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
STATISTICAL SUMMARY OF ANALYTICAL RESULTS
BACKGROUND - WEBB CREEK
SURFACE WATER - METALS

PARAMETER	MINIMUM DETECTED VALUE (ug/L)	MAXIMUM DETECTED VALUE (ug/L)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/L)	RME (ug/L)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/L)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
Barium	27.00	29.00	*+ WC-SW02	28.00	34.31	32.19	2	2	100%
Calcium	40500.00	46900.00	*+ WC-SW02	43700.00	63904.80	58284.51	2	2	100%
Chromium	97.00	97.00	*+ WC-SW03	52.25	334.80	1.32E+20	1	2	50%
Iron	321.00	660.00	*+ WC-SW02	490.50	1560.72	14358.69	2	2	100%
Magnesium	29000.00	44800.00	*+ WC-SW03	36900.00	86780.60	133710.58	2	2	100%
Potassium	10900.00	136000.00	*+ WC-SW03	73450.00	468390.70	1.01E+23	2	2	100%
Sodium	202000.00	895000.00	*+ WC-SW03	548500.00	2736301.00	6.83E+11	2	2	100%

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RME = REASONABLE MAXIMUM EXPOSURE
NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
STATISTICAL SUMMARY OF ANALYTICAL RESULTS
BACKGROUND - WEBB CREEK
SURFACE WATER - PESTICIDES/PCBs

PARAMETER	MINIMUM DETECTED VALUE (ug/L)	MAXIMUM DETECTED VALUE (ug/L)		SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/L)	RME (ug/L)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/L)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
Aldrin	0.04	0.04	*+	WC-SW02	0.03	0.06	0.07	1	2	50%

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RME = REASONABLE MAXIMUM EXPOSURE
NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
STATISTICAL SUMMARY OF ANALYTICAL RESULTS
BACKGROUND - WEBB CREEK
SURFACE WATER - SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	MINIMUM DETECTED VALUE (ug/L)	MAXIMUM DETECTED VALUE (ug/L)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/L)	RME (ug/L)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/L)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
NO SEMIVOLATILE ORGANIC COMPOUNDS WERE DETECTED									

* = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
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RME = REASONABLE MAXIMUM EXPOSURE
NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
STATISTICAL SUMMARY OF ANALYTICAL RESULTS
BACKGROUND - WEBB CREEK
SURFACE WATER - VOLATILE ORGANIC COMPOUNDS

PARAMETER	MINIMUM DETECTED VALUE (ug/L)	MAXIMUM DETECTED VALUE (ug/L)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/L)	RME (ug/L)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/L)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
NO VOLATILE ORGANIC COMPOUNDS WERE DETECTED									

* = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
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Statistical Summary of Analytical Results (Sediment)

MARINE CORPS BASE CAMP LEJEUNE
STATISTICAL SUMMARY OF ANALYTICAL RESULTS
BACKGROUND - HADNOT CREEK
SEDIMENT - METALS

PARAMETER	MINIMUM DETECTED VALUE (mg/kg)	MAXIMUM DETECTED VALUE (mg/kg)		SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (mg/kg)	RME (mg/kg)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (mg/kg)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
Aluminum	780.00	14000.00	+	HC-SD03-612	5467.78	8305.91	20353.32	9	9	100%
Arsenic	0.26	1.90	*+	HC-SD02-612	1.71	2.67	8.56	6	9	67%
Barium	4.10	17.20	+	HC-SD03-612	9.75	13.11	21.84	8	9	89%
Beryllium	0.14	0.32	+	HC-SD02-612	0.16	0.24	4.60	3	6	50%
Cadmium	0.03	0.66		HC-SD03-06	0.11	0.24	0.42	7	9	78%
Calcium	1030.00	3620.00	+	HC-SD01-06	2645.56	3233.82	3840.09	9	9	100%
Chromium	1.30	41.60	+	HC-SD03-612	10.81	18.97	53.55	9	9	100%
Cobalt	4.50	5.00		HC-SD03-612	1.87	2.91	4.01	2	9	22%
Copper	0.66	1.50	*+	HC-SD02-06	1.35	1.75	2.01	6	9	67%
Iron	382.00	11100.00	+	HC-SD03-06D	3396.56	5709.65	28323.00	9	9	100%
Lead	3.70	5.30	*+	HC-SD03-06	4.50	9.55	305.02	2	2	100%
Magnesium	77.10	6540.00	+	HC-SD03-612	1977.79	3486.31	1292043.17	7	9	78%
Manganese	3.50	64.70		HC-SD03-612	16.54	29.38	62.63	9	9	100%
Mercury	0.25	0.42	*+	HC-SD03-612	0.34	0.48	11.17	3	3	100%
Nickel	1.80	12.10	+	HC-SD03-612	3.77	6.49	17.25	4	9	44%
Potassium	623.00	1840.00	+	HC-SD03-612	671.39	1079.26	2769.97	4	9	44%
Selenium	0.21	0.60		HC-SD02-06	0.30	0.39	0.48	5	9	56%
Sodium	1630.00	2750.00	+	HC-SD02-06	845.25	1750.35	183541390882.91	2	6	33%
Thallium	0.14	0.44	+	HC-SD03-612	0.23	0.31	0.46	6	9	67%
Vanadium	1.50	36.90	+	HC-SD03-612	11.11	18.54	56.26	9	9	100%
Zinc	20.80	40.00	+	HC-SD03-612	12.71	22.07	63.76	3	9	33%

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RME = REASONABLE MAXIMUM EXPOSURE
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MARINE CORPS BASE CAMP LEJEUNE
STATISTICAL SUMMARY OF ANALYTICAL RESULTS
BACKGROUND - HADNOT CREEK
SEDIMENT - PESTICIDES/PCBs

PARAMETER	MINIMUM DETECTED VALUE (ug/kg)	MAXIMUM DETECTED VALUE (ug/kg)		SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/kg)	RME (ug/kg)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/kg)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
beta-BHC	1.70	1.70	*+	HC-SD04-612	1.93	2.39	2.58	1	9	11%
delta-BHC	0.64	0.64	*+	HC-SD01-06	1.82	2.35	2.91	1	9	11%
Heptachlor	0.48	2.00	*+	HC-SD04-612	1.89	2.42	3.26	2	9	22%
4,4'-DDD	1.50	4.00		HC-SD03-612	2.16	3.11	3.50	3	9	33%
4,4'-DDT	1.20	1.20	*+	HC-SD03-06D	3.23	4.23	5.08	1	9	11%
Methoxychlor	0.94	0.94	*+	HC-SD04-06	17.66	23.58	92.52	1	9	11%
Endrin aldehyde	0.59	7.10	+	HC-SD02-06	3.56	5.02	10.80	3	9	33%

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MARINE CORPS BASE CAMP LEJEUNE
STATISTICAL SUMMARY OF ANALYTICAL RESULTS
BACKGROUND - HADNOT CREEK
SEDIMENT - SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	MINIMUM DETECTED VALUE (ug/kg)	MAXIMUM DETECTED VALUE (ug/kg)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/kg)	RME (ug/kg)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/kg)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
NO SEMIVOLATILE ORGANIC COMPOUNDS WERE DETECTED									

* = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
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MARINE CORPS BASE CAMP LEJEUNE
STATISTICAL SUMMARY OF ANALYTICAL RESULTS
BACKGROUND - HADNOT CREEK
SEDIMENT - VOLATILE ORGANIC COMPOUNDS

PARAMETER	MINIMUM DETECTED VALUE (ug/kg)	MAXIMUM DETECTED VALUE (ug/kg)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/kg)	RME (ug/kg)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/kg)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
Acetone	70.00	70.00	HC-SD01-06	18.06	30.44	36.73	1	9	11%
Carbon Disulfide	14.00	19.00	HC-SD02-612	12.44	15.67	18.14	2	9	22%
2-Butanone	7.00	7.00	*+ HC-SD01-06	11.06	13.94	15.49	1	9	11%

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RME = REASONABLE MAXIMUM EXPOSURE
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MARINE CORPS BASE CAMP LEJEUNE
STATISTICAL SUMMARY OF ANALYTICAL RESULTS
BACKGROUND - HOLLAND MILL CREEK
SEDIMENT - METALS

PARAMETER	MINIMUM DETECTED VALUE (mg/kg)	MAXIMUM DETECTED VALUE (mg/kg)		SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (mg/kg)	RME (mg/kg)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (mg/kg)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
Aluminum	337.00	13600.00	+	HM-SD02-06	6181.29	10282.21	655067.62	7	7	100%
Barium	11.00	18.70	+	HM-SD02-06	8.71	13.92	68.49	4	7	57%
Cadmium	0.03	0.11		HM-SD01-06D	0.06	0.08	0.10	7	7	100%
Calcium	282.00	7860.00	+	HM-SD02-612	2952.86	4844.12	22431.34	7	7	100%
Chromium	1.10	38.40	+	HM-SD02-06	19.63	32.39	2021.73	7	7	100%
Cobalt	4.00	4.40	+	HM-SD02-06	2.02	3.18	6.18	2	7	29%
Iron	225.00	32400.00	+	HM-SD02-612	12262.43	21399.01	27918943.98	7	7	100%
Lead	0.62	9.20	+	HM-SD03-06	4.35	6.94	32.96	7	7	100%
Magnesium	26.70	5700.00	+	HM-SD03-06	2576.66	4422.69	136198282.35	7	7	100%
Manganese	1.30	67.20	+	HM-SD02-06	34.14	56.82	8851.72	7	7	100%
Mercury	0.09	0.35	+	HM-SD03-06	0.23	0.30	0.38	7	7	100%
Nickel	9.60	14.20	+	HM-SD03-06	6.76	11.07	359.48	4	7	57%
Potassium	1510.00	1760.00	+	HM-SD03-612	1007.00	1596.65	13233.89	4	7	57%
Selenium	0.25	0.40		HM-SD02-06	0.21	0.29	0.39	2	7	29%
Silver	0.49	0.49	*+	HM-SD01-06	0.39	0.49	0.60	1	7	14%
Thallium	0.13	0.37	+	HM-SD02-06	0.20	0.29	0.52	4	7	57%
Vanadium	0.66	30.00	+	HM-SD02-612	16.69	27.76	18094.26	6	7	86%
Zinc	6.70	43.10	+	HM-SD02-06	23.57	34.53	65.13	7	7	100%

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RME = REASONABLE MAXIMUM EXPOSURE
NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
STATISTICAL SUMMARY OF ANALYTICAL RESULTS
BACKGROUND - HOLLAND MILL CREEK
SEDIMENT - PESTICIDES/PCBs

PARAMETER	MINIMUM DETECTED VALUE (ug/kg)	MAXIMUM DETECTED VALUE (ug/kg)		SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/kg)	RME (ug/kg)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/kg)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
beta-BHC	3.80	7.30		HM-SD01-06D	3.24	4.69	5.98	2	7	29%
Aldrin	0.56	0.72	*+	HM-SD01-612	1.84	2.60	4.20	2	7	29%
Dieldrin	0.58	1.50	*+	HM-SD01-612	3.55	5.13	12.37	2	7	29%
4,4'-DDE	1.00	4.30	*+	HM-SD01-612	4.01	5.37	8.82	2	7	29%
4,4'-DDD	0.87	3.10	*+	HM-SD01-612	2.85	4.16	6.44	4	7	57%
4,4'-DDT	1.70	1.70	*+	HM-SD01-612	3.79	5.13	6.75	1	7	14%
alpha-Chlordane	1.30	1.30	*+	HM-SD01-612	1.99	2.61	3.14	1	7	14%
gamma-Chlordane	3.00	3.00	+	HM-SD01-612	2.24	2.86	3.56	1	7	14%

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MARINE CORPS BASE CAMP LEJEUNE
STATISTICAL SUMMARY OF ANALYTICAL RESULTS
BACKGROUND - HOLLAND MILL CREEK
SEDIMENT - SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	MINIMUM DETECTED VALUE (ug/kg)	MAXIMUM DETECTED VALUE (ug/kg)		SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/kg)	RME (ug/kg)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/kg)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
Di-n-butylphthalate	534.00	619.00	+	HM-SD02-612	423.29	573.31	766.73	3	7	43%
bis(2-Ethylhexyl)phthalate	454.00	454.00	*+	HM-SD03-612	378.64	500.04	607.73	1	7	14%

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MARINE CORPS BASE CAMP LEJEUNE
STATISTICAL SUMMARY OF ANALYTICAL RESULTS
BACKGROUND - HOLLAND MILL CREEK
SEDIMENT - VOLATILE ORGANIC COMPOUNDS

PARAMETER	MINIMUM DETECTED VALUE (ug/kg)	MAXIMUM DETECTED VALUE (ug/kg)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/kg)	RME (ug/kg)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/kg)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
NO VOLATILE ORGANIC COMPOUNDS WERE DETECTED									

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MARINE CORPS BASE CAMP LEJEUNE
STATISTICAL SUMMARY OF ANALYTICAL RESULTS
BACKGROUND - WEBB CREEK
SEDIMENT - METALS

PARAMETER	MINIMUM DETECTED VALUE (mg/kg)	MAXIMUM DETECTED VALUE (mg/kg)		SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (mg/kg)	RME (mg/kg)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (mg/kg)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
Aluminum	8200.00	14800.00	*+	WC-SD02-06	12275.00	15932.10	19239.95	4	4	100%
Barium	13.30	28.20	+	WC-SD02-06	18.83	26.76	35.92	4	4	100%
Cadmium	0.06	0.26	+	WC-SD02-06	0.13	0.24	1.11	4	4	100%
Calcium	2190.00	4060.00	*+	WC-SD02-06	3222.50	4132.21	4914.08	4	4	100%
Chromium	8.70	42.60	+	WC-SD03-612	24.93	42.26	246.57	4	4	100%
Cobalt	3.50	3.90	*+	WC-SD03-612	2.44	4.16	21.71	2	4	50%
Iron	8120.00	20700.00	+	WC-SD03-612	13980.00	20133.62	29586.84	4	4	100%
Lead	5.10	16.90	+	WC-SD02-06	9.85	16.48	51.03	4	4	100%
Magnesium	618.00	6060.00	*+	WC-SD03-612	3197.00	6127.63	817766.37	4	4	100%
Manganese	26.00	47.80	*+	WC-SD03-612	39.35	50.44	60.95	4	4	100%
Mercury	0.23	0.40	*+	WC-SD02-06	0.31	0.41	0.48	4	4	100%
Nickel	3.80	11.40	+	WC-SD03-612	7.25	11.11	21.80	4	4	100%
Potassium	1410.00	1590.00	*+	WC-SD03-612	905.88	1719.51	81148.45	2	4	50%
Thallium	0.24	0.24	+	WC-SD03-06	0.16	0.23	0.31	1	4	25%
Vanadium	11.90	31.00	+	WC-SD03-612	21.33	30.50	45.84	4	4	100%
Zinc	27.20	52.00	+	WC-SD02-06	33.83	48.09	61.59	4	4	100%

* = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
+ = THE LOG NORMAL 95% UCL IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
*+ = BOTH THE RME AND LOG NORMAL 95% UCL ARE GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
RME = REASONABLE MAXIMUM EXPOSURE
NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
STATISTICAL SUMMARY OF ANALYTICAL RESULTS
BACKGROUND - WEBB CREEK
SEDIMENT - PESTICIDES/PCBs

PARAMETER	MINIMUM DETECTED VALUE (ug/kg)	MAXIMUM DETECTED VALUE (ug/kg)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/kg)	RME (ug/kg)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/kg)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
delta-BHC	0.79	0.79	*+ WC-SD02-612	1.99	3.02	9.99	1	4	25%
Aldrin	1.20	1.20	*+ WC-SD02-06	1.93	2.65	3.66	1	4	25%
Dieldrin	3.70	3.70	*+ WC-SD02-06	4.00	4.79	4.98	1	4	25%
4,4'-DDE	16.00	16.00	+ WC-SD02-06	7.08	14.12	97.81	1	4	25%
4,4'-DDD	12.00	12.00	+ WC-SD02-06	6.08	10.78	28.91	1	4	25%
4,4'-DDT	0.76	2.60	*+ WC-SD02-06	2.37	4.64	91.00	3	4	75%

* = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
+ = THE LOG NORMAL 95% UCL IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
*+ = BOTH THE RME AND LOG NORMAL 95% UCL ARE GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
RME = REASONABLE MAXIMUM EXPOSURE
NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
STATISTICAL SUMMARY OF ANALYTICAL RESULTS
BACKGROUND - WEBB CREEK
SEDIMENT - SEMIVOLATILE ORGANIC COMPOUNDS

PARAMETER	MINIMUM DETECTED VALUE (ug/kg)	MAXIMUM DETECTED VALUE (ug/kg)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/kg)	RME (ug/kg)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/kg)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
Benzo(a)pyrene	544.00	544.00	*+ WC-SD03-612	436.25	554.81	635.17	1	4	25%

* = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
+ = THE LOG NORMAL 95% UCL IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
*+ = BOTH THE RME AND LOG NORMAL 95% UCL ARE GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
RME = REASONABLE MAXIMUM EXPOSURE
NA = NOT APPLICABLE

MARINE CORPS BASE CAMP LEJEUNE
STATISTICAL SUMMARY OF ANALYTICAL RESULTS
BACKGROUND - WEBB CREEK
SEDIMENT - VOLATILE ORGANIC COMPOUNDS

PARAMETER	MINIMUM DETECTED VALUE (ug/kg)	MAXIMUM DETECTED VALUE (ug/kg)	SAMPLE No. OF MAXIMUM DETECTED VALUE	ARITHMETIC AVERAGE (ug/kg)	RME (ug/kg)	LOG NORMAL UPPER 95% CONFIDENCE LEVEL (ug/kg)	No. OF TIMES DETECTED	No. OF TIMES ANALYZED	FREQUENCY OF DETECTION
NO VOLATILE ORGANIC COMPOUNDS WERE DETECTED									

* = THE RME IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
+ = THE LOG NORMAL 95% UCL IS GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
*+ = BOTH THE RME AND LOG NORMAL 95% UCL ARE GREATER THAN THE MAXIMUM DETECTED VALUE; THEREFORE, THE MAXIMUM VALUE IS USED TO CALCULATE CHRONIC DAILY INTAKE
RME = REASONABLE MAXIMUM EXPOSURE
NA = NOT APPLICABLE

Analytical Summary of Results
(Surface Water)

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - HADNOT CREEK
SURFACE WATER - METALS

BAKER I.D.	HC-SW01	HC-SW02	HC-SW03	HC-SW03D	HC-SW04
LABORATORY I.D.	5167-16	5162	5166	5163	5152
DATE COLLECTED	08-MAY-1994	06-MAY-1994	06-MAY-1994	06-MAY-1994	08-MAY-1994
UNITS	UG/L	UG/L	UG/L	UG/L	UG/L
Aluminum	356 U	303 U	301 U	187 U	692
Arsenic	1 U	1 UJ	20	10 UJ	1 U
Barium	19 J	20 J	26 J	24 J	9 J
Calcium	27000	36600	86600	107000	11600
Chromium	9 U	19 U	130 J	125 J	9 U
Iron	746	528	339	291	556
Magnesium	1450	44800	633000	613000	954
Potassium	1670 U	14500	203000	202000	1670 U
Selenium	1 U	5 U	6 J	1 UJ	1 UJ
Sodium	6900	383000	2090000	2560000	6090

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - HADNOT CREEK
SURFACE WATER PESTICIDES AND PCBs

BAKER I.D.	HC-SW01	HC-SW02	HC-SW03	HC-SW03D	HC-SW04
LABORATORY I.D.	5167-16	5162	5166	5163	5152
DATE COLLECTED	08-MAY-1994	06-MAY-1994	06-MAY-1994	06-MAY-1994	08-MAY-1994
UNITS	ug/l	ug/l	ug/l	ug/l	ug/l

NO PESTICIDES OR PCBs WERE DETECTED

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - HADNOT CREEK
SURFACE WATER - SEMIVOLATILE ORGANIC COMPOUNDS

BAKER I.D.	HC-SW01	HC-SW02	HC-SW03	HC-SW03D	HC-SW04
LABORATORY I.D.	5167-16	5162	5166	5163	5152
DATE COLLECTED	08-MAY-1994	06-MAY-1994	06-MAY-1994	06-MAY-1994	08-MAY-1994
UNITS	ug/l	ug/l	ug/l	ug/l	ug/l

NO SEMIVOLATILE ORGANIC COMPOUNDS WERE DETECTED

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - HADNOT CREEK
SURFACE WATER - VOLATILE ORGANIC COMPOUNDS

BAKER I.D.	HC-SW01	HC-SW02	HC-SW03	HC-SW03D	HC-SW04
LABORATORY I.D.	5167-16	5162	5166	5163	5152
DATE COLLECTED	08-MAY-1994	06-MAY-1994	06-MAY-1994	06-MAY-1994	08-MAY-1994
UNITS	ug/l	ug/l	ug/l	ug/l	ug/l

NO VOLATILE ORGANIC COMPOUNDS WERE DETECTED

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - HOLLAND MILL CREEK
SURFACE WATER - METALS

BAKER I.D.	HM-SW01		HM-SW02		HM-SW03	
LABORATORY I.D.	5167-18		5161		5160	
DATE COLLECTED	08-MAY-1994		06-MAY-1994		06-MAY-1994	
UNITS	UG/L		UG/L		UG/L	
Aluminum	259	U	535	J	288	U
Barium	49	J	38	J	20	J
Calcium	14100		40200		302000	
Chromium	10	U	36	J	158	J
Iron	425		559		320	
Lead	1	U	2.5	U	58.1	
Magnesium	2830		109000		754000	
Potassium	1670	U	41100		288000	
Selenium	1.5	J	5	U	41	J
Silver	10	U	17	U	37	J
Sodium	16500		739000		6750000	

MARINE CORPS BASE CAMP LEJEUNE
ANLAYTICAL SUMMARY OF RESULTS
BACKGROUND - HOLLAND MILL CREEK
SURFACE WATER - PESTICIDES AND PCBs

BAKER I.D.	HM-SW01	HM-SW02	HM-SW03
LABORATORY I.D.	5167-18	5161	5160
DATE COLLECTED	08-MAY-1994	06-MAY-1994	06-MAY-1994
UNITS	ug/l	ug/l	ug/l

NO PESTICIDES OR PCBs WERE DETECTED

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - HOLLAND MILL CREEK
SURFACE WATER - SEMIVOLATILE ORGANIC COMPOUNDS

BAKER I.D.	HM-SW01	HM-SW02	HM-SW03
LABORATORY I.D.	5167-18	5161	5160
DATE COLLECTED	08-MAY-1994	06-MAY-1994	06-MAY-1994
UNITS	ug/l	ug/l	ug/l

NO SEMIVOLATILE ORGANIC COMPOUNDS WERE DETECTED

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - HOLLAND MILL CREEK
SURFACE WATER - VOLATILE ORGANIC COMPOUNDS

BAKER I.D.	HM-SW01	HM-SW02	HM-SW03
LABORATORY I.D.	5167-18	5161	5160
DATE COLLECTED	08-MAY-1994	06-MAY-1994	06-MAY-1994
UNITS	ug/l	ug/l	ug/l

NO VOLATILE ORGANIC COMPOUNDS WERE DETECTED

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - WEBB CREEK
SURFACE WATER - METALS

BAKER I.D.	WC-SW02		WC-SW03	
LABORATORY I.D.	5167-8		5158	
DATE COLLECTED	06-MAY-1994		06-MAY-1994	
UNITS	UG/L		UG/L	
Barium	29	J	27	J
Calcium	46900		40500	
Chromium	15	U	97	J
Iron	660		321	
Magnesium	29000		44800	
Potassium	10900		136000	
Sodium	202000		895000	

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - WEBB CREEK
SURFACE WATER - PESTICIDES AND PCBs

BAKER I.D.	WC-SW02	WC-SW03
LABORATORY I.D.	5167-8	5158
DATE COLLECTED	06-MAY-1994	06-MAY-1994
UNITS	ug/l	ug/l
Aldrin	0.035 J	0.05 U

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - WEBB CREEK
SURFACE WATER - SEMIVOLATILE ORGANIC COMPOUNDS

BAKER I.D.	WC-SW02	WC-SW03
LABORATORY I.D.	5167-8	5158
DATE COLLECTED	06-MAY-1994	06-MAY-1994
UNITS	ug/l	ug/l

NO SEMIVOLATILE ORGANIC COMPOUNDS WERE DETECTED

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - WEBB CREEK
SURFACE WATER - VOLATILE ORGANIC COMPOUNDS

BAKER I.D.	WC-SW02	WC-SW03
LABORATORY I.D.	5167-8	5158
DATE COLLECTED	06-MAY-1994	06-MAY-1994
UNITS	ug/l	ug/l

NO VOLATILE ORGANIC COMPOUNDS WERE DETECTED

Analytical Summary of Results
(Sediment)

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - HADNOT CREEK
SEDIMENT - METALS

BAKER I.D.	HC-SD01-06	HC-SD01-612	HC-SD02-06	HC-SD02-612	HC-SD03-06	HC-SD03-06D	HC-SD03-612	HC-SD04-06	HC-SD04-612
LABORATORY I.D	5050	5044	5057-2	5054	5238	5237	5236	5052	5051
DATE COLLECTED	8-MAY-1994	8-MAY-1994	6-MAY-1994	6-MAY-1994	07-MAY-1994	07-MAY-1994	07-MAY-1994	8-MAY-1994	8-MAY-1994
UNITS	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	2940 J	1880 J	7820 J	10100 J	3120 J	7310 J	14000 J	780 J	1260 J
Arsenic	0.46 J	0.28 J	1.1 J	1.9 J	7.5 U	6.5 U	7.9 U	0.45 J	0.26 J
Barium	16.3 J	14.6 J	9.2 J	8.7 J	3.9 U	10.2	17.2	4.1 J	5.5 J
Beryllium	0.14 J	0.16 U	0.25 J	0.32 J	0.95 R	0.92 R	1.3 R	0.13 U	0.15 U
Cadmium	0.03 J	0.03 J	0.1 J	0.04 J	0.66	0.08	0.04 U	0.03 J	0.03 UJ
Calcium	3620 J	3330 J	2030 J	1610 J	3380 J	3350 J	3310 J	1030 J	2150 J
Chromium	2.3	3.2	6	6	16.1	18.8	41.6	2	1.3
Cobalt	1.6 U	1.8 U	2.7 U	1.8 U	3.7 U	4.5	5	1.5 U	1.6 U
Copper	1	1.1	1.5	0.81	4.9 U	4.3 U	3.5 U	0.66	0.73
Iron	648	586	3660	4630	7280 J	11100 J	1700 J	382	583
Lead	0.77 R	0.88 R	1.1 R	7.1 R	5.3	3.7	8.6 R	1 R	1.1 R
Magnesium	87.7	77.1	1450	1040	4420	4130	6540	48.2 U	62.5 U
Manganese	6.9	6.5	6.5	4.9	17.1	35.1	64.7	3.7	3.5
Mercury	0.19 R	0.13 R	0.42 R	0.24 R	0.34	0.25	0.42	0.11 R	0.08 R
Nickel	1.6 U	1.8 U	2.7 U	1.8	9.9	5.5	12.1	1.5 U	1.6 U
Potassium	349 U	396 U	623	395 U	1420	1250	1840	324 U	355 U
Selenium	0.27 J	0.34 J	0.6 J	0.47 J	0.48 UJ	0.41 UJ	0.51 UJ	0.21 J	0.2 UJ
Sodium	339 U	385 U	2750	1630	14100 R	9860 R	6620 R	315 U	344 U
Thallium	0.14	0.16	0.42	0.28	0.34 U	0.29	0.44	0.13 U	0.15 U
Vanadium	2.6	2.8	6.4	7	20.5	18.4	36.9	1.5	1.9
Zinc	4.9 U	4.5 U	9.7 U	6.6 U	20.8	34.3	40	4.5 U	8.3 U

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - HADNOT CREEK
SEDIMENT - PESTICIDES AND PCBs

BAKER I.D.	HC-SD01-06	HC-SD01-612	HC-SD02-06	HC-SD02-612	HC-SD03-06	HC-SD03-06D	HC-SD03-612	HC-SD04-06	HC-SD04-612
LABORATORY I.D.	5057-7	5044	5055	5054	5238	5237	5236	5052	5051
DATE COLLECTED	8-MAY-1994	8-MAY-1994	6-MAY-1994	6-MAY-1994	07-MAY-1994	07-MAY-1994	07-MAY-1994	8-MAY-1994	8-MAY-1994
UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
beta-BHC	2.4 U	2.8 U	4.2 U	2.8 U	5.8 U	4.9 U	6.2 U	2.3 U	1.7 J
delta-BHC	0.64 J	2.8 U	4.2 U	2.8 U	5.8 U	4.9 U	6.2 U	2.3 U	2.5 U
Heptachlor	0.48 J	2.8 U	4.2 U	2.8 U	5.8 U	4.9 U	6.2 U	2.3 U	2 J
4,4'-DDD	2.4 U	2.8 U	1.5 J	2.8 U	11 U	2 J	4 J	2.3 U	2.5 U
4,4'-DDT	4.7 U	5.4 U	8.2 U	5.3 U	11 U	1.2 J	12 U	4.4 U	4.8 U
Methoxychlor	24 U	28 U	42 U	28 U	58 U	49 U	62 U	0.94 J	25 U
Endrin aldehyde	0.59 J	5.4 U	7.1 J	0.77 J	11 U	9.6 U	12 U	4.4 U	4.8 U

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - HADNOT CREEK
SEDIMENT - SEMIVOLATILE ORGANIC COMPOUNDS

BAKER I.D.	HC-SD01-06	HC-SD01-612	HC-SD02-06	HC-SD02-612	HC-SD03-06	HC-SD03-06D	HC-SD03-612	HC-SD04-06	HC-SD04-612
LABORATORY I.D.	5057-7	5044	5055	5054	5238	5237	5236	5052	5051
DATE COLLECTED	8-MAY-1994	8-MAY-1994	6-MAY-1994	6-MAY-1994	07-MAY-1994	07-MAY-1994	07-MAY-1994	8-MAY-1994	8-MAY-1994
UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg

NO SEMIVOLATILE ORGANIC COMPOUNDS WERE DETECTED

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - HADNOT CREEK
SEDIMENT - VOLATILE ORGANIC COMPOUNDS

BAKER I.D.	HC-SD01-06	HC-SD01-612	HC-SD02-06	HC-SD02-612	HC-SD03-06	HC-SD03-06D	HC-SD03-612	HC-SD04-06	HC-SD04-612
LABORATORY I.D.	5057-7	5044	5055	5054	5238	5237	5236	5052	5051
DATE COLLECTED	8-MAY-1994	8-MAY-1994	6-MAY-1994	6-MAY-1994	07-MAY-1994	07-MAY-1994	07-MAY-1994	8-MAY-1994	8-MAY-1994
UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Acetone	70 J	16 UJ	25 UJ	16 UJ	34 UJ	29 UJ	37 UJ	13 UJ	15 UJ
Carbon Disulfide	14 U	16 U	14	19 J	34 U	29 U	37 U	13 U	15 U
2-Butanone	7 J	16 UJ	25 UJ	16 UJ	34 UJ	29 UJ	37 UJ	13 UJ	15 UJ

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - HOLLAND MILL CREEK
SEDIMENT - METALS

BAKER I.D.	HM-SD01-06	HM-SD01-06D	HM-SD01-612	HM-SD02-06	HM-SD02-612	HM-SD03-06	HM-SD03-612
LABORATORY I.D.	5243-18	5220	5219	5242	5241	5240	5239
DATE COLLECTED	08-MAY-1994	08-MAY-1994	08-MAY-1994	07-MAY-1994	07-MAY-1994	07-MAY-1994	07-MAY-1994
UNITS	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
Aluminum	457 J	337 J	505 J	13600 J	9850 J	8760 J	9760 J
Barium	3.4 U	2.1 U	3.9 U	18.7	13.7	11	12.9
Cadmium	0.03	0.11	0.03	0.08	0.06	0.05	0.03
Calcium	282 J	508 J	2850 J	4250 J	7860 J	2920 J	2000 J
Chromium	1.6	1.1	1.5	38.4	28.1	30.7	36
Cobalt	1.3 U	1.4 U	1.4 U	4.4	3.5 U	3.9 U	4
Iron	262 J	225 J	350 J	15800 J	32400 J	16900 J	19900 J
Lead	0.62 J	0.74 J	1	6	7.2	9.2	5.7
Magnesium	35.5	26.7	34.4	4940	3000	5700	4300
Manganese	1.9	1.3	1.6	67.2	55.5	50.2	61.3
Mercury	0.09	0.16	0.18	0.27	0.32	0.35	0.27
Nickel	1.3 U	1.4 U	1.4 U	11.2	9.6	14.2	10.3
Potassium	297 U	304 U	317 U	1510	1600	1720	1760
Selenium	0.17 U	0.17 U	0.25 J	0.4 J	0.45 UJ	0.5 UJ	0.37 UJ
Silver	0.49	0.37 U	0.39 U	0.85 U	0.95 U	1.1 U	0.79 U
Thallium	0.12 U	0.12 U	0.13	0.37	0.32	0.35 U	0.27
Vanadium	0.84	0.62 U	0.66	27.1	30	28.4	29.5
Zinc	9.7	6.7	8.3	43.1	33.2	34.1	29.9

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - HOLLAND MILL CREEK
SEDIMENT - PESTICIDES AND PCBs

BAKER I.D.	HM-SD01-06	HM-SD01-06D	HM-SD01-612	HM-SD02-06	HM-SD02-612	HM-SD03-06	HM-SD03-612
LABORATORY I.D.	5243-18	5220	5219	5242	5241	5240	5239
DATE COLLECTED	08-MAY-1994	08-MAY-1994	08-MAY-1994	07-MAY-1994	07-MAY-1994	07-MAY-1994	07-MAY-1994
UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
beta-BHC	2.1 UJ	7.3 J	3.8	5.1 U	5.5 U	6 U	4.5 U
Aldrin	2.1 U	0.56 J	0.72 J	5.1 U	5.5 U	6 U	4.5 U
Dieldrin	4 U	0.58 J	1.5 J	9.8 U	11 U	12 U	8.8 U
4,4'-DDE	4 U	1 J	4.3	9.8 U	11 U	12 U	8.8 U
4,4'-DDD	4 U	0.87 J	3.1	9.8 U	11 U	2.5 J	1.1 J
4,4'-DDT	4 U	4.1 U	1.7 J	9.8 U	11 U	12 U	8.8 U
alpha-Chlordane	2.1 U	2.1 U	1.3 J	5.1 U	5.5 U	6 U	4.5 U
gamma-Chlordane	2.1 U	2.1 U	3	5.1 U	5.5 U	6 U	4.5 U

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - HOLLAND MILL CREEK
SEDIMENT - SEMIVOLATILE ORGANIC COMPOUNDS

BAKER I.D.	HM-SD01-06	HM-SD01-06D	HM-SD01-612	HM-SD02-06	HM-SD02-612	HM-SD03-06	HM-SD03-612
LABORATORY I.D.	5243-18	5220	5219	5242	5241	5240	5239
DATE COLLECTED	08-MAY-1994	08-MAY-1994	08-MAY-1994	07-MAY-1994	07-MAY-1994	07-MAY-1994	07-MAY-1994
UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Di-n-butylphthalate	401 U	412 U	429 U	614 J	619 J	1150 U	534 J
bis(2-Ethylhexyl)phthalate	401 UJ	412 UJ	429 UJ	943 U	1058 U	1150 U	454 J

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - HOLLAND MILL CREEK
SEDIMENT - VOLATILE ORGANIC COMPOUNDS

BAKER I.D.	HM-SD01-06	HM-SD01-06D	HM-SD01-612	HM-SD02-06	HM-SD02-612	HM-SD03-06	HM-SD03-612
LABORATORY I.D.	5243-18	5220	5219	5242	5241	5240	5239
DATE COLLECTED	08-MAY-1994	08-MAY-1994	08-MAY-1994	07-MAY-1994	07-MAY-1994	07-MAY-1994	07-MAY-1994
UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg

NO VOLATILE ORGANIC COMPOUNDS WERE DETECTED

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - WEBB CREEK
SEDIMENT - METALS

BAKER I.D.	WC-SD02-06		WC-SD02-612		WC-SD03-06		WC-SD03-612	
LABORATORY I.D.	5243-10		5232		5235		5234	
DATE COLLECTED	06-MAY-1994		06-MAY-1994		07-MAY-1994		07-MAY-1994	
UNITS	MG/KG		MG/KG		MG/KG		MG/KG	
Aluminum	14800	J	8200		11500	J	14600	J
Barium	28.2		13.3		14.6		19.2	
Cadmium	0.26		0.12		0.06		0.07	
Calcium	4060	J	3260	J	2190	J	3380	J
Chromium	18.1		8.7		30.3		42.6	
Cobalt	3.5		2.3	U	2.4	U	3.9	
Iron	14600	J	8120		12500	J	20700	J
Lead	16.9		11.9		5.1		5.5	
Magnesium	1690		618		4420		6060	
Manganese	40.2		26		43.4		47.8	
Mercury	0.4		0.36		0.23		0.26	
Nickel	5.7		3.8		8.1		11.4	
Potassium	739	U	508	U	1410		1590	
Thallium	0.3	U	0.21	U	0.24		0.32	U
Vanadium	21		11.9		21.4		31	
Zinc	52		27.8		28.3		27.2	

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - WEBB CREEK
SEDIMENT - PESTICIDES AND PCBs

BAKER I.D.	WC-SD02-06	WC-SD02-612	WC-SD03-06	WC-SD03-612
LABORATORY I.D.	5243-10	5232	5235	5234
DATE COLLECTED	06-MAY-1994	06-MAY-1994	07-MAY-1994	07-MAY-1994
UNITS	ug/kg	ug/kg	ug/kg	ug/kg
delta-BHC	5.2 U	0.79 J	3.7 U	5.4 U
Aldrin	1.2 J	3.9 U	3.7 U	5.4 U
Dieldrin	3.7 J	7.5 U	7.1 U	10 U
4,4'-DDE	16	7.5 U	7.1 U	10 U
4,4'-DDD	12	7.5 U	7.1 U	10 U
4,4'-DDT	2.6 J	1.1 J	0.76 J	10 U

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - WEBB CREEK
SEDIMENT - SEMIVOLATILE ORGANIC COMPOUNDS

BAKER I.D.	WC-SD02-06	WC-SD02-612	WC-SD03-06	WC-SD03-612
LABORATORY I.D.	5243-10	5232	5235	5234
DATE COLLECTED	06-MAY-1994	06-MAY-1994	07-MAY-1994	07-MAY-1994
UNITS	ug/kg	ug/kg	ug/kg	ug/kg
Benzo(a)pyrene	1000 U	688 U	714 U	544 J

MARINE CORPS BASE CAMP LEJEUNE
ANALYTICAL SUMMARY OF RESULTS
BACKGROUND - WEBB CREEK
SEDIMENT - VOLATILE ORGANIC COMPOUNDS

BAKER I.D.	WC-SD02-06	WC-SD02-612	WC-SD03-06	WC-SD03-612
LABORATORY I.D.	5243-10	5232	5235	5234
DATE COLLECTED	06-MAY-1994	06-MAY-1994	07-MAY-1994	07-MAY-1994
UNITS	ug/kg	ug/kg	ug/kg	ug/kg

NO VOLATILE ORGANIC COMPOUNDS WERE DETECTED

Field Chemistry Results

FIELD CHEMISTRY FROM BIOLOGICAL SAMPLES
HADNOT CREEK, HOLLAND MILL CREEK, AND WEBB CREEK
MCB CAMP LEJEUNE, NORTH CAROLINA

Sample Identification	Sample Location	Salinity (ppt)	Conductivity (micromhos/cm)	DO (mg/L)	pH (S.U.)	Temperature (deg. C)
HC01-SW/SD-FS/BN	surface	0	13.5	7.7	6.89	17
	bottom	NA	NA	NA	NA	NA
HC02-SW/SD	surface	0.8	1,810	5.9	6.71	16.1
	bottom	15.5	21,900	1.0	6.73	18.2
HC02-FS/BN	surface	0.3	1,200	NA	NA	20.5
	bottom	13.1	20,900	NA	NA	22
	surface	0	720	7.3	7.2	15.5
	bottom	10.5	17,200	1	6.7	20
	surface	0	1,050	NA	NA	20.5
	bottom	16.5	22,800	NA	NA	21
HC03-SW/SD	surface	17	25,500	12	7.79	17.5
	bottom	NA	NA	NA	NA	NA
HC03-FS/BN	surface	17.9	26,500	NA	7.69	17.8
	bottom	NA	NA	NA	NA	NA
HC04-SW/SD-FS/BN	surface	0	65	5.3	6.16	17.3
	bottom	NA	NA	NA	NA	NA
HM01-SW/SD-FS/BN	surface	0	140	8.0	6.9	17.5
	bottom	NA	NA	NA	NA	NA
HM02-SW/SD	surface	24	36,000	11.8	7.9	17.2
	bottom	25	38,000	11.6	7.6	17.6
HM02-FS/BN	surface	21	29,000	7.75	NA	21
	bottom	19	27,000	7.75	NA	20
	surface	2	3,810	NA	NA	19
	bottom	3.75	6,000	NA	NA	19.5
	surface	1	2,490	5.8	6.85	15.5
	bottom	1.1	2,700	5.0	6.72	15.2
HM03-SW/SD	surface	13.5	19,000	3.4	6.81	17.8
	bottom	NA	NA	NA	NA	NA
HM03-FS/BN	surface	22	32,000	10.8	7.90	17.5
	bottom	NA	NA	NA	NA	NA

Sample Identification	Sample Location	Salinity (ppt)	Conductivity (micromhos/cm)	DO (mg/L)	pH (S.U.)	Temperature (deg. C)
WC02-SW/SD	surface	4.5	9,000	9.0	7.48	21
	bottom	5.5	9,000	7.0	7.48	20.5
	surface	0	975	5.1	7.08	17.5
	bottom	0	1,250	4.4	7.15	17.5
WC02-FS/BN	surface	0	850	5.5	6.98	20.5
	bottom	7	10,500	6.1	6.85	21
WC03-SW/SD	surface	10	16,500	10	7.33	23
	bottom	10	16,500	8.5	7.36	22.4
WC03-FS/BN	surface	12	17,200	9.1	7.43	20
	bottom	12.8	18,000	9.6	7.56	19

ppt = parts per thousand
S.U. = Standard Units
NA = Not Analyzed
Sample Location = Water surface or water bottom
DO = Dissolved Oxygen level

FS = Fish sample
BN = Benthic Macroinvertebrate sample
SW/SD = Surface water/sediment sample

Positive Detection Summary
Fish Fillet Tissue Analysis

MARINE CORPS BASE CAMP LEJEUNE
BACKGROUND - HADNOT CREEK
POSITIVE DETECTIONS SUMMARY
FISH FILLET TISSUE SAMPLES

Parameter	HC1A-RD (Red Drum) (mg/kg)		HC1A-SF (Southern Flounder) (mg/kg)		HC1A-LBA (Largemouth Bass) (mg/kg)		HC1A-LBB (Largemouth Bass) (mg/kg)		HC1A-LBC (Largemouth Bass) (mg/kg)		HC1A-BCA (Blue Crab) (mg/kg)		HC1A-BCA (Blue Crab) (mg/kg)		HC1A-GA (Longnose Gar) (mg/kg)		HC1A-GB (Longnose Gar) (mg/kg)	
Volatiles																		
Acetone	0.13	J	0.056	J	0.077	J	0.07	J	0.037	J	0.11	J	0.099	J	0.028	J	0.016	J
Methylene Chloride	0.041		0.013	B	0.017	B	0.016	B	0.003	B	0.011	B	0.022	B	0.004	B	0.015	B
Semivolatiles																		
Phenol	ND		0.46		ND		2.1		1.6		ND		ND		ND		ND	
Di-n-octyl phthalate	ND		ND		0.061	J	ND		0.085		ND		ND		0.29	J	0.5	J
Bis(2-ethylhexyl)phthalate	1.1	B	0.82	B	3.6	B	3.2	B	4.8	B	ND		ND		11	J	17	J
Pesticides/PCBs																		
4,4'-DDD	ND		ND		ND		ND		ND		0.0066		0.0056		ND		ND	
4,4'-DDE	ND		ND		ND		ND		ND		0.0087		0.0046		0.012		0.0097	
alpha-Chlordane	ND		ND		ND		ND		0.00017	P	0.0018		0.0012		ND		ND	
Aroclor-1260	ND		ND		ND		ND		ND		ND		ND		ND		ND	
Inorganics																		
Aluminum	ND		ND		ND		36.5		ND		ND		ND		ND		ND	
Arsenic	0.7	L	0.82		0.34	L	0.37	L	0.36	K	0.68		0.39		2.5		3.9	L
Barium	ND		ND		ND		ND		ND		ND		10.1		ND		ND	
Cadmium	ND		ND		ND		ND		ND		0.14		0.11	J	ND		ND	
Calcium	154		271		528		684		1170		4480		32200		493		520	
Chromium	0.38	L	ND		0.23	L	0.68	L	0.63	L	ND		0.52	L	0.32	L	0.21	L
Copper	0.3	J	0.18	J	0.2	J	0.24	J	0.28	J	7.9		5.8		0.46	J	0.18	J
Iron	ND		ND		ND		ND		ND		ND		ND		ND		ND	
Lead	ND		ND		ND		ND		ND		ND		ND		ND		ND	
Magnesium	285		254		298		292		319		591		1800		286		300	
Manganese	0.13		0.38		0.09	J	0.09	J	0.08	J	1.8		13.6		0.24	J	0.21	J
Mercury	0.07		0.05		0.22		0.24		0.17	K	0.08		0.02	J	0.22		0.14	
Nickel	ND		ND		ND		ND		ND		ND		ND		0.45	L	ND	
Potassium	3930		3700		3740		3610		4040		2170		1860		3410		3270	
Sodium	1060		607		505		580		529		4060		4270		623		523	
Zinc	5		5		3.9		4.4		4.6	L	25		17.9		6.5		4.6	

Fish Distribution and Characterization

FISH DISTRIBUTION AND CHARACTERIZATION
BACKGROUND STATIONS - WEBB, HADNOT, AND HOLLAND MILL CREEKS

MCB CAMP LEJEUNE, NORTH CAROLINA

Common Name	Scientific Name	Length N.C. (cm)	Length Atlas (cm)	Water Type	Habitat	Spawning	Tolerance	Family	Sources
Atlantic Menhaden	Brevoortia tyrannus	20	46	Brackish or marine, enters freshwater	Rivers, streams	NA	Intermediate	Clupeidae	1,2,3,4
Spot	Leiostomas xanthurus	NA	NA	Brackish or marine, enters freshwater	NA	NA	NA	Sciaenidae	1
Stripped Mullet	Mugil cephalus	NA	23-35	Brackish or marine, enters freshwater	Rivers	NA	NA	Mugilidae	1,2
Pinfish	Lagodon rhomboides	NA	38	Marine, seldom enters freshwater	Shallow waters	NA	NA	Sparidae	1,2
Mud Catfish (Yellow Bullhead)	Ictalupus natalis	24	-38	Freshwater	Rivers Streams	April through May	Tolerant	Ictaluridae	1,2,3
Redbreast Sunfish	Lepomis auritus	18	6-15	Freshwater	Streams	April through June	NA	Centrarchidae	1,2,3
Atlantic Croaker	Micropogonias undulatus	NA	61	Estuaries, brackish-water or marine	NA	NA	NA	Sciaenidae	1,2
Pumpkinseed	Lepomis gibbosus	20	8-20	Freshwater	Streams Creeks	April through October	Moderately Tolerant	Centrarchidae	1,2,3,4
Longnose Gar	Lepisosteus osseus	80	-150	Freshwater; May enter brackish water	Rivers	April through May	Intermediate	Lepisosteidae	1,2,3
Summer Flounder	Paralichthys dentatus	NA	37	Brackish or marine, enters freshwater	Rivers	NA	NA	Bothidae	1
Flier	Centrarchus macropterus	12	7-19	Freshwater	Streams	April through May	NA	Centrarchidae	1,2,3
Chain Pickerel	Esox niger	44	38-45	Freshwater	Streams Creeks	February through March	Intermediate	Esocidae	1,2,3

FISH DISTRIBUTION AND CHARACTERIZATION
BACKGROUND STATIONS - WEBB, HADNOT, AND HOLLAND MILL CREEKS
REMEDIAL INVESTIGATION, CTO-0232
MCB CAMP LEJEUNE, NORTH CAROLINA

Common Name	Scientific Name	Length N.C. (cm)	Length Atlas (cm)	Water Type	Habitat	Spawning	Tolerance	Family	Sources
Redear Fish	Lepomis microlophus	18	14-25	Freshwater	Streams	May through August	Intermediate	Centrarchidae	1,2,3
Warmouth	Lepomis gulosus	16	8-26	Freshwater	Rivers Streams	May through August	Intermediate	Centrarchidae	1,2,3
White Perch	Morone americana	NA	to 48	Brackish water; Freshwater	Bays and estuaries; Rivers and lakes	NA	Intermediate	Percichthyidae	3,5
Bluefish	Pomatomus saltatrix	NA	NA	Coastal waters	Surface waters; Near shore and off shore	NA	NA	Pomatomidae	2
Bluegill	Lepomis macrochirus	25	18-20	Freshwater	Rivers Streams Creeks	May through October	Intermediate	Centrarchidae	1,2,3
White Catfish	Ictalurus catus	31	-46	Freshwater	Rivers	May through June	Intermediate	Ictaluridae	1,2,3
Largemouth Bass	Micropterus salmoides	48	12-70	Freshwater	Rivers Streams Creeks	May through June	Intermediate	Centrarchidae	1,2,3
Mummichog	Fundulus heterclitus	7	8-10	Shallow coastal waters	Rivers Streams	April through August	NA	Cyprinodontidae	1,2,3
Redfin Pickerel	Esox americanus	23	25-30	Freshwater	Streams Creeks	February through March	NA	Esocidae	1,2,3
Hog Choker	Trinectes maculatus	5	7-12	Shallow coastal waters; Occasionally enters freshwater	Rivers Streams	March through April	NA	Soleidae	1,2,3

FISH DISTRIBUTION AND CHARACTERIZATION
BACKGROUND STATIONS - WEBB, HADNOT, AND HOLLAND MILL CREEKS
REMEDIAL INVESTIGATION, CTO-0232
MCB CAMP LEJEUNE, NORTH CAROLINA

Common Name	Scientific Name	Length N.C. (cm)	Length Atlas (cm)	Water Type	Habitat	Spawning	Tolerance	Family	Sources
Pirate Perch	Aphredoderus sayanus	9	7-14	Freshwater	Streams Creeks	January through March	Intermediate	Aphredoderidae	1,2,3
Eastern Mosquito (Mosquitofish)	Gambusia affinis	NA	NA	Fresh or brackish water	Ponds, lakes, ditches, backwaters, sluggish streams	NA	Intermediate	Poeciliidae	2,5

1 Menhinick, 1992.
2 Boschung, 1983.
3 USEPA, 1989d.
4 Raasch, 1991.
5 Kennish, 1986.
NA = Information not Available

TOTAL NUMBER AND PERCENT OF AQUATIC SPECIES IDENTIFIED PER AREA
WEBB CREEK AND HADNOT CREEK

MCB CAMP LEJEUNE, NORTH CAROLINA

SPECIES	WEBB CREEK		Total Detected	HADNOT CREEK				Total Detected
	WC02	WC03		HC01	HCO2	HC03	HC04	
FISH SPECIES								
Spot	4		4			12		12
Stripped Mullet	4		4			3		3
Pumpkinseed			0		3			3
Mudcat	3		3	3				3
Redbreast sunfish	1		1	2				2
Long-Nosed Gar	9	5	14					0
American flier			0	3				3
Chain pickerel			0	1				1
Redear fish			0	1				1
Atlantic croaker			0			5		5
Warmouth			0		1			1
Bluefish			0			3		3
Yellow Bullhead	3		3	2				2
Blue gill	4		4					0
White catfish	1		1					0
Largemouth bass	2		2					0
Summer flounder		1	1					0
Mummichog		3	3					0
Pinfish	25	24	49			5		5
Atlantic menhaden			0			2		2
Redfin pickerel			0				2	2
White perch			0			1		1
Hog choker			0			1		1
Pirate perch			0				8	8

TOTAL NUMBER AND PERCENT OF AQUATIC SPECIES IDENTIFIED PER AREA
WEBB CREEK AND HADNOT CREEK

MCB CAMP LEJEUNE, NORTH CAROLINA

SPECIES	WEBB CREEK		Total Detected	HADNOT CREEK				Total Detected
	WC02	WC03		HC01	HC02	HC03	HC04	
NO. OF SPECIES	9	4	12	5	2	8	2	18
NO. OF INDIVIDUALS	53	33	86	10	4	32	10	56
OTHER AQUATIC SPECIES								
Grass shrimp		3	3					0
Crayfish			0				3	3
NUMBER OF SPECIES	0	1	1	0	0	0	1	1
NO. OF INDIVIDUALS	0	3	3	0	0	0	3	3

TOTAL NUMBER AND PERCENT OF AQUATIC SPECIES IDENTIFIED PER AREA
HOLLAND MILL CREEK

MCB CAMP LEJEUNE, NORTH CAROLINA

SPECIES	HOLLAND MILL CREEK (CARTWHEEL BRANCH)			Total Detected
	HM01	HM02	HM03	
Spot			8	8
Stripped Mullet		11	3	14
Pumpkinseed	16	2		18
Chain pickerel	2			2
Swamp darter	6			6
Mud sunfish	1			1
Black drum		1		1
Ligar		3		3
Gizzard Shad		2		2
Spotted sunfish		2		2
Blue gill	2	1		3
Atlantic menhaden			199	199
Largemouth bass		1		1
Hog choker			2	2
Summer flounder		1	17	18
Mummichog		6		6
Pinfish		7	4	11
Goby, freshwater	1	1		2
NUMBER OF SPECIES	6	12	6	18
NO. OF INDIVIDUALS	28	38	233	299

TOTAL NUMBER AND PERCENT OF AQUATIC SPECIES IDENTIFIED PER AREA
HOLLAND MILL CREEK

MCB CAMP LEJEUNE, NORTH CAROLINA

SPECIES	HOLLAND MILL CREEK (CARTWHEEL BRANCH)			Total Detected
	HM01	HM02	HM03	
OTHER AQUATIC SPECIES				
Unknown	1			1
Grass shrimp		13		13
Crayfish	3			3
NUMBER OF SPECIES	2	1	0	3
NO. OF INDIVIDUALS	4	13	0	17

HADNOT CREEK - BACKGROUND STATIONS

SPECIES	COC SAMPLE NO.	HC01 Fish Length (cm)	Mass Weight	Average Weight (g)	HC02 Fish Length (cm)	Mass Weight	Average Weight (g)	HC03 Fish Length (cm)	Mass Weight	Average Weight (g)	HC04 Fish Length (cm)	Mass Weight	Average Weight (g)
Strippet Mullet	HC03							15.25	45	45			
								12.5	20	20			
								12.5	20	20			
	COUNT							3		3			
	AVERAGE							13.416666667		28.333333333			
	MAXIMUM							15.25		45			
	MINIMUM							12.5		20			
								+1 collected, no length or weight					
Atlantic Menhaden	HC03							5	<5	2.5			
	COUNT							2		2			
	AVERAGE							5		2.5			
	MAXIMUM							5		2.5			
	MINIMUM							5		2.5			
Blue Fish	HC03							7	7	7			
								11	17	17			
								8	8	8			
	COUNT							3		3			
	AVERAGE							8.6666666667		10.666666667			
	MAXIMUM							11		17			
	MINIMUM							7		7			
Spot	HC03							12.5	22	22			
								5.5	<5.0	2.5			
								5.75	<5.0	2.5			
								5	<5.0	2.5			
								3.5	<5.0	2.5			
								5.5	<5.0	2.5			
								14	40	40			
								13.5	35	35			
								12	35	35			
								14	35	35			
								5.5	<5.0	2.5			
								11.5	20	20			
	COUNT							12		12			
	AVERAGE							9.0208333333		16.833333333			
	MAXIMUM							14		40			
	MINIMUM							3.5		2.5			

HADNOT CREEK - BACKGROUND STATIONS

SPECIES	COC SAMPLE NO.	HC01 Fish Length (cm)	Mass Weight	Average Weight (g)	HC02 Fish Length (cm)	Mass Weight	Average Weight (g)	HC03 Fish Length (cm)	Mass Weight	Average Weight (g)	HC04 Fish Length (cm)	Mass Weight	Average Weight (g)
White Perch	HC03							18.5	105	105			
	COUNT							1		1			
	AVERAGE							18.5		105			
	MAXIMUM							18.5		105			
	MINIMUM							18.5		105			
Hogchoker	HC03							5.5	5	5			
	COUNT							1		1			
	AVERAGE							5.5		5			
	MAXIMUM							5.5		5			
	MINIMUM							5.5		5			
Pinfish													
	HC03							13	35	35			
								10.8	25	25			
								11	22	22			
								10.5	25	25			
								13	37	37			
	COUNT							5		5			
	AVERAGE							11.66		28.8			
	MAXIMUM							13		37			
	MINIMUM							10.5		22			
Atlantic Croaker	HC03							11.5	20	20			
								10.5	16	16			
								9	10	10			
								10.5	14	14			
								7.5	<5	2.5			
	COUNT							5		5			
	AVERAGE							9.8		12.5			
	MAXIMUM							11.5		20			
	MINIMUM							7.5		2.5			
Redbreast Sunfish	HC01	23.5	265	265									
		20	175	175									
	COUNT	2		2									
	AVERAGE	21.75		220									
	MAXIMUM	23.5		265									
	MINIMUM	20		175									
American Flyer	HC01	16.5	65	65									
		9.5	15	15									
		+1 collected, no length or weight											
	COUNT	3		3									
	AVERAGE	13		40									
	MAXIMUM	16.5		65									
	MINIMUM	9.5		15									

HADNOT CREEK - 1OUND STATIONS

SPECIES	COC SAMPLE NO.	HC01 Fish Length (cm)	Mass Weight	Average Weight (g)	HC02 Fish Length (cm)	Mass Weight	Average Weight (g)	HC03 Fish Length (cm)	Mass Weight	Average Weight (g)	HC04 Fish Length (cm)	Mass Weight	Average Weight (g)
Chain Pickerel	HC01	37	290	290									
	COUNT	1		1									
	AVERAGE	37		290									
	MAXIMUM	37		290									
	MINIMUM	37		290									
Yellow Bullhead	HC01	26.5	270	270									
		26.5	275	275									
	COUNT	2		2									
	AVERAGE	26.5		272.5									
	MAXIMUM	26.5		275									
	MINIMUM	26.5		270									
Pumpkinseed	HC02				13	50	50						
					17.5	125	125						
					16	100	100						
	COUNT				3		3						
	AVERAGE				15.5		91.666667						
	MAXIMUM				17.5		125						
	MINIMUM				13		50						
Warmouth	HC02				22	250	250						
	COUNT				1		1						
	AVERAGE				22		250						
	MAXIMUM				22		250						
	MINIMUM				22		250						
Redfin Pickerel	HC04										+1 collected, no length or weight		
											17	30	30
	COUNT										2		2
	AVERAGE										17		30
	MAXIMUM										17		30
	MINIMUM										17		30
Pirate Perch	HC04										5	>5	2.5
											4.5		2.5
											+6 collected, no length or weight		
	COUNT										6		6
	AVERAGE										4.75		2.5
	MAXIMUM										5		2.5
	MINIMUM										4.5		2.5
Crayfish	HC04										6	10	3.3
											4.5		3.3
											4		3.3
	COUNT										3		3
	AVERAGE										4.8333333		3.3
	MAXIMUM										6		3.3
	MINIMUM										4		3.3
Mudcat	3 collected at HC01, no length or weight												

HOLLAND MILL CREEK - BACKGROUND STATIONS

SPECIES	COC SAMPLE NO.	HM01 Fish Length (cm)	Mass Weight	Average Weight (g)	HM02 Fish Length (cm)	Mass Weight	Average Weight (g)	HM03 Fish Length (cm)	Mass Weight	Average Weight (g)
Striped Mullet	HM02				38.5	640	640			
					39.5	600	600			
					34.5	400	400			
					34.5	400	400			
					33.5	360	360			
					34	340	340			
					37	460	460			
					35	520	520			
					33.5	410	410			
					32	320	320			
					31	370	370			
	HM03							14.5	40	40
								6.5	<5	2.5
								+1 collected, no length or weight		
	COUNT				11		11	3		3
	AVERAGE				34.81818182		438.1818182	10.5		21.25
	MAXIMUM				39.5		640	14.5		40
	MINIMUM				31		320	6.5		2.5
Atlantic Menhaden	HM03							6	24	4
								6		4
								5.7		4
								5.4		4
								5.5		4
								5.6		4
								5.7	22	2.2
								5.5		2.2
								5		2.2
								5.5		2.2
								5.5		2.2
								5.2		2.2
								5.5		2.2
								5.5		2.2
								5.6		2.2
								6.2		2.2
								6	25	2.5
								5.5		2.5
								5		2.5
								5.5		2.5
								5.5		2.5
								5.5		2.5
								6		2.5
								5		2.5
								5.5		2.5
								5.5	20	2
								5.7		2
								5		2
								5		2
								6		2
								5.5		2
								5.5		2
								6		2
								6		2
								5.5		2
								5.5	27	1.8
								5.8		1.8
								5.5		1.8
								5.7		1.8
								6		1.8
								6		1.8
								6.5		1.8
								5.5		1.8
								6.5		1.8
								5.5		1.8
								5.5		1.8
								5.5		1.8
								6		1.8
								5.5		1.8
								5.5		1.8
								5.5	20	2
								4.5		2
								5		2
								5.5		2
								5.5		2
								5.5		2
								5.5		2
								6		2
								5.5		2
								6		2
								6		2
								138 collected no length or weight		
	COUNT							199		61
	AVERAGE							5.6		2.2540984
	MAXIMUM							6.5		4
	MINIMUM							4.5		1.8

HOLLAND MILL CREEK - BACKGROUND STATIONS

SPECIES	COC SAMPLE NO.	HM01 Fish Length (cm)	Mass Weight	Average Weight (g)	HM02 Fish Length (cm)	Mass Weight	Average Weight (g)	HM03 Fish Length (cm)	Mass Weight	Average Weight (g)
Flounder	HM02				29.5	250	250			
	HM03							33	400	400
								43	850	850
								20.5	90	90
								24	120	120
								+13 collected, no length or weight		
	COUNT				1		1	17		4
	AVERAGE				29.5		250	30.125		365
	MAXIMUM				29.5		250	43		850
	MINIMUM				29.5		250	20.5		90
Black Drum	HM02				28	350	350			
	COUNT				1		1			
	AVERAGE				28		350			
	MAXIMUM				28		350			
	MINIMUM				28		350			
Spotted Sunfish	HM02				15.5	65	65			
					17	110	110			
	COUNT				2		2			
	AVERAGE				16.25		87.5			
	MAXIMUM				17		110			
	MINIMUM				15.5		65			
Largemouth Bass	HM02				34	540	540			
	COUNT				1		1			
	AVERAGE				34		540			
	MAXIMUM				34		540			
	MINIMUM				34		540			
								+1 collected, no length or weight		
Hogchoker	HM03							6	10	10
	COUNT							2		1
	AVERAGE							6		10
	MAXIMUM							6		10
	MINIMUM							6		10
Spot	HM03							5	<5	2.5
								12	25	25
								5.8	20	4
								6		4
								6.2		4
								6.4		4
								6.4		4
								+1 collected, no length or weight		
	COUNT							8		7
	AVERAGE							6.82857143		6.78571429
	MAXIMUM							12		25
	MINIMUM							5		2.5
Blue Gill	HM02				17		105			
	HM01	10.5	10	10						
		+1 collected, no length or weight								
	COUNT	2		1	1		1			
	AVERAGE	10.5		10	17		105			
	MAXIMUM	10.5		10	17		105			
	MINIMUM	10.5		10	17		105			

HOLLAND MILL CREEK - BACKGROUND STATIONS

SPECIES	COC SAMPLE NO.	HM01 Fish Length (cm)	Mass Weight	Average Weight (g)	HM02 Fish Length (cm)	Mass Weight	Average Weight (g)	HM03 Fish Length (cm)	Mass Weight	Average Weight (g)
Pumpkinseed	HM02				15	50	50			
					11.5	30	30			
	HM01	7.5	45	4.5						
		6.5		4.5						
		7.5		4.5						
		7.5		4.5						
		6		4.5						
		6		4.5						
		4.5		4.5						
		8.5		4.5						
		8		4.5						
		5.5		4.5						
		8	50	8.3						
		8.5		8.3						
		6.5		8.3						
		8.5		8.3						
		11		8.3						
		7.5		8.3						
	COUNT	16		16	2		2			
	AVERAGE	7.34375		5.925	13.25		40			
	MAXIMUM	11		8.3	15		50			
	MINIMUM	4.5		4.5	11.5		30			
Long-nose Gar	HM02				73	1250	1250			
					83	2000	2000			
					72.5	1640	1640			
	COUNT				3		3			
	AVERAGE				76.16666667		1630			
	MAXIMUM				83		2000			
	MINIMUM				72.5		1250			
Pinfish	HM02				17.5	80	80			
	HM03							5	<5	2.5
					+6 collected, no length or weight			+3 collected, no length or weight		
	COUNT				7		1	4		1
	AVERAGE				17.5		80	5		2.5
	MAXIMUM				17.5		80	5		2.5
	MINIMUM				17.5		80	5		2.5
Gizzard Shad	HM02				33	480	480			
					34	460	460			
	COUNT				2		2			
	AVERAGE				33.5		470			
	MAXIMUM				34		480			
	MINIMUM				33		460			
Chain Pickerel	HM01	13	10	5						
		13.5		5						
	COUNT	2		2						
	AVERAGE	13.25		5						
	MAXIMUM	13.5		5						
	MINIMUM	13		5						
Unknown Fish	HM01	7.5	<5	2.5						
	COUNT	1		1						
	AVERAGE	7.5		2.5						
	MAXIMUM	7.5		2.5						
	MINIMUM	7.5		2.5						
Swamp Darter	HM01	6	18	3						
		6		3						
		6		3						
		6		3						
		6		3						
		6		3						
	COUNT	6		6						
	AVERAGE	6		3						
	MAXIMUM	6		3						
	MINIMUM	6		3						

HOLLAND MILL CREEK - BACKGROUND STATIONS

SPECIES	COC SAMPLE NO.	HM01 Fish Length (cm)	Mass Weight	Average Weight (g)	HM02 Fish Length (cm)	Mass Weight	Average Weight (g)	HM03 Fish Length (cm)	Mass Weight	Average Weight (g)
Crayfish	HM01	8.5	15	5						
		4.5		5						
		5.5		5						
	COUNT	3		3						
	AVERAGE	6.16666667		5						
	MAXIMUM	8.5		5						
	MINIMUM	4.5		5						

Mud Sunfish	1 collected at HM01, no length or weight
Mummichog	6 collected at HM02, no length or weight
Goby, freshwater	1 collected at HM01 and 1 collected at HM02, no length or weight
Gras shrimp	13 collected at HM02, no length or weight

WEBB CREEK - BACKGROUND STATIONS

SPECIES	COC SAMPLE NO.	WC02 Fish Length (cm)	Mass Weight	Average Weight (g)	WC03 Fish Length (cm)	Mass Weight	Average Weight (g)
Strippet Mullet	WC02	39.5	500	500			
		35.5	380	380			
		41.5	700	700			
		37	600	600			
	COUNT	4		4			
	AVERAGE	38.375		545			
	MAXIMUM	41.5		700			
	MINIMUM	35.5		380			
Summer Flounder	WC03				21	60	60
	COUNT				1		1
	AVERAGE				21		60
	MAXIMUM				21		60
	MINIMUM				21		60
Largemouth Bass	WC02	34	525	525			
		34	600	600			
	COUNT	2		2			
	AVERAGE	34		562.5			
	MAXIMUM	34		600			
	MINIMUM	34		525			
Redbreast Sunfish	WC02	16	60	60			
	COUNT	1		1			
	AVERAGE	16		60			
	MAXIMUM	16		60			
	MINIMUM	16		60			
White Catfish	WC02	37	750	750			
	COUNT	1		1			
	AVERAGE	37		750			
	MAXIMUM	37		750			
	MINIMUM	37		750			
Spot	WC02	14.5	10	10			
		13	10	10			
		13	<10	5			
		+1 collected, no length or weight					
	COUNT	4		4			
	AVERAGE	13.5		8.33333333			
	MAXIMUM	14.5		10			
	MINIMUM	13		5			
Blue Gill	WC02	23	300	300			
		23.5	300	300			
		21.5	250	250			
		16.75	85	85			
	COUNT	4		4			
	AVERAGE	21.1875		233.75			
	MAXIMUM	23.5		300			
	MINIMUM	16.75		85			

WEBB CREEK - BACKGROUND STATIONS

ICIES	COC SAMPLE NO.	WC02 Fish Length (cm)	Mass Weight	Average Weight (g)	WC03 Fish Length (cm)	Mass Weight	Average Weight (g)
Long-nose Gar	WC02	68	1100	1100			
		71.5	1220	1220			
		73.5	1350	1350			
		72.5	1220	1220			
		66.5	1120	1120			
		72.5	1260	1260			
		71.5	1340	1340			
		69.5	1240	1240			
		75	1420	1420			
	WC03				87	1900	1900
					83	1850	1850
					97	2850	2850
					71.5	1000	1000
					73	1580	1580
	COUNT	9		9	5		5
	AVERAGE	71.16667		1252.222	82.3		1836
	MAXIMUM	75		1420	97		2850
	MINIMUM	66.5		1100	71.5		1000
Pinfish	WC02	10.5	NA				
		+24 collected, no length or weight			24 collected, no length or weight		
	COUNT	25			24		
	AVERAGE	10.5					
	MAXIMUM	10.5					
	MINIMUM	10.5					
Yellow Bullhead Catfish	WC02	38.5	900	900			
		32.5	620	620			
		36.5	640	640			
	COUNT	3		3			
	AVERAGE	35.83333		720			
	MAXIMUM	38.5		900			
	MINIMUM	32.5		620			

Mudcat — 3 fish collected at WC02, no length or weight

Mummichog — 3 fish collected at WC03, no length or weight

Grass shrimp — 3 collected at WC03, no length or weight

Benthic Macroinvertebrate Characterization and Statistics

MARINE CORPS BASE CAMP LEJEUNE
BACKGROUND - WEBB CREEK
BENTHIC MACROINVERTEBRATES

	WC02-BN			WC03-BN		
	01	02	03	01	02	03
NEMERTEA						
Anopla						
Heteronemertea						
Lineidae						
Micrura leidyl				1	2	2
ANNELIDA						
Polychaeta						
Capitellida						
Capitellidae						
Heteromestus filiformis	2					
Phyllodocida						
Nereidae						
Nereis succinea			1			
Spionida						
Spionidae						
Scolecolepides viridis						1
Terebellida						
Ampharetidae						
Hypaniola grayi		4	10			
ARTHROPODA						
Crustacea						
Amphipoda						
Gammaridae						
Gammarus tigrinus	10			1	1	
Insecta						
Diptera						
Chironomidae						
Chironomus decorus gr.	8	24	13	38	17	6
Procladius sp.	1	3		2		1
Tanytarsus sp.		2	1			
MOLLUSCA						
Bivalvia						
Veneroida						
Corbiculidae						
Polymesoda caroliniana					1	
Tellinidae						
Macoma tenta					1	
Total Taxa	4	4	4	4	5	4
Total Specimens	21	33	25	42	22	10
Replicate Specimens Average		26.33			24.67	
Standard Deviation	4.42531	10.5317	6.18466	18.3394	7.05691	2.38048
Brillouin's Diversity		0.518			0.279	
SPECIES DENSITY (#/M^2)	134	210	159	268	140	64
SPECIES DIVERSITY (Shannon-Wiener)	0.473	0.380	0.419	0.180	0.304	0.473

MARINE CORPS BASE CAMP LEJEUNE
BACKGROUND - HADNOT CREEK
BENTHIC MACROINVERTEBRATES

	HC01-BN			HC02-BN			HC03-BN			HC04-BN		
	01	02	03	01	02	03	01	02	03	01	02	03
RTEA												
pta												
Heteronemertea												
Lineidae												
Micrura leidyi						6	5	3				
ANNELIDA												
Oligochaeta												
Lumbriculida												
Lumbriculidae												
Eclipidrilus sp.			1									
Tubificida												
Tubificidae												
Isochaetides freyi	77	42	38							21	21	9
Limnodrilus hoffmeisteri											1	
Spirosperma carolinensis		3									1	3
Polychaeta												
Capitellida												
Capitellidae												
Heteromastus filiformis							14	9				
Phyllodocida												
Nereidae												
Nereis succinea							6		18			
Phyllodocidae												
Eteone heteropoda									1			
Terebellida												
Ampharetidae												
Hypaniola grayi (ampharetid worm)				19	6	46						
ARTHROPODA												
Crustacea												
Amphipoda												
Corophiidae												
Corophium lacustre									82			
Gammaridae												
Crangonyx pseudogracilis					1	1					15	20
Gammarus tigrinus												
Tanaidacea												
Tanaidae												
Leptocheliа rapax									80			
Insecta												
Coleoptera												
Dytiscidae												
Hydroporus sp.			1							5	2	6
Elmidae												
Dubiraphia sp.		1										
Diptera												
Ceratopogonidae												
Palpomyia/alpheromia sp. (biting midges)	5	7	4			1						
Chironomidae												
Ablabesmyia annulata	2	7	1									
Ablabesmyia rhamphe gr.	4	7	8									
Clinotanypus pinguis											1	
Cryptochironomus fulvus gr.		2	3									
Epoicladius sp.			1									
Glyptotendipes sp.												1
Nilothauma sp.		2	1									
Parauterborniella nigrohalteralis	1	5	2									
Polypedilum illinoense	3	1										
Procladius sp. (midges)		1										
Tanytarsus sp.	2	9	2									
Tribelos lucundum	4	8	8								9	8
Tipulidae												
Pseudolimnophila sp.											1	2
Ephemeroptera												
Ephemeridae												
Hexagenia bilineata	3	3	1									
Megaloptera												
Sialidae												
Sialis sp.										1		
Odonata												
Coenagrionidae												
Argia sp.		1										
Libellulidae												
Pachydiplax longipennis											1	
Trichoptera												
Polycentropodidae												
Phylacentropus sp.	1	5	7							17	13	4
MOLLUSCA												
Bivalvia												
Mytiloida												
Mytilidae												
Geukensia demissa									1			
Veneroida												
Sphaeriidae												
Pisidium casertanum		2	1								4	
Tellinidae												
Macoma tenta							5	19	1			
Total Taxa	10	17	15	1	2	4	4	3	6	4	11	8
Total Specimens	102	108	78	18	7	54	30	31	183	44	89	32
Replicate Specimens Average		36.33333			26.33333			81.33333			55	
Standard Deviation	23.50792	9.514633	8.961824	NA	3.535534	21.79449	4.358899	8.082904	39.67241	9.521905	7.128687	6.047432
Shannon's Diversity		0.755			0.072			0.675			0.757	
SPECIES DENSITY (#/M^2)	850	676	487	113	45	344	191	198	1166	280	440	331
SPECIES DIVERSITY (Shannon-Wiener)	0.463	0.956	0.831	0.000	0.178	0.230	0.554	0.384	0.449	0.456	0.803	0.783

MARINE CORPS BASE CAMP LEJEUNE
BACKGROUND - HADNOT CREEK
BENTHIC MACROINVERTEBRATES

	HM01-BN			HM02-BN			HM03-BN		
	01	02	03	01	02	03	01	02	03
NEMERTEA									
Anopla									
Heteronemertea									
Lineidae									
Micrura leidyi							3	4	2
ANNELIDA									
Oligochaeta									
Tubificida									
Tubificidae									
Limnodrilus hoffmeisteri	3	1	3						
Polychaeta									
Ariciida									
Orbiniidae									
Scoloplos fragilis							3	20	8
Capitellida									
Capitellidae									
Heteromastus filiformis							1	1	1
Phyllodocida									
Nereidae									
Nereis succinea				7	9	6			
Spionida									
Spionidae									
Streblospio benedicti							1		
Terebellida									
Ampharetidae									
Hypaniola grayi (ampharetid worm)				3		2			
ARTHROPODA									
Crustacea									
Decapoda									
Palaemonidae									
Palaemonetes pugic						1			
Insecta									
Coleoptera									
Dytiscidae									
Hydroporus sp.	1								
Elmidae									
Dubiraphis sp.			8						
Diptera									
Chaoboridae									
Chaoborus sp.			1						
Chironomidae									
Ablabesmyia mallochi	1								
Chironomus decorus gr.	2	2	2	120	180	76	1		
Dicrotendipes nervosus	5		3						
Larsia sp.			1						
Polypedilum illinoense	12		7						
Polypedilum scalaenum	18		11						
Tanytarsus sp.	11		12						
Tribelos lucundum	50	159	31						
Megaloptera									
Sialidae									
Sialis sp.	1								
MOLLUSCA									
Bivalvia									
Veneroida									
Mactridae									
Mulinia lateralis							3		
Tellinidae									
Macoma tenta							17	23	9
Total Taxa	10	3	10	3	2	4	7	4	4
Total Specimens	104	162	79	130	189	85	29	48	20
Replicate Specimens Average		115			134.667			32.3333	
Standard Deviation	15.0864	90.934	9.06091	66.4254	120.915	36.5639	5.75698	11.1056	4.08248
Brillouin's Diversity		0.5			0.122			0.497	
SPECIES DENSITY (#/M ^ 2)	663	1033	504	829	1205	542	185	306	127
SPECIES DIVERSITY (Shannon-Wiener)	0.695	0.045	0.793	0.138	0.083	0.186	0.593	0.436	0.480

SUMMARY STATISTICS OF BENTHIC MACROINVERTEBRATE SPECIES AT HADNOT CREEK, HOLLAND MILL CREEK, AND WEBB CREEK MCB CAMP LEJEUNE, NORTH CAROLINA

Station	Number of Species	Number of Organisms	Species Density (#/m^2)	Species Diversity (Shannon-Weiner)	Species Diversity (Brillouin's)	Macroinvertebrate Biotic Index
WC02	7	79	504	0.570	0.518	9.4
WC03	7	74	472	0.323	0.279	9.6
HC01	20	286	1,823	0.802	0.755	7.8
HC02	4	79	504	0.196	0.072	7.6
HC03	8	244	1,555	0.683	0.675	NA
HC04	13	165	1,052	0.807	0.757	7.6
HM01	13	345	2,199	0.525	0.500	6.9
HM02	4	404	2,575	0.128	0.122	9.6
HM03	7	97	618	0.538	0.497	9.6

WC = Webb Creek Stations
HC = Hadnot Creek Stations
HM = Holland Mill Creek Stations
BN = Benthic Macroinvertebrate Sample
NA = Not Applicable
Species Density (#m^2) is based on a sample area of 0.0523 m^2.

SYSTEMATIC LIST OF BENTHIC MACROINVERTEBRATE SPECIES
AT BACKGROUND STATIONS
(WEBB, HADNOT, AND HOLLAND MILL CREEKS)
MCB CAMP LEJEUNE, NORTH CAROLINA

Species	USEPA[1] Metals
NERMERTEA	Phylum
Anopla	Class
Heteronemertea	Order
Lineidae	Family
Micrura leidyl	Genus Species
ANNELIDA	Phylum
Oligochaeta	Class
Lumbriculida	Order
Lumbriculiae	Family
Eclipidrillus sp.	Genus Species
Tubificida	Order
Tubificidae	Family
Isochaetides freyi	Genus Species
Limnodrilus hoffmeisteri	Genus Species
Spirosperma carolinensis	Genus Species
Polychaeta	Class
Ariciida	Order
Orbiniidae	Family
Scoloplos fragilis	Genus Species
Capitellida	Order
Capitellidae	Family
Heteromestus filiformis	Genus Species
Phyllodocida	Order
Nereidae	Family
Nereis succinea	Genus Species
Phyliodocidae	Family
Eteone heteropoda	Genus Species
Spionida	Order
Spionidae	Family
Scolecolepides virdis	Genus Species
Streblospio benedicti	Genus Species
Terebellida	Order

SYSTEMATIC LIST OF BENTHIC MACROINVERTEBRATE SPECIES
AT BACKGROUND STATIONS
(WEBB, HADNOT, AND HOLLAND MILL CREEKS)
MCB CAMP LEJEUNE, NORTH CAROLINA

Species	USEPA[1] Metals
Ampharetidae	Family
Hypaniola grayi	Genus Species
ARTHROPODA	Phylum
Crustacea	Class
Amphipoda	Order
Corophiidae	Family
Corophium lacuatre	Genus Species
Gammaridae	Family
Crangonyx pseudogracillus	Genus Species
Gammarus tigrinus	Genus Species
Tanaidacea	Order
Tanaidae	Family
Leptochelia rapox	Genus Species
Decapoda	Order
Palaemonidae	Family
Palaemonetes pugio	Genus Species
Insecta	Class
Coleoptera	Order
Dytiscidae	Family
Hydroporus sp.	Genus Species
Elmidae	Family
Dubiraphia sp.	Genus Species
Diptera	Order
Ceratopogonidae	Family
Palpomyia/sphaeromias sp.	Genus Species
Chaoboridae	Family
Chaoborus sp.	Genus Species
Chironomidae	Family
Ablabesmyia annulata	Genus Species
Ablabesmyia mallochi	Genus Species
Ablabesmyia ramphe gr.	Genus Species
Clinotanypus pinguis	Genus Species
Chironomus decorus gr.	Genus Species

SYSTEMATIC LIST OF BENTHIC MACROINVERTEBRATE SPECIES
AT BACKGROUND STATIONS
(WEBB, HADNOT, AND HOLLAND MILL CREEKS)
MCB CAMP LEJEUNE, NORTH CAROLINA

Species	USEPA[1] Metals
Cryptochironomus fulvus gr	Genus Species
Dicrotendipes nervosus	Genus Species
Epoicladius sp.	Genus Species
Glyptotendipes sp.	Genus Species
Larsia sp.	Genus Species
Nilothauma sp.	Genus Species
Paraiauterborniella nigrohaite	Genus Species
Polypedilum illinoense	Genus Species
Polypedilum scalaenum	Genus Species
Procladius sp.	Genus Species
Tanytarsus sp.	Genus Species
Tribelos jucundum	Genus Species
Tribelos lucundum	Genus Species
Tipulidae	Family
Psuedolimnophila sp.	Genus Species
Ephemeroptera	Order
Ephemeridae	Family
Hexagenia billineata	Genus Species
Megaloptera	Order
Sialidae	Family
Sialis sp.	Genus Species
Odonata	Order
Coenagrionidae	Family
Argia sp.	Genus Species
Libelluiidae	Family
Pechydiplax longipennis	Genus Species
Trichoptera	Order
Polycentropodidae	Family
Phylacentropus sp.	Genus Species
MOLLUSCA	Phylum
Bivalvia	Class
Mytiloida	Order
Mytilldae	Family

SYSTEMATIC LIST OF BENTHIC MACROINVERTEBRATE SPECIES
AT BACKGROUND STATIONS
(WEBB, HADNOT, AND HOLLAND MILL CREEKS)
MCB CAMP LEJEUNE, NORTH CAROLINA

Species	USEPA[1] Metals
Geukensia demissa	Genus Species
Veneroida	Order
Corbiculidae	Family
Polymesoda caroliniana	Genus Species
Mactridae	Family
Mullinia lateralis	Genus Species
Sphaeriidae	Family
Pisidium casertanum	Genus Species
Tellinidae	Family
Macoma tenta	Genus Species

USEPA SENSITIVITY TO METALS AND TOLERANCE TO ORGANIC WASTE AND BIOTIC INDEX FOR BENTHIC MACROINVERTEBRATE SPECIES AT BACKGROUND STATIONS (WEBB, HADNOT, AND HOLLAND MILL CREEKS) MCB CAMP LEJEUNE, NORTH CAROLINA

Species	USEPA[1] Metals	Organics	NCDEHNR[2] Biotic Index
NERMERTEA			
Anopla			
Heteronemertea			
Lineidae			
Micrura leidyl	NA	NA	NA
ANNELIDA			
Oligochaeta			
Lumbriculida			
Lumbriculiae			
Eclipidrillus sp.	NA	NA	NA
Tubificida			
Tubificidae			
Isochaetides freyi	NA	NA	8.6
Limnodrilus hoffmeisteri	NA	5	9.4
Spirosperma carolinensis	NA	3	NA
Polychaeta			
Ariciida			
Orbiniidae			
Scoloplos fragilis	NA	NA	NA
Capitellida			
Capitellidae			
Heteromestus filiformis	NA	NA	NA
Phyllodocida			
Nereidae			
Nereis succinea	NA	NA	NA
Phyliodocidae			
Eteone heteropoda	NA	NA	NA
Spionida			
Spionidae			
Scolecolepides virdis	NA	NA	NA
Streblospio benedicti	NA	NA	NA
Terebellida			

USEPA SENSITIVITY TO METALS AND TOLERANCE TO ORGANIC WASTE AND BIOTIC INDES FOR BENTHIC MACROINVERTEBRATE SPECIES AT BACKGROUND STATIONS (WEBB, HADNOT, AND HOLLAND MILL CREEKS) MCB CAMP LEJEUNE, NORTH CAROLINA

Species	USEPA[1] Metals	Organics	NCDEHNR[2] Biotic Index
Ampharetidae			
Hypaniola grayi	NA	NA	NA
ARTHROPODA			
Crustacea			
Amphipoda			
Corophiidae			
Corophium lacuatre	NA	NA	NA
Gammaridae			
Crangonyx pseudogracillus	NA	NA	7.9
Gammarus tigrinus	NA	2	NA
Tanaidacea			
Tanaidae			
Leptochelia rapox	NA	NA	NA
Decapoda			
Palaemonidae			
Palaemonetes pugio	NA	NA	NA
Insecta			
Coleoptera			
Dytiscidae			
Hydroporus sp.	NA	NA	8.6
Elmidae			
Dubiraphia sp.	NA	NA	5.9
Diptera			
Ceratopogonidae			
Palpomyia/sphaeromias sp.	NA	NA	7.0
Chaoboridae			
Chaoborus sp.	NA	NA	8.5
Chironomidae			
Ablabesmyia annulata	NA	1	3.5
Ablabesmyia mallochi	S	2	7.2
Ablabesmyia ramphe gr.	NA	2	NA
Clinotanypus pinguis	S	3	8.7

USEPA SENSITIVITY TO METALS AND TOLERANCE TO ORGANIC WASTE AND BIOTIC INDES FOR BENTHIC MACROINVERTEBRATE SPECIES AT BACKGROUND STATIONS (WEBB, HADNOT, AND HOLLAND MILL CREEKS) MCB CAMP LEJEUNE, NORTH CAROLINA

Species	USEPA[1] Metals	Organics	NCDEHNR[2] Biotic Index
Chironomus decorus gr.	NA	NA	9.6
Cryptochironomus fulvus gr	NA	3	6.4
Dicrotendipes nervosus	S	2	9.7
Epoicladius sp.	NA	NA	0.0
Glyptotendipes sp.	NA	NA	9.4
Larsia sp.	NA	2	9.3
Nilothauma sp.	NA	NA	5.0
Paraiauterborniella nigrohaite	NA	NA	NA
Polypedilum illinoense	NA	3	9.0
Polypedilum scalaenum	NA	2	8.4
Procladius sp.	NA	NA	9.1
Tanytarsus sp.	NA	NA	6.7
Tribelos jucundum	S	1	6.3
Tribelos lucundum	NA	NA	6.3
Tipulidae			
Psuedolimnophila sp.	NA	NA	7.2
Ephemeroptera			
Ephemeridae			
Hexagenia billineata	NA	2	NA
Megaloptera			
Sialidae			
Sialis sp.	T	4	7.2
Odonata			
Coenagrionidae			
Argia sp.	NA	NA	8.2
Libelluiidae			
Pechydiplax longipennis	NA	NA	NA
Trichoptera			
Polycentropodidae			
Phylacentropus sp.	NA	NA	6.2
MOLLUSCA			
Bivalvia			

USEPA SENSITIVITY TO METALS AND TOLERANCE TO ORGANIC WASTE AND BIOTIC INDES FOR BENTHIC MACROINVERTEBRATE SPECIES AT BACKGROUND STATIONS (WEBB, HADNOT, AND HOLLAND MILL CREEKS) MCB CAMP LEJEUNE, NORTH CAROLINA

Species	USEPA[1] Metals	Organics	NCDEHNR[2] Biotic Index
Mytiloida			
Mytilldae			
Geukensia demissa	NA	NA	NA
Veneroida			
Corbiculidae			
Polymesoda caroliniana	NA	NA	NA
Mactridae			
Mullinia lateralis	NA	NA	NA
Sphaeriidae			
Pisidium casertanum	NA	4	6.5
Tellinidae			
Macoma tenta	NA	NA	NA

(1) Macroinvertebrate Field and Laboratory Methods for Evaluating the Biological Integrity of Surface Waters

(2) Lenat, 1993

NA = Not Available

S = Sensitive to heavy metals

T = Tolerant to heavy metals

Organics Ranking = 0 to 5 with 0 being the least tolerant

APPENDIX O
FREQUENCY OF DETECTION SUMMARIES

APPENDIX O.1
SURFACE SOIL ORGANICS

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-DW01-00	65-DW02-00	65-DW04-00	65-MW05A-00	65-MW06A-00	65-MW07A-00
DATE COLLECTED	04/10/95	04/09/95	04/05/95	04/05/95	04/08/95	04/04/95
DEPTH	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
VOLATILES (ug/kg)						
CHLOROMETHANE	11 U	11 U	11 U	11 U	12 U	11 U
BROMOMETHANE	11 U	11 U	11 U	11 U	12 U	11 U
VINYL CHLORIDE	11 U	11 U	11 U	11 U	12 U	11 U
CHLOROETHANE	11 U	11 U	11 U	11 U	12 U	11 U
METHYLENE CHLORIDE	11 U	11 U	11 U	2 U	12 U	2 J
ACETONE	11 U	13 U	11 U	10 J	12 U	11 U
CARBON DISULFIDE	11 U	11 U	11 U	11 U	12 U	11 U
1,1-DICHLOROETHENE	11 U	11 U	11 U	11 U	12 U	11 U
1,1-DICHLOROETHANE	11 U	11 U	11 U	11 U	12 U	11 U
1,2-DICHLOROETHENE	11 U	11 U	11 U	11 U	12 U	11 U
CHLOROFORM	11 U	11 U	11 U	11 U	12 U	11 U
1,2-DICHLOROETHANE	11 U	11 U	11 U	11 U	12 U	11 U
2-BUTANONE	11 U	11 U	11 U	11 U	12 U	11 U
1,1,1-TRICHLOROETHANE	11 U	11 U	11 U	11 U	12 U	11 U
CARBON TETRACHLORIDE	11 U	11 U	11 U	11 U	12 U	11 U
BROMODICHLOROMETHANE	11 U	11 U	11 U	11 U	12 U	11 U
1,2-DICHLOROPROPANE	11 U	11 U	11 U	11 U	12 U	11 U
CIS-1,3-DICHLOROPROPENE	11 U	11 U	11 U	11 U	12 U	11 U
TRICHLOROETHENE	11 U	11 U	11 U	11 U	12 U	11 U
DIBROMOCHLOROMETHANE	11 U	11 U	11 U	11 U	12 U	11 U
1,1,2-TRICHLOROETHANE	11 U	11 U	11 U	11 U	12 U	11 U
BENZENE	11 U	11 U	11 U	11 U	12 U	11 U
TRANS-1,3-DICHLOROPROPENE	11 U	11 U	11 U	11 U	12 U	11 U
BROMOFORM	11 U	11 U	11 U	11 U	12 U	11 U
4-METHYL-2-PENTANONE	11 U	11 U	11 U	11 U	12 U	11 U
2-HEXANONE	11 U	11 U	11 U	11 U	12 U	11 U
TETRACHLOROETHENE	11 U	11 U	11 U	11 U	12 U	11 U
1,1,2,2-TETRACHLOROETHANE	11 U	11 U	11 U	11 U	12 U	11 U
TOLUENE	11 U	11 U	2 J	1 J	12 U	2 J
CHLOROBENZENE	11 U	11 U	11 U	11 U	12 U	11 U
ETHYLBENZENE	11 U	11 U	11 U	11 U	12 U	11 U
STYRENE	11 U	11 U	11 U	11 U	12 U	11 U
TOTAL XYLENES	3 J	11 U	11 U	11 U	12 U	11 U

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-SB06-00	65-SB07-00	65-SB08-00	65-SB09-00	65-SB10-00	65-SB11-00
DATE COLLECTED	04/10/95	04/08/95	04/11/95	04/08/95	04/08/95	04/08/95
DEPTH	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
VOLATILES (ug/kg)						
CHLOROMETHANE	12 U	13 U	11 U	11 U	12 U	12 U
BROMOMETHANE	12 U	13 U	11 U	11 U	12 U	12 U
VINYL CHLORIDE	12 U	13 U	11 U	11 U	12 U	12 U
CHLOROETHANE	12 U	13 U	11 U	11 U	12 U	12 U
METHYLENE CHLORIDE	12 U	13 U	11 U	11 U	12 U	12 U
ACETONE	12 U	13 U	11 U	11 U	12 U	12 U
CARBON DISULFIDE	12 U	13 U	11 U	11 U	12 U	12 U
1,1-DICHLOROETHENE	12 U	13 U	11 U	11 U	12 U	12 U
1,1-DICHLOROETHANE	12 U	13 U	11 U	11 U	12 U	12 U
1,2-DICHLOROETHENE	12 U	13 U	11 U	11 U	12 U	12 U
CHLOROFORM	12 U	13 U	11 U	11 U	12 U	12 U
1,2-DICHLOROETHANE	12 U	13 U	11 U	11 U	12 U	12 U
2-BUTANONE	12 U	13 U	11 U	11 U	12 U	12 U
1,1,1-TRICHLOROETHANE	12 U	13 U	11 U	11 U	12 U	12 U
CARBON TETRACHLORIDE	12 U	13 U	11 U	11 U	12 U	12 U
BROMODICHLOROMETHANE	12 U	13 U	11 U	11 U	12 U	12 U
1,2-DICHLOROPROPANE	12 U	13 U	11 U	11 U	12 U	12 U
CIS-1,3-DICHLOROPROPENE	12 U	13 U	11 U	11 U	12 U	12 U
TRICHLOROETHENE	1 J	13 U	11 U	11 U	12 U	12 U
DIBROMOCHLOROMETHANE	12 U	13 U	11 U	11 U	12 U	12 U
1,1,2-TRICHLOROETHANE	12 U	13 U	11 U	11 U	12 U	12 U
BENZENE	12 U	13 U	11 U	11 U	12 U	12 U
TRANS-1,3-DICHLOROPROPENE	12 U	13 U	11 U	11 U	12 U	12 U
BROMOFORM	12 U	13 U	11 U	11 U	12 U	12 U
4-METHYL-2-PENTANONE	12 U	13 U	11 U	11 U	12 U	12 U
2-HEXANONE	12 U	13 U	11 U	11 U	12 U	12 U
TETRACHLOROETHENE	12 U	13 U	11 U	11 U	12 U	12 U
1,1,2,2-TETRACHLOROETHANE	12 U	13 U	11 U	11 U	12 U	12 U
TOLUENE	12 U	13 U	11 U	11 U	12 U	12 U
CHLOROBENZENE	12 U	13 U	11 U	11 U	12 U	12 U
ETHYLBENZENE	12 U	1 J	11 U	11 U	12 U	12 U
STYRENE	12 U	13 U	11 U	11 U	12 U	12 U
TOTAL XYLENES	12 U	5 J	11 U	11 U	12 U	12 U

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-SB12-00	
DATE COLLECTED	04/17/95	
DEPTH	0-1'	
VOLATILES (ug/kg)		
CHLOROMETHANE	11	U
BROMOMETHANE	11	U
VINYL CHLORIDE	11	U
CHLOROETHANE	11	U
METHYLENE CHLORIDE	2	J
ACETONE	11	U
CARBON DISULFIDE	11	U
1,1-DICHLOROETHENE	11	U
1,1-DICHLOROETHANE	11	U
1,2-DICHLOROETHENE	11	U
CHLOROFORM	11	U
1,2-DICHLOROETHANE	11	U
2-BUTANONE	11	U
1,1,1-TRICHLOROETHANE	11	U
CARBON TETRACHLORIDE	11	U
BROMODICHLOROMETHANE	11	U
1,2-DICHLOROPROPANE	11	U
CIS-1,3-DICHLOROPROPENE	11	U
TRICHLOROETHENE	11	U
DIBROMOCHLOROMETHANE	11	U
1,1,2-TRICHLOROETHANE	11	U
BENZENE	11	U
TRANS-1,3-DICHLOROPROPENE	11	U
BROMOFORM	11	U
4-METHYL-2-PENTANONE	11	U
2-HEXANONE	11	U
TETRACHLOROETHENE	11	U
1,1,2,2-TETRACHLOROETHANE	11	U
TOLUENE	11	U
CHLOROBENZENE	11	U
ETHYLBENZENE	11	U
STYRENE	11	U
TOTAL XYLENES	11	U

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED DEPTH	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
VOLATILES (ug/kg)						
CHLOROMETHANE	11 U	13 U	ND	ND		0/13
BROMOMETHANE	11 U	13 U	ND	ND		0/13
VINYL CHLORIDE	11 U	13 U	ND	ND		0/13
CHLOROETHANE	11 U	13 U	ND	ND		0/13
METHYLENE CHLORIDE	2 U	13 U	2 J	2 J	65-SB12-00	2/13
ACETONE	11 U	13 U	10 J	10 J	65-MW05A-00	1/13
CARBON DISULFIDE	11 U	13 U	ND	ND		0/13
1,1-DICHLOROETHENE	11 U	13 U	ND	ND		0/13
1,1-DICHLOROETHANE	11 U	13 U	ND	ND		0/13
1,2-DICHLOROETHENE	11 U	13 U	ND	ND		0/13
CHLOROFORM	11 U	13 U	ND	ND		0/13
1,2-DICHLOROETHANE	11 U	13 U	ND	ND		0/13
2-BUTANONE	11 U	13 U	ND	ND		0/13
1,1,1-TRICHLOROETHANE	11 U	13 U	ND	ND		0/13
CARBON TETRACHLORIDE	11 U	13 U	ND	ND		0/13
BROMODICHLOROMETHANE	11 U	13 U	ND	ND		0/13
1,2-DICHLOROPROPANE	11 U	13 U	ND	ND		0/13
CIS-1,3-DICHLOROPROPENE	11 U	13 U	ND	ND		0/13
TRICHLOROETHENE	11 U	13 U	1 J	1 J	65-SB06-00	1/13
DIBROMOCHLOROMETHANE	11 U	13 U	ND	ND		0/13
1,1,2-TRICHLOROETHANE	11 U	13 U	ND	ND		0/13
BENZENE	11 U	13 U	ND	ND		0/13
TRANS-1,3-DICHLOROPROPENE	11 U	13 U	ND	ND		0/13
BROMOFORM	11 U	13 U	ND	ND		0/13
4-METHYL-2-PENTANONE	11 U	13 U	ND	ND		0/13
2-HEXANONE	11 U	13 U	ND	ND		0/13
TETRACHLOROETHENE	11 U	13 U	ND	ND		0/13
1,1,2,2-TETRACHLOROETHANE	11 U	13 U	ND	ND		0/13
TOLUENE	11 U	13 U	1 J	2 J	65-MW07A-00	3/13
CHLOROBENZENE	11 U	13 U	ND	ND		0/13
ETHYLBENZENE	11 U	12 U	1 J	1 J	65-SB07-00	1/13
STYRENE	11 U	13 U	ND	ND		0/13
TOTAL XYLENES	11 U	12 U	3 J	5 J	65-SB07-00	2/13

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-DW01-00	65-DW02-00	65-DW04-00	65-MW05A-00	65-MW06A-00	65-MW07A-00
DATE COLLECTED	04/10/95	04/09/95	04/05/95	04/05/95	04/08/95	04/04/95
DEPTH	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
SEMIVOLATILES (ug/kg)						
PHENOL	360 U	360 U	360 U	360 U	390 U	370 U
BIS(2-CHLOROETHYL)ETHER	360 U	360 U	360 U	360 U	390 U	370 U
2-CHLOROPHENOL	360 U	360 U	360 U	360 U	390 U	370 U
1,3-DICHLOROBENZENE	360 U	360 U	360 U	360 U	390 U	370 U
1,4-DICHLOROBENZENE	360 U	360 U	360 U	360 U	390 U	370 U
1,2-DICHLOROBENZENE	360 U	360 U	360 U	360 U	390 U	370 U
2-METHYLPHENOL	360 U	360 U	360 U	360 U	390 U	370 U
2,2'-OXYBIS(1-CHLOROPROPANE)	360 U	360 U	360 U	360 U	390 U	370 U
4-METHYLPHENOL	360 U	360 U	360 U	360 U	390 U	370 U
N-NITROSO-DI-N-PROPYLAMINE	360 U	360 U	360 U	360 U	390 U	370 U
HEXACHLOROETHANE	360 U	360 U	360 U	360 U	390 U	370 U
NITROBENZENE	360 U	360 U	360 U	360 U	390 U	370 U
ISOPHORONE	360 U	360 U	360 U	360 U	390 U	370 U
2-NITROPHENOL	360 U	360 U	360 U	360 U	390 U	370 U
2,4-DIMETHYLPHENOL	360 U	360 U	360 U	360 U	390 U	370 U
BIS(2-CHLOROETHOXY)METHANE	360 U	360 U	360 U	360 U	390 U	370 U
2,4-DICHLOROPHENOL	360 U	360 U	360 U	360 U	390 U	370 U
1,2,4-TRICHLOROBENZENE	360 U	360 U	360 U	360 U	390 U	370 U
NAPHTHALENE	360 U	360 U	360 U	360 U	390 U	370 U
4-CHLOROANILINE	360 U	360 U	360 U	360 U	390 U	370 U
HEXACHLOROBUTADIENE	360 U	360 U	360 U	360 U	390 U	370 U
4-CHLORO-3-METHYLPHENOL	360 U	360 U	360 U	360 U	390 U	370 U
2-METHYLNAPHTHALENE	360 U	360 U	360 U	360 U	390 U	370 U
HEXACHLOROCYCLOPENTADIENE	360 U	360 UJ	360 U	360 U	390 U	370 U
2,4,6-TRICHLOROPHENOL	360 U	360 U	360 U	360 U	390 U	370 U
2,4,5-TRICHLOROPHENOL	880 U	860 U	880 U	860 U	930 U	900 U
2-CHLORONAPHTHALENE	360 U	360 U	360 U	360 U	390 U	370 U
2-NITROANILINE	880 U	860 U	880 U	860 U	930 U	900 U
DIMETHYL PHTHALATE	360 U	360 U	360 U	360 U	390 U	370 U
ACENAPHTHYLENE	360 U	360 U	360 U	360 U	390 U	370 U
2,6-DINITROTOLUENE	360 U	360 U	360 U	360 U	390 U	370 U
3-NITROANILINE	880 U	860 U	880 U	860 U	930 U	900 U
ACENAPHTHENE	130 J	360 U	360 U	360 U	390 U	370 U
2,4-DINITROPHENOL	880 UJ	860 U	150 J	860 U	930 UJ	900 U
4-NITROPHENOL	880 U	860 U	880 U	860 U	930 U	900 U

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-DW01-00	65-DW02-00	65-DW04-00	65-MW05A-00	65-MW06A-00	65-MW07A-00
DATE COLLECTED	04/10/95	04/09/95	04/05/95	04/05/95	04/08/95	04/04/95
DEPTH	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
SEMIVOLATILES (ug/kg) cont.						
DIBENZOFURAN	58 J	360 U	360 U	360 U	390 U	370 U
2,4-DINITROTOLUENE	360 U	360 U	360 U	360 U	390 U	370 U
DIETHYL PHTHALATE	360 U	360 U	360 U	360 U	390 U	370 U
4-CHLOROPHENYLPHENYL ETHER	360 U	360 U	360 U	360 U	390 U	370 U
FLUORENE	100 J	360 U	360 U	360 U	390 U	370 U
4-NITROANILINE	880 U	860 U	880 U	860 U	930 U	900 U
4,6-DINITRO-2-METHYLPHENOL	880 U	860 U	880 UJ	860 U	930 U	900 U
N-NITROSODIPHENYLAMINE	360 U	360 U	360 U	360 U	390 U	370 U
4-BROMOPHENYL PHENYL ETHER	360 U	360 U	360 U	360 U	390 U	370 U
HEXACHLOROBENZENE	360 U	360 U	360 U	360 U	390 U	370 U
PENTACHLOROPHENOL	880 U	860 U	880 U	860 U	930 U	900 U
PHENANTHRENE	860	360 U	360 U	360 U	390 U	370 U
ANTHRACENE	190 J	360 U	360 U	360 U	390 U	370 U
CARBAZOLE	180 J	360 U	360 U	360 U	390 U	370 U
DI-N-BUTYL PHTHALATE	360 U	360 U	360 U	360 U	390 U	370 U
FLUORANTHENE	830	360 U	360 U	360 U	390 U	370 U
PYRENE	850	360 U	360 U	360 U	390 U	370 U
BUTYL BENZYL PHTHALATE	360 U	360 U	360 U	360 U	390 U	370 U
3,3'-DICHLOROBENZIDINE	360 U	360 U	360 U	360 U	390 U	370 U
BENZO(A)ANTHRACENE	510	360 U	360 U	360 U	390 U	370 U
CHRYSENE	470	360 U	360 U	360 U	390 U	370 U
BIS(2-ETHYLHEXYL)PHTHALATE	64 J	360 U	360 U	60 J	87 J	51 J
DI-N-OCTYL PHTHALATE	360 U	360 U	360 U	360 U	390 U	370 U
BENZO(B)FLUORANTHENE	360 J	360 U	360 U	360 U	390 U	370 U
BENZO(K)FLUORANTHENE	510	360 U	360 U	360 U	390 U	370 U
BENZO(A)PYRENE	400	360 U	360 U	360 U	390 U	370 U
INDENO(1,2,3-CD)PYRENE	310 J	360 U	360 U	360 U	390 U	370 U
DIBENZO(A,H)ANTHRACENE	150 J	360 U	360 U	360 U	390 U	370 U
BENZO(G,H,I)PERYLENE	250 J	360 U	360 U	360 U	390 U	370 U

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-SB06-00	65-SB07-00	65-SB08-00	65-SB09-00	65-SB10-00	65-SB11-00
DATE COLLECTED	04/10/95	04/08/95	04/11/95	04/08/95	04/08/95	04/08/95
DEPTH	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
SEMIVOLATILES (ug/kg)						
PHENOL	410 U	420 U	350 U	370 U	380 U	390 U
BIS(2-CHLOROETHYL)ETHER	410 U	420 U	350 U	370 U	380 U	390 U
2-CHLOROPHENOL	410 U	420 U	350 U	370 U	380 U	390 U
1,3-DICHLOROBENZENE	410 U	420 U	350 U	370 U	380 U	390 U
1,4-DICHLOROBENZENE	410 U	420 U	350 U	370 U	380 U	390 U
1,2-DICHLOROBENZENE	410 U	420 U	350 U	370 U	380 U	390 U
2-METHYLPHENOL	410 U	420 U	350 U	370 U	380 U	390 U
2,2'-OXYBIS(1-CHLOROPROPANE)	410 U	420 U	350 U	370 U	380 U	390 U
4-METHYLPHENOL	410 U	420 U	350 U	370 U	380 U	390 U
N-NITROSO-DI-N-PROPYLAMINE	410 U	420 U	350 U	370 U	380 U	390 U
HEXACHLOROETHANE	410 U	420 U	350 U	370 U	380 U	390 U
NITROBENZENE	410 U	420 U	350 U	370 U	380 U	390 U
ISOPHORONE	410 U	420 U	350 U	370 U	380 U	390 U
2-NITROPHENOL	410 U	420 U	350 U	370 U	380 U	390 U
2,4-DIMETHYLPHENOL	410 U	420 U	350 U	370 U	380 U	390 U
BIS(2-CHLOROETHOXY)METHANE	410 U	420 U	350 U	370 U	380 U	390 U
2,4-DICHLOROPHENOL	410 U	420 U	350 U	370 U	380 U	390 U
1,2,4-TRICHLOROBENZENE	410 U	420 U	350 U	370 U	380 U	390 U
NAPHTHALENE	410 U	420 U	350 U	370 U	380 U	390 U
4-CHLOROANILINE	410 U	420 U	350 U	370 U	380 U	390 U
HEXACHLOROBUTADIENE	410 U	420 U	350 U	370 U	380 U	390 U
4-CHLORO-3-METHYLPHENOL	410 U	420 U	350 U	370 U	380 U	390 U
2-METHYLNAPHTHALENE	410 U	420 U	350 U	370 U	380 U	390 U
HEXACHLOROCYCLOPENTADIENE	410 U	420 U	350 U	370 U	380 UJ	390 UJ
2,4,6-TRICHLOROPHENOL	410 U	420 U	350 U	370 U	380 U	390 U
2,4,5-TRICHLOROPHENOL	1000 U	1000 U	850 U	900 U	930 U	950 U
2-CHLORONAPHTHALENE	410 U	420 U	350 U	370 U	380 U	390 U
2-NITROANILINE	1000 U	1000 U	850 U	900 U	930 U	950 U
DIMETHYL PHTHALATE	410 U	420 U	350 U	370 U	380 U	390 U
ACENAPHTHYLENE	410 U	420 U	350 U	370 U	380 U	390 U
2,6-DINITROTOLUENE	410 U	420 U	350 U	370 U	380 U	390 U
3-NITROANILINE	1000 U	1000 U	850 U	900 U	930 U	950 U
ACENAPHTHENE	410 U	420 U	350 U	370 U	380 U	390 U
2,4-DINITROPHENOL	1000 UJ	1000 U	850 UJ	900 U	930 U	950 U
4-NITROPHENOL	1000 U	1000 U	850 U	900 U	930 U	950 U

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-SB06-00	65-SB07-00	65-SB08-00	65-SB09-00	65-SB10-00	65-SB11-00
DATE COLLECTED	04/10/95	04/08/95	04/11/95	04/08/95	04/08/95	04/08/95
DEPTH	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
SEMIVOLATILES (ug/kg) cont.						
DIBENZOFURAN	410 U	420 U	350 U	370 U	380 U	390 U
2,4-DINITROTOLUENE	410 U	420 U	350 U	370 U	380 U	390 U
DIETHYL PHTHALATE	410 U	420 U	350 U	370 U	380 U	390 U
4-CHLOROPHENYLPHENYL ETHER	410 U	420 U	350 U	370 U	380 U	390 U
FLUORENE	410 U	420 U	350 U	370 U	380 U	390 U
4-NITROANILINE	1000 U	1000 U	850 U	900 U	930 U	950 U
4,6-DINITRO-2-METHYLPHENOL	1000 U	1000 U	850 U	900 U	930 U	950 U
N-NITROSODIPHENYLAMINE	410 U	420 U	350 U	370 U	380 U	390 U
4-BROMOPHENYL PHENYL ETHER	410 U	420 U	350 U	370 U	380 U	390 U
HEXACHLOROBENZENE	410 U	420 U	350 U	370 U	380 U	390 U
PENTACHLOROPHENOL	1000 U	1000 U	850 U	900 U	930 U	950 U
PHENANTHRENE	74 J	420 U	350 U	370 U	380 U	390 U
ANTHRACENE	410 U	420 U	350 U	370 U	380 U	390 U
CARBAZOLE	410 U	420 U	350 U	370 U	380 U	390 U
DI-N-BUTYL PHTHALATE	390 J	420 U	260 J	370 U	380 U	390 U
FLUORANTHENE	210 J	420 U	350 U	370 U	380 U	390 U
PYRENE	150 J	420 U	350 U	370 U	380 U	390 U
BUTYL BENZYL PHTHALATE	410 U	420 U	350 U	370 U	380 U	390 U
3,3'-DICHLOROBENZIDINE	410 U	420 U	350 U	370 U	380 U	390 U
BENZO(A)ANTHRACENE	110 J	420 U	350 U	370 U	380 U	390 U
CHRYSENE	110 J	420 U	350 U	370 U	380 U	390 U
BIS(2-ETHYLHEXYL)PHTHALATE	72 J	73 J	350 U	57 J	48 J	74 J
DI-N-OCTYL PHTHALATE	410 U	420 U	350 U	370 U	380 U	390 U
BENZO(B)FLUORANTHENE	96 J	420 U	350 U	370 U	380 U	390 U
BENZO(K)FLUORANTHENE	120 J	420 U	350 U	370 U	380 U	390 U
BENZO(A)PYRENE	100 J	420 U	350 U	370 U	380 U	390 U
INDENO(1,2,3-CD)PYRENE	88 J	420 U	350 U	370 U	380 U	390 U
DIBENZO(A,H)ANTHRACENE	45 J	420 U	350 U	370 U	380 U	390 U
BENZO(G,H,I)PERYLENE	70 J	420 U	350 U	370 U	380 U	390 U

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-SB12-00
DATE COLLECTED	04/17/95
DEPTH	0-1'
SEMIVOLATILES (ug/kg)	
PHENOL	360 U
BIS(2-CHLOROETHYL)ETHER	360 U
2-CHLOROPHENOL	360 U
1,3-DICHLOROBENZENE	360 U
1,4-DICHLOROBENZENE	360 U
1,2-DICHLOROBENZENE	360 U
2-METHYLPHENOL	360 U
2,2'-OXYBIS(1-CHLOROPROPANE)	360 U
4-METHYLPHENOL	360 U
N-NITROSO-DI-N-PROPYLAMINE	360 U
HEXACHLOROETHANE	360 U
NITROBENZENE	360 U
ISOPHORONE	360 U
2-NITROPHENOL	360 U
2,4-DIMETHYLPHENOL	360 U
BIS(2-CHLOROETHOXY)METHANE	360 U
2,4-DICHLOROPHENOL	360 U
1,2,4-TRICHLOROBENZENE	360 U
NAPHTHALENE	360 U
4-CHLOROANILINE	360 U
HEXACHLOROBUTADIENE	360 U
4-CHLORO-3-METHYLPHENOL	360 U
2-METHYLNAPHTHALENE	360 U
HEXACHLOROCYCLOPENTADIENE	360 U
2,4,6-TRICHLOROPHENOL	360 U
2,4,5-TRICHLOROPHENOL	870 U
2-CHLORONAPHTHALENE	360 U
2-NITROANILINE	870 U
DIMETHYL PHTHALATE	360 U
ACENAPHTHYLENE	360 U
2,6-DINITROTOLUENE	360 U
3-NITROANILINE	870 U
ACENAPHTHENE	360 U
2,4-DINITROPHENOL	870 U
4-NITROPHENOL	870 U

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-SB12-00	
DATE COLLECTED	04/17/95	
DEPTH	0-1'	
SEMIVOLATILES (ug/kg) cont.		
DIBENZOFURAN	360	U
2,4-DINITROTOLUENE	360	U
DIETHYL PHTHALATE	360	U
4-CHLOROPHENYLPHENYL ETHER	360	U
FLUORENE	360	U
4-NITROANILINE	870	U
4,6-DINITRO-2-METHYLPHENOL	870	U
N-NITROSODIPHENYLAMINE	360	U
4-BROMOPHENYL PHENYL ETHER	360	U
HEXACHLOROBENZENE	360	U
PENTACHLOROPHENOL	870	U
PHENANTHRENE	59	J
ANTHRACENE	360	U
CARBAZOLE	360	U
DI-N-BUTYL PHTHALATE	360	U
FLUORANTHENE	130	J
PYRENE	260	J
BUTYL BENZYL PHTHALATE	360	U
3,3'-DICHLOROBENZIDINE	360	U
BENZO(A)ANTHRACENE	76	J
CHRYSENE	70	J
BIS(2-ETHYLHEXYL)PHTHALATE	360	U
DI-N-OCTYL PHTHALATE	360	U
BENZO(B)FLUORANTHENE	89	J
BENZO(K)FLUORANTHENE	360	U
BENZO(A)PYRENE	360	U
INDENO(1,2,3-CD)PYRENE	360	U
DIBENZO(A,H)ANTHRACENE	360	U
BENZO(G,H,I)PERYLENE	360	U

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED DEPTH	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/kg)						
PHENOL	350 U	420 U	ND	ND		0/13
BIS(2-CHLOROETHYL)ETHER	350 U	420 U	ND	ND		0/13
2-CHLOROPHENOL	350 U	420 U	ND	ND		0/13
1,3-DICHLOROBENZENE	350 U	420 U	ND	ND		0/13
1,4-DICHLOROBENZENE	350 U	420 U	ND	ND		0/13
1,2-DICHLOROBENZENE	350 U	420 U	ND	ND		0/13
2-METHYLPHENOL	350 U	420 U	ND	ND		0/13
2,2'-OXYBIS(1-CHLOROPROPANE)	350 U	420 U	ND	ND		0/13
4-METHYLPHENOL	350 U	420 U	ND	ND		0/13
N-NITROSO-DI-N-PROPYLAMINE	350 U	420 U	ND	ND		0/13
HEXACHLOROETHANE	350 U	420 U	ND	ND		0/13
NITROBENZENE	350 U	420 U	ND	ND		0/13
ISOPHORONE	350 U	420 U	ND	ND		0/13
2-NITROPHENOL	350 U	420 U	ND	ND		0/13
2,4-DIMETHYLPHENOL	350 U	420 U	ND	ND		0/13
BIS(2-CHLOROETHOXY)METHANE	350 U	420 U	ND	ND		0/13
2,4-DICHLOROPHENOL	350 U	420 U	ND	ND		0/13
1,2,4-TRICHLOROBENZENE	350 U	420 U	ND	ND		0/13
NAPHTHALENE	350 U	420 U	ND	ND		0/13
4-CHLOROANILINE	350 U	420 U	ND	ND		0/13
HEXACHLOROBUTADIENE	350 U	420 U	ND	ND		0/13
4-CHLORO-3-METHYLPHENOL	350 U	420 U	ND	ND		0/13
2-METHYLNAPHTHALENE	350 U	420 U	ND	ND		0/13
HEXACHLOROCYCLOPENTADIENE	350 U	420 U	ND	ND		0/13
2,4,6-TRICHLOROPHENOL	350 U	420 U	ND	ND		0/13
2,4,5-TRICHLOROPHENOL	850 U	1000 U	ND	ND		0/13
2-CHLORONAPHTHALENE	350 U	420 U	ND	ND		0/13
2-NITROANILINE	850 U	1000 U	ND	ND		0/13
DIMETHYL PHTHALATE	350 U	420 U	ND	ND		0/13
ACENAPHTHYLENE	350 U	420 U	ND	ND		0/13
2,6-DINITROTOLUENE	350 U	420 U	ND	ND		0/13
3-NITROANILINE	850 U	1000 U	ND	ND		0/13
ACENAPHTHENE	350 U	420 U	130 J	130 J	65-DW01-00	1/13
2,4-DINITROPHENOL	850 UJ	1000 UJ	150 J	150 J	65-DW04-00	1/13
4-NITROPHENOL	850 U	1000 U	ND	ND		0/13

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED DEPTH	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/kg) cont.						
DIBENZOFURAN	350 U	420 U	58 J	58 J	65-DW01-00	1/13
2,4-DINITROTOLUENE	350 U	420 U	ND	ND		0/13
DIETHYL PHTHALATE	350 U	420 U	ND	ND		0/13
4-CHLOROPHENYLPHENYL ETHER	350 U	420 U	ND	ND		0/13
FLUORENE	350 U	420 U	100 J	100 J	65-DW01-00	1/13
4-NITROANILINE	850 U	1000 U	ND	ND		0/13
4,6-DINITRO-2-METHYLPHENOL	850 U	1000 U	ND	ND		0/13
N-NITROSODIPHENYLAMINE	350 U	420 U	ND	ND		0/13
4-BROMOPHENYL PHENYL ETHER	350 U	420 U	ND	ND		0/13
HEXACHLOROBENZENE	350 U	420 U	ND	ND		0/13
PENTACHLOROPHENOL	850 U	1000 U	ND	ND		0/13
PHENANTHRENE	350 U	420 U	59 J	860	65-DW01-00	3/13
ANTHRACENE	350 U	420 U	190 J	190 J	65-DW01-00	1/13
CARBAZOLE	350 U	420 U	180 J	180 J	65-DW01-00	1/13
DI-N-BUTYL PHTHALATE	360 U	420 U	260 J	390 J	65-SB06-00	2/13
FLUORANTHENE	350 U	420 U	130 J	830	65-DW01-00	3/13
PYRENE	350 U	420 U	150 J	850	65-DW01-00	3/13
BUTYL BENZYL PHTHALATE	350 U	420 U	ND	ND		0/13
3,3'-DICHLOROBENZIDINE	350 U	420 U	ND	ND		0/13
BENZO(A)ANTHRACENE	350 U	420 U	76 J	510	65-DW01-00	3/13
CHRYSENE	350 U	420 U	70 J	470	65-DW01-00	3/13
BIS(2-ETHYLHEXYL)PHTHALATE	350 U	360 U	48 J	87 J	65-MW06A-00	9/13
DI-N-OCTYL PHTHALATE	350 U	420 U	ND	ND		0/13
BENZO(B)FLUORANTHENE	350 U	420 U	89 J	360 J	65-DW01-00	3/13
BENZO(K)FLUORANTHENE	350 U	420 U	120 J	510	65-DW01-00	2/13
BENZO(A)PYRENE	350 U	420 U	100 J	400	65-DW01-00	2/13
INDENO(1,2,3-CD)PYRENE	350 U	420 U	88 J	310 J	65-DW01-00	2/13
DIBENZO(A,H)ANTHRACENE	350 U	420 U	45 J	150 J	65-DW01-00	2/13
BENZO(G,H,I)PERYLENE	350 U	420 U	70 J	250 J	65-DW01-00	2/13

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-DW01-00	65-DW02-00	65-DW04-00	65-MW05A-00	65-MW06A-00	65-MW07A-00
DATE COLLECTED	04/10/95	04/09/95	04/05/95	04/05/95	04/08/95	04/04/95
DEPTH	0-1'	0-1'	N/A	N/A	0-1'	N/A
PESTICIDE/PCBS (ug/kg)						
ALPHA-BHC	1.9 U	1.8 U	1.9 U	1.8 U	1.9 U	1.9 U
BETA-BHC	1.9 U	1.8 U	1.9 U	1.8 U	1.9 U	1.9 U
DELTA-BHC	1.9 U	1.8 U	1.9 U	1.8 U	1.9 U	1.9 U
GAMMA-BHC(LINDANE)	1.9 U	1.8 U	1.9 U	1.8 U	1.9 U	1.9 U
HEPTACHLOR	1.9 U	1.8 U	1.9 U	1.8 U	1.9 U	1.9 U
ALDRIN	1.9 U	1.8 U	1.9 U	1.8 U	1.9 U	1.9 U
HEPTACHLOR EPOXIDE	1.9 U	1.8 U	1.9 U	1.8 U	1.9 U	2.3
ENDOSULFAN I	1.9 U	1.8 U	1.9 U	1.8 U	1.9 U	1.9 U
DIELDRIN	3.7 U	3.5 U	3.6 U	3.6 U	3.8 U	3.7 U
4,4'-DDE	27	3.5 U	3.6 U	3.6 U	3.8 U	83 J
ENDRIN	3.7 U	3.5 U	3.6 U	3.6 U	3.8 U	3.7 U
ENDOSULFAN II	3.7 U	3.9 NJ	3.6 U	3.8 NJ	3.8 U	3.7 U
4,4'-DDD	3.8 NJ	3.5 UJ	3.6 UJ	3.6 U	3.8 UJ	5 NJ
ENDOSULFAN SULFATE	3.7 U	3.5 U	3.6 U	3.6 U	3.8 U	3.7 U
4,4'-DDT	20 U	3.5 U	3.6 U	3.6 U	3.8 U	56 J
METHOXYCHLOR	19 U	18 U	19 U	18 U	19 U	19 U
ENDRIN KETONE	3.7 U	3.5 U	3.6 U	3.6 U	3.8 U	3.7 U
ENDRIN ALDEHYDE	3.7 U	3.5 U	3.6 U	3.6 U	3.8 U	3.7 U
ALPHA CHLORDANE	1.9 U	1.8 U	1.9 U	1.8 U	1.9 U	1.9 U
GAMMA CHLORDANE	1.9 U	1.8 U	1.9 U	1.8 U	1.9 U	1.9 U
TOXAPHENE	190 U	180 U	190 U	180 U	190 U	190 U
PCB-1016	37 U	35 U	36 U	36 U	38 U	37 U
PCB-1221	74 U	72 U	73 U	72 U	77 U	75 U
PCB-1232	37 U	35 U	36 U	36 U	38 U	37 U
PCB-1242	37 U	35 U	36 U	36 U	38 U	37 U
PCB-1248	37 U	35 U	36 U	36 U	38 U	37 U
PCB-1254	37 U	35 U	36 U	36 U	38 U	37 U
PCB-1260	52 J	35 U	36 U	36 U	38 U	37 U

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-SB06-00	65-SB07-00	65-SB08-00	65-SB09-00	65-SB10-00	65-SB11-00
DATE COLLECTED	04/10/95	04/08/95	04/11/95	04/08/95	04/08/95	04/08/95
DEPTH	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
PESTICIDE/PCBS (ug/kg)						
ALPHA-BHC	2.1 U	2.2 U	1.8 U	1.9 U	1.9 U	2 U
BETA-BHC	2.1 U	2.2 U	1.8 U	1.9 U	1.9 U	2 U
DELTA-BHC	2.1 U	2.2 U	1.8 U	1.9 U	1.9 U	2 U
GAMMA-BHC(LINDANE)	2.1 U	2.2 U	1.8 U	1.9 U	1.9 U	2 U
HEPTACHLOR	2.1 U	2.2 U	1.8 U	1.9 U	1.9 U	2 U
ALDRIN	2.1 U	2.2 U	1.8 U	1.9 U	1.9 U	2 U
HEPTACHLOR EPOXIDE	2.1 U	2.2 U	1.8 U	1.9 U	1.9 U	2 U
ENDOSULFAN I	2.1 U	2.2 U	1.8 U	1.9 U	1.9 U	2 U
DIELDRIN	4.1 U	4.2 U	3.5 U	3.7 U	3.7 U	3.9 U
4,4'-DDE	47	77 J	3.5 U	3.7 U	3.7 U	4.3
ENDRIN	4.1 U	4.2 U	3.5 U	3.7 U	3.7 U	3.9 U
ENDOSULFAN II	4.1 U	4.2 U	3.5 U	3.7 U	3.7 U	3.9 U
4,4'-DDD	17 J	4.2 UJ	3.5 UJ	31 J	59 J	16 J
ENDOSULFAN SULFATE	4.1 U	4.2 U	3.5 U	3.7 U	3.7 U	3.9 U
4,4'-DDT	23 U	56 J	3.5 U	5.3 U	3.7 U	3.9 U
METHOXYCHLOR	21 U	22 U	18 U	19 U	19 U	20 U
ENDRIN KETONE	4.1 U	4.2 U	3.5 U	3.7 U	3.7 U	3.9 U
ENDRIN ALDEHYDE	4.1 U	4.2 U	3.5 U	3.7 U	3.7 U	3.9 U
ALPHA CHLORDANE	2.1 U	2.2 U	1.8 U	1.9 U	1.9 U	2 U
GAMMA CHLORDANE	2.1 U	2.2 U	1.8 U	1.9 U	1.9 U	2 U
TOXAPHENE	210 U	220 U	180 U	190 U	190 U	200 U
PCB-1016	41 U	42 U	35 U	37 U	37 U	39 U
PCB-1221	82 U	85 U	72 U	76 U	76 U	80 U
PCB-1232	41 U	42 U	35 U	37 U	37 U	39 U
PCB-1242	41 U	42 U	35 U	37 U	37 U	39 U
PCB-1248	41 U	42 U	35 U	37 U	37 U	39 U
PCB-1254	41 U	42 U	35 U	37 U	37 U	39 U
PCB-1260	41 U	42 U	35 U	37 U	37 U	39 U

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-SB12-00
DATE COLLECTED	04/17/95
DEPTH	0-1'
PESTICIDE/PCBS (ug/kg)	
ALPHA-BHC	1.9 U
BETA-BHC	1.9 U
DELTA-BHC	1.9 U
GAMMA-BHC(LINDANE)	1.9 U
HEPTACHLOR	1.9 U
ALDRIN	1.9 U
HEPTACHLOR EPOXIDE	1.9 U
ENDOSULFAN I	1.9 U
DIELDRIN	3.6 U
4,4'-DDE	75
ENDRIN	3.6 U
ENDOSULFAN II	3.6 U
4,4'-DDD	20 J
ENDOSULFAN SULFATE	3.6 U
4,4'-DDT	25
METHOXYCHLOR	19 U
ENDRIN KETONE	3.6 U
ENDRIN ALDEHYDE	3.6 U
ALPHA CHLORDANE	1.9 U
GAMMA CHLORDANE	1.9 U
TOXAPHENE	190 U
PCB-1016	36 U
PCB-1221	73 U
PCB-1232	36 U
PCB-1242	36 U
PCB-1248	36 U
PCB-1254	36 U
PCB-1260	36 U

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED DEPTH	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
PESTICIDE/PCBS (ug/kg)						
ALPHA-BHC	1.8 U	2.2 U	ND	ND		0/13
BETA-BHC	1.8 U	2.2 U	ND	ND		0/13
DELTA-BHC	1.8 U	2.2 U	ND	ND		0/13
GAMMA-BHC(LINDANE)	1.8 U	2.2 U	ND	ND		0/13
HEPTACHLOR	1.8 U	2.2 U	ND	ND		0/13
ALDRIN	1.8 U	2.2 U	ND	ND		0/13
HEPTACHLOR EPOXIDE	1.8 U	2.2 U	2.3	2.3	65-MW07A-00	1/13
ENDOSULFAN I	1.8 U	2.2 U	ND	ND		0/13
DIELDRIN	3.5 U	4.2 U	ND	ND		0/13
4,4'-DDE	3.5 U	3.8 U	4.3	83 J	65-MW07A-00	6/13
ENDRIN	3.5 U	4.2 U	ND	ND		0/13
ENDOSULFAN II	3.5 U	4.2 U	3.8 NJ	3.9 NJ	65-DW02-00	2/13
4,4'-DDD	3.5 UJ	4.2 UJ	3.8 NJ	59 J	65-SB10-00	7/13
ENDOSULFAN SULFATE	3.5 U	4.2 U	ND	ND		0/13
4,4'-DDT	3.5 U	23 U	25	56 J	65-SB07-00	3/13
METHOXYCHLOR	18 U	22 U	ND	ND		0/13
ENDRIN KETONE	3.5 U	4.2 U	ND	ND		0/13
ENDRIN ALDEHYDE	3.5 U	4.2 U	ND	ND		0/13
ALPHA CHLORDANE	1.8 U	2.2 U	ND	ND		0/13
GAMMA CHLORDANE	1.8 U	2.2 U	ND	ND		0/13
TOXAPHENE	180 U	220 U	ND	ND		0/13
PCB-1016	35 U	42 U	ND	ND		0/13
PCB-1221	72 U	85 U	ND	ND		0/13
PCB-1232	35 U	42 U	ND	ND		0/13
PCB-1242	35 U	42 U	ND	ND		0/13
PCB-1248	35 U	42 U	ND	ND		0/13
PCB-1254	35 U	42 U	ND	ND		0/13
PCB-1260	35 U	42 U	52 J	52 J	65-DW01-00	1/13

APPENDIX O.2
SURFACE SOIL METALS

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION	65-DW01-00	65-DW02-00	65-DW04-00	65-MW05A-00	65-MW06A-00	65-MW07A-00
DATE_STAMP	04/10/95	04/09/95	04/05/95	04/05/95	04/08/95	04/04/95
DEPTH	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
MOISTURE	10.74	9.43	10.17	10.34	15.45	11.66
ANALYTES (mg/kg)						
ALUMINUM	5040	1350	773	1050	3190	1520
ANTIMONY	11.2 U	11 U	11.1 U	11.1 U	11.8 U	11.3 U
ARSENIC	2.2 U	2.2 U	2.2 U	2.2 U	2.4 U	2.3 U
BARIUM	36.3	5.4	6.9	6.2	6.8	19.2
BERYLLIUM	0.22 U	0.22 U	0.22 U	0.22 U	0.24 U	0.23 U
CADMIUM	1.1 U	1.1 U	1.1 U	1.1 U	1.2 U	1.1 U
CALCIUM	806	176	79.3	243	367	3460
CHROMIUM	8.6	2.3	2.2 U	2.4	4.1	2.3
COBALT	4.5 UJ	4.4 UJ	8.3 U	8.2 U	4.7 UJ	4.5 U
COPPER	55.6	2.5	2.2 U	2.2 U	3.3	2.3 U
IRON	7470 J	773 J	509	1020	1300 J	684
LEAD	178 J	7.7 J	2	3.7	7.3 J	8.6
MAGNESIUM	169	32.4	30.3	42.8	88.1	82.5
MANGANESE	163 J	7.9 J	9.6	8.2	8 J	7.1
MERCURY	0.11 U	0.11 U	0.11 U	0.11 U	0.12 U	0.11 U
NICKEL	4.6	4.4 U	4.5 U	4.5 U	4.7 U	4.5 U
POTASSIUM	224 U	221 U	223 U	223 U	236 U	227 U
SELENIUM	1.1 U	1.1 U	1.1 U	1.1 U	1.2 U	1.1 U
SILVER	1.1 U	1.1 U	1.1 U	1.1 U	1.2 U	1.1 U
SODIUM	51.3	44.2 U	44.5 U	44.6 U	47.3 U	56.3
THALLIUM	2.2 U	2.2 U	2.2 U	2.2 U	2.4 U	2.3 U
VANADIUM	12	2.2 U	2.2 U	2.8	3.4	2.3 U
ZINC	377 J	12.2 J	7.8 U	5.3	13.8 J	9.1 U

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION	65-SB06-00	65-SB07-00	65-SB08-00	65-SB09-00	65-SB10-00	65-SB11-00
DATE_STAMP	04/10/95	04/08/95	04/11/95	04/08/95	04/08/95	04/08/95
DEPTH	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
MOISTURE	19.19	23.14	7.48	11.86	13.86	18.31
ANALYTES (mg/kg)						
ALUMINUM	2140	1490	656	2830	4700	4110
ANTIMONY	12.4 U	13 U	10.8 U	11.4 U	11.6 U	12.2 U
ARSENIC	2.5 U	2.6 U	2.2 U	2.3 U	2.3 U	2.4 U
BARIUM	17.5	6.8	2.7	10.9	11.5	9.9
BERYLLIUM	0.25 U	0.26 U	0.22 U	0.23 U	0.23 U	0.24 U
CADMIUM	1.2 U	1.3 U	1.1 U	1.1 U	1.2 U	1.2 U
CALCIUM	542	168	121	554	514	470
CHROMIUM	4.6	3	2.2 U	4.6	6.8	6.3
COBALT	5 UJ	5.2 UJ	4.3 UJ	4.5 UJ	4.6 UJ	4.9 UJ
COPPER	51	6	2.2 U	15	10	9
IRON	3600	890 J	597	2110 J	2010 J	2050 J
LEAD	94.5	8.8 J	2.5	40.9 J	20.4 J	15.4 J
MAGNESIUM	55	52	28.5	97.1	187	143
MANGANESE	119	6.9 J	2.9	19.1	19.3 J	17.6 J
MERCURY	0.12 U	0.13 U	0.11 U	0.11 U	0.12 U	0.12 U
NICKEL	5 U	5.2 U	4.3 U	4.5 U	4.6 U	4.9 U
POTASSIUM	248 U	260 U	216 U	227 U	232 U	248
SELENIUM	1.2 U	1.3 U	1.1 U	1.1 U	1.2 U	1.2 U
SILVER	1.2 U	1.3 U	1.1 U	1.1 U	1.2 U	1.2 U
SODIUM	49.5 U	52 U	43.2 U	45.4 U	46.5 U	49 U
THALLIUM	2.5 U	2.6 U	2.2 U	2.3 U	2.3	2.4 U
VANADIUM	7.2	2.9	2.2 U	3.2	5.1	4.8
ZINC	190	9 J	3.7	39.7 J	33.2 J	24 J

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION	65-SB12-00
DATE_STAMP	04/17/95
DEPTH	0-1'
MOISTURE	9.13
ANALYTES (mg/kg)	
ALUMINUM	2940
ANTIMONY	11 U
ARSENIC	2.2 U
BARIUM	12.6
BERYLLIUM	0.22 U
CADMIUM	1.1 U
CALCIUM	729
CHROMIUM	4.8
COBALT	4.4 U
COPPER	42.3
IRON	16400
LEAD	117
MAGNESIUM	54.8
MANGANESE	75.4
MERCURY	0.11 U
NICKEL	5.7
POTASSIUM	220 U
SELENIUM	1.1 U
SILVER	1.1 U
SODIUM	44 U
THALLIUM	2.2 U
VANADIUM	5.1
ZINC	110

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION DATE_STAMP DEPTH MOISTURE	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
ANALYTES (mg/kg)						
ALUMINUM	NA	NA	656	5040	65-DW01-00	13/13
ANTIMONY	10.8 U	13 U	ND	ND		0/13
ARSENIC	2.2 U	2.6 U	ND	ND		0/13
BARIUM	NA	NA	2.7	36.3	65-DW01-00	13/13
BERYLLIUM	0.22 U	0.26 U	ND	ND		0/13
CADMIUM	1.1 U	1.3 U	ND	ND		0/13
CALCIUM	NA	NA	79.3	3460	65-MW07A-00	13/13
CHROMIUM	2.2 U	2.2 U	2.3	8.6	65-DW01-00	11/13
COBALT	4.3 UJ	8.3 U	ND	ND		0/13
COPPER	2.2 U	2.3 U	2.5	55.6	65-DW01-00	9/13
IRON	NA	NA	509	16400	65-SB12-00	13/13
LEAD	NA	NA	2	178 J	65-DW01-00	13/13
MAGNESIUM	NA	NA	28.5	187	65-SB10-00	13/13
MANGANESE	NA	NA	2.9	163 J	65-DW01-00	13/13
MERCURY	0.11 U	0.13 U	ND	ND		0/13
NICKEL	4.3 U	5.2 U	4.6	5.7	65-SB12-00	2/13
POTASSIUM	216 U	260 U	248	248	65-SB11-00	1/13
SELENIUM	1.1 U	1.3 U	ND	ND		0/13
SILVER	1.1 U	1.3 U	ND	ND		0/13
SODIUM	43.2 U	52 U	51.3	56.3	65-MW07A-00	2/13
THALLIUM	2.2 U	2.6 U	2.3	2.3	65-SB10-00	1/13
VANADIUM	2.2 U	2.3 U	2.8	12	65-DW01-00	9/13
ZINC	7.8 U	9.1 U	3.7	377 J	65-DW01-00	11/13

APPENDIX O.3
SUBSURFACE SOIL ORGANICS

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-DW01-04	65-DW02-02	65-DW04-05	65-MW05A-04	65-MW06A-03	65-MW07A-05
DATE COLLECTED	04/10/95	04/09/95	04/05/95	04/05/95	04/08/95	04/04/95
DEPTH	7-9'	3-5'	9-11'	7-9'	5-7'	9-11'
VOLATILES (ug/kg)						
CHLOROMETHANE	11 U	12 U	11 U	12 U	11 U	12 U
BROMOMETHANE	11 U	12 U	11 U	12 U	11 U	12 U
VINYL CHLORIDE	11 U	12 U	11 U	12 U	11 U	12 U
CHLOROETHANE	11 U	12 U	11 U	12 U	11 U	12 U
METHYLENE CHLORIDE	11 U	12 U	11 U	12 U	11 U	12 U
ACETONE	18 U	380	180	10 J	11 U	12 U
CARBON DISULFIDE	11 U	12 U	11 U	12 U	11 U	12 U
1,1-DICHLOROETHENE	11 U	12 U	11 U	12 U	11 U	12 U
1,1-DICHLOROETHANE	11 U	12 U	11 U	12 U	11 U	12 U
1,2-DICHLOROETHENE	11 U	12 U	11 U	12 U	11 U	12 U
CHLOROFORM	11 U	12 U	11 U	12 U	11 U	12 U
1,2-DICHLOROETHANE	11 U	12 U	11 U	12 U	11 U	12 U
2-BUTANONE	11 U	12 U	11 U	12 U	11 U	12 U
1,1,1-TRICHLOROETHANE	11 U	12 U	11 U	12 U	11 U	12 U
CARBON TETRACHLORIDE	11 U	12 U	11 U	12 U	11 U	12 U
BROMODICHLOROMETHANE	11 U	12 U	11 U	12 U	11 U	12 U
1,2-DICHLOROPROPANE	11 U	12 U	11 U	12 U	11 U	12 U
CIS-1,3-DICHLOROPROPENE	11 U	12 U	11 U	12 U	11 U	12 U
TRICHLOROETHENE	11 U	12 U	11 U	12 U	11 U	12 U
DIBROMOCHLOROMETHANE	11 U	12 U	11 U	12 U	11 U	12 U
1,1,2-TRICHLOROETHANE	11 U	12 U	11 U	12 U	11 U	12 U
BENZENE	11 U	12 U	11 U	12 U	11 U	12 U
TRANS-1,3-DICHLOROPROPENE	11 U	12 U	11 U	12 U	11 U	12 U
BROMOFORM	11 U	12 U	11 U	12 U	11 U	12 U
4-METHYL-2-PENTANONE	11 U	12 U	111 U	12 U	11 U	12 U
2-HEXANONE	11 U	12 U	44 U	12 U	11 U	12 U
TETRACHLOROETHENE	11 U	12 U	11 U	12 U	11 U	12 U
1,1,2,2-TETRACHLOROETHANE	11 U	12 U	11 U	12 U	11 U	12 U
TOLUENE	11 U	12 U	11 U	12 U	11 U	12 U
CHLOROBENZENE	11 U	12 U	11 U	12 U	11 U	12 U
ETHYLBENZENE	11 U	12 U	11 U	12 U	11 U	12 U
STYRENE	11 U	12 U	11 U	12 U	11 U	12 U
TOTAL XYLENES	3 J	1 J	11 U	12 U	1 J	12 U

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-SB06-02	65-SB07-04	65-SB08-04	65-SB09-02	65-SB10-01	65-SB11-04
DATE COLLECTED	04/10/95	04/08/95	04/11/95	04/08/95	04/08/95	04/08/95
DEPTH	3-5'	7-9'	7-9'	3-5'	1-3'	7-9'
VOLATILES (ug/kg)						
CHLOROMETHANE	12 U	14 U	12 U	11 U	11 U	12 U
BROMOMETHANE	12 U	14 U	12 U	11 U	11 U	12 U
VINYL CHLORIDE	12 U	14 U	12 U	11 U	11 U	12 U
CHLOROETHANE	12 U	14 U	12 U	11 U	11 U	12 U
METHYLENE CHLORIDE	12 U	14 U	12 U	11 U	11 U	12 U
ACETONE	21 U	79	12 U	31	26	37
CARBON DISULFIDE	12 U	14 U	12 U	11 U	11 U	12 U
1,1-DICHLOROETHENE	12 U	14 U	12 U	11 U	11 U	12 U
1,1-DICHLOROETHANE	12 U	14 U	12 U	11 U	11 U	12 U
1,2-DICHLOROETHENE	12 U	14 U	12 U	11 U	11 U	12 U
CHLOROFORM	12 U	14 U	12 U	11 U	11 U	12 U
1,2-DICHLOROETHANE	12 U	14 U	12 U	11 U	11 U	12 U
2-BUTANONE	12 U	14 U	12 U	4 J	2 J	12 U
1,1,1-TRICHLOROETHANE	12 U	14 U	12 U	11 U	11 U	12 U
CARBON TETRACHLORIDE	12 U	14 U	12 U	11 U	11 U	12 U
BROMODICHLOROMETHANE	12 U	14 U	12 U	11 U	11 U	12 U
1,2-DICHLOROPROPANE	12 U	14 U	12 U	11 U	11 U	12 U
CIS-1,3-DICHLOROPROPENE	12 U	14 U	12 U	11 U	11 U	12 U
TRICHLOROETHENE	12 U	2 J	12 U	11 U	11 U	12 U
DIBROMOCHLOROMETHANE	12 U	14 U	12 U	11 U	11 U	12 U
1,1,2-TRICHLOROETHANE	12 U	14 U	12 U	11 U	11 U	12 U
BENZENE	12 U	14 U	12 U	11 U	11 U	12 U
TRANS-1,3-DICHLOROPROPENE	12 U	14 U	12 U	11 U	11 U	12 U
BROMOFORM	12 U	14 U	12 U	11 U	11 U	12 U
4-METHYL-2-PENTANONE	12 U	14 U	12 U	11 U	11 U	12 U
2-HEXANONE	12 U	14 U	12 U	11 U	11 U	12 U
TETRACHLOROETHENE	12 U	14 U	12 U	11 U	11 U	12 U
1,1,2,2-TETRACHLOROETHANE	12 U	14 U	12 U	11 U	11 U	12 U
TOLUENE	12 U	14 U	12 U	11 U	11 U	1 J
CHLOROBENZENE	12 U	14 U	12 U	11 U	11 U	12 U
ETHYLBENZENE	12 U	14 U	12 U	11 U	11 U	12 U
STYRENE	12 U	14 U	12 U	11 U	11 U	12 U
TOTAL XYLENES	12 U	14 U	12 U	2 J	3 J	12 U

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-SB12-05	65-TP01	65-TP02	65-TP04	65-TP05	65-TP06
DATE COLLECTED	04/17/95	05/07/95	05/08/95	05/07/95	05/07/95	05/08/95
DEPTH	9-11'					
VOLATILES (ug/kg)						
CHLOROMETHANE	11 U	12 U	11 U	11 U	14 U	11 U
BROMOMETHANE	11 U	12 U	11 U	11 U	14 U	11 U
VINYL CHLORIDE	11 U	12 U	11 U	11 U	14 U	11 U
CHLOROETHANE	11 U	12 U	11 U	11 U	14 U	11 U
METHYLENE CHLORIDE	11 U	12 U	11 U	11 U	14 U	11 U
ACETONE	11 U	12	46	25	210	9 J
CARBON DISULFIDE	11 U	12 U	11 U	2 J	14 U	11 U
1,1-DICHLOROETHENE	11 U	12 U	11 U	11 U	14 U	11 U
1,1-DICHLOROETHANE	11 U	12 U	11 U	11 U	14 U	11 U
1,2-DICHLOROETHENE	11 U	12 U	11 U	11 U	14 U	11 U
CHLOROFORM	11 U	12 U	11 U	11 U	14 U	11 U
1,2-DICHLOROETHANE	11 U	12 U	11 U	11 U	14 U	11 U
2-BUTANONE	11 U	12 U	11 U	11 U	29	11 U
1,1,1-TRICHLOROETHANE	11 U	12 U	11 U	11 U	14 U	11 U
CARBON TETRACHLORIDE	11 U	12 U	11 U	11 U	14 U	11 U
BROMODICHLOROMETHANE	11 U	12 U	11 U	11 U	14 U	11 U
1,2-DICHLOROPROPANE	11 U	12 U	11 U	11 U	14 U	11 U
CIS-1,3-DICHLOROPROPENE	11 U	12 U	11 U	11 U	14 U	11 U
TRICHLOROETHENE	11 U	12 U	11 U	11 U	14 U	11 U
DIBROMOCHLOROMETHANE	11 U	12 U	11 U	11 U	14 U	11 U
1,1,2-TRICHLOROETHANE	11 U	12 U	11 U	11 U	14 U	11 U
BENZENE	11 U	12 U	11 U	11 U	14 U	11 U
TRANS-1,3-DICHLOROPROPENE	11 U	12 U	11 U	11 U	14 U	11 U
BROMOFORM	11 U	12 U	11 U	11 U	14 U	11 U
4-METHYL-2-PENTANONE	11 U	12 U	11 U	11 U	14 U	11 U
2-HEXANONE	11 U	12 U	11 U	11 U	14 U	11 U
TETRACHLOROETHENE	11 U	12 U	11 U	11 U	14 U	11 U
1,1,2,2-TETRACHLOROETHANE	11 U	12 U	11 U	11 U	14 U	11 U
TOLUENE	11 U	12 U	11 U	11 U	14 U	11 U
CHLOROBENZENE	11 U	12 U	11 U	11 U	14 U	11 U
ETHYLBENZENE	11 U	12 U	11 U	11 U	14 U	11 U
STYRENE	11 U	12 U	11 U	11 U	14 U	11 U
TOTAL XYLENES	11 U	12 U	11 U	11 U	14 U	11 U

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-TP07
DATE COLLECTED	05/07/95
DEPTH	
VOLATILES (ug/kg)	
CHLOROMETHANE	11 U
BROMOMETHANE	11 U
VINYL CHLORIDE	11 U
CHLOROETHANE	11 U
METHYLENE CHLORIDE	11 U
ACETONE	7 J
CARBON DISULFIDE	11 U
1,1-DICHLOROETHENE	11 U
1,1-DICHLOROETHANE	11 U
1,2-DICHLOROETHENE	11 U
CHLOROFORM	11 U
1,2-DICHLOROETHANE	11 U
2-BUTANONE	11 U
1,1,1-TRICHLOROETHANE	11 U
CARBON TETRACHLORIDE	11 U
BROMODICHLOROMETHANE	11 U
1,2-DICHLOROPROPANE	11 U
CIS-1,3-DICHLOROPROPENE	11 U
TRICHLOROETHENE	11 U
DIBROMOCHLOROMETHANE	11 U
1,1,2-TRICHLOROETHANE	11 U
BENZENE	11 U
TRANS-1,3-DICHLOROPROPENE	11 U
BROMOFORM	11 U
4-METHYL-2-PENTANONE	11 U
2-HEXANONE	11 U
TETRACHLOROETHENE	11 U
1,1,2,2-TETRACHLOROETHANE	11 U
TOLUENE	11 U
CHLOROBENZENE	11 U
ETHYLBENZENE	11 U
STYRENE	11 U
TOTAL XYLENES	11 U

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED DEPTH	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
VOLATILES (ug/kg)						
CHLOROMETHANE	11 U	14 U	ND	ND		0/19
BROMOMETHANE	11 U	14 U	ND	ND		0/19
VINYL CHLORIDE	11 U	14 U	ND	ND		0/19
CHLOROETHANE	11 U	14 U	ND	ND		0/19
METHYLENE CHLORIDE	11 U	14 U	ND	ND		0/19
ACETONE	11 U	21 U	7 J	380	65-DW02-02	13/19
CARBON DISULFIDE	11 U	14 U	2 J	2 J	65-TP04	1/19
1,1-DICHLOROETHENE	11 U	14 U	ND	ND		0/19
1,1-DICHLOROETHANE	11 U	14 U	ND	ND		0/19
1,2-DICHLOROETHENE	11 U	14 U	ND	ND		0/19
CHLOROFORM	11 U	14 U	ND	ND		0/19
1,2-DICHLOROETHANE	11 U	14 U	ND	ND		0/19
2-BUTANONE	11 U	14 U	2 J	29	65-TP05	3/19
1,1,1-TRICHLOROETHANE	11 U	14 U	ND	ND		0/19
CARBON TETRACHLORIDE	11 U	14 U	ND	ND		0/19
BROMODICHLOROMETHANE	11 U	14 U	ND	ND		0/19
1,2-DICHLOROPROPANE	11 U	14 U	ND	ND		0/19
CIS-1,3-DICHLOROPROPENE	11 U	14 U	ND	ND		0/19
TRICHLOROETHENE	11 U	14 U	2 J	2 J	65-SB07-04	1/19
DIBROMOCHLOROMETHANE	11 U	14 U	ND	ND		0/19
1,1,2-TRICHLOROETHANE	11 U	14 U	ND	ND		0/19
BENZENE	11 U	14 U	ND	ND		0/19
TRANS-1,3-DICHLOROPROPENE	11 U	14 U	ND	ND		0/19
BROMOFORM	11 U	14 U	ND	ND		0/19
4-METHYL-2-PENTANONE	11 U	111 U	ND	ND		0/19
2-HEXANONE	11 U	44 U	ND	ND		0/19
TETRACHLOROETHENE	11 U	14 U	ND	ND		0/19
1,1,2,2-TETRACHLOROETHANE	11 U	14 U	ND	ND		0/19
TOLUENE	11 U	14 U	1 J	1 J	65-SB11-04	1/19
CHLOROBENZENE	11 U	14 U	ND	ND		0/19
ETHYLBENZENE	11 U	14 U	ND	ND		0/19
STYRENE	11 U	14 U	ND	ND		0/19
TOTAL XYLENES	11 U	14 U	1 J	3 J	65-SB10-01	5/19

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-DW01-04	65-DW02-02	65-DW04-05	65-MW05A-04	65-MW06A-03	65-MW07A-05
DATE COLLECTED	04/10/95	04/09/95	04/05/95	04/05/95	04/08/95	04/04/95
DEPTH	7-9'	3-5'	9-11'	7-9'	5-7'	9-11'
SEMIVOLATILES (ug/kg)						
PHENOL	370 U	380 U	340 U	370 U	360 U	380 U
BIS(2-CHLOROETHYL)ETHER	370 U	380 U	340 U	370 U	360 U	380 U
2-CHLOROPHENOL	370 U	380 U	340 U	370 U	360 U	380 U
1,3-DICHLOROBENZENE	370 U	380 U	340 U	370 U	360 U	380 U
1,4-DICHLOROBENZENE	370 U	380 U	340 U	370 U	360 U	380 U
1,2-DICHLOROBENZENE	370 U	380 U	340 U	370 U	360 U	380 U
2-METHYLPHENOL	370 U	380 U	340 U	370 U	360 U	380 U
2,2'-OXYBIS(1-CHLOROPROPANE)	370 U	380 U	340 U	370 U	360 U	380 U
4-METHYLPHENOL	370 U	380 U	340 U	370 U	360 U	380 U
N-NITROSO-DI-N-PROPYLAMINE	370 U	380 U	340 U	370 U	360 U	380 U
HEXACHLOROETHANE	370 U	380 U	340 U	370 U	360 U	380 U
NITROBENZENE	370 U	380 U	340 U	370 U	360 U	380 U
ISOPHORONE	370 U	380 U	340 U	370 U	360 U	380 U
2-NITROPHENOL	370 U	380 U	340 U	370 U	360 U	380 U
2,4-DIMETHYLPHENOL	370 U	380 U	340 U	370 U	360 U	380 U
BIS(2-CHLOROETHOXY)METHANE	370 U	380 U	340 U	370 U	360 U	380 U
2,4-DICHLOROPHENOL	370 U	380 U	340 U	370 U	360 U	380 U
1,2,4-TRICHLOROBENZENE	370 U	380 U	340 U	370 U	360 U	380 U
NAPHTHALENE	370 U	380 U	340 U	370 U	360 U	380 U
4-CHLOROANILINE	370 U	380 U	340 U	370 U	360 U	380 U
HEXACHLOROBUTADIENE	370 U	380 U	340 U	370 U	360 U	380 U
4-CHLORO-3-METHYLPHENOL	370 U	380 U	340 U	370 U	360 U	380 U
2-METHYLNAPHTHALENE	370 U	380 U	340 U	370 U	360 U	380 U
HEXACHLOROCYCLOPENTADIENE	370 UJ	380 UJ	340 U	370 U	360 U	380 U
2,4,6-TRICHLOROPHENOL	370 U	380 U	340 U	370 U	360 U	380 U
2,4,5-TRICHLOROPHENOL	900 U	930 U	830 U	910 U	880 U	930 U
2-CHLORONAPHTHALENE	370 U	380 U	340 U	370 U	360 U	380 U
2-NITROANILINE	900 U	930 U	830 U	910 U	880 U	930 U
DIMETHYL PHTHALATE	370 U	380 U	340 U	370 U	360 U	380 U
ACENAPHTHYLENE	370 U	380 U	340 U	370 U	360 U	380 U
2,6-DINITROTOLUENE	370 U	380 U	340 U	370 U	360 U	380 U
3-NITROANILINE	900 U	930 U	830 U	910 U	880 U	930 U
ACENAPHTHENE	370 U	380 U	340 U	370 U	360 U	380 U
2,4-DINITROPHENOL	900 U	930 U	830 U	910 U	880 U	930 U
4-NITROPHENOL	900 U	930 U	830 U	910 U	880 U	930 U

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-DW01-04	65-DW02-02	65-DW04-05	65-MW05A-04	65-MW06A-03	65-MW07A-05
DATE COLLECTED	04/10/95	04/09/95	04/05/95	04/05/95	04/08/95	04/04/95
DEPTH	7-9'	3-5'	9-11'	7-9'	5-7'	9-11'
SEMIVOLATILES (ug/kg) cont.						
DIBENZOFURAN	370 U	380 U	340 U	370 U	360 U	380 U
2,4-DINITROTOLUENE	370 U	380 U	340 U	370 U	360 U	380 U
DIETHYL PHTHALATE	370 U	380 U	340 U	370 U	360 U	380 U
4-CHLOROPHENYLPHENYL ETHER	370 U	380 U	340 U	370 U	360 U	380 U
FLUORENE	370 U	380 U	340 U	370 U	360 U	380 U
4-NITROANILINE	900 U	930 U	830 R	910 U	880 U	930 U
4,6-DINITRO-2-METHYLPHENOL	900 U	930 U	830 U	910 U	880 U	930 U
N-NITROSODIPHENYLAMINE	370 U	380 U	340 U	370 U	360 U	380 U
4-BROMOPHENYL PHENYL ETHER	370 U	380 U	340 U	370 U	360 U	380 U
HEXACHLOROBENZENE	370 U	380 U	340 U	370 U	360 U	380 U
PENTACHLOROPHENOL	900 U	930 U	830 U	910 U	880 U	930 U
PHENANTHRENE	370 U	380 U	340 U	370 U	360 U	380 U
ANTHRACENE	370 U	380 U	340 U	370 U	360 U	380 U
CARBAZOLE	370 U	380 U	340 U	370 U	360 U	380 U
DI-N-BUTYL PHTHALATE	370 U	380 U	340 U	370 U	360 U	380 U
FLUORANTHENE	370 U	380 U	340 U	370 U	360 U	380 U
PYRENE	370 U	380 U	340 U	370 U	360 U	380 U
BUTYL BENZYL PHTHALATE	370 U	380 U	340 U	370 U	360 U	380 U
3,3'-DICHLOROBENZIDINE	370 U	380 U	340 U	370 U	360 U	380 U
BENZO(A)ANTHRACENE	370 U	380 U	340 U	370 U	360 U	380 U
CHRYSENE	370 U	380 U	340 U	370 U	360 U	380 U
BIS(2-ETHYLHEXYL)PHTHALATE	370	65 J	340 U	96 J	49 J	61 J
DI-N-OCTYL PHTHALATE	370 U	380 U	340 U	370 U	360 U	380 U
BENZO(B)FLUORANTHENE	370 U	380 U	340 U	370 U	360 U	380 U
BENZO(K)FLUORANTHENE	370 U	380 U	340 U	370 U	360 U	380 U
BENZO(A)PYRENE	370 U	380 U	340 U	370 U	360 U	380 U
INDENO(1,2,3-CD)PYRENE	370 U	380 U	340 U	370 U	360 U	380 U
DIBENZO(A,H)ANTHRACENE	370 U	380 U	340 U	370 U	360 U	380 U
BENZO(G,H,I)PERYLENE	370 U	380 U	340 U	370 U	360 U	380 U

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-SB06-02	65-SB07-04	65-SB08-04	65-SB09-02	65-SB10-01	65-SB11-04
DATE COLLECTED	04/10/95	04/08/95	04/11/95	04/08/95	04/08/95	04/08/95
DEPTH	3-5'	7-9'	7-9'	3-5'	1-3'	7-9'
SEMIVOLATILES (ug/kg)						
PHENOL	410 U	440 U	400 U	370 U	370 U	380 U
BIS(2-CHLOROETHYL)ETHER	410 U	440 U	400 U	370 U	370 U	380 U
2-CHLOROPHENOL	410 U	440 U	400 U	370 U	370 U	380 U
1,3-DICHLOROBENZENE	410 U	440 U	400 U	370 U	370 U	380 U
1,4-DICHLOROBENZENE	410 U	440 U	400 U	370 U	370 U	380 U
1,2-DICHLOROBENZENE	410 U	440 U	400 U	370 U	370 U	380 U
2-METHYLPHENOL	410 U	440 U	400 U	370 U	370 U	380 U
2,2'-OXYBIS(1-CHLOROPROPANE)	410 U	440 U	400 U	370 U	370 U	380 U
4-METHYLPHENOL	410 U	440 U	400 U	370 U	370 U	380 U
N-NITROSO-DI-N-PROPYLAMINE	410 U	440 U	400 U	370 U	370 U	380 U
HEXACHLOROETHANE	410 U	440 U	400 U	370 U	370 U	380 U
NITROBENZENE	410 U	440 U	400 U	370 U	370 U	380 U
ISOPHORONE	410 U	440 U	400 U	370 U	370 U	380 U
2-NITROPHENOL	410 U	440 U	400 U	370 U	370 U	380 U
2,4-DIMETHYLPHENOL	410 U	440 U	400 U	370 U	370 U	380 U
BIS(2-CHLOROETHOXY)METHANE	410 U	440 U	400 U	370 U	370 U	380 U
2,4-DICHLOROPHENOL	410 U	440 U	400 U	370 U	370 U	380 U
1,2,4-TRICHLOROBENZENE	410 U	440 U	400 U	370 U	370 U	380 U
NAPHTHALENE	410 U	440 U	400 U	370 U	370 U	380 U
4-CHLOROANILINE	410 U	440 U	400 U	370 U	370 U	380 U
HEXACHLOROBUTADIENE	410 U	440 U	400 U	370 U	370 U	380 U
4-CHLORO-3-METHYLPHENOL	410 U	440 U	400 U	370 U	370 U	380 U
2-METHYLNAPHTHALENE	410 U	440 U	400 U	370 U	370 U	380 U
HEXACHLOROCYCLOPENTADIENE	410 U	440 U	400 U	370 U	370 UJ	380 UJ
2,4,6-TRICHLOROPHENOL	410 U	440 U	400 U	370 U	370 U	380 U
2,4,5-TRICHLOROPHENOL	1000 U	1100 U	980 U	890 U	910 U	910 U
2-CHLORONAPHTHALENE	410 U	440 U	400 U	370 U	370 U	380 U
2-NITROANILINE	1000 U	1100 U	980 U	890 U	910 U	910 U
DIMETHYL PHTHALATE	410 U	440 U	400 U	370 U	370 U	380 U
ACENAPHTHYLENE	410 U	440 U	400 U	370 U	370 U	380 U
2,6-DINITROTOLUENE	410 U	440 U	400 U	370 U	370 U	380 U
3-NITROANILINE	1000 U	1100 U	980 U	890 U	910 U	910 U
ACENAPHTHENE	97 J	440 U	400 U	370 U	370 U	380 U
2,4-DINITROPHENOL	1000 UJ	1100 U	980 UJ	890 U	910 U	910 U
4-NITROPHENOL	1000 U	1100 U	980 U	890 U	910 U	910 U

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-SB06-02	65-SB07-04	65-SB08-04	65-SB09-02	65-SB10-01	65-SB11-04
DATE COLLECTED	04/10/95	04/08/95	04/11/95	04/08/95	04/08/95	04/08/95
DEPTH	3-5'	7-9'	7-9'	3-5'	1-3'	7-9'
SEMIVOLATILES (ug/kg) cont.						
DIBENZOFURAN	410 U	440 U	400 U	370 U	370 U	380 U
2,4-DINITROTOLUENE	410 U	440 U	400 U	370 U	370 U	380 U
DIETHYL PHTHALATE	410 U	440 U	400 U	370 U	370 U	380 U
4-CHLOROPHENYLPHENYL ETHER	410 U	440 U	400 U	370 U	370 U	380 U
FLUORENE	110 J	440 U	400 U	370 U	370 U	380 U
4-NITROANILINE	1000 U	1100 U	980 U	890 U	910 U	910 U
4,6-DINITRO-2-METHYLPHENOL	1000 U	1100 U	980 U	890 U	910 U	910 U
N-NITROSODIPHENYLAMINE	410 U	440 U	400 U	370 U	370 U	380 U
4-BROMOPHENYL PHENYL ETHER	410 U	440 U	400 U	370 U	370 U	380 U
HEXACHLOROBENZENE	410 U	440 U	400 U	370 U	370 U	380 U
PENTACHLOROPHENOL	1000 U	1100 U	980 U	890 U	910 U	910 U
PHENANTHRENE	1200	440 U	400 U	370 U	370 U	380 U
ANTHRACENE	290 J	440 U	400 U	370 U	370 U	380 U
CARBAZOLE	120 J	440 U	400 U	370 U	370 U	380 U
DI-N-BUTYL PHTHALATE	340 J	440 U	240 J	370 UJ	370 U	380 U
FLUORANTHENE	1900	440 U	400 U	370 U	370 U	380 U
PYRENE	1400	440 U	400 U	370 U	370 U	380 U
BUTYL BENZYL PHTHALATE	410 U	440 U	400 U	370 U	370 U	380 U
3,3'-DICHLOROBENZIDINE	410 U	440 U	400 U	370 U	370 U	380 U
BENZO(A)ANTHRACENE	900	440 U	400 U	370 U	370 U	380 U
CHRYSENE	800	440 U	400 U	370 U	370 U	380 U
BIS(2-ETHYLHEXYL)PHTHALATE	110 J	90 J	95 J	81 J	93 J	110 J
DI-N-OCTYL PHTHALATE	410 U	440 U	400 U	370 U	370 U	380 U
BENZO(B)FLUORANTHENE	710	440 U	400 U	370 U	370 U	380 U
BENZO(K)FLUORANTHENE	620	440 U	400 U	370 U	370 U	380 U
BENZO(A)PYRENE	680	440 U	400 U	370 U	370 U	380 U
INDENO(1,2,3-CD)PYRENE	480 J	440 U	400 U	370 U	370 U	380 U
DIBENZO(A,H)ANTHRACENE	410 U	440 U	400 U	370 U	370 U	380 U
BENZO(G,H,I)PERYLENE	360 J	440 U	400 U	370 U	370 U	380 U

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-SB12-05	65-TP01	65-TP02	65-TP04	65-TP05	65-TP06
DATE COLLECTED	04/17/95	05/07/95	05/08/95	05/07/95	05/07/95	05/08/95
DEPTH	9-11'	N/A	N/A	N/A	N/A	N/A
		UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILES (ug/kg)						
PHENOL	370 U	390 U	360 U	370 U	460 U	350 U
BIS(2-CHLOROETHYL)ETHER	370 U	390 U	360 U	370 U	460 U	350 U
2-CHLOROPHENOL	370 U	390 U	360 U	370 U	460 U	350 U
1,3-DICHLOROBENZENE	370 U	390 U	360 U	370 U	460 U	350 U
1,4-DICHLOROBENZENE	370 U	390 U	360 U	370 U	460 U	350 U
1,2-DICHLOROBENZENE	370 U	390 U	360 U	370 U	460 U	350 U
2-METHYLPHENOL	370 U	390 U	360 U	370 U	460 U	350 U
2,2'-OXYBIS(1-CHLOROPROPANE)	370 U	390 U	360 U	370 U	460 U	350 U
4-METHYLPHENOL	370 U	390 U	360 U	370 U	460 U	350 U
N-NITROSO-DI-N-PROPYLAMINE	370 U	390 U	360 U	370 U	460 U	350 U
HEXACHLOROETHANE	370 U	390 U	360 U	370 U	460 U	350 U
NITROBENZENE	370 U	390 U	360 U	370 U	460 U	350 U
ISOPHORONE	370 U	390 U	360 U	370 U	460 U	350 U
2-NITROPHENOL	370 U	390 U	360 U	370 U	460 U	350 U
2,4-DIMETHYLPHENOL	370 U	390 U	360 U	370 U	460 U	350 U
BIS(2-CHLOROETHOXY)METHANE	370 U	390 U	360 U	370 U	460 U	350 U
2,4-DICHLOROPHENOL	370 U	390 U	360 U	370 U	460 U	350 U
1,2,4-TRICHLOROBENZENE	370 U	390 U	360 U	370 U	460 U	350 U
NAPHTHALENE	370 U	390 U	360 U	370 U	460 U	350 U
4-CHLOROANILINE	370 U	390 U	360 U	370 U	460 U	350 U
HEXACHLOROBUTADIENE	370 U	390 U	360 U	370 U	460 U	350 U
4-CHLORO-3-METHYLPHENOL	370 U	390 U	360 U	370 U	460 U	350 U
2-METHYLNAPHTHALENE	370 U	390 U	360 U	370 U	460 U	350 U
HEXACHLOROCYCLOPENTADIENE	370 U	390 U	360 U	370 U	460 U	350 U
2,4,6-TRICHLOROPHENOL	370 U	390 U	360 U	370 U	460 U	350 U
2,4,5-TRICHLOROPHENOL	890 U	940 U	870 U	890 U	1100 U	860 U
2-CHLORONAPHTHALENE	370 U	390 U	360 U	370 U	460 U	350 U
2-NITROANILINE	890 U	940 U	870 U	890 U	1100 U	860 U
DIMETHYL PHTHALATE	370 U	390 U	360 U	370 U	460 U	350 U
ACENAPHTHYLENE	370 U	390 U	360 U	370 U	460 U	350 U
2,6-DINITROTOLUENE	370 U	390 U	360 U	370 U	460 U	350 U
3-NITROANILINE	890 U	940 U	870 U	890 U	1100 U	860 U
ACENAPHTHENE	370 U	390 U	360 U	370 U	460 U	350 U
2,4-DINITROPHENOL	890 U	940 UJ	870 UJ	890 UJ	1100 UJ	860 UJ
4-NITROPHENOL	890 U	940 U	870 U	890 U	1100 U	860 U

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-SB12-05	65-TP01	65-TP02	65-TP04	65-TP05	65-TP06
DATE COLLECTED	04/17/95	05/07/95	05/08/95	05/07/95	05/07/95	05/08/95
DEPTH	9-11'	N/A	N/A	N/A	N/A	N/A
		UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SEMIVOLATILES (ug/kg) cont.						
DIBENZOFURAN	370 U	390 U	360 U	370 U	460 U	350 U
2,4-DINITROTOLUENE	370 U	390 U	360 U	370 U	460 U	350 U
DIETHYL PHTHALATE	370 U	390 U	360 U	370 U	460 U	350 U
4-CHLOROPHENYLPHENYL ETHER	370 U	390 U	360 U	370 U	460 U	350 U
FLUORENE	370 U	390 U	360 U	370 U	460 U	350 U
4-NITROANILINE	890 U	940 U	870 U	890 U	1100 U	860 U
4,6-DINITRO-2-METHYLPHENOL	890 U	940 U	870 U	890 U	1100 U	860 U
N-NITROSODIPHENYLAMINE	370 U	390 U	360 U	370 U	460 U	350 U
4-BROMOPHENYL PHENYL ETHER	370 U	390 U	360 U	370 U	460 U	350 U
HEXACHLOROBENZENE	370 U	390 U	360 U	370 U	460 U	350 U
PENTACHLOROPHENOL	890 U	940 U	870 U	890 U	1100 U	860 U
PHENANTHRENE	370 U	390 U	360 U	370 U	460 U	350 U
ANTHRACENE	370 U	390 U	360 U	370 U	460 U	350 U
CARBAZOLE	370 U	390 U	360 U	370 U	460 U	350 U
DI-N-BUTYL PHTHALATE	370 U	280 J	250 J	200 J	160 J	210 J
FLUORANTHENE	370 U	390 U	360 U	370 U	460 U	350 U
PYRENE	370 U	390 U	360 U	370 U	460 U	350 U
BUTYL BENZYL PHTHALATE	370 U	390 U	360 U	370 U	460 U	350 U
3,3'-DICHLOROBENZIDINE	370 U	390 U	360 U	370 U	460 U	350 U
BENZO(A)ANTHRACENE	370 U	390 U	360 U	370 U	460 U	350 U
CHRYSENE	370 U	390 U	360 U	370 U	460 U	350 U
BIS(2-ETHYLHEXYL)PHTHALATE	370 U	390 U	37 J	370 U	49 J	39 J
DI-N-OCTYL PHTHALATE	370 U	390 U	360 U	370 U	460 U	350 U
BENZO(B)FLUORANTHENE	370 U	390 U	360 U	370 U	460 U	350 U
BENZO(K)FLUORANTHENE	370 U	390 U	360 U	370 U	460 U	350 U
BENZO(A)PYRENE	370 U	390 U	360 U	370 U	460 U	350 U
INDENO(1,2,3-CD)PYRENE	370 U	390 U	360 U	370 U	460 U	350 U
DIBENZO(A,H)ANTHRACENE	370 U	390 U	360 U	370 U	460 U	350 U
BENZO(G,H,I)PERYLENE	370 U	390 U	360 U	370 U	460 U	350 U

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-TP07
DATE COLLECTED	05/07/95
DEPTH	N/A
	UG/KG
SEMIVOLATILES (ug/kg)	
PHENOL	360 U
BIS(2-CHLOROETHYL)ETHER	360 U
2-CHLOROPHENOL	360 U
1,3-DICHLOROBENZENE	360 U
1,4-DICHLOROBENZENE	360 U
1,2-DICHLOROBENZENE	360 U
2-METHYLPHENOL	360 U
2,2'-OXYBIS(1-CHLOROPROPANE)	360 U
4-METHYLPHENOL	360 U
N-NITROSO-DI-N-PROPYLAMINE	360 U
HEXACHLOROETHANE	360 U
NITROBENZENE	360 U
ISOPHORONE	360 U
2-NITROPHENOL	360 U
2,4-DIMETHYLPHENOL	360 U
BIS(2-CHLOROETHOXY)METHANE	360 U
2,4-DICHLOROPHENOL	360 U
1,2,4-TRICHLOROBENZENE	360 U
NAPHTHALENE	55 J
4-CHLOROANILINE	360 U
HEXACHLOROBUTADIENE	360 U
4-CHLORO-3-METHYLPHENOL	360 U
2-METHYLNAPHTHALENE	60 J
HEXACHLOROCYCLOPENTADIENE	360 U
2,4,6-TRICHLOROPHENOL	360 U
2,4,5-TRICHLOROPHENOL	870 U
2-CHLORONAPHTHALENE	360 U
2-NITROANILINE	870 U
DIMETHYL PHTHALATE	360 U
ACENAPHTHYLENE	360 U
2,6-DINITROTOLUENE	360 U
3-NITROANILINE	870 U
ACENAPHTHENE	94 J
2,4-DINITROPHENOL	870 UJ
4-NITROPHENOL	870 U

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-TP07
DATE COLLECTED	05/07/95
DEPTH	N/A
	UG/KG
SEMIVOLATILES (ug/kg) cont.	
DIBENZOFURAN	42 J
2,4-DINITROTOLUENE	360 U
DIETHYL PHTHALATE	360 U
4-CHLOROPHENYLPHENYL ETHER	360 U
FLUORENE	360 U
4-NITROANILINE	870 U
4,6-DINITRO-2-METHYLPHENOL	870 U
N-NITROSODIPHENYLAMINE	360 U
4-BROMOPHENYL PHENYL ETHER	360 U
HEXACHLOROBENZENE	360 U
PENTACHLOROPHENOL	870 U
PHENANTHRENE	150 J
ANTHRACENE	360 U
CARBAZOLE	360 U
DI-N-BUTYL PHTHALATE	270 J
FLUORANTHENE	230 J
PYRENE	190 J
BUTYL BENZYL PHTHALATE	360 U
3,3'-DICHLOROBENZIDINE	360 U
BENZO(A)ANTHRACENE	100 J
CHRYSENE	110 J
BIS(2-ETHYLHEXYL)PHTHALATE	230 J
DI-N-OCTYL PHTHALATE	360 U
BENZO(B)FLUORANTHENE	96 J
BENZO(K)FLUORANTHENE	110 J
BENZO(A)PYRENE	69 J
INDENO(1,2,3-CD)PYRENE	360 U
DIBENZO(A,H)ANTHRACENE	360 U
BENZO(G,H,I)PERYLENE	67 J

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED DEPTH	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/kg)						
PHENOL	340 U	460 U	ND	ND		0/19
BIS(2-CHLOROETHYL)ETHER	340 U	460 U	ND	ND		0/19
2-CHLOROPHENOL	340 U	460 U	ND	ND		0/19
1,3-DICHLOROBENZENE	340 U	460 U	ND	ND		0/19
1,4-DICHLOROBENZENE	340 U	460 U	ND	ND		0/19
1,2-DICHLOROBENZENE	340 U	460 U	ND	ND		0/19
2-METHYLPHENOL	340 U	460 U	ND	ND		0/19
2,2'-OXYBIS(1-CHLOROPROPANE)	340 U	460 U	ND	ND		0/19
4-METHYLPHENOL	340 U	460 U	ND	ND		0/19
N-NITROSO-DI-N-PROPYLAMINE	340 U	460 U	ND	ND		0/19
HEXACHLOROETHANE	340 U	460 U	ND	ND		0/19
NITROBENZENE	340 U	460 U	ND	ND		0/19
ISOPHORONE	340 U	460 U	ND	ND		0/19
2-NITROPHENOL	340 U	460 U	ND	ND		0/19
2,4-DIMETHYLPHENOL	340 U	460 U	ND	ND		0/19
BIS(2-CHLOROETHOXY)METHANE	340 U	460 U	ND	ND		0/19
2,4-DICHLOROPHENOL	340 U	460 U	ND	ND		0/19
1,2,4-TRICHLOROBENZENE	340 U	460 U	ND	ND		0/19
NAPHTHALENE	340 U	460 U	55 J	55 J	65-TP07	1/19
4-CHLOROANILINE	340 U	460 U	ND	ND		0/19
HEXACHLOROBUTADIENE	340 U	460 U	ND	ND		0/19
4-CHLORO-3-METHYLPHENOL	340 U	460 U	ND	ND		0/19
2-METHYLNAPHTHALENE	340 U	460 U	60 J	60 J	65-TP07	1/19
HEXACHLOROCYCLOPENTADIENE	340 U	460 U	ND	ND		0/19
2,4,6-TRICHLOROPHENOL	340 U	460 U	ND	ND		0/19
2,4,5-TRICHLOROPHENOL	830 U	1100 U	ND	ND		0/19
2-CHLORONAPHTHALENE	340 U	460 U	ND	ND		0/19
2-NITROANILINE	830 U	1100 U	ND	ND		0/19
DIMETHYL PHTHALATE	340 U	460 U	ND	ND		0/19
ACENAPHTHYLENE	340 U	460 U	ND	ND		0/19
2,6-DINITROTOLUENE	340 U	460 U	ND	ND		0/19
3-NITROANILINE	830 U	1100 U	ND	ND		0/19
ACENAPHTHENE	340 U	460 U	94 J	97 J	65-SB06-02	2/19
2,4-DINITROPHENOL	830 U	1100 U	ND	ND		0/19
4-NITROPHENOL	830 U	1100 U	ND	ND		0/19

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED DEPTH	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/kg) cont.						
DIBENZOFURAN	340 U	460 U	42 J	42 J	65-TP07	1/19
2,4-DINITROTOLUENE	340 U	460 U	ND	ND		0/19
DIETHYL PHTHALATE	340 U	460 U	ND	ND		0/19
4-CHLOROPHENYLPHENYL ETHER	340 U	460 U	ND	ND		0/19
FLUORENE	340 U	460 U	110 J	110 J	65-SB06-02	1/19
4-NITROANILINE	860 U	1100 U	ND	ND		0/18
4,6-DINITRO-2-METHYLPHENOL	830 U	1100 U	ND	ND		0/19
N-NITROSODIPHENYLAMINE	340 U	460 U	ND	ND		0/19
4-BROMOPHENYL PHENYL ETHER	340 U	460 U	ND	ND		0/19
HEXACHLOROBENZENE	340 U	460 U	ND	ND		0/19
PENTACHLOROPHENOL	830 U	1100 U	ND	ND		0/19
PHENANTHRENE	340 U	460 U	150 J	1200	65-SB06-02	2/19
ANTHRACENE	340 U	460 U	290 J	290 J	65-SB06-02	1/19
CARBAZOLE	340 U	460 U	120 J	120 J	65-SB06-02	1/19
DI-N-BUTYL PHTHALATE	340 U	440 U	160 J	340 J	65-SB06-02	8/19
FLUORANTHENE	340 U	460 U	230 J	1900	65-SB06-02	2/19
PYRENE	340 U	460 U	190 J	1400	65-SB06-02	2/19
BUTYL BENZYL PHTHALATE	340 U	460 U	ND	ND		0/19
3,3'-DICHLOROBENZIDINE	340 U	460 U	ND	ND		0/19
BENZO(A)ANTHRACENE	340 U	460 U	100 J	900	65-SB06-02	2/19
CHRYSENE	340 U	460 U	110 J	800	65-SB06-02	2/19
BIS(2-ETHYLHEXYL)PHTHALATE	340 U	390 U	37 J	370	65-DW01-04	15/19
DI-N-OCTYL PHTHALATE	340 U	460 U	ND	ND		0/19
BENZO(B)FLUORANTHENE	340 U	460 U	96 J	710	65-SB06-02	2/19
BENZO(K)FLUORANTHENE	340 U	460 U	110 J	620	65-SB06-02	2/19
BENZO(A)PYRENE	340 U	460 U	69 J	680	65-SB06-02	2/19
INDENO(1,2,3-CD)PYRENE	340 U	460 U	480 J	480 J	65-SB06-02	1/19
DIBENZO(A,H)ANTHRACENE	340 U	460 U	ND	ND		0/19
BENZO(G,H,I)PERYLENE	340 U	460 U	67 J	360 J	65-SB06-02	2/19

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-DW01-04	65-DW02-02	65-DW04-05	65-MW05A-04	65-MW06A-03	65-MW07A-05
DATE COLLECTED	04/10/95	04/09/95	04/05/95	04/05/95	04/08/95	04/04/95
DEPTH	7-9'	3-5'	9-11'	7-9'	5-7'	9-11'
PESTICIDE/PCBS (ug/kg)						
ALPHA-BHC	1.9 U	2 U	1.8 U	1.9 U	1.8 U	1.9 U
BETA-BHC	1.9 U	2 U	1.8 U	1.9 U	1.8 U	1.9 U
DELTA-BHC	1.9 U	2 U	1.8 U	1.9 U	1.8 U	1.9 U
GAMMA-BHC(LINDANE)	1.9 U	2 U	1.8 U	1.9 U	1.8 U	1.9 U
HEPTACHLOR	1.9 U	2 U	1.8 U	1.9 U	1.8 U	1.9 U
ALDRIN	1.9 U	2 U	1.8 U	1.9 U	1.8 U	1.9 U
HEPTACHLOR EPOXIDE	1.9 U	2 U	1.8 U	1.9 U	1.8 U	1.9 U
ENDOSULFAN I	1.9 U	2 U	1.8 U	1.9 U	1.8 U	1.9 U
DIELDRIN	3.8 U	3.9 U	3.4 U	3.7 U	3.6 U	3.7 U
4,4'-DDE	8.8 J	3.9 U	3.4 U	3.7 U	3.6 U	3.7 U
ENDRIN	3.8 U	3.9 U	3.4 U	3.7 U	3.6 U	3.7 U
ENDOSULFAN II	3.8 U	3.9 U	3.4 U	3.7 U	3.6 U	3.7 U
4,4'-DDD	4.4 J	3.9 UJ	3.4 UJ	3.7 U	3.6 UJ	3.7 U
ENDOSULFAN SULFATE	3.8 U	3.9 U	3.4 U	3.7 U	3.6 U	3.7 U
4,4'-DDT	6.3 U	3.9 U	3.4 U	3.7 U	3.6 U	3.7 U
METHOXYCHLOR	19 U	20 U	18 U	19 U	18 U	19 U
ENDRIN KETONE	3.8 U	3.9 U	3.4 U	3.7 U	3.6 U	3.7 U
ENDRIN ALDEHYDE	9.4 J	3.9 U	3.4 U	3.7 U	3.6 U	3.7 U
ALPHA CHLORDANE	1.9 U	2 U	1.8 U	1.9 U	1.8 U	1.9 U
GAMMA CHLORDANE	1.9 U	2 U	1.8 U	1.9 U	1.8 U	1.9 U
TOXAPHENE	190 U	200 U	180 U	190 U	180 U	190 U
PCB-1016	38 U	39 U	34 U	37 U	36 U	37 U
PCB-1221	77 U	79 U	70 U	76 U	72 U	76 U
PCB-1232	38 U	39 U	34 U	37 U	36 U	37 U
PCB-1242	38 U	39 U	34 U	37 U	36 U	37 U
PCB-1248	38 U	39 U	34 U	37 U	36 U	37 U
PCB-1254	38 U	39 U	34 U	37 U	36 U	37 U
PCB-1260	38 U	39 U	34 U	37 U	36 U	37 U

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-SB06-02	65-SB07-04	65-SB08-04	65-SB09-02	65-SB10-01	65-SB11-04
DATE COLLECTED	04/10/95	04/08/95	04/11/95	04/08/95	04/08/95	04/08/95
DEPTH	3-5'	7-9'	7-9'	3-5'	1-3'	7-9'
PESTICIDE/PCBS (ug/kg)						
ALPHA-BHC	2.1 U	2.3 U	2.1 U	1.9 U	1.9 U	2 U
BETA-BHC	2.1 U	2.3 U	2.1 U	1.9 U	1.9 U	2 U
DELTA-BHC	2.1 U	2.3 U	2.1 U	1.9 U	1.9 U	2 U
GAMMA-BHC(LINDANE)	2.1 U	2.3 U	2.1 U	1.9 U	1.9 U	2 U
HEPTACHLOR	2.1 U	2.3 U	2.1 U	1.9 U	1.9 U	2 U
ALDRIN	2.1 U	2.3 U	2.1 U	1.9 U	1.9 U	2 U
HEPTACHLOR EPOXIDE	2.1 U	2.3 U	2.1 U	1.9 U	1.9 U	2 U
ENDOSULFAN I	2.1 U	2.3 U	2.1 U	1.9 U	1.9 U	2 U
DIELDRIN	4.1 U	4.4 U	4 U	3.6 U	3.7 U	3.8 U
4,4'-DDE	41	4.4 U	4 U	13	4.6	3.8 U
ENDRIN	4.1 U	4.4 U	4 U	3.6 U	3.7 U	3.8 U
ENDOSULFAN II	4.1 U	4.4 U	4 U	3.6 U	3.7 U	3.8 U
4,4'-DDD	9.1 NJ	4.4 UJ	4 UJ	68 J	76 J	3.8 UJ
ENDOSULFAN SULFATE	4.1 U	4.4 U	4 U	3.6 U	3.7 U	3.8 U
4,4'-DDT	37 U	4.4 U	4 U	3.6 U	3.7 U	3.8 U
METHOXYCHLOR	21 U	23 U	21 U	19 U	19 U	20 U
ENDRIN KETONE	4.1 U	4.4 U	4 U	3.6 U	3.7 U	3.8 U
ENDRIN ALDEHYDE	4.1 U	4.4 U	4 U	3.6 U	3.7 U	3.8 U
ALPHA CHLORDANE	8.3 J	2.3 U	2.1 U	1.9 U	1.9 U	2 U
GAMMA CHLORDANE	7.5 J	2.3 U	2.1 U	1.9 U	1.9 U	2 U
TOXAPHENE	210 U	230 U	210 U	190 U	190 U	200 U
PCB-1016	41 U	44 U	40 U	36 U	37 U	38 U
PCB-1221	83 U	89 U	82 U	73 U	76 U	78 U
PCB-1232	41 U	44 U	40 U	36 U	37 U	38 U
PCB-1242	41 U	44 U	40 U	36 U	37 U	38 U
PCB-1248	41 U	44 U	40 U	36 U	37 U	38 U
PCB-1254	41 U	44 U	40 U	36 U	37 U	38 U
PCB-1260	41 U	44 U	40 U	36 U	37 U	38 U

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-SB12-05	65-TP01	65-TP02	65-TP04	65-TP05	65-TP06
DATE COLLECTED	04/17/95	05/07/95	05/08/95	05/07/95	05/07/95	05/08/95
DEPTH	9-11'					
PESTICIDE/PCBS (ug/kg)						
ALPHA-BHC	1.9 U	2 U	1.9 U	1.9 U	2.4 U	1.8 U
BETA-BHC	1.9 U	2 U	1.9 U	1.9 U	2.4 U	1.8 U
DELTA-BHC	1.9 U	2 U	1.9 U	1.9 U	2.4 U	1.8 U
GAMMA-BHC(LINDANE)	1.9 U	2 U	1.9 U	1.9 U	2.4 U	1.8 U
HEPTACHLOR	1.9 U	2 U	1.9 U	1.9 U	2.4 U	1.8 U
ALDRIN	1.9 U	2 U	1.9 U	1.9 U	2.4 U	1.8 U
HEPTACHLOR EPOXIDE	1.9 U	2 U	1.9 U	1.9 U	2.4 U	1.8 U
ENDOSULFAN I	1.9 U	2 U	1.9 U	1.9 U	3.1 NJ	1.8 U
DIELDRIN	3.6 U	3.9 U	3.6 U	3.6 U	4.6 U	3.6 U
4,4'-DDE	3.6 U	3.9 U	28	45 J	38 J	3.6 U
ENDRIN	3.6 U	3.9 U	3.6 U	3.6 U	4.6 U	3.6 U
ENDOSULFAN II	3.6 U	3.9 U	3.6 U	3.6 U	4.6 U	3.6 U
4,4'-DDD	3.6 U	3.9 U	7.3 J	140	340 J	3.6 U
ENDOSULFAN SULFATE	3.6 U	3.9 U	3.6 U	3.6 U	4.6 U	3.6 U
4,4'-DDT	3.6 U	3.9 U	15	31	9.6	3.6 U
METHOXYCHLOR	19 U	20 UJ	19 UJ	19 UJ	24 UJ	18 UJ
ENDRIN KETONE	3.6 U	3.9 U	3.6 U	3.6 U	4.6 U	3.6 U
ENDRIN ALDEHYDE	3.6 U	3.9 U	3.6 U	3.6 U	4.6 U	3.6 U
ALPHA CHLORDANE	1.9 U	2 U	1.9 U	1.9 U	2.4 U	1.8 U
GAMMA CHLORDANE	1.9 U	2 U	1.9 U	3.1 J	2.4 U	1.8 U
TOXAPHENE	190 U	200 U	190 U	190 U	240 U	180 U
PCB-1016	36 U	39 U	36 U	36 U	46 U	36 U
PCB-1221	74 U	79 U	73 U	74 U	94 U	73 U
PCB-1232	36 U	39 U	36 U	36 U	46 U	36 U
PCB-1242	36 U	39 U	36 U	36 U	46 U	36 U
PCB-1248	36 U	39 U	36 U	36 U	46 U	36 U
PCB-1254	36 U	39 U	36 U	36 U	46 U	36 U
PCB-1260	36 U	39 U	36 U	36 U	46 U	36 U

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-TP07
DATE COLLECTED	05/07/95
DEPTH	
PESTICIDE/PCBS (ug/kg)	
ALPHA-BHC	1.9 U
BETA-BHC	1.9 U
DELTA-BHC	1.9 U
GAMMA-BHC(LINDANE)	1.9 U
HEPTACHLOR	1.9 U
ALDRIN	1.9 U
HEPTACHLOR EPOXIDE	1.9 U
ENDOSULFAN I	1.9 U
DIELDRIN	3.6 U
4,4'-DDE	43 J
ENDRIN	3.6 U
ENDOSULFAN II	3.6 U
4,4'-DDD	110
ENDOSULFAN SULFATE	3.6 U
4,4'-DDT	40
METHOXYCHLOR	19 UJ
ENDRIN KETONE	3.6 U
ENDRIN ALDEHYDE	3.6 U
ALPHA CHLORDANE	1.9 U
GAMMA CHLORDANE	3 J
TOXAPHENE	190 U
PCB-1016	36 U
PCB-1221	73 U
PCB-1232	36 U
PCB-1242	36 U
PCB-1248	36 U
PCB-1254	36 U
PCB-1260	36 U

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED DEPTH	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
PESTICIDE/PCBS (ug/kg)						
ALPHA-BHC	1.8 U	2.4 U	ND	ND		0/19
BETA-BHC	1.8 U	2.4 U	ND	ND		0/19
DELTA-BHC	1.8 U	2.4 U	ND	ND		0/19
GAMMA-BHC(LINDANE)	1.8 U	2.4 U	ND	ND		0/19
HEPTACHLOR	1.8 U	2.4 U	ND	ND		0/19
ALDRIN	1.8 U	2.4 U	ND	ND		0/19
HEPTACHLOR EPOXIDE	1.8 U	2.4 U	ND	ND		0/19
ENDOSULFAN I	1.8 U	2.3 U	3.1 NJ	3.1 NJ	65-TP05	1/19
DIELDRIN	3.4 U	4.6 U	ND	ND		0/19
4,4'-DDE	3.4 U	4.4 U	4.6	45 J	65-TP04	8/19
ENDRIN	3.4 U	4.6 U	ND	ND		0/19
ENDOSULFAN II	3.4 U	4.6 U	ND	ND		0/19
4,4'-DDD	3.4 UJ	4.4 UJ	4.4 J	340 J	65-TP05	8/19
ENDOSULFAN SULFATE	3.4 U	4.6 U	ND	ND		0/19
4,4'-DDT	3.4 U	37 U	9.6	40	65-TP07	4/19
METHOXYCHLOR	18 U	24 UJ	ND	ND		0/19
ENDRIN KETONE	3.4 U	4.6 U	ND	ND		0/19
ENDRIN ALDEHYDE	3.4 U	4.6 U	9.4 J	9.4 J	65-DW01-04	1/19
ALPHA CHLORDANE	1.8 U	2.4 U	8.3 J	8.3 J	65-SB06-02	1/19
GAMMA CHLORDANE	1.8 U	2.4 U	3 J	7.5 J	65-SB06-02	3/19
TOXAPHENE	180 U	240 U	ND	ND		0/19
PCB-1016	34 U	46 U	ND	ND		0/19
PCB-1221	70 U	94 U	ND	ND		0/19
PCB-1232	34 U	46 U	ND	ND		0/19
PCB-1242	34 U	46 U	ND	ND		0/19
PCB-1248	34 U	46 U	ND	ND		0/19
PCB-1254	34 U	46 U	ND	ND		0/19
PCB-1260	34 U	46 U	ND	ND		0/19

APPENDIX O.4
SUBSURFACE SOIL METALS

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION	65-DW01-04	65-DW02-02	65-DW04-05	65-MW05A-04	65-MW06A-03	65-MW07A-05
DATE COLLECTED	04/10/95	04/09/95	04/05/95	04/05/95	04/08/95	04/04/95
DEPTH	7-9'	3-5'	9-11'	7-9'	5-7'	9-11'
MOISTURE	13.13	16.36	4.68	14.25	9.72	13.65
ANALYTES (mg/kg)						
ALUMINUM	4840	1020	4560	1380	3790	1050
ANTIMONY	11.5 U	12 U	10.5 U	11.7 U	11.1 U	11.6 U
ARSENIC	2.3 U	2.4 U	2.1 U	2.3 U	2.2 U	2.3 U
BARIUM	35.5	5.6	10.9	2.7	3.3	3.5
BERYLLIUM	0.23 U	0.24 U	0.21 U	0.23 U	0.22 U	0.23 U
CADMIUM	1.2 U	1.2 U	1 U	1.2 U	1.1 U	1.2 U
CALCIUM	1040	320	111	57.4 U	208	90.6
CHROMIUM	10.8	2.4 U	5.7	2.8	2.6	2.3 U
COBALT	4.6 UJ	4.8 UJ	6.4 U	8.7 U	4.4 UJ	7.2 U
COPPER	55.8	2.4 U	2.1 U	2.3 U	2.2 U	2.3 U
IRON	9120 J	1250 J	925	686	236 J	412
LEAD	159 J	2.9 J	2.7	1.6	2.1 J	1.7
MAGNESIUM	159	23.8	192	83.1	102	67.1
MANGANESE	127 J	4.8 J	5.6	3	3.2 J	2
MERCURY	0.12 U	0.12 U	0.1 U	0.12 U	0.11 U	0.12 U
NICKEL	8.9	4.8 U	4.2 U	4.7 U	4.4 U	4.6 U
POTASSIUM	230 U	239 U	210 U	233 U	221 U	231 U
SELENIUM	1.2 U	1.2 U	1 U	1.2 U	1.1 U	1.2 U
SILVER	1.2 U	1.2 U	1 U	1.2 U	1.1 U	1.2 U
SODIUM	46 U	47.8 U	69.9	46.6 U	44.3 U	46.3 U
THALLIUM	2.3 U	2.4 U	2.1 U	2.3 U	2.2 U	2.3 U
VANADIUM	9.8	2.4 U	4.1	3.1	2.2 U	2.3 U
ZINC	302 J	4.2 J	6.9 U	3.7 U	2.5 J	4.5 U

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION	65-SB06-02	65-SB07-04	65-SB08-04	65-SB09-02	65-SB10-01	65-SB11-04
DATE COLLECTED	04/10/95	04/08/95	04/11/95	04/08/95	04/08/95	04/08/95
DEPTH	3-5'	7-9'	7-9'	3-5'	1-3'	7-9'
MOISTURE	19.19	26.15	19.45	10.99	12.23	15.06
ANALYTES (mg/kg)						
ALUMINUM	4340	10600	3190	5730	4720	6440
ANTIMONY	12.4 U	13.6 U	12.4 U	11.2 U	11.4 U	11.8 U
ARSENIC	3.3	2.8	2.5 U	2.2 U	2.3 U	2.4 U
BARIUM	38.3	17.5	6.4	16.4	11.6	9.4
BERYLLIUM	0.25 U	0.27 U	0.25 U	0.22 U	0.23 U	0.24 U
CADMIUM	1.3	1.4 U	1.2 U	1.1 U	1.1 U	1.2 U
CALCIUM	1350	49.8	103	628	511	219
CHROMIUM	10.4	17.3	7.3	7.8	6.4	7.7
COBALT	5 UJ	5.4 UJ	5 UJ	4.5 UJ	4.6 UJ	4.7 UJ
COPPER	478	2.7 U	2.5 U	11.5	12.2	2.4 U
IRON	31300	8890 J	7850	2450 J	2610 J	1570 J
LEAD	539	6.9 J	3.6	24.6 J	19.1 J	3.4 J
MAGNESIUM	180	410	223	201	183	309
MANGANESE	471	3.7 J	2.7	21.1 J	15.1 J	3.4 J
MERCURY	0.12 U	0.14 U	0.12 U	0.11 U	0.11 U	0.12 U
NICKEL	243	5.4 U	5 U	4.5 U	4.6 U	4.7 U
POTASSIUM	248 U	453	292	253	228 U	284
SELENIUM	1.2 U	1.4 U	1.2 U	1.1 U	1.1 U	1.2 U
SILVER	1.2 U	1.4 U	1.2 U	1.1 U	1.1 U	1.2 U
SODIUM	63.9	130	50.8	44.9 U	45.6 U	47.1 U
THALLIUM	4.2	2.7 U	2.5 U	2.2 U	2.3 U	2.4 U
VANADIUM	11.1	27.2	10.5	5	5.9	6.2
ZINC	764	7.8 J	5.3	44.7 J	41.7 J	15.2 J

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION	65-SB12-05	65-TP01	65-TP02	65-TP04	65-TP05	65-TP06
DATE COLLECTED	04/17/95	05/07/95	05/08/95	05/07/95	05/07/95	05/08/95
DEPTH	9-11'					
MOISTURE	10.3					
ANALYTES (mg/kg)						
ALUMINUM	5190	2750	4740	5030	5730	2590
ANTIMONY	11.1 U	12 U	11 U	11.3 U	14.4 U	10.9 U
ARSENIC	2.2 U	2.4 U	2.2 U	2.6	2.9 U	2.2 U
BARIUM	10.1	4.2	9.9	21.6	34.7	6.4
BERYLLIUM	0.22 U	0.24 U	0.22 U	0.23 U	0.29 U	0.22 U
CADMIUM	1.1 U	1.2 U	1.1 U	1.3	1.4 U	1.1 U
CALCIUM	587	259	439	847	1270	130
CHROMIUM	4.8	2.4 U	4.4	8.5	6.6	3.2
COBALT	4.5 U	4.8 U	4.4 U	4.5 U	5.7 U	4.3 U
COPPER	2.2 U	2.4 U	7.7	61.4	29.4	2.2 U
IRON	1010	571	1010	4290	3640	992
LEAD	3.1	3.7	12.1	129	59.2	4.9
MAGNESIUM	122	57.7	80.7	193	223	82.1
MANGANESE	4.9	10.1	11.5	132	60.2	13.3
MERCURY	0.11 U	0.12 U	0.11 U	0.11 U	0.14 U	0.11 U
NICKEL	4.5 U	4.8 U	4.4 U	4.5 U	5.7 U	4.3 U
POTASSIUM	223 U	240 U	220 U	225 U	287 U	217 U
SELENIUM	1.1 U	1.2 U	1.1 U	1.1 U	1.4 U	1.1 U
SILVER	1.1 U	1.2 U	1.1 U	1.1 U	1.4 U	1.1 U
SODIUM	44.6 U	48 U	44 U	45 U	110	43.5 U
THALLIUM	2.2 U	2.4 U	2.2 U	2.3 U	2.9 U	2.2 U
VANADIUM	3.5	2.4 U	3.4	8.9	5.3	3.5
ZINC	5.5	11.4	30.6	480	158	10.1

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION	65-TP07
DATE COLLECTED	05/07/95
DEPTH	
MOISTURE	
ANALYTES (mg/kg)	
ALUMINUM	3680
ANTIMONY	11.8
ARSENIC	2.2 U
BARIUM	31.8
BERYLLIUM	0.22 U
CADMIUM	1.1 U
CALCIUM	1230
CHROMIUM	8.2
COBALT	11.5
COPPER	672
IRON	9170
LEAD	210
MAGNESIUM	136
MANGANESE	223
MERCURY	0.11 U
NICKEL	4.8
POTASSIUM	221 U
SELENIUM	1.5
SILVER	4.2
SODIUM	44.2 U
THALLIUM	2.2 U
VANADIUM	9.1
ZINC	418

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION DATE COLLECTED DEPTH MOISTURE	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
ANALYTES (mg/kg)						
ALUMINUM	NA	NA	1020	10600	65-SB07-04	19/19
ANTIMONY	10.5 U	14.4 U	11.8	11.8	65-TP07	1/19
ARSENIC	2.1 U	2.9 U	2.6	3.3	65-SB06-02	3/19
BARIUM	NA	NA	2.7	38.3	65-SB06-02	19/19
BERYLLIUM	0.21 U	0.29 U	ND	ND		0/19
CADMIUM	1 U	1.4 U	1.3	1.3	65-TP04	2/19
CALCIUM	57.4 U	57.4 U	49.8	1350	65-SB06-02	18/19
CHROMIUM	2.3 U	2.4 U	2.6	17.3	65-SB07-04	16/19
COBALT	4.3 U	8.7 U	11.5	11.5	65-TP07	1/19
COPPER	2.1 U	2.7 U	7.7	672	65-TP07	8/19
IRON	NA	NA	236 J	31300	65-SB06-02	19/19
LEAD	NA	NA	1.6	539	65-SB06-02	19/19
MAGNESIUM	NA	NA	23.8	410	65-SB07-04	19/19
MANGANESE	NA	NA	2	471	65-SB06-02	19/19
MERCURY	0.1 U	0.14 U	ND	ND		0/19
NICKEL	4.2 U	5.7 U	4.8	243	65-SB06-02	3/19
POTASSIUM	210 U	287 U	253	453	65-SB07-04	4/19
SELENIUM	1 U	1.4 U	1.5	1.5	65-TP07	1/19
SILVER	1 U	1.4 U	4.2	4.2	65-TP07	1/19
SODIUM	43.5 U	48 U	50.8	130	65-SB07-04	5/19
THALLIUM	2.1 U	2.9 U	4.2	4.2	65-SB06-02	1/19
VANADIUM	2.2 U	2.4 U	3.1	27.2	65-SB07-04	15/19
ZINC	3.7 U	6.9 U	2.5 J	764	65-SB06-02	16/19

APPENDIX O.5
GROUNDWATER ORGANICS

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-DW01-01	65-DW02-01	65-DW02-02	65-DW04-01	65-MW01A-01	65-MW02A-01
DATE COLLECTED	05/08/95	05/09/95	05/18/95	05/16/95	05/08/95	05/09/95
VOLATILES (ug/L)						
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U	10 U
VINYL CHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROETHANE	10 UJ	10 U	10 U	10 U	10 UJ	10 U
METHYLENE CHLORIDE	10 U	1 J	10 U	10 U	10 U	1 J
ACETONE	10 U	5 J	5 J	10 U	10 U	5 J
CARBON DISULFIDE	10 U	10 U	10 U	10 U	10 U	10 U
1,1-DICHLOROETHENE	10 U	10 U	10 U	10 U	10 U	10 U
1,1-DICHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U
1,2-DICHLOROETHENE	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROFORM	10 U	10 U	10 U	10 U	10 U	10 U
1,2-DICHLOROETHANE	2 J	2 J	10 U	10 U	2 J	10 U
2-BUTANONE	10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-TRICHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U
CARBON TETRACHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U
BROMODICHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U
1,2-DICHLOROPROPANE	10 U	10 U	10 U	10 U	10 U	10 U
CIS-1,3-DICHLOROPROPENE	10 U	10 U	10 U	10 U	10 U	10 U
TRICHLOROETHENE	10 U	10 U	10 U	10 U	10 U	10 U
DIBROMOCHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-TRICHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U
BENZENE	10 U	10 U	10 U	10 U	10 U	10 U
TRANS-1,3-DICHLOROPROPENE	10 U	10 U	10 U	10 U	10 U	10 U
BROMOFORM	10 U	10 U	10 U	10 U	10 U	10 U
4-METHYL-2-PENTANONE	10 U	10 U	10 U	10 U	10 U	10 U
2-HEXANONE	10 U	10 U	10 U	10 U	10 U	10 U
TETRACHLOROETHENE	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-TETRACHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U
TOLUENE	10 U	10 U	10 U	10 U	10 U	10 U
CHLOROBENZENE	10 U	10 U	10 U	10 U	10 U	10 U
ETHYLBENZENE	10 U	10 U	10 U	10 U	10 U	10 U
STYRENE	10 U	10 U	10 U	10 U	10 U	10 U
TOTAL XYLENES	10 U	10 U	10 U	10 U	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-MW03-01	65-MW04A-01	65-MW05A-01	65-MW06A-01	65-MW07A-01
DATE COLLECTED	05/09/95	05/16/95	05/09/95	05/09/95	05/09/95
VOLATILES (ug/L)					
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U
VINYL CHLORIDE	10 U	10 U	10 U	10 U	10 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U
METHYLENE CHLORIDE	1 J	10 U	1 J	2 J	1 J
ACETONE	7 J	14 U	5 J	7 J	5 J
CARBON DISULFIDE	10 U	5 J	10 U	10 U	10 U
1,1-DICHLOROETHENE	10 U	10 U	10 U	10 U	10 U
1,1-DICHLOROETHANE	10 U	10 U	10 U	10 U	10 U
1,2-DICHLOROETHENE	10 U	10 U	10 U	10 U	10 U
CHLOROFORM	10 U	10 U	10 U	10 U	10 U
1,2-DICHLOROETHANE	2 J	2 J	2 J	2 J	2 J
2-BUTANONE	1 J	10 U	1 J	1 J	10 U
1,1,1-TRICHLOROETHANE	10 U	10 U	10 U	10 U	10 U
CARBON TETRACHLORIDE	10 U	10 U	10 U	10 U	10 U
BROMODICHLOROMETHANE	10 U	10 U	10 U	10 U	10 U
1,2-DICHLOROPROPANE	10 U	10 U	10 U	10 U	10 U
CIS-1,3-DICHLOROPROPENE	10 U	10 U	10 U	10 U	10 U
TRICHLOROETHENE	10 U	10 U	10 U	10 U	10 U
DIBROMOCHLOROMETHANE	10 U	10 U	10 U	10 U	10 U
1,1,2-TRICHLOROETHANE	10 U	10 U	10 U	10 U	10 U
BENZENE	10 U	10 U	10 U	10 U	10 U
TRANS-1,3-DICHLOROPROPENE	10 U	10 U	10 U	10 U	10 U
BROMOFORM	10 U	10 U	10 U	10 U	10 U
4-METHYL-2-PENTANONE	10 U	10 U	10 U	10 U	10 U
2-HEXANONE	10 U	10 U	10 U	10 U	10 U
TETRACHLOROETHENE	10 U	10 U	10 U	10 U	10 U
1,1,2,2-TETRACHLOROETHANE	10 U	10 U	10 U	10 U	10 U
TOLUENE	10 U	10 U	10 U	10 U	10 U
CHLOROBENZENE	10 U	10 U	10 U	10 U	10 U
ETHYLBENZENE	10 U	10 U	10 U	10 U	10 U
STYRENE	10 U	10 U	10 U	10 U	10 U
TOTAL XYLENES	10 U	10 U	10 U	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
VOLATILES (ug/L)						
CHLOROMETHANE	10 U	10 U	ND	ND		0/11
BROMOMETHANE	10 U	10 U	ND	ND		0/11
VINYL CHLORIDE	10 U	10 U	ND	ND		0/11
CHLOROETHANE	10 UJ	10 UJ	ND	ND		0/11
METHYLENE CHLORIDE	10 U	10 U	1 J	2 J	65-MW06A-01	6/11
ACETONE	10 U	14 U	5 J	7 J	65-MW06A-01	7/11
CARBON DISULFIDE	10 U	10 U	5 J	5 J	65-MW04A-01	1/11
1,1-DICHLOROETHENE	10 U	10 U	ND	ND		0/11
1,1-DICHLOROETHANE	10 U	10 U	ND	ND		0/11
1,2-DICHLOROETHENE	10 U	10 U	ND	ND		0/11
CHLOROFORM	10 U	10 U	ND	ND		0/11
1,2-DICHLOROETHANE	10 U	10 U	2 J	2 J	65-MW07A-01	8/11
2-BUTANONE	10 U	10 U	1 J	1 J	65-MW06A-01	3/11
1,1,1-TRICHLOROETHANE	10 U	10 U	ND	ND		0/11
CARBON TETRACHLORIDE	10 U	10 U	ND	ND		0/11
BROMODICHLOROMETHANE	10 U	10 U	ND	ND		0/11
1,2-DICHLOROPROPANE	10 U	10 U	ND	ND		0/11
CIS-1,3-DICHLOROPROPENE	10 U	10 U	ND	ND		0/11
TRICHLOROETHENE	10 U	10 U	ND	ND		0/11
DIBROMOCHLOROMETHANE	10 U	10 U	ND	ND		0/11
1,1,2-TRICHLOROETHANE	10 U	10 U	ND	ND		0/11
BENZENE	10 U	10 U	ND	ND		0/11
TRANS-1,3-DICHLOROPROPENE	10 U	10 U	ND	ND		0/11
BROMOFORM	10 U	10 U	ND	ND		0/11
4-METHYL-2-PENTANONE	10 U	10 U	ND	ND		0/11
2-HEXANONE	10 U	10 U	ND	ND		0/11
TETRACHLOROETHENE	10 U	10 U	ND	ND		0/11
1,1,2,2-TETRACHLOROETHANE	10 U	10 U	ND	ND		0/11
TOLUENE	10 U	10 U	ND	ND		0/11
CHLOROBENZENE	10 U	10 U	ND	ND		0/11
ETHYLBENZENE	10 U	10 U	ND	ND		0/11
STYRENE	10 U	10 U	ND	ND		0/11
TOTAL XYLENES	10 U	10 U	ND	ND		0/11

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-DW01-01	65-DW02-01	65-DW02-02	65-DW04-01	65-MW01A-01	65-MW02A-01
DATE COLLECTED	05/08/95	05/09/95	05/18/95	05/16/95	05/08/95	05/09/95
SEMIVOLATILES (ug/L)						
PHENOL	10 U	10 U	10 U	10 U	10 U	10 U
BIS(2-CHLOROETHYL)ETHER	10 U	10 U	10 U	10 U	10 U	10 U
2-CHLOROPHENOL	10 U	10 U	10 U	10 U	10 U	10 U
1,3-DICHLOROBENZENE	10 U	10 U	10 U	10 U	10 U	10 U
1,4-DICHLOROBENZENE	10 U	10 U	10 U	10 U	10 U	10 U
1,2-DICHLOROBENZENE	10 U	10 U	10 U	10 U	10 U	10 U
2-METHYLPHENOL	10 U	10 U	10 U	10 U	10 U	10 U
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	10 U	10 U	10 U	10 U	10 U
4-METHYLPHENOL	10 U	10 U	10 U	10 U	10 U	10 U
N-NITROSO-DI-N-PROPYLAMINE	10 U	10 U	10 U	10 U	10 U	10 U
HEXACHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U
NITROBENZENE	10 U	10 U	10 U	10 U	10 U	10 U
ISOPHORONE	10 U	10 U	10 U	10 U	10 U	10 U
2-NITROPHENOL	10 U	10 U	10 U	10 U	10 U	10 U
2,4-DIMETHYLPHENOL	10 U	10 U	10 U	10 U	10 U	10 U
BIS(2-CHLOROETHOXY)METHANE	10 U	10 U	10 U	10 U	10 U	10 U
2,4-DICHLOROPHENOL	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-TRICHLOROBENZENE	10 U	10 U	10 U	10 U	10 U	10 U
NAPHTHALENE	10 U	10 U	10 U	3 J	10 U	10 U
4-CHLOROANILINE	10 U	10 U	10 U	10 U	10 U	10 U
HEXACHLOROBUTADIENE	10 U	10 U	10 U	10 U	10 U	10 U
4-CHLORO-3-METHYLPHENOL	10 U	10 U	10 U	10 U	10 U	10 U
2-METHYLNAPHTHALENE	10 U	10 U	10 U	10 U	10 U	10 U
HEXACHLOROCYCLOPENTADIENE	10 U	10 U	10 U	10 R	10 U	10 U
2,4,6-TRICHLOROPHENOL	10 U	10 U	10 U	10 U	10 U	10 U
2,4,5-TRICHLOROPHENOL	25 U	25 U	25 U	25 U	25 U	25 U
2-CHLORONAPHTHALENE	10 U	10 U	10 U	10 U	10 U	10 U
2-NITROANILINE	25 U	25 U	25 U	25 U	25 U	25 U
DIMETHYL PHTHALATE	10 U	10 U	10 U	10 U	10 U	10 U
ACENAPHTHYLENE	10 U	10 U	10 U	10 U	10 U	10 U
2,6-DINITROTOLUENE	10 U	10 U	10 U	10 U	10 U	10 U
3-NITROANILINE	25 U	25 U	25 U	25 U	25 U	25 U
ACENAPHTHENE	10 U	10 U	10 U	10 U	10 U	10 U
2,4-DINITROPHENOL	25 UJ	25 U	25 U	25 R	25 UJ	25 U
4-NITROPHENOL	25 U	25 U	25 U	25 U	25 U	25 U
DIBENZOFURAN	10 U	10 U	10 U	10 U	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-DW01-01	65-DW02-01	65-DW02-02	65-DW04-01	65-MW01A-01	65-MW02A-01
DATE COLLECTED	05/08/95	05/09/95	05/18/95	05/16/95	05/08/95	05/09/95
SEMIVOLATILES (ug/L) cont.						
2,4-DINITROTOLUENE	10 U	10 U	10 U	10 U	10 U	10 U
DIETHYL PHTHALATE	10 U	10 U	10 U	10 U	10 U	10 U
4-CHLOROPHENYLPHENYL ETHER	10 U	10 U	10 U	10 U	10 U	10 U
FLUORENE	10 U	10 U	10 U	10 U	10 U	10 U
4-NITROANILINE	25 U	25 U	25 U	25 U	25 U	25 U
4,6-DINITRO-2-METHYLPHENOL	25 U	25 U	25 U	25 U	25 U	25 U
N-NITROSODIPHENYLAMINE	10 U	10 U	10 U	10 U	10 U	10 U
4-BROMOPHENYL PHENYL ETHER	10 U	10 U	10 U	10 U	10 U	10 U
HEXACHLOROBENZENE	10 U	10 U	10 U	10 U	10 U	10 U
PENTACHLOROPHENOL	25 U	25 U	25 U	25 U	25 U	25 U
PHENANTHRENE	10 U	10 U	10 U	10 U	10 U	10 U
ANTHRACENE	10 U	10 U	10 U	10 U	10 U	10 U
CARBAZOLE	10 U	10 U	10 U	10 U	10 U	10 U
DI-N-BUTYL PHTHALATE	10 U	3 J	10 U	10 U	10 U	10 U
FLUORANTHENE	10 U	10 U	10 U	10 U	10 U	10 U
PYRENE	10 U	10 U	10 U	10 U	10 U	10 U
BUTYL BENZYL PHTHALATE	10 U	10 U	10 U	10 U	10 U	10 U
3,3'-DICHLOROBENZIDINE	10 U	10 U	10 U	10 U	10 U	10 U
BENZO(A)ANTHRACENE	10 U	10 U	10 U	10 U	10 U	10 U
CHRYSENE	10 U	10 U	10 U	10 U	10 U	10 U
BIS(2-ETHYLHEXYL)PHTHALATE	1 J	4 J	10 U	10 U	1 J	10 U
DI-N-OCTYL PHTHALATE	10 U	10 U	10 U	10 U	10 U	10 U
BENZO(B)FLUORANTHENE	10 U	10 U	10 U	10 U	10 U	10 U
BENZO(K)FLUORANTHENE	10 U	10 U	10 U	10 U	10 U	10 U
BENZO(A)PYRENE	10 U	10 U	10 U	10 U	10 U	10 U
INDENO(1,2,3-CD)PYRENE	10 U	10 U	10 U	10 U	10 U	10 U
DIBENZO(A,H)ANTHRACENE	10 U	10 U	10 U	10 U	10 U	10 U
BENZO(G,H,I)PERYLENE	10 U	10 U	10 U	10 U	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-MW03-01	65-MW04A-01	65-MW05A-01	65-MW06A-01	65-MW07A-01
DATE COLLECTED	05/09/95	05/16/95	05/09/95	05/09/95	05/09/95
SEMIVOLATILES (ug/L)					
PHENOL	10 U	10 U	10 U	10 U	10 U
BIS(2-CHLOROETHYL)ETHER	10 U	10 U	10 U	10 U	10 U
2-CHLOROPHENOL	10 U	10 U	10 U	10 U	10 U
1,3-DICHLOROBENZENE	10 U	10 U	10 U	10 U	10 U
1,4-DICHLOROBENZENE	10 U	10 U	10 U	10 U	10 U
1,2-DICHLOROBENZENE	10 U	10 U	10 U	10 U	10 U
2-METHYLPHENOL	10 U	10 U	10 U	10 U	10 U
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	10 U	10 U	10 U	10 U
4-METHYLPHENOL	10 U	10 U	10 U	10 U	10 U
N-NITROSO-DI-N-PROPYLAMINE	10 U	10 U	10 U	10 U	10 U
HEXACHLOROETHANE	10 U	10 U	10 U	10 U	10 U
NITROBENZENE	10 U	10 U	10 U	10 U	10 U
ISOPHORONE	10 U	10 U	10 U	10 U	10 U
2-NITROPHENOL	10 U	10 U	10 U	10 U	10 U
2,4-DIMETHYLPHENOL	10 U	10 U	10 U	10 U	10 U
BIS(2-CHLOROETHOXY)METHANE	10 U	10 U	10 U	10 U	10 U
2,4-DICHLOROPHENOL	10 U	10 U	10 U	10 U	10 U
1,2,4-TRICHLOROBENZENE	10 U	10 U	10 U	10 U	10 U
NAPHTHALENE	10 U	10 U	10 U	10 U	10 U
4-CHLOROANILINE	10 U	10 U	10 U	10 U	10 U
HEXACHLOROBUTADIENE	10 U	10 U	10 U	10 U	10 U
4-CHLORO-3-METHYLPHENOL	10 U	10 U	10 U	10 U	10 U
2-METHYLNAPHTHALENE	10 U	10 U	10 U	10 U	10 U
HEXACHLOROCYCLOPENTADIENE	10 U	10 R	10 U	10 U	10 U
2,4,6-TRICHLOROPHENOL	10 U	10 U	10 U	10 U	10 U
2,4,5-TRICHLOROPHENOL	25 U	25 U	25 U	25 U	25 U
2-CHLORONAPHTHALENE	10 U	10 U	10 U	10 U	10 U
2-NITROANILINE	25 U	25 U	25 U	25 U	25 U
DIMETHYL PHTHALATE	10 U	10 U	10 U	10 U	10 U
ACENAPHTHYLENE	10 U	10 U	10 U	10 U	10 U
2,6-DINITROTOLUENE	10 U	10 U	10 U	10 U	10 U
3-NITROANILINE	25 U	25 U	25 U	25 U	25 U
ACENAPHTHENE	10 U	10 U	10 U	10 U	10 U
2,4-DINITROPHENOL	25 U	25 R	25 U	25 U	25 U
4-NITROPHENOL	25 U	25 U	25 U	25 U	25 U
DIBENZOFURAN	10 U	10 U	10 U	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-MW03-01	65-MW04A-01	65-MW05A-01	65-MW06A-01	65-MW07A-01
DATE COLLECTED	05/09/95	05/16/95	05/09/95	05/09/95	05/09/95
SEMIVOLATILES (ug/L) cont.					
2,4-DINITROTOLUENE	10 U	10 U	10 U	10 U	10 U
DIETHYL PHTHALATE	10 U	10 U	10 U	10 U	10 U
4-CHLOROPHENYLPHENYL ETHER	10 U	10 U	10 U	10 U	10 U
FLUORENE	10 U	10 U	10 U	10 U	10 U
4-NITROANILINE	25 U	25 U	25 U	25 U	25 U
4,6-DINITRO-2-METHYLPHENOL	25 U	25 U	25 U	25 U	25 U
N-NITROSODIPHENYLAMINE	10 U	10 U	10 U	10 U	10 U
4-BROMOPHENYL PHENYL ETHER	10 U	10 U	10 U	10 U	10 U
HEXACHLOROBENZENE	10 U	10 U	10 U	10 U	10 U
PENTACHLOROPHENOL	25 U	25 U	25 U	25 U	25 U
PHENANTHRENE	10 U	10 U	10 U	10 U	10 U
ANTHRACENE	10 U	10 U	10 U	10 U	10 U
CARBAZOLE	10 U	10 U	10 U	10 U	10 U
DI-N-BUTYL PHTHALATE	2 J	10 U	10 U	10 U	6 J
FLUORANTHENE	10 U	10 U	10 U	10 U	10 U
PYRENE	10 U	10 U	10 U	10 U	10 U
BUTYL BENZYL PHTHALATE	10 U	10 U	10 U	10 U	10 U
3,3'-DICHLOROBENZIDINE	10 U	10 U	10 U	10 U	10 U
BENZO(A)ANTHRACENE	10 U	10 U	10 U	10 U	10 U
CHRYSENE	10 U	10 U	10 U	10 U	10 U
BIS(2-ETHYLHEXYL)PHTHALATE	2 J	10 U	10 U	10 U	6 J
DI-N-OCTYL PHTHALATE	10 U	10 U	10 U	10 U	10 U
BENZO(B)FLUORANTHENE	10 U	10 U	10 U	10 U	10 U
BENZO(K)FLUORANTHENE	10 U	10 U	10 U	10 U	10 U
BENZO(A)PYRENE	10 U	10 U	10 U	10 U	10 U
INDENO(1,2,3-CD)PYRENE	10 U	10 U	10 U	10 U	10 U
DIBENZO(A,H)ANTHRACENE	10 U	10 U	10 U	10 U	10 U
BENZO(G,H,I)PERYLENE	10 U	10 U	10 U	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/L)						
PHENOL	10 U	10 U	ND	ND		0/11
BIS(2-CHLOROETHYL)ETHER	10 U	10 U	ND	ND		0/11
2-CHLOROPHENOL	10 U	10 U	ND	ND		0/11
1,3-DICHLOROBENZENE	10 U	10 U	ND	ND		0/11
1,4-DICHLOROBENZENE	10 U	10 U	ND	ND		0/11
1,2-DICHLOROBENZENE	10 U	10 U	ND	ND		0/11
2-METHYLPHENOL	10 U	10 U	ND	ND		0/11
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	10 U	ND	ND		0/11
4-METHYLPHENOL	10 U	10 U	ND	ND		0/11
N-NITROSO-DI-N-PROPYLAMINE	10 U	10 U	ND	ND		0/11
HEXACHLOROETHANE	10 U	10 U	ND	ND		0/11
NITROBENZENE	10 U	10 U	ND	ND		0/11
ISOPHORONE	10 U	10 U	ND	ND		0/11
2-NITROPHENOL	10 U	10 U	ND	ND		0/11
2,4-DIMETHYLPHENOL	10 U	10 U	ND	ND		0/11
BIS(2-CHLOROETHOXY)METHANE	10 U	10 U	ND	ND		0/11
2,4-DICHLOROPHENOL	10 U	10 U	ND	ND		0/11
1,2,4-TRICHLOROBENZENE	10 U	10 U	ND	ND		0/11
NAPHTHALENE	10 U	10 U	3 J	3 J	65-DW04-01	1/11
4-CHLOROANILINE	10 U	10 U	ND	ND		0/11
HEXACHLOROBUTADIENE	10 U	10 U	ND	ND		0/11
4-CHLORO-3-METHYLPHENOL	10 U	10 U	ND	ND		0/11
2-METHYLNAPHTHALENE	10 U	10 U	ND	ND		0/11
HEXACHLOROCYCLOPENTADIENE	10 U	10 U	ND	ND		0/9
2,4,6-TRICHLOROPHENOL	10 U	10 U	ND	ND		0/11
2,4,5-TRICHLOROPHENOL	25 U	25 U	ND	ND		0/11
2-CHLORONAPHTHALENE	10 U	10 U	ND	ND		0/11
2-NITROANILINE	25 U	25 U	ND	ND		0/11
DIMETHYL PHTHALATE	10 U	10 U	ND	ND		0/11
ACENAPHTHYLENE	10 U	10 U	ND	ND		0/11
2,6-DINITROTOLUENE	10 U	10 U	ND	ND		0/11
3-NITROANILINE	25 U	25 U	ND	ND		0/11
ACENAPHTHENE	10 U	10 U	ND	ND		0/11
2,4-DINITROPHENOL	25 UJ	25 UJ	ND	ND		0/9
4-NITROPHENOL	25 U	25 U	ND	ND		0/11
DIBENZOFURAN	10 U	10 U	ND	ND		0/11

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/L) cont.						
2,4-DINITROTOLUENE	10 U	10 U	ND	ND		0/11
DIETHYL PHTHALATE	10 U	10 U	ND	ND		0/11
4-CHLOROPHENYLPHENYL ETHER	10 U	10 U	ND	ND		0/11
FLUORENE	10 U	10 U	ND	ND		0/11
4-NITROANILINE	25 U	25 U	ND	ND		0/11
4,6-DINITRO-2-METHYLPHENOL	25 U	25 U	ND	ND		0/11
N-NITROSODIPHENYLAMINE	10 U	10 U	ND	ND		0/11
4-BROMOPHENYL PHENYL ETHER	10 U	10 U	ND	ND		0/11
HEXACHLOROBENZENE	10 U	10 U	ND	ND		0/11
PENTACHLOROPHENOL	25 U	25 U	ND	ND		0/11
PHENANTHRENE	10 U	10 U	ND	ND		0/11
ANTHRACENE	10 U	10 U	ND	ND		0/11
CARBAZOLE	10 U	10 U	ND	ND		0/11
DI-N-BUTYL PHTHALATE	10 U	10 U	2 J	6 J	65-MW07A-01	3/11
FLUORANTHENE	10 U	10 U	ND	ND		0/11
PYRENE	10 U	10 U	ND	ND		0/11
BUTYL BENZYL PHTHALATE	10 U	10 U	ND	ND		0/11
3,3'-DICHLOROBENZIDINE	10 U	10 U	ND	ND		0/11
BENZO(A)ANTHRACENE	10 U	10 U	ND	ND		0/11
CHRYSENE	10 U	10 U	ND	ND		0/11
BIS(2-ETHYLHEXYL)PHTHALATE	10 U	10 U	1 J	6 J	65-MW07A-01	5/11
DI-N-OCTYL PHTHALATE	10 U	10 U	ND	ND		0/11
BENZO(B)FLUORANTHENE	10 U	10 U	ND	ND		0/11
BENZO(K)FLUORANTHENE	10 U	10 U	ND	ND		0/11
BENZO(A)PYRENE	10 U	10 U	ND	ND		0/11
INDENO(1,2,3-CD)PYRENE	10 U	10 U	ND	ND		0/11
DIBENZO(A,H)ANTHRACENE	10 U	10 U	ND	ND		0/11
BENZO(G,H,I)PERYLENE	10 U	10 U	ND	ND		0/11

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-DW01-01	65-DW02-01	65-DW02-02	65-DW04-01	65-MW01A-01	65-MW02A-01
DATE COLLECTED	05/08/95	05/09/95	05/18/95	05/16/95	05/08/95	05/09/95
PESTICIDE/PCBS (ug/L)						
ALPHA-BHC	0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 U
BETA-BHC	0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 U
DELTA-BHC	0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 U
GAMMA-BHC(LINDANE)	0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 U
HEPTACHLOR	0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 U
ALDRIN	0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 U
HEPTACHLOR EPOXIDE	0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 U
ENDOSULFAN I	0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 U
DIELDRIN	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 U
4,4'-DDE	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 U
ENDRIN	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 U
ENDOSULFAN II	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 U
4,4'-DDD	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 U
ENDOSULFAN SULFATE	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 U
4,4'-DDT	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 U
METHOXYCHLOR	0.5 UJ	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 U
ENDRIN KETONE	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 U
ENDRIN ALDEHYDE	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 U
ALPHA CHLORDANE	0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 U
GAMMA CHLORDANE	0.05 UJ	0.05 U	0.05 U	0.05 UJ	0.05 UJ	0.05 U
TOXAPHENE	5 UJ	5 U	5 U	5 UJ	5 UJ	5 U
PCB-1016	1 UJ	1 U	1 U	1 UJ	1 UJ	1 U
PCB-1221	2 UJ	2 U	2 U	2 UJ	2 UJ	2 U
PCB-1232	1 UJ	1 U	1 U	1 UJ	1 UJ	1 U
PCB-1242	1 UJ	1 U	1 U	1 UJ	1 UJ	1 U
PCB-1248	1 UJ	1 U	1 U	1 UJ	1 UJ	1 U
PCB-1254	1 UJ	1 U	1 U	1 UJ	1 UJ	1 U
PCB-1260	1 UJ	1 U	1 U	1 UJ	1 UJ	1 U

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-MW03-01	65-MW04A-01	65-MW05A-01	65-MW06A-01	65-MW07A-01
DATE COLLECTED	05/09/95	05/16/95	05/09/95	05/09/95	05/09/95
PESTICIDE/PCBS (ug/L)					
ALPHA-BHC	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
BETA-BHC	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
DELTA-BHC	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
GAMMA-BHC(LINDANE)	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
HEPTACHLOR	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
ALDRIN	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
HEPTACHLOR EPOXIDE	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
ENDOSULFAN I	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
DIELDRIN	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
4,4'-DDE	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
ENDRIN	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
ENDOSULFAN II	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
4,4'-DDD	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
ENDOSULFAN SULFATE	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
4,4'-DDT	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
METHOXYCHLOR	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
ENDRIN KETONE	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
ENDRIN ALDEHYDE	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
ALPHA CHLORDANE	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
GAMMA CHLORDANE	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
TOXAPHENE	5 U	5 U	5 U	5 U	5 U
PCB-1016	1 U	1 U	1 U	1 U	1 U
PCB-1221	2 U	2 U	2 U	2 U	2 U
PCB-1232	1 U	1 U	1 U	1 U	1 U
PCB-1242	1 U	1 U	1 U	1 U	1 U
PCB-1248	1 U	1 U	1 U	1 U	1 U
PCB-1254	1 U	1 U	1 U	1 U	1 U
PCB-1260	1 U	1 U	1 U	1 U	1 U

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
PESTICIDE/PCBS (ug/L)						
ALPHA-BHC	0.05 UJ	0.05 UJ	ND	ND		0/11
BETA-BHC	0.05 UJ	0.05 UJ	ND	ND		0/11
DELTA-BHC	0.05 UJ	0.05 UJ	ND	ND		0/11
GAMMA-BHC(LINDANE)	0.05 UJ	0.05 UJ	ND	ND		0/11
HEPTACHLOR	0.05 UJ	0.05 UJ	ND	ND		0/11
ALDRIN	0.05 UJ	0.05 UJ	ND	ND		0/11
HEPTACHLOR EPOXIDE	0.05 UJ	0.05 UJ	ND	ND		0/11
ENDOSULFAN I	0.05 UJ	0.05 UJ	ND	ND		0/11
DIELDRIN	0.1 UJ	0.1 UJ	ND	ND		0/11
4,4'-DDE	0.1 UJ	0.1 UJ	ND	ND		0/11
ENDRIN	0.1 UJ	0.1 UJ	ND	ND		0/11
ENDOSULFAN II	0.1 UJ	0.1 UJ	ND	ND		0/11
4,4'-DDD	0.1 UJ	0.1 UJ	ND	ND		0/11
ENDOSULFAN SULFATE	0.1 UJ	0.1 UJ	ND	ND		0/11
4,4'-DDT	0.1 UJ	0.1 UJ	ND	ND		0/11
METHOXYCHLOR	0.5 UJ	0.5 UJ	ND	ND		0/11
ENDRIN KETONE	0.1 UJ	0.1 UJ	ND	ND		0/11
ENDRIN ALDEHYDE	0.1 UJ	0.1 UJ	ND	ND		0/11
ALPHA CHLORDANE	0.05 UJ	0.05 UJ	ND	ND		0/11
GAMMA CHLORDANE	0.05 UJ	0.05 UJ	ND	ND		0/11
TOXAPHENE	5 UJ	5 UJ	ND	ND		0/11
PCB-1016	1 UJ	1 UJ	ND	ND		0/11
PCB-1221	2 UJ	2 UJ	ND	ND		0/11
PCB-1232	1 UJ	1 UJ	ND	ND		0/11
PCB-1242	1 UJ	1 UJ	ND	ND		0/11
PCB-1248	1 UJ	1 UJ	ND	ND		0/11
PCB-1254	1 UJ	1 UJ	ND	ND		0/11
PCB-1260	1 UJ	1 UJ	ND	ND		0/11

APPENDIX O.6
GROUNDWATER METALS

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION	65-DW01-01	65-DW02-01	65-DW02-02	65-DW04-01	65-MW01A-01	65-MW02A-01
DATE COLLECTED	05/08/95	05/09/95	05/18/95	05/16/95	05/08/95	05/09/95
ANALYTES (ug/L)						
ALUMINUM	233	40 U	40 U	322	40 U	68.5
ANTIMONY	50 U	50 U	50 U	50 U	50 U	50 U
ARSENIC	10 U	10 U	10 U	10 U	10 U	10 U
BARIUM	15.6 U	33.6	32.6	17.9	54.6	27.7
BERYLLIUM	1 U	1 U	1 U	1 U	1 U	1 U
CADMIUM	5 U	5 U	5 U	5 U	5 U	5 U
CALCIUM	52000	107000	116000	33600	146000	58200
CHROMIUM	10 U	10 U	10 U	10 U	10.2	10 U
COBALT	20 U	40.9	52.4	20 U	20.1	20 U
COPPER	10 U	10 U	10 U	10 U	10 U	10 U
IRON	84.4	2060	2300	557	253	6580
LEAD	3 U	3 U	3 U	3.4	3 U	3 U
MAGNESIUM	2030	6120	6400	1200	16200	2470
MANGANESE	4.2	172	186	15.7	178	20.1
MERCURY	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
NICKEL	20 U	53.1	59.6	20 U	20 U	20 U
POTASSIUM	3000	2150	2340	2440	5790	1590
SELENIUM	5 U	5 U	5 U	5 U	5 U	5 U
SILVER	5 U	5 U	5 U	5 U	5 U	5 U
SODIUM	6720	11000	11500	8240	10700	6350
THALLIUM	10 U	10 U	10 U	10 U	10 U	10 U
VANADIUM	10 U	10 U	10 U	10 U	10 U	10 U
ZINC	19.4	27.6	58.9	31.8	19.1	20.5

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION	65-MW03-01	65-MW04A-01	65-MW05A-01	65-MW06A-01	65-MW07A-01
DATE COLLECTED	05/09/95	05/16/95	05/09/95	05/09/95	05/09/95
ANALYTES (ug/L)					
ALUMINUM	40 U	121	40.3	421	138
ANTIMONY	50 U	50 U	50 U	50 U	50 U
ARSENIC	10 U	10 U	10 U	10 U	10 U
BARIUM	151	21	35.3	25.8	44.3
BERYLLIUM	1 U	1 U	1 U	1 U	1 U
CADMIUM	5 U	5 U	5 U	5 U	5 U
CALCIUM	50500	2820	21100	2700	30400
CHROMIUM	10	10 U	10 U	10 U	10 U
COBALT	20 U	20 U	20 U	20 U	20.4
COPPER	10 U	10 U	10 U	10 U	10 U
IRON	41.9	57.9 U	232	1730	99.4
LEAD	3 U	3 U	3 U	3 U	3 U
MAGNESIUM	5160	2550	7810	2890	8160
MANGANESE	6.6	3	52.8	28.7	87.8
MERCURY	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
NICKEL	20 U	20 U	20 U	20 U	20 U
POTASSIUM	3650	1000 U	4030	1200	7940
SELENIUM	5 U	5 U	5 U	5 U	5 U
SILVER	5 U	5 U	5 U	5 U	5 U
SODIUM	5620	5880	11400	16400	9390
THALLIUM	10 U	10 U	10 U	10 U	10 U
VANADIUM	10 U	10 U	10 U	10 U	10 U
ZINC	11	14.6 U	22.5	17.8	14.5

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
ANALYTES (ug/L)						
ALUMINUM	40 U	40 U	40.3	421	65-MW06A-01	7/11
ANTIMONY	50 U	50 U	ND	ND		0/11
ARSENIC	10 U	10 U	ND	ND		0/11
BARIUM	15.6 U	15.6 U	17.9	151	65-MW03-01	10/11
BERYLLIUM	1 U	1 U	ND	ND		0/11
CADMIUM	5 U	5 U	ND	ND		0/11
CALCIUM	NA	NA	2700	146000	65-MW01A-01	11/11
CHROMIUM	10 U	10 U	10	10.2	65-MW01A-01	2/11
COBALT	20 U	20 U	20.1	52.4	65-DW02-02	4/11
COPPER	10 U	10 U	ND	ND		0/11
IRON	57.9 U	57.9 U	41.9	6580	65-MW02A-01	10/11
LEAD	3 U	3 U	3.4	3.4	65-DW04-01	1/11
MAGNESIUM	NA	NA	1200	16200	65-MW01A-01	11/11
MANGANESE	NA	NA	3	186	65-DW02-02	11/11
MERCURY	0.2 U	0.2 U	ND	ND		0/11
NICKEL	20 U	20 U	53.1	59.6	65-DW02-02	2/11
POTASSIUM	1000 U	1000 U	1200	7940	65-MW07A-01	10/11
SELENIUM	5 U	5 U	ND	ND		0/11
SILVER	5 U	5 U	ND	ND		0/11
SODIUM	NA	NA	5620	16400	65-MW06A-01	11/11
THALLIUM	10 U	10 U	ND	ND		0/11
VANADIUM	10 U	10 U	ND	ND		0/11
ZINC	14.6 U	14.6 U	11	58.9	65-DW02-02	10/11

FREQUENCY OF DETECTION SUMMARY
FILTERED GROUNDWATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION	65-MW01AF-01
DATE COLLECTED	05/08/95
ANALYTES (ug/L)	
ALUMINUM	40 U
ANTIMONY	50 U
ARSENIC	10 U
BARIUM	61.4
BERYLLIUM	1 U
CADMIUM	5 U
CALCIUM	161000
CHROMIUM	10 U
COBALT	20 U
COPPER	10 U
IRON	187
LEAD	3 U
MAGNESIUM	18300
MANGANESE	182
MERCURY	0.2 U
NICKEL	20 U
POTASSIUM	6220
SELENIUM	5 U
SILVER	5 U
SODIUM	11900
THALLIUM	10 U
VANADIUM	10 U
ZINC	5.1 U

APPENDIX O.7
SURFACE WATER ORGANICS

FREQUENCY OF DETECTION SUMMARY
SURFACE WATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-SW04-01	65-SW05-01
DATE COLLECTED	05/15/95	05/16/95
VOLATILES (ug/L)		
CHLOROMETHANE	10 U	10 U
BROMOMETHANE	10 U	10 U
VINYL CHLORIDE	10 U	10 U
CHLOROETHANE	10 U	10 U
METHYLENE CHLORIDE	10 U	10 U
ACETONE	5 J	10 U
CARBON DISULFIDE	10 U	10 U
1,1-DICHLOROETHENE	10 U	10 U
1,1-DICHLOROETHANE	10 U	10 U
1,2-DICHLOROETHENE	10 U	10 U
CHLOROFORM	10 U	10 U
1,2-DICHLOROETHANE	1 J	1 J
2-BUTANONE	10 U	10 U
1,1,1-TRICHLOROETHANE	10 U	10 U
CARBON TETRACHLORIDE	10 U	10 U
BROMODICHLOROMETHANE	10 U	10 U
1,2-DICHLOROPROPANE	10 U	10 U
CIS-1,3-DICHLOROPROPENE	10 U	10 U
TRICHLOROETHENE	10 U	10 U
DIBROMOCHLOROMETHANE	10 U	10 U
1,1,2-TRICHLOROETHANE	10 U	10 U
BENZENE	10 U	10 U
TRANS-1,3-DICHLOROPROPENE	10 U	10 U
BROMOFORM	10 U	10 U
4-METHYL-2-PENTANONE	10 U	10 U
2-HEXANONE	10 U	10 U
TETRACHLOROETHENE	10 U	10 U
1,1,2,2-TETRACHLOROETHANE	10 U	10 U
TOLUENE	10 U	10 U
CHLOROBENZENE	10 U	10 U
ETHYLBENZENE	10 U	10 U
STYRENE	10 U	10 U
TOTAL XYLENES	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
SURFACE WATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
VOLATILES (ug/L)						
CHLOROMETHANE	10 U	10 U	ND	ND		0/2
BROMOMETHANE	10 U	10 U	ND	ND		0/2
VINYL CHLORIDE	10 U	10 U	ND	ND		0/2
CHLOROETHANE	10 U	10 U	ND	ND		0/2
METHYLENE CHLORIDE	10 U	10 U	ND	ND		0/2
ACETONE	10 U	10 U	5 J	5 J	65-SW04-01	1/2
CARBON DISULFIDE	10 U	10 U	ND	ND		0/2
1,1-DICHLOROETHENE	10 U	10 U	ND	ND		0/2
1,1-DICHLOROETHANE	10 U	10 U	ND	ND		0/2
1,2-DICHLOROETHENE	10 U	10 U	ND	ND		0/2
CHLOROFORM	10 U	10 U	ND	ND		0/2
1,2-DICHLOROETHANE	NA	NA	1 J	1 J	65-SW05-01	2/2
2-BUTANONE	10 U	10 U	ND	ND		0/2
1,1,1-TRICHLOROETHANE	10 U	10 U	ND	ND		0/2
CARBON TETRACHLORIDE	10 U	10 U	ND	ND		0/2
BROMODICHLOROMETHANE	10 U	10 U	ND	ND		0/2
1,2-DICHLOROPROPANE	10 U	10 U	ND	ND		0/2
CIS-1,3-DICHLOROPROPENE	10 U	10 U	ND	ND		0/2
TRICHLOROETHENE	10 U	10 U	ND	ND		0/2
DIBROMOCHLOROMETHANE	10 U	10 U	ND	ND		0/2
1,1,2-TRICHLOROETHANE	10 U	10 U	ND	ND		0/2
BENZENE	10 U	10 U	ND	ND		0/2
TRANS-1,3-DICHLOROPROPENE	10 U	10 U	ND	ND		0/2
BROMOFORM	10 U	10 U	ND	ND		0/2
4-METHYL-2-PENTANONE	10 U	10 U	ND	ND		0/2
2-HEXANONE	10 U	10 U	ND	ND		0/2
TETRACHLOROETHENE	10 U	10 U	ND	ND		0/2
1,1,2,2-TETRACHLOROETHANE	10 U	10 U	ND	ND		0/2
TOLUENE	10 U	10 U	ND	ND		0/2
CHLOROBENZENE	10 U	10 U	ND	ND		0/2
ETHYLBENZENE	10 U	10 U	ND	ND		0/2
STYRENE	10 U	10 U	ND	ND		0/2
TOTAL XYLENES	10 U	10 U	ND	ND		0/2

FREQUENCY OF DETECTION SUMMARY
SURFACE WATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-SW04-01	65-SW05-01
DATE COLLECTED	05/15/95	05/16/95
SEMIVOLATILES (ug/L)		
PHENOL	10 U	10 U
BIS(2-CHLOROETHYL)ETHER	10 U	10 U
2-CHLOROPHENOL	10 U	10 U
1,3-DICHLOROBENZENE	10 U	10 U
1,4-DICHLOROBENZENE	10 U	10 U
1,2-DICHLOROBENZENE	10 U	10 U
2-METHYLPHENOL	10 U	10 U
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	10 U
4-METHYLPHENOL	10 U	10 U
N-NITROSO-DI-N-PROPYLAMINE	10 U	10 U
HEXACHLOROETHANE	10 U	10 U
NITROBENZENE	10 U	10 U
ISOPHORONE	10 U	10 U
2-NITROPHENOL	10 U	10 U
2,4-DIMETHYLPHENOL	10 U	10 U
BIS(2-CHLOROETHOXY)METHANE	10 U	10 U
2,4-DICHLOROPHENOL	10 U	10 U
1,2,4-TRICHLOROBENZENE	10 U	10 U
NAPHTHALENE	10 U	10 U
4-CHLOROANILINE	10 U	10 U
HEXACHLOROBUTADIENE	10 U	10 U
4-CHLORO-3-METHYLPHENOL	10 U	10 U
2-METHYLNAPHTHALENE	10 U	10 U
HEXACHLOROCYCLOPENTADIENE	10 U	10 R
2,4,6-TRICHLOROPHENOL	10 U	10 U
2,4,5-TRICHLOROPHENOL	25 U	25 U
2-CHLORONAPHTHALENE	10 U	10 U
2-NITROANILINE	25 U	25 U
DIMETHYL PHTHALATE	10 U	10 U
ACENAPHTHYLENE	10 U	10 U
2,6-DINITROTOLUENE	10 U	10 U
3-NITROANILINE	25 U	25 U
ACENAPHTHENE	10 U	10 U
2,4-DINITROPHENOL	25 U	25 R
4-NITROPHENOL	25 U	25 U
DIBENZOFURAN	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
SURFACE WATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-SW04-01	65-SW05-01
DATE COLLECTED	05/15/95	05/16/95
SEMIVOLATILES (ug/L) cont.		
2,4-DINITROTOLUENE	10 U	10 U
DIETHYL PHTHALATE	10 U	10 U
4-CHLOROPHENYLPHENYL ETHER	10 U	10 U
FLUORENE	10 U	10 U
4-NITROANILINE	25 U	25 U
4,6-DINITRO-2-METHYLPHENOL	25 U	25 U
N-NITROSODIPHENYLAMINE	10 U	10 U
4-BROMOPHENYL PHENYL ETHER	10 U	10 U
HEXACHLOROBENZENE	10 U	10 U
PENTACHLOROPHENOL	25 U	25 U
PHENANTHRENE	10 U	10 U
ANTHRACENE	10 U	10 U
CARBAZOLE	10 U	10 U
DI-N-BUTYL PHTHALATE	10 U	10 U
FLUORANTHENE	10 U	10 U
PYRENE	10 U	10 U
BUTYL BENZYL PHTHALATE	10 U	10 U
3,3'-DICHLOROBENZIDINE	10 U	10 U
BENZO(A)ANTHRACENE	10 U	10 U
CHRYSENE	10 U	10 U
BIS(2-ETHYLHEXYL)PHTHALATE	10 U	10 U
DI-N-OCTYL PHTHALATE	10 U	10 U
BENZO(B)FLUORANTHENE	10 U	10 U
BENZO(K)FLUORANTHENE	10 U	10 U
BENZO(A)PYRENE	10 U	10 U
INDENO(1,2,3-CD)PYRENE	10 U	10 U
DIBENZO(A,H)ANTHRACENE	10 U	10 U
BENZO(G,H,I)PERYLENE	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
SURFACE WATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/L)						
PHENOL	10 U	10 U	ND	ND		0/2
BIS(2-CHLOROETHYL)ETHER	10 U	10 U	ND	ND		0/2
2-CHLOROPHENOL	10 U	10 U	ND	ND		0/2
1,3-DICHLOROBENZENE	10 U	10 U	ND	ND		0/2
1,4-DICHLOROBENZENE	10 U	10 U	ND	ND		0/2
1,2-DICHLOROBENZENE	10 U	10 U	ND	ND		0/2
2-METHYLPHENOL	10 U	10 U	ND	ND		0/2
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	10 U	ND	ND		0/2
4-METHYLPHENOL	10 U	10 U	ND	ND		0/2
N-NITROSO-DI-N-PROPYLAMINE	10 U	10 U	ND	ND		0/2
HEXACHLOROETHANE	10 U	10 U	ND	ND		0/2
NITROBENZENE	10 U	10 U	ND	ND		0/2
ISOPHORONE	10 U	10 U	ND	ND		0/2
2-NITROPHENOL	10 U	10 U	ND	ND		0/2
2,4-DIMETHYLPHENOL	10 U	10 U	ND	ND		0/2
BIS(2-CHLOROETHOXY)METHANE	10 U	10 U	ND	ND		0/2
2,4-DICHLOROPHENOL	10 U	10 U	ND	ND		0/2
1,2,4-TRICHLOROBENZENE	10 U	10 U	ND	ND		0/2
NAPHTHALENE	10 U	10 U	ND	ND		0/2
4-CHLOROANILINE	10 U	10 U	ND	ND		0/2
HEXACHLOROBUTADIENE	10 U	10 U	ND	ND		0/2
4-CHLORO-3-METHYLPHENOL	10 U	10 U	ND	ND		0/2
2-METHYLNAPHTHALENE	10 U	10 U	ND	ND		0/2
HEXACHLOROCYCLOPENTADIENE	10 U	10 U	ND	ND		0/1
2,4,6-TRICHLOROPHENOL	10 U	10 U	ND	ND		0/2
2,4,5-TRICHLOROPHENOL	25 U	25 U	ND	ND		0/2
2-CHLORONAPHTHALENE	10 U	10 U	ND	ND		0/2
2-NITROANILINE	25 U	25 U	ND	ND		0/2
DIMETHYL PHTHALATE	10 U	10 U	ND	ND		0/2
ACENAPHTHYLENE	10 U	10 U	ND	ND		0/2
2,6-DINITROTOLUENE	10 U	10 U	ND	ND		0/2
3-NITROANILINE	25 U	25 U	ND	ND		0/2
ACENAPHTHENE	10 U	10 U	ND	ND		0/2
2,4-DINITROPHENOL	25 U	25 U	ND	ND		0/1
4-NITROPHENOL	25 U	25 U	ND	ND		0/2
DIBENZOFURAN	10 U	10 U	ND	ND		0/2

FREQUENCY OF DETECTION SUMMARY
SURFACE WATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/L) cont.						
2,4-DINITROTOLUENE	10 U	10 U	ND	ND		0/2
DIETHYL PHTHALATE	10 U	10 U	ND	ND		0/2
4-CHLOROPHENYLPHENYL ETHER	10 U	10 U	ND	ND		0/2
FLUORENE	10 U	10 U	ND	ND		0/2
4-NITROANILINE	25 U	25 U	ND	ND		0/2
4,6-DINITRO-2-METHYLPHENOL	25 U	25 U	ND	ND		0/2
N-NITROSODIPHENYLAMINE	10 U	10 U	ND	ND		0/2
4-BROMOPHENYL PHENYL ETHER	10 U	10 U	ND	ND		0/2
HEXACHLOROBENZENE	10 U	10 U	ND	ND		0/2
PENTACHLOROPHENOL	25 U	25 U	ND	ND		0/2
PHENANTHRENE	10 U	10 U	ND	ND		0/2
ANTHRACENE	10 U	10 U	ND	ND		0/2
CARBAZOLE	10 U	10 U	ND	ND		0/2
DI-N-BUTYL PHTHALATE	10 U	10 U	ND	ND		0/2
FLUORANTHENE	10 U	10 U	ND	ND		0/2
PYRENE	10 U	10 U	ND	ND		0/2
BUTYL BENZYL PHTHALATE	10 U	10 U	ND	ND		0/2
3,3'-DICHLOROBENZIDINE	10 U	10 U	ND	ND		0/2
BENZO(A)ANTHRACENE	10 U	10 U	ND	ND		0/2
CHRYSENE	10 U	10 U	ND	ND		0/2
BIS(2-ETHYLHEXYL)PHTHALATE	10 U	10 U	ND	ND		0/2
DI-N-OCTYL PHTHALATE	10 U	10 U	ND	ND		0/2
BENZO(B)FLUORANTHENE	10 U	10 U	ND	ND		0/2
BENZO(K)FLUORANTHENE	10 U	10 U	ND	ND		0/2
BENZO(A)PYRENE	10 U	10 U	ND	ND		0/2
INDENO(1,2,3-CD)PYRENE	10 U	10 U	ND	ND		0/2
DIBENZO(A,H)ANTHRACENE	10 U	10 U	ND	ND		0/2
BENZO(G,H,I)PERYLENE	10 U	10 U	ND	ND		0/2

FREQUENCY OF DETECTION SUMMARY
SURFACE WATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-SW04-01	65-SW05-01
DATE COLLECTED	05/15/95	05/16/95
PESTICIDE/PCBS (ug/L)		
ALPHA-BHC	0.05 U	0.05 UJ
BETA-BHC	0.05 U	0.05 UJ
DELTA-BHC	0.05 U	0.05 UJ
GAMMA-BHC(LINDANE)	0.05 U	0.05 UJ
HEPTACHLOR	0.05 U	0.05 UJ
ALDRIN	0.05 U	0.05 UJ
HEPTACHLOR EPOXIDE	0.05 U	0.05 UJ
ENDOSULFAN I	0.05 U	0.05 UJ
DIELDRIN	0.1 U	0.1 UJ
4,4'-DDE	0.1 U	0.1 UJ
ENDRIN	0.1 U	0.1 UJ
ENDOSULFAN II	0.1 U	0.1 UJ
4,4'-DDD	0.1 U	0.1 UJ
ENDOSULFAN SULFATE	0.1 U	0.1 UJ
4,4'-DDT	0.1 U	0.1 UJ
METHOXYCHLOR	0.5 U	0.5 UJ
ENDRIN KETONE	0.1 U	0.1 UJ
ENDRIN ALDEHYDE	0.1 U	0.1 UJ
ALPHA CHLORDANE	0.05 U	0.05 UJ
GAMMA CHLORDANE	0.05 U	0.05 UJ
TOXAPHENE	5 U	5 UJ
PCB-1016	1 U	1 UJ
PCB-1221	2 U	2 UJ
PCB-1232	1 U	1 UJ
PCB-1242	1 U	1 UJ
PCB-1248	1 U	1 UJ
PCB-1254	1 U	1 UJ
PCB-1260	1 U	1 UJ

FREQUENCY OF DETECTION SUMMARY
SURFACE WATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
PESTICIDE/PCBS (ug/L)						
ALPHA-BHC	0.05 U	0.05 U	ND	ND		0/2
BETA-BHC	0.05 U	0.05 U	ND	ND		0/2
DELTA-BHC	0.05 U	0.05 U	ND	ND		0/2
GAMMA-BHC(LINDANE)	0.05 U	0.05 U	ND	ND		0/2
HEPTACHLOR	0.05 U	0.05 U	ND	ND		0/2
ALDRIN	0.05 U	0.05 U	ND	ND		0/2
HEPTACHLOR EPOXIDE	0.05 U	0.05 U	ND	ND		0/2
ENDOSULFAN I	0.05 U	0.05 U	ND	ND		0/2
DIELDRIN	0.1 U	0.1 U	ND	ND		0/2
4,4'-DDE	0.1 U	0.1 U	ND	ND		0/2
ENDRIN	0.1 U	0.1 U	ND	ND		0/2
ENDOSULFAN II	0.1 U	0.1 U	ND	ND		0/2
4,4'-DDD	0.1 U	0.1 U	ND	ND		0/2
ENDOSULFAN SULFATE	0.1 U	0.1 U	ND	ND		0/2
4,4'-DDT	0.1 U	0.1 U	ND	ND		0/2
METHOXYCHLOR	0.5 U	0.5 U	ND	ND		0/2
ENDRIN KETONE	0.1 U	0.1 U	ND	ND		0/2
ENDRIN ALDEHYDE	0.1 U	0.1 U	ND	ND		0/2
ALPHA CHLORDANE	0.05 U	0.05 U	ND	ND		0/2
GAMMA CHLORDANE	0.05 U	0.05 U	ND	ND		0/2
TOXAPHENE	5 U	5 U	ND	ND		0/2
PCB-1016	1 U	1 U	ND	ND		0/2
PCB-1221	2 U	2 U	ND	ND		0/2
PCB-1232	1 U	1 U	ND	ND		0/2
PCB-1242	1 U	1 U	ND	ND		0/2
PCB-1248	1 U	1 U	ND	ND		0/2
PCB-1254	1 U	1 U	ND	ND		0/2
PCB-1260	1 U	1 U	ND	ND		0/2

APPENDIX O.8
SURFACE WATER METALS

FREQUENCY OF DETECTION SUMMARY
SURFACE WATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION	65-SW04-01	65-SW05-01
DATE COLLECTED	05/15/95	05/16/95
ANALYTES (ug/L)		
ALUMINUM	25800	40 U
ANTIMONY	50 U	50 U
ARSENIC	10 U	10 U
BARIUM	69.3	36.7
BERYLLIUM	1 U	1 U
CADMIUM	5 U	5 U
CALCIUM	12000	26800
CHROMIUM	27.6	10 U
COBALT	20 U	20 U
COPPER	41.1	10 U
IRON	7890	348
LEAD	45.8	3 U
MAGNESIUM	2060	2520
MANGANESE	88.4	57.3
MERCURY	0.2 U	0.2 U
NICKEL	20 U	20 U
POTASSIUM	2970	1000 U
SELENIUM	5 U	5 U
SILVER	5 U	5 U
SODIUM	3330	6320
THALLIUM	10 U	10 U
VANADIUM	26.2	10 U
ZINC	144	33.6

FREQUENCY OF DETECTION SUMMARY
SURFACE WATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
ANALYTES (ug/L)						
ALUMINUM	40 U	40 U	25800	25800	65-SW04-01	1/2
ANTIMONY	50 U	50 U	ND	ND		0/2
ARSENIC	10 U	10 U	ND	ND		0/2
BARIUM	NA	NA	36.7	69.3	65-SW04-01	2/2
BERYLLIUM	1 U	1 U	ND	ND		0/2
CADMIUM	5 U	5 U	ND	ND		0/2
CALCIUM	NA	NA	12000	26800	65-SW05-01	2/2
CHROMIUM	10 U	10 U	27.6	27.6	65-SW04-01	1/2
COBALT	20 U	20 U	ND	ND		0/2
COPPER	10 U	10 U	41.1	41.1	65-SW04-01	1/2
IRON	NA	NA	348	7890	65-SW04-01	2/2
LEAD	3 U	3 U	45.8	45.8	65-SW04-01	1/2
MAGNESIUM	NA	NA	2060	2520	65-SW05-01	2/2
MANGANESE	NA	NA	57.3	88.4	65-SW04-01	2/2
MERCURY	0.2 U	0.2 U	ND	ND		0/2
NICKEL	20 U	20 U	ND	ND		0/2
POTASSIUM	1000 U	1000 U	2970	2970	65-SW04-01	1/2
SELENIUM	5 U	5 U	ND	ND		0/2
SILVER	5 U	5 U	ND	ND		0/2
SODIUM	NA	NA	3330	6320	65-SW05-01	2/2
THALLIUM	10 U	10 U	ND	ND		0/2
VANADIUM	10 U	10 U	26.2	26.2	65-SW04-01	1/2
ZINC	NA	NA	33.6	144	65-SW04-01	2/2

APPENDIX O.9
SEDIMENT ORGANICS

FREQUENCY OF DETECTION SUMMARY
SEDIMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-SD04-06	65-SD04-612	65-SD05-06	65-SD05-612
DATE COLLECTED	05/16/95	05/16/95	05/17/95	05/17/95
DEPTH	0-6"	6-12"	0-6"	6-12"
VOLATILES (ug/kg)				
CHLOROMETHANE	38 U	43 U	32 U	29 U
BROMOMETHANE	38 U	43 U	32 U	29 U
VINYL CHLORIDE	38 U	43 U	32 U	29 U
CHLOROETHANE	38 U	43 U	32 U	29 U
METHYLENE CHLORIDE	38 U	43 U	35 U	29 U
ACETONE	220 J	190 J	260 J	450 J
CARBON DISULFIDE	38 UJ	43 UJ	32 UJ	29 UJ
1,1-DICHLOROETHENE	38 U	43 U	32 U	29 U
1,1-DICHLOROETHANE	38 U	43 U	32 U	29 U
1,2-DICHLOROETHENE	38 U	43 U	32 U	29 U
CHLOROFORM	79 J	43 U	32 U	29 U
1,2-DICHLOROETHANE	38 U	43 U	32 U	29 U
2-BUTANONE	94 J	79	72 J	88
1,1,1-TRICHLOROETHANE	38 U	43 U	32 U	29 U
CARBON TETRACHLORIDE	18 J	13 J	32 U	29 U
BROMODICHLOROMETHANE	38 U	43 U	32 U	29 U
1,2-DICHLOROPROPANE	38 U	43 U	32 U	29 U
CIS-1,3-DICHLOROPROPENE	38 U	43 U	32 U	29 U
TRICHLOROETHENE	38 U	43 U	32 U	29 U
DIBROMOCHLOROMETHANE	38 U	43 U	32 U	29 U
1,1,2-TRICHLOROETHANE	38 U	43 U	32 U	29 U
BENZENE	38 U	43 U	32 U	29 U
TRANS-1,3-DICHLOROPROPENE	38 U	43 U	32 U	29 U
BROMOFORM	38 U	43 U	32 U	29 U
4-METHYL-2-PENTANONE	38 UJ	43 UJ	32 UJ	29 U
2-HEXANONE	38 UJ	43 UJ	32 UJ	29 U
TETRACHLOROETHENE	15 J	6 J	32 UJ	29 U
1,1,2,2-TETRACHLOROETHANE	38 UJ	43 UJ	32 UJ	29 U
TOLUENE	7 J	43 UJ	6 J	3 J
CHLOROBENZENE	38 UJ	43 UJ	32 UJ	29 U
ETHYLBENZENE	38 UJ	43 UJ	32 UJ	29 U
STYRENE	38 UJ	43 UJ	32 UJ	29 U
TOTAL XYLENES	38 UJ	43 UJ	32 UJ	29 U

FREQUENCY OF DETECTION SUMMARY
SEDIMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED DEPTH	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
VOLATILES (ug/kg)						
CHLOROMETHANE	29 U	43 U	ND	ND		0/4
BROMOMETHANE	29 U	43 U	ND	ND		0/4
VINYL CHLORIDE	29 U	43 U	ND	ND		0/4
CHLOROETHANE	29 U	43 U	ND	ND		0/4
METHYLENE CHLORIDE	29 U	43 U	ND	ND		0/4
ACETONE	NA	NA	190 J	450 J	65-SD05-612	4/4
CARBON DISULFIDE	29 UJ	43 UJ	ND	ND		0/4
1,1-DICHLOROETHENE	29 U	43 U	ND	ND		0/4
1,1-DICHLOROETHANE	29 U	43 U	ND	ND		0/4
1,2-DICHLOROETHENE	29 U	43 U	ND	ND		0/4
CHLOROFORM	29 U	43 U	79 J	79 J	65-SD04-06	1/4
1,2-DICHLOROETHANE	29 U	43 U	ND	ND		0/4
2-BUTANONE	NA	NA	72 J	94 J	65-SD04-06	4/4
1,1,1-TRICHLOROETHANE	29 U	43 U	ND	ND		0/4
CARBON TETRACHLORIDE	29 U	32 U	13 J	18 J	65-SD04-06	2/4
BROMODICHLOROMETHANE	29 U	43 U	ND	ND		0/4
1,2-DICHLOROPROPANE	29 U	43 U	ND	ND		0/4
CIS-1,3-DICHLOROPROPENE	29 U	43 U	ND	ND		0/4
TRICHLOROETHENE	29 U	43 U	ND	ND		0/4
DIBROMOCHLOROMETHANE	29 U	43 U	ND	ND		0/4
1,1,2-TRICHLOROETHANE	29 U	43 U	ND	ND		0/4
BENZENE	29 U	43 U	ND	ND		0/4
TRANS-1,3-DICHLOROPROPENE	29 U	43 U	ND	ND		0/4
BROMOFORM	29 U	43 U	ND	ND		0/4
4-METHYL-2-PENTANONE	29 U	43 UJ	ND	ND		0/4
2-HEXANONE	29 U	43 UJ	ND	ND		0/4
TETRACHLOROETHENE	29 U	32 UJ	6 J	15 J	65-SD04-06	2/4
1,1,2,2-TETRACHLOROETHANE	29 U	43 UJ	ND	ND		0/4
TOLUENE	43 UJ	43 UJ	3 J	7 J	65-SD04-06	3/4
CHLOROBENZENE	29 U	43 UJ	ND	ND		0/4
ETHYLBENZENE	29 U	43 UJ	ND	ND		0/4
STYRENE	29 U	43 UJ	ND	ND		0/4
TOTAL XYLENES	29 U	43 UJ	ND	ND		0/4

FREQUENCY OF DETECTION SUMMARY
SEDIMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-SD04-06	65-SD04-612	65-SD05-06	65-SD05-612
DATE COLLECTED	05/16/95	05/16/95	05/17/95	05/17/95
DEPTH	0-6"	6-12"	0-6"	6-12"
SEMIVOLATILES (ug/kg)				
PHENOL	6200 U	7000 U	5200 U	4600 U
BIS(2-CHLOROETHYL)ETHER	6200 U	7000 U	5200 U	4600 U
2-CHLOROPHENOL	6200 U	7000 U	5200 U	4600 U
1,3-DICHLOROBENZENE	6200 U	7000 U	5200 U	4600 U
1,4-DICHLOROBENZENE	6200 U	7000 U	5200 U	4600 U
1,2-DICHLOROBENZENE	6200 U	7000 U	5200 U	4600 U
2-METHYLPHENOL	6200 U	7000 U	5200 U	4600 U
2,2'-OXYBIS(1-CHLOROPROPANE)	6200 U	7000 U	5200 U	4600 U
4-METHYLPHENOL	6200 U	7000 U	5200 U	4600 U
N-NITROSO-DI-N-PROPYLAMINE	6200 U	7000 U	5200 U	4600 U
HEXACHLOROETHANE	6200 U	7000 U	5200 U	4600 U
NITROBENZENE	6200 U	7000 U	5200 U	4600 U
ISOPHORONE	6200 U	7000 U	5200 U	4600 U
2-NITROPHENOL	6200 U	7000 U	5200 U	4600 U
2,4-DIMETHYLPHENOL	6200 U	7000 U	5200 U	4600 U
BIS(2-CHLOROETHOXY)METHANE	6200 U	7000 U	5200 U	4600 U
2,4-DICHLOROPHENOL	6200 U	7000 U	5200 U	4600 U
1,2,4-TRICHLOROBENZENE	6200 U	7000 U	5200 U	4600 U
NAPHTHALENE	6200 U	7000 U	5200 U	4600 U
4-CHLOROANILINE	6200 U	7000 U	5200 U	4600 U
HEXACHLOROBUTADIENE	6200 U	7000 U	5200 U	4600 U
4-CHLORO-3-METHYLPHENOL	6200 U	7000 U	5200 U	4600 U
2-METHYLNAPHTHALENE	6200 U	7000 U	5200 U	4600 U
HEXACHLOROCYCLOPENTADIENE	6200 U	7000 U	5200 U	4600 U
2,4,6-TRICHLOROPHENOL	6200 U	7000 U	5200 U	4600 U
2,4,5-TRICHLOROPHENOL	15000 U	17000 U	12000 U	11000 U
2-CHLORONAPHTHALENE	6200 U	7000 U	5200 U	4600 U
2-NITROANILINE	15000 U	17000 U	12000 U	11000 U
DIMETHYL PHTHALATE	6200 U	7000 U	5200 U	4600 U
ACENAPHTHYLENE	6200 U	7000 U	5200 U	4600 U
2,6-DINITROTOLUENE	6200 U	7000 U	5200 U	4600 U
3-NITROANILINE	15000 U	17000 U	12000 U	11000 U
ACENAPHTHENE	6200 U	7000 U	5200 U	4600 U
2,4-DINITROPHENOL	15000 U	17000 U	12000 U	11000 U
4-NITROPHENOL	15000 U	17000 U	12000 U	11000 U

FREQUENCY OF DETECTION SUMMARY
SEDIMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-SD04-06	65-SD04-612	65-SD05-06	65-SD05-612
DATE COLLECTED	05/16/95	05/16/95	05/17/95	05/17/95
DEPTH	0-6"	6-12"	0-6"	6-12"
SEMIVOLATILES (ug/kg) cont.				
DIBENZOFURAN	6200 U	7000 U	5200 U	4600 U
2,4-DINITROTOLUENE	6200 U	7000 U	5200 U	4600 U
DIETHYL PHTHALATE	6200 U	7000 U	5200 U	4600 U
4-CHLOROPHENYLPHENYL ETHER	6200 U	7000 U	5200 U	4600 U
FLUORENE	6200 U	7000 U	5200 U	4600 U
4-NITROANILINE	15000 U	17000 U	12000 U	11000 U
4,6-DINITRO-2-METHYLPHENOL	15000 U	17000 U	12000 U	11000 U
N-NITROSODIPHENYLAMINE	6200 U	7000 U	5200 U	4600 U
4-BROMOPHENYL PHENYL ETHER	6200 U	7000 U	5200 U	4600 U
HEXACHLOROBENZENE	6200 U	7000 U	5200 U	4600 U
PENTACHLOROPHENOL	15000 U	17000 U	12000 U	11000 U
PHENANTHRENE	6200 U	7000 U	5200 U	4600 U
ANTHRACENE	6200 U	7000 U	5200 U	4600 U
CARBAZOLE	6200 UJ	7000 UJ	5200 UJ	4600 UJ
DI-N-BUTYL PHTHALATE	1400 J	1600 J	1200 J	940 J
FLUORANTHENE	6200 U	7000 U	5200 U	4600 U
PYRENE	6200 U	7000 U	5200 U	4600 U
BUTYL BENZYL PHTHALATE	6200 U	7000 U	5200 U	4600 U
3,3'-DICHLOROBENZIDINE	6200 U	7000 U	5200 U	4600 U
BENZO(A)ANTHRACENE	6200 U	7000 U	5200 U	4600 U
CHRYSENE	6200 U	7000 U	5200 U	4600 U
BIS(2-ETHYLHEXYL)PHTHALATE	6200 U	7000 U	5200 U	4600 U
DI-N-OCTYL PHTHALATE	6200 U	7000 U	5200 U	4600 U
BENZO(B)FLUORANTHENE	6200 U	7000 U	5200 U	4600 U
BENZO(K)FLUORANTHENE	6200 U	7000 U	5200 U	4600 U
BENZO(A)PYRENE	6200 U	7000 U	5200 U	4600 U
INDENO(1,2,3-CD)PYRENE	6200 U	7000 U	5200 U	4600 U
DIBENZO(A,H)ANTHRACENE	6200 U	7000 U	5200 U	4600 U
BENZO(G,H,I)PERYLENE	6200 U	7000 U	5200 U	4600 U

FREQUENCY OF DETECTION SUMMARY
SEDIMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED DEPTH	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/kg)						
PHENOL	4600 U	7000 U	ND	ND		0/4
BIS(2-CHLOROETHYL)ETHER	4600 U	7000 U	ND	ND		0/4
2-CHLOROPHENOL	4600 U	7000 U	ND	ND		0/4
1,3-DICHLOROBENZENE	4600 U	7000 U	ND	ND		0/4
1,4-DICHLOROBENZENE	4600 U	7000 U	ND	ND		0/4
1,2-DICHLOROBENZENE	4600 U	7000 U	ND	ND		0/4
2-METHYLPHENOL	4600 U	7000 U	ND	ND		0/4
2,2'-OXYBIS(1-CHLOROPROPANE)	4600 U	7000 U	ND	ND		0/4
4-METHYLPHENOL	4600 U	7000 U	ND	ND		0/4
N-NITROSO-DI-N-PROPYLAMINE	4600 U	7000 U	ND	ND		0/4
HEXACHLOROETHANE	4600 U	7000 U	ND	ND		0/4
NITROBENZENE	4600 U	7000 U	ND	ND		0/4
ISOPHORONE	4600 U	7000 U	ND	ND		0/4
2-NITROPHENOL	4600 U	7000 U	ND	ND		0/4
2,4-DIMETHYLPHENOL	4600 U	7000 U	ND	ND		0/4
BIS(2-CHLOROETHOXY)METHANE	4600 U	7000 U	ND	ND		0/4
2,4-DICHLOROPHENOL	4600 U	7000 U	ND	ND		0/4
1,2,4-TRICHLOROBENZENE	4600 U	7000 U	ND	ND		0/4
NAPHTHALENE	4600 U	7000 U	ND	ND		0/4
4-CHLOROANILINE	4600 U	7000 U	ND	ND		0/4
HEXACHLOROBUTADIENE	4600 U	7000 U	ND	ND		0/4
4-CHLORO-3-METHYLPHENOL	4600 U	7000 U	ND	ND		0/4
2-METHYLNAPHTHALENE	4600 U	7000 U	ND	ND		0/4
HEXACHLOROCYCLOPENTADIENE	4600 U	7000 U	ND	ND		0/4
2,4,6-TRICHLOROPHENOL	4600 U	7000 U	ND	ND		0/4
2,4,5-TRICHLOROPHENOL	11000 U	17000 U	ND	ND		0/4
2-CHLORONAPHTHALENE	4600 U	7000 U	ND	ND		0/4
2-NITROANILINE	11000 U	17000 U	ND	ND		0/4
DIMETHYL PHTHALATE	4600 U	7000 U	ND	ND		0/4
ACENAPHTHYLENE	4600 U	7000 U	ND	ND		0/4
2,6-DINITROTOLUENE	4600 U	7000 U	ND	ND		0/4
3-NITROANILINE	11000 U	17000 U	ND	ND		0/4
ACENAPHTHENE	4600 U	7000 U	ND	ND		0/4
2,4-DINITROPHENOL	11000 U	17000 U	ND	ND		0/4
4-NITROPHENOL	11000 U	17000 U	ND	ND		0/4

FREQUENCY OF DETECTION SUMMARY
SEDIMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED DEPTH	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/kg) cont.						
DIBENZOFURAN	4600 U	7000 U	ND	ND		0/4
2,4-DINITROTOLUENE	4600 U	7000 U	ND	ND		0/4
DIETHYL PHTHALATE	4600 U	7000 U	ND	ND		0/4
4-CHLOROPHENYLPHENYL ETHER	4600 U	7000 U	ND	ND		0/4
FLUORENE	4600 U	7000 U	ND	ND		0/4
4-NITROANILINE	11000 U	17000 U	ND	ND		0/4
4,6-DINITRO-2-METHYLPHENOL	11000 U	17000 U	ND	ND		0/4
N-NITROSODIPHENYLAMINE	4600 U	7000 U	ND	ND		0/4
4-BROMOPHENYL PHENYL ETHER	4600 U	7000 U	ND	ND		0/4
HEXACHLOROBENZENE	4600 U	7000 U	ND	ND		0/4
PENTACHLOROPHENOL	11000 U	17000 U	ND	ND		0/4
PHENANTHRENE	4600 U	7000 U	ND	ND		0/4
ANTHRACENE	4600 U	7000 U	ND	ND		0/4
CARBAZOLE	4600 UJ	7000 UJ	ND	ND		0/4
DI-N-BUTYL PHTHALATE	NA	NA	940 J	1600 J	65-SD04-612	4/4
FLUORANTHENE	4600 U	7000 U	ND	ND		0/4
PYRENE	4600 U	7000 U	ND	ND		0/4
BUTYL BENZYL PHTHALATE	4600 U	7000 U	ND	ND		0/4
3,3'-DICHLOROBENZIDINE	4600 U	7000 U	ND	ND		0/4
BENZO(A)ANTHRACENE	4600 U	7000 U	ND	ND		0/4
CHRYSENE	4600 U	7000 U	ND	ND		0/4
BIS(2-ETHYLHEXYL)PHTHALATE	4600 U	7000 U	ND	ND		0/4
DI-N-OCTYL PHTHALATE	4600 U	7000 U	ND	ND		0/4
BENZO(B)FLUORANTHENE	4600 U	7000 U	ND	ND		0/4
BENZO(K)FLUORANTHENE	4600 U	7000 U	ND	ND		0/4
BENZO(A)PYRENE	4600 U	7000 U	ND	ND		0/4
INDENO(1,2,3-CD)PYRENE	4600 U	7000 U	ND	ND		0/4
DIBENZO(A,H)ANTHRACENE	4600 U	7000 U	ND	ND		0/4
BENZO(G,H,I)PERYLENE	4600 U	7000 U	ND	ND		0/4

FREQUENCY OF DETECTION SUMMARY
SEDIMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-SD04-06	65-SD04-612	65-SD05-06	65-SD05-612
DATE COLLECTED	05/16/95	05/16/95	05/17/95	05/17/95
DEPTH	0-6"	6-12"	0-6"	6-12"
PESTICIDE/PCBS (ug/kg)				
ALPHA-BHC	6.5 U	7.2 U	5.4 U	4.8 U
BETA-BHC	6.5 U	8.3 NJ	5.4 U	4.8 U
DELTA-BHC	6.5 U	7.2 U	5.4 U	4.8 U
GAMMA-BHC(LINDANE)	6.5 U	7.2 U	5.4 U	4.8 U
HEPTACHLOR	6.5 U	7.2 U	5.4 U	4.8 U
ALDRIN	6.5 U	7.2 U	5.4 U	4.8 U
HEPTACHLOR EPOXIDE	6.5 U	7.2 U	5.4 U	4.8 U
ENDOSULFAN I	6.5 U	7.2 U	5.4 U	4.8 U
DIELDRIN	13 U	14 U	10 U	9.4 U
4,4'-DDE	18 J	14 U	19 NJ	9.4 U
ENDRIN	13 U	14 U	10 U	9.4 U
ENDOSULFAN II	13 U	14 U	10 U	9.4 U
4,4'-DDD	76 J	14 UJ	84 J	9.4 UJ
ENDOSULFAN SULFATE	13 U	14 U	10 U	9.4 U
4,4'-DDT	13 U	14 U	10 U	9.4 U
METHOXYCHLOR	65 U	72 U	54 U	48 U
ENDRIN KETONE	13 U	14 U	10 U	9.4 U
ENDRIN ALDEHYDE	13 U	14 U	10 U	9.4 U
ALPHA CHLORDANE	6.5 U	7.2 U	5.4 U	4.8 U
GAMMA CHLORDANE	6.5 U	7.2 U	5.4 U	4.8 U
TOXAPHENE	650 U	720 U	540 U	480 U
PCB-1016	130 U	140 U	100 U	94 U
PCB-1221	260 U	280 U	210 U	190 U
PCB-1232	130 U	140 U	100 U	94 U
PCB-1242	130 U	140 U	100 U	94 U
PCB-1248	130 U	140 U	100 U	94 U
PCB-1254	130 U	140 U	100 U	94 U
PCB-1260	130 U	140 U	100 U	94 U

FREQUENCY OF DETECTION SUMMARY
SEDIMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED DEPTH	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
PESTICIDE/PCBS (ug/kg)						
ALPHA-BHC	4.8 U	7.2 U	ND	ND		0/4
BETA-BHC	4.8 U	6.5 U	8.3 NJ	8.3 NJ	65-SD04-612	1/4
DELTA-BHC	4.8 U	7.2 U	ND	ND		0/4
GAMMA-BHC(LINDANE)	4.8 U	7.2 U	ND	ND		0/4
HEPTACHLOR	4.8 U	7.2 U	ND	ND		0/4
ALDRIN	4.8 U	7.2 U	ND	ND		0/4
HEPTACHLOR EPOXIDE	4.8 U	7.2 U	ND	ND		0/4
ENDOSULFAN I	4.8 U	7.2 U	ND	ND		0/4
DIELDRIN	9.4 U	14 U	ND	ND		0/4
4,4'-DDE	9.4 U	14 U	18 J	19 NJ	65-SD05-06	2/4
ENDRIN	9.4 U	14 U	ND	ND		0/4
ENDOSULFAN II	9.4 U	14 U	ND	ND		0/4
4,4'-DDD	9.4 UJ	14 UJ	76 J	84 J	65-SD05-06	2/4
ENDOSULFAN SULFATE	9.4 U	14 U	ND	ND		0/4
4,4'-DDT	9.4 U	14 U	ND	ND		0/4
METHOXYCHLOR	48 U	72 U	ND	ND		0/4
ENDRIN KETONE	9.4 U	14 U	ND	ND		0/4
ENDRIN ALDEHYDE	9.4 U	14 U	ND	ND		0/4
ALPHA CHLORDANE	4.8 U	7.2 U	ND	ND		0/4
GAMMA CHLORDANE	4.8 U	7.2 U	ND	ND		0/4
TOXAPHENE	480 U	720 U	ND	ND		0/4
PCB-1016	94 U	140 U	ND	ND		0/4
PCB-1221	190 U	280 U	ND	ND		0/4
PCB-1232	94 U	140 U	ND	ND		0/4
PCB-1242	94 U	140 U	ND	ND		0/4
PCB-1248	94 U	140 U	ND	ND		0/4
PCB-1254	94 U	140 U	ND	ND		0/4
PCB-1260	94 U	140 U	ND	ND		0/4

APPENDIX O.10
SEDIMENT METALS

FREQUENCY OF DETECTION SUMMARY
SEDIMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION	65-SD04-06	65-SD04-612	65-SD05-06	65-SD05-612
DATE COLLECTED	05/16/95	05/16/95	05/17/95	05/17/95
DEPTH	0-6"	6-12"	0-6"	6-12"
ANALYTES (mg/kg)				
ALUMINUM	37000 J	10900 J	3090	394
ANTIMONY	46.6 J	44.1 UJ	32.5 U	28.5 U
ARSENIC	7.5 U	8.8 U	6.5 U	5.7 U
BARIUM	110	94.2	86.1	13.6
BERYLLIUM	0.75 U	0.88 U	0.65 U	0.57 U
CADMIUM	3.8 U	4.4 U	3.2 U	2.8 U
CALCIUM	4470	2470	4640	322
CHROMIUM	43.6 J	9.8 J	6.5 U	5.7 U
COBALT	36.3	17.6 U	13 U	11.4 U
COPPER	100 J	21.4 J	8.2	5.7 U
IRON	14600 J	3250 J	985	414
LEAD	176 J	38.5 J	23.9	1.7 U
MAGNESIUM	1140	674	470 U	94.8
MANGANESE	126 J	37.4 J	38.7	25.6
MERCURY	0.38 U	0.44 U	0.32 U	0.28 U
NICKEL	15.1 U	17.6 U	13 U	11.4 U
POTASSIUM	1410	881 U	649 U	570 U
SELENIUM	3.8 U	4.4 U	3.2 U	2.8 U
SILVER	3.8 U	4.4 U	3.2 U	2.8 U
SODIUM	203	177	139	114 U
THALLIUM	7.5 U	8.8 U	6.5 U	5.7 U
VANADIUM	40.5	8.8 U	6.5 U	5.7 U
ZINC	280 J	56.3 J	36.5	7.9

FREQUENCY OF DETECTION SUMMARY
SEDIMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION DATE COLLECTED DEPTH	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
ANALYTES (mg/kg)						
ALUMINUM	NA	NA	394	37000 J	65-SD04-06	4/4
ANTIMONY	28.5 U	44.1 UJ	46.6 J	46.6 J	65-SD04-06	1/4
ARSENIC	5.7 U	8.8 U	ND	ND		0/4
BARIUM	NA	NA	13.6	110	65-SD04-06	4/4
BERYLLIUM	0.57 U	0.88 U	ND	ND		0/4
CADMIUM	2.8 U	4.4 U	ND	ND		0/4
CALCIUM	NA	NA	322	4640	65-SD05-06	4/4
CHROMIUM	5.7 U	6.5 U	9.8 J	43.6 J	65-SD04-06	2/4
COBALT	11.4 U	17.6 U	36.3	36.3	65-SD04-06	1/4
COPPER	5.7 U	5.7 U	8.2	100 J	65-SD04-06	3/4
IRON	NA	NA	414	14600 J	65-SD04-06	4/4
LEAD	1.7 U	1.7 U	23.9	176 J	65-SD04-06	3/4
MAGNESIUM	470 U	470 U	94.8	1140	65-SD04-06	3/4
MANGANESE	NA	NA	25.6	126 J	65-SD04-06	4/4
MERCURY	0.28 U	0.44 U	ND	ND		0/4
NICKEL	11.4 U	17.6 U	ND	ND		0/4
POTASSIUM	570 U	881 U	1410	1410	65-SD04-06	1/4
SELENIUM	2.8 U	4.4 U	ND	ND		0/4
SILVER	2.8 U	4.4 U	ND	ND		0/4
SODIUM	114 U	114 U	139	203	65-SD04-06	3/4
THALLIUM	5.7 U	8.8 U	ND	ND		0/4
VANADIUM	5.7 U	8.8 U	40.5	40.5	65-SD04-06	1/4
ZINC	NA	NA	7.9	280 J	65-SD04-06	4/4

APPENDIX O.11
FISH FILLET

FREQUENCY OF DETECTION
FISH TISSUE - FILLET
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

SAMPLE ID.	65-FS04-BG01F	65-FS05-BG01F	65-FS05-LB01F	65-FS05-RS01F
DATE COLLECTED	05/17/95	05/16/95	05/16/95	05/16/95
VOLATILES (ug/kg)				
CHLOROMETHANE	4800 U	4800 U	4800 U	4800 U
BROMOMETHANE	4800 U	4800 U	4800 U	4800 U
VINYL CHLORIDE	4800 U	4800 U	4800 U	4800 U
CHLOROETHANE	4800 U	4800 U	4800 U	4800 U
METHYLENE CHLORIDE	4800 U	4800 U	4800 U	4800 U
ACETONE	4800 U	5600 J	7900 J	7500 UJ
CARBON DISULFIDE	4800 U	4800 U	4800 U	4800 U
1,1-DICHLOROETHENE	4800 U	4800 U	4800 U	4800 U
1,1-DICHLOROETHANE	4800 U	4800 U	4800 U	4800 U
1,2-DICHLOROETHENE (TOTAL)	4800 U	4800 U	4800 U	4800 U
CHLOROFORM	4800 U	4800 U	4800 U	4800 U
1,2-DICHLOROETHANE	4800 U	4800 U	4800 U	4800 U
2-BUTANONE (MEK)	4800 U	4800 U	4800 U	4800 U
1,1,1-TRICHLOROETHANE	4800 U	4800 U	4800 U	4800 U
CARBON TETRACHLORIDE	4800 U	4800 U	4800 U	4800 U
BROMODICHLOROMETHANE	4800 U	4800 U	4800 U	4800 U
1,2-DICHLOROPROPANE	4800 U	4800 U	4800 U	4800 U
CIS-1,3-DICHLOROPROPENE	4800 U	4800 U	4800 U	4800 U
TRICHLOROETHENE	4800 U	4800 U	4800 U	4800 U
DIBROMOCHLOROMETHANE	4800 U	4800 U	4800 U	4800 U
1,1,2-TRICHLOROETHANE	4800 U	4800 U	4800 U	4800 U
BENZENE	4800 U	4800 U	4800 U	4800 U
TRANS-1,3-DICHLOROPROPENE	4800 U	4800 U	4800 U	4800 U
BROMOFORM	4800 U	4800 U	4800 U	4800 U
4-METHYL-2-PENTANONE (MIBK)	4800 U	4800 U	4800 U	4800 U
2-HEXANONE	4800 U	4800 U	4800 U	4800 U
TETRACHLOROETHENE	4800 U	4800 U	4800 U	4800 U
1,1,2,2-TETRACHLOROETHANE	4800 U	4800 U	4800 U	4800 U
TOLUENE	4800 U	4800 U	4800 U	4800 U
CHLOROBENZENE	4800 U	4800 U	4800 U	4800 U
ETHYLBENZENE	4800 U	4800 U	4800 U	4800 U
STYRENE	4800 U	4800 U	4800 U	4800 U
XYLENES (TOTAL)	4800 U	4800 U	4800 U	4800 U

FREQUENCY OF DETECTION
FISH TISSUE - FILLET
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

SAMPLE ID. DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
VOLATILES (ug/kg)						
CHLOROMETHANE	4800 U	4800 U	ND	ND		0/4
BROMOMETHANE	4800 U	4800 U	ND	ND		0/4
VINYL CHLORIDE	4800 U	4800 U	ND	ND		0/4
CHLOROETHANE	4800 U	4800 U	ND	ND		0/4
METHYLENE CHLORIDE	4800 U	4800 U	ND	ND		0/4
ACETONE	4800 U	7500 UJ	5600 J	7900 J	65-FS05-LB01F	2/4
CARBON DISULFIDE	4800 U	4800 U	ND	ND		0/4
1,1-DICHLOROETHENE	4800 U	4800 U	ND	ND		0/4
1,1-DICHLOROETHANE	4800 U	4800 U	ND	ND		0/4
1,2-DICHLOROETHENE (TOTAL)	4800 U	4800 U	ND	ND		0/4
CHLOROFORM	4800 U	4800 U	ND	ND		0/4
1,2-DICHLOROETHANE	4800 U	4800 U	ND	ND		0/4
2-BUTANONE (MEK)	4800 U	4800 U	ND	ND		0/4
1,1,1-TRICHLOROETHANE	4800 U	4800 U	ND	ND		0/4
CARBON TETRACHLORIDE	4800 U	4800 U	ND	ND		0/4
BROMODICHLOROMETHANE	4800 U	4800 U	ND	ND		0/4
1,2-DICHLOROPROPANE	4800 U	4800 U	ND	ND		0/4
CIS-1,3-DICHLOROPROPENE	4800 U	4800 U	ND	ND		0/4
TRICHLOROETHENE	4800 U	4800 U	ND	ND		0/4
DIBROMOCHLOROMETHANE	4800 U	4800 U	ND	ND		0/4
1,1,2-TRICHLOROETHANE	4800 U	4800 U	ND	ND		0/4
BENZENE	4800 U	4800 U	ND	ND		0/4
TRANS-1,3-DICHLOROPROPENE	4800 U	4800 U	ND	ND		0/4
BROMOFORM	4800 U	4800 U	ND	ND		0/4
4-METHYL-2-PENTANONE (MIBK)	4800 U	4800 U	ND	ND		0/4
2-HEXANONE	4800 U	4800 U	ND	ND		0/4
TETRACHLOROETHENE	4800 U	4800 U	ND	ND		0/4
1,1,2,2-TETRACHLOROETHANE	4800 U	4800 U	ND	ND		0/4
TOLUENE	4800 U	4800 U	ND	ND		0/4
CHLOROBENZENE	4800 U	4800 U	ND	ND		0/4
ETHYLBENZENE	4800 U	4800 U	ND	ND		0/4
STYRENE	4800 U	4800 U	ND	ND		0/4
XYLENES (TOTAL)	4800 U	4800 U	ND	ND		0/4

FREQUENCY OF DETECTION
FISH TISSUE - FILLET
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

SAMPLE ID	65-FS04-BG01F	65-FS05-BG01F	65-FS05-LB01F	65-FS05-RS01F
DATE COLLECTED	05/17/95	05/16/95	05/16/95	05/16/95
SEMIVOLATILES (UG/KG)				
PHENOL	1000 U	1000 U	1000 U	1000 U
2-CHLOROPHENOL	1000 U	1000 U	1000 U	1000 U
1,3-DICHLOROBENZENE	1000 U	1000 U	1000 U	1000 U
1,4-DICHLOROBENZENE	1000 U	1000 U	1000 U	1000 U
1,2-DICHLOROBENZENE	1000 U	1000 U	1000 U	1000 U
2-METHYLPHENOL	1000 U	1000 U	1000 U	1000 U
2,2'-OXYBIS(1-CHLOROPROPANE)	1000 U	1000 U	1000 U	1000 U
4-METHYLPHENOL	1000 U	1000 U	1000 U	1000 U
N-NITROSO-DI-N-PROPYLAMINE	1000 U	1000 U	1000 U	1000 U
HEXACHLOROETHANE	1000 U	1000 U	1000 U	1000 U
NITROBENZENE	1000 U	1000 U	1000 U	1000 U
ISOPHORONE	1000 U	1000 U	1000 U	1000 U
2-NITROPHENOL	1000 U	1000 U	1000 U	1000 U
2,4-DIMETHYLPHENOL	1000 U	1000 U	1000 U	1000 U
2,4-DICHLOROPHENOL	1000 U	1000 U	1000 U	1000 U
1,2,4-TRICHLOROBENZENE	1000 U	1000 U	1000 U	1000 U
NAPHTHALENE	1000 U	1000 U	1000 U	1000 U
4-CHLOROANILINE	1000 U	1000 U	1000 U	1000 U
HEXACHLOROBUTADIENE	1000 U	1000 U	1000 U	1000 U
4-CHLORO-3-METHYLPHENOL	1000 U	1000 U	1000 U	1000 U
2-METHYLNAPHTHALENE	1000 U	1000 U	1000 U	1000 U
HEXACHLOROCYCLOPENTADIENE	1000 U	1000 U	1000 U	1000 U
2,4,6-TRICHLOROPHENOL	1000 U	1000 U	1000 U	1000 U
2,4,5-TRICHLOROPHENOL	2500 U	2500 U	2500 U	2500 U
2-CHLORONAPHTHALENE	1000 U	1000 U	1000 U	1000 U
2-NITROANILINE	2500 U	2500 U	2500 U	2500 U
DIMETHYL PHTHALATE	1000 U	1000 U	1000 U	1000 U
ACENAPHTHYLENE	1000 U	1000 U	1000 U	1000 U
2,6-DINITROTOLUENE	1000 U	1000 U	1000 U	1000 U
3-NITROANILINE	2500 U	2500 UJ	2500 U	2500 UJ
ACENAPHTHENE	1000 U	1000 U	1000 U	1000 U
2,4-DINITROPHENOL	2500 U	2500 U	2500 U	2500 U
4-NITROPHENOL	2500 U	2500 U	2500 U	2500 U

FREQUENCY OF DETECTION
FISH TISSUE - FILLET
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

SAMPLE ID	65-FS04-BG01F	65-FS05-BG01F	65-FS05-LB01F	65-FS05-RS01F
DATE COLLECTED	05/17/95	05/16/95	05/16/95	05/16/95
SEMIVOLATILES (UG/KG) cont.				
DIBENZOFURAN	1000 U	1000 U	1000 U	1000 U
2,4-DINITROTOLUENE	1000 U	1000 U	1000 U	1000 U
DIETHYL PHTHALATE	1000 U	1000 U	1000 U	1000 U
FLUORENE	1000 U	1000 U	1000 U	1000 U
4-NITROANILINE	2500 U	2500 U	2500 U	2500 U
4,6-DINITRO-2-METHYLPHENOL	2500 U	2500 U	2500 U	2500 U
N-NITROSODIPHENYLAMINE	1000 U	1000 U	1000 U	1000 U
4-BROMOPHENYL PHENYL ETHER	1000 U	1000 U	1000 U	1000 U
HEXACHLOROBENZENE	1000 U	1000 U	1000 U	1000 U
PENTACHLOROPHENOL	2500 U	2500 U	2500 U	2500 U
PHENANTHRENE	1000 U	1000 U	1000 U	1000 U
ANTHRACENE	1000 U	1000 U	1000 U	1000 U
CARBAZOLE	1000 U	1000 U	1000 U	1000 U
DI-N-BUTYL PHTHALATE	1000 U	1000 U	1000 U	1000 U
FLUORANTHENE	1000 U	1000 U	1000 U	1000 U
PYRENE	1000 U	1000 U	1000 U	1000 U
BUTYL BENZYL PHTHALATE	1000 U	1000 U	1000 U	1000 U
3,3'-DICHLOROBENZIDINE	1000 U	1000 U	1000 U	1000 U
BENZO(A)ANTHRACENE	1000 U	1000 U	1000 U	1000 U
CHRYSENE	1000 U	1000 U	1000 U	1000 U
BIS(2-ETHYLHEXYL)PHTHALATE	1000 U	1000 U	1000 U	1000 U
DI-N-OCTYL PHTHALATE	1000 U	1000 U	1000 U	1000 U
BENZO(B)FLUORANTHENE	1000 U	1000 U	1000 U	1000 U
BENZO(K)FLUORANTHENE	1000 U	1000 U	1000 U	1000 U
BENZO(A)PYRENE	1000 U	1000 U	1000 U	1000 U
INDENO(1,2,3-CD)PYRENE	1000 U	1000 U	1000 U	1000 U
DIBENZO(A,H)ANTHRACENE	1000 U	1000 U	1000 U	1000 U
BENZO(G,H,I)PERYLENE	1000 U	1000 U	1000 U	1000 U
BIS(2-CHLOROETHOXY)-METHANE	1000 U	1000 U	1000 U	1000 U
BIS(2-CHLOROETHYL) ETHER	1000 U	1000 U	1000 U	1000 U
4-CHLOROPHENYL PHENYL ETHER	1000 U	1000 U	1000 U	1000 U

FREQUENCY OF DETECTION
FISH TISSUE - FILLET
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, *CTO-0312*
MCB, CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

SAMPLE ID DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (UG/KG)						
PHENOL	1000 U	1000 U	ND	ND		0/4
2-CHLOROPHENOL	1000 U	1000 U	ND	ND		0/4
1,3-DICHLOROBENZENE	1000 U	1000 U	ND	ND		0/4
1,4-DICHLOROBENZENE	1000 U	1000 U	ND	ND		0/4
1,2-DICHLOROBENZENE	1000 U	1000 U	ND	ND		0/4
2-METHYLPHENOL	1000 U	1000 U	ND	ND		0/4
2,2'-OXYBIS(1-CHLOROPROPANE)	1000 U	1000 U	ND	ND		0/4
4-METHYLPHENOL	1000 U	1000 U	ND	ND		0/4
N-NITROSO-DI-N-PROPYLAMINE	1000 U	1000 U	ND	ND		0/4
HEXACHLOROETHANE	1000 U	1000 U	ND	ND		0/4
NITROBENZENE	1000 U	1000 U	ND	ND		0/4
ISOPHORONE	1000 U	1000 U	ND	ND		0/4
2-NITROPHENOL	1000 U	1000 U	ND	ND		0/4
2,4-DIMETHYLPHENOL	1000 U	1000 U	ND	ND		0/4
2,4-DICHLOROPHENOL	1000 U	1000 U	ND	ND		0/4
1,2,4-TRICHLOROBENZENE	1000 U	1000 U	ND	ND		0/4
NAPHTHALENE	1000 U	1000 U	ND	ND		0/4
4-CHLOROANILINE	1000 U	1000 U	ND	ND		0/4
HEXACHLOROBUTADIENE	1000 U	1000 U	ND	ND		0/4
4-CHLORO-3-METHYLPHENOL	1000 U	1000 U	ND	ND		0/4
2-METHYLNAPHTHALENE	1000 U	1000 U	ND	ND		0/4
HEXACHLOROCYCLOPENTADIENE	1000 U	1000 U	ND	ND		0/4
2,4,6-TRICHLOROPHENOL	1000 U	1000 U	ND	ND		0/4
2,4,5-TRICHLOROPHENOL	2500 U	2500 U	ND	ND		0/4
2-CHLORONAPHTHALENE	1000 U	1000 U	ND	ND		0/4
2-NITROANILINE	2500 U	2500 U	ND	ND		0/4
DIMETHYL PHTHALATE	1000 U	1000 U	ND	ND		0/4
ACENAPHTHYLENE	1000 U	1000 U	ND	ND		0/4
2,6-DINITROTOLUENE	1000 U	1000 U	ND	ND		0/4
3-NITROANILINE	2500 U	2500 U	ND	ND		0/4
ACENAPHTHENE	1000 U	1000 U	ND	ND		0/4
2,4-DINITROPHENOL	2500 U	2500 U	ND	ND		0/4
4-NITROPHENOL	2500 U	2500 U	ND	ND		0/4

FREQUENCY OF DETECTION
FISH TISSUE - FILLET
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

SAMPLE ID DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (UG/KG) cont.						
DIBENZOFURAN	1000 U	1000 U	ND	ND		0/4
2,4-DINITROTOLUENE	1000 U	1000 U	ND	ND		0/4
DIETHYL PHTHALATE	1000 U	1000 U	ND	ND		0/4
FLUORENE	1000 U	1000 U	ND	ND		0/4
4-NITROANILINE	2500 U	2500 U	ND	ND		0/4
4,6-DINITRO-2-METHYLPHENOL	2500 U	2500 U	ND	ND		0/4
N-NITROSODIPHENYLAMINE	1000 U	1000 U	ND	ND		0/4
4-BROMOPHENYL PHENYL ETHER	1000 U	1000 U	ND	ND		0/4
HEXACHLOROBENZENE	1000 U	1000 U	ND	ND		0/4
PENTACHLOROPHENOL	2500 U	2500 U	ND	ND		0/4
PHENANTHRENE	1000 U	1000 U	ND	ND		0/4
ANTHRACENE	1000 U	1000 U	ND	ND		0/4
CARBAZOLE	1000 U	1000 U	ND	ND		0/4
DI-N-BUTYL PHTHALATE	1000 U	1000 U	ND	ND		0/4
FLUORANTHENE	1000 U	1000 U	ND	ND		0/4
PYRENE	1000 U	1000 U	ND	ND		0/4
BUTYL BENZYL PHTHALATE	1000 U	1000 U	ND	ND		0/4
3,3'-DICHLOROBENZIDINE	1000 U	1000 U	ND	ND		0/4
BENZO(A)ANTHRACENE	1000 U	1000 U	ND	ND		0/4
CHRYSENE	1000 U	1000 U	ND	ND		0/4
BIS(2-ETHYLHEXYL)PHTHALATE	1000 U	1000 U	ND	ND		0/4
DI-N-OCTYL PHTHALATE	1000 U	1000 U	ND	ND		0/4
BENZO(B)FLUORANTHENE	1000 U	1000 U	ND	ND		0/4
BENZO(K)FLUORANTHENE	1000 U	1000 U	ND	ND		0/4
BENZO(A)PYRENE	1000 U	1000 U	ND	ND		0/4
INDENO(1,2,3-CD)PYRENE	1000 U	1000 U	ND	ND		0/4
DIBENZO(A,H)ANTHRACENE	1000 U	1000 U	ND	ND		0/4
BENZO(G,H,I)PERYLENE	1000 U	1000 U	ND	ND		0/4
BIS(2-CHLOROETHOXY)-METHANE	1000 U	1000 U	ND	ND		0/4
BIS(2-CHLOROETHYL) ETHER	1000 U	1000 U	ND	ND		0/4
4-CHLOROPHENYL PHENYL ETHER	1000 U	1000 U	ND	ND		0/4

FREQUENCY OF DETECTION
FISH TISSUE - FILLET
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

SAMPLE ID	65-FS04-BG01F	65-FS05-BG01F	65-FS05-LB01F	65-FS05-RS01F
DATE COLLECTED	05/17/95	05/16/95	05/16/95	05/16/95
PESTICIDE/PCBS (ug/kg)				
ALPHA-BHC	5 UJ	5.1 UJ	5.1 UJ	5.1 UJ
BETA-BHC	5 UJ	5.1 U	5.1 U	5.1 U
DELTA-BHC	5 UJ	5.1 U	5.1 U	5.1 U
GAMMA-BHC(LINDANE)	5 UJ	5.1 UJ	5.1 UJ	5.1 UJ
HEPTACHLOR	5 UJ	5.1 UJ	5.1 UJ	5.1 UJ
ALDRIN	5 UJ	5.1 U	5.1 U	5.1 U
HEPTACHLOR EPOXIDE	5 UJ	5.1 U	5.1 U	5.1 U
ENDOSULFAN I	5 UJ	5.1 UJ	5.1 UJ	5.1 UJ
DIELDRIN	9.8 UJ	9.9 UJ	9.9 UJ	9.9 UJ
4,4'-DDE	9.8 UJ	9.9 UJ	9.9 UJ	9.9 UJ
ENDRIN	9.8 UJ	9.9 UJ	9.9 UJ	9.9 UJ
ENDOSULFAN II	9.8 UJ	9.9 U	9.9 U	9.9 U
4,4'-DDD	5.7 J	9.9 UJ	9.9 UJ	9.9 UJ
ENDOSULFAN SULFATE	9.8 UJ	9.9 UJ	9.9 UJ	9.9 UJ
4,4'-DDT	9.8 UJ	9.9 UJ	9.9 UJ	9.9 UJ
METHOXYCHLOR	50 UJ	51 UJ	51 UJ	51 UJ
ENDRIN KETONE	9.8 UJ	9.9 U	9.9 U	9.9 U
ENDRIN ALDEHYDE	9.8 UJ	9.9 U	9.9 U	9.9 U
ALPHA CHLORDANE	5 UJ	5.1 U	5.1 U	5.1 U
GAMMA CHLORDANE	5 UJ	5.1 U	5.1 U	5.1 U
TOXAPHENE	500 UJ	510 U	510 U	510 U
AROCLOR 1016	98 UJ	99 U	99 U	99 U
AROCLOR 1221	200 UJ	200 U	200 U	200 U
AROCLOR 1232	98 UJ	99 U	99 U	99 U
AROCLOR 1242	98 UJ	99 U	99 U	99 U
AROCLOR 1248	98 UJ	99 U	99 U	99 U
AROCLOR 1254	98 UJ	99 U	99 U	99 U
AROCLOR 1260	98 UJ	99 U	99 U	99 U

FREQUENCY OF DETECTION
FISH TISSUE - FILLET
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

SAMPLE ID DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
PESTICIDE/PCBS (ug/kg)						
ALPHA-BHC	5 UJ	5.1 UJ	ND	ND		0/4
BETA-BHC	5 UJ	5.1 U	ND	ND		0/4
DELTA-BHC	5 UJ	5.1 U	ND	ND		0/4
GAMMA-BHC(LINDANE)	5 UJ	5.1 UJ	ND	ND		0/4
HEPTACHLOR	5 UJ	5.1 UJ	ND	ND		0/4
ALDRIN	5 UJ	5.1 U	ND	ND		0/4
HEPTACHLOR EPOXIDE	5 UJ	5.1 U	ND	ND		0/4
ENDOSULFAN I	5 UJ	5.1 UJ	ND	ND		0/4
DIELDRIN	9.8 UJ	9.9 UJ	ND	ND		0/4
4,4'-DDE	9.8 UJ	9.9 UJ	ND	ND		0/4
ENDRIN	9.8 UJ	9.9 UJ	ND	ND		0/4
ENDOSULFAN II	9.8 UJ	9.9 U	ND	ND		0/4
4,4'-DDD	9.9 UJ	9.9 UJ	5.7 J	5.7 J	65-FS04-BG01F	1/4
ENDOSULFAN SULFATE	9.8 UJ	9.9 UJ	ND	ND		0/4
4,4'-DDT	9.8 UJ	9.9 UJ	ND	ND		0/4
METHOXYCHLOR	50 UJ	51 UJ	ND	ND		0/4
ENDRIN KETONE	9.8 UJ	9.9 U	ND	ND		0/4
ENDRIN ALDEHYDE	9.8 UJ	9.9 U	ND	ND		0/4
ALPHA CHLORDANE	5 UJ	5.1 U	ND	ND		0/4
GAMMA CHLORDANE	5 UJ	5.1 U	ND	ND		0/4
TOXAPHENE	500 UJ	510 U	ND	ND		0/4
AROCLOR 1016	98 UJ	99 U	ND	ND		0/4
AROCLOR 1221	200 UJ	200 UJ	ND	ND		0/4
AROCLOR 1232	98 UJ	99 U	ND	ND		0/4
AROCLOR 1242	98 UJ	99 U	ND	ND		0/4
AROCLOR 1248	98 UJ	99 U	ND	ND		0/4
AROCLOR 1254	98 UJ	99 U	ND	ND		0/4
AROCLOR 1260	98 UJ	99 U	ND	ND		0/4

FREQUENCY OF DETECTION
FISH TISSUE - FILLET
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA
TAL METALS

SAMPLE ID	65-FS04-BG01F	65-FS05-BG01F	65-FS05-LB01F	65-FS05-RS01F
DATE COLLECTED	05/17/95	05/16/95	05/16/95	05/16/95
ANALYTES (mg/kg)				
ALUMINUM	3.5 U	1.7 U	0.99	1 U
ANTIMONY	1 U	1 U	1 U	1 U
ARSENIC	0.08 UJ	0.08 UJ	0.08 UJ	0.08 UJ
BARIUM	0.21 J	0.1 U	0.052 U	0.051 U
BERYLLIUM	0.015 U	0.015 U	0.015 U	0.015 U
BORON	0.7 U	0.71 U	0.71 U	0.7 U
CADMIUM	0.1 U	0.1 U	0.1 U	0.1 U
CALCIUM	2100 J	560 J	399 J	385 J
CHROMIUM	0.31 U	0.22 U	0.15 U	0.3 U
COBALT	0.32 U	0.32 U	0.32 U	0.32 U
COPPER	0.49	0.46	0.23 U	0.51 U
CYANIDE, TOTAL	0.5 U	0.5 U	0.5 U	0.5 U
IRON	3.3 U	2.7 U	1.5 U	2.4 U
LEAD	0.054 U	0.055 U	0.054 U	0.054 U
MAGNESIUM	298 J	299 J	290 J	293 J
MANGANESE	0.45 J	0.22 J	0.092 J	0.14 J
MERCURY	0.22 J	0.07 J	0.3 J	0.051 J
MOLYBDENUM	0.12 U	0.12 U	0.12 U	0.12 U
NICKEL	0.86 U	0.87 U	0.87 U	0.86 U
POTASSIUM	2700 J	3220 J	3540 J	3520 J
SELENIUM	0.22	0.15	0.16	0.14
SILVER	0.094 U	0.094 U	0.094 U	0.094 U
SODIUM	869	708	441	620
THALLIUM	0.11	0.11 U	0.11	0.11
TIN	9.6 U	9.6 U	9.6 U	9.6 U
VANADIUM	0.12 U	0.12 U	0.12 U	0.12 U
ZINC	8.1 J	8.4 J	5.8 J	8.2 J

FREQUENCY OF DETECTION
FISH TISSUE - FILLET
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA
TAL METALS

SAMPLE ID DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
ANALYTES (mg/kg)						
ALUMINUM	1 U	3.5 U	0.99	0.99	65-FS05-LB01F	1/4
ANTIMONY	1 U	1 U	ND	ND		0/4
ARSENIC	0.08 UJ	0.08 UJ	ND	ND		0/4
BARIUM	0.051 U	0.1 U	0.21 J	0.21 J	65-FS04-BG01F	1/4
BERYLLIUM	0.015 U	0.015 U	ND	ND		0/4
BORON	0.7 U	0.71 U	ND	ND		0/4
CADMIUM	0.1 U	0.1 U	ND	ND		0/4
CALCIUM	NA	NA	385 J	2100 J	65-FS04-BG01F	4/4
CHROMIUM	0.15 U	0.31 U	ND	ND		0/4
COBALT	0.32 U	0.32 U	ND	ND		0/4
COPPER	0.23 U	0.51 U	0.46	0.49	65-FS04-BG01F	2/4
CYANIDE, TOTAL	0.5 U	0.5 U	ND	ND		0/4
IRON	1.5 U	3.3 U	ND	ND		0/4
LEAD	0.054 U	0.055 U	ND	ND		0/4
MAGNESIUM	NA	NA	290 J	299 J	65-FS05-BG01F	4/4
MANGANESE	NA	NA	0.092 J	0.45 J	65-FS04-BG01F	4/4
MERCURY	NA	NA	0.051 J	0.3 J	65-FS05-LB01F	4/4
MOLYBDENUM	0.12 U	0.12 U	ND	ND		0/4
NICKEL	0.86 U	0.87 U	ND	ND		0/4
POTASSIUM	NA	NA	2700 J	3540 J	65-FS05-LB01F	4/4
SELENIUM	NA	NA	0.14	0.22	65-FS04-BG01F	4/4
SILVER	0.094 U	0.094 U	ND	ND		0/4
SODIUM	NA	NA	441	869	65-FS04-BG01F	4/4
THALLIUM	0.11 U	0.11 U	0.11	0.11	65-FS05-RS01F	3/4
TIN	9.6 U	9.6 U	ND	ND		0/4
VANADIUM	0.12 U	0.12 U	ND	ND		0/4
ZINC	NA	NA	5.8 J	8.4 J	65-FS05-BG01F	4/4

APPENDIX O.12
FISH WHOLE BODY

FREQUENCY OF DETECTION
FISH TISSUE - WHOLE BODY
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

SAMPLE ID.	65-FS04-BG01W	65-FS04-RS01W	65-FS05-BG01W	65-FS05-LB01W	65-FS05-RS01W
DATE COLLECTED	05/17/95	05/17/95	05/16/95	05/16/95	05/16/95
VOLATILES (ug/kg)					
CHLOROMETHANE	4800 U	4800 U	96000 U	48000 U	4800 U
BROMOMETHANE	4800 U	4800 U	96000 U	48000 U	4800 U
VINYL CHLORIDE	4800 U	4800 U	96000 U	48000 U	4800 U
CHLOROETHANE	4800 U	4800 U	96000 U	48000 U	4800 U
METHYLENE CHLORIDE	4800 U	1000 J	96000 U	48000 U	4800 U
ACETONE	4800 U	4800 U	1400000 J	690000 J	27000
CARBON DISULFIDE	4800 U	4800 U	96000 U	48000 U	4800 U
1,1-DICHLOROETHENE	4800 U	4800 U	96000 U	48000 U	4800 U
1,1-DICHLOROETHANE	4800 U	4800 U	96000 U	48000 U	4800 U
1,2-DICHLOROETHENE (TOTAL)	4800 U	4800 U	96000 U	48000 U	4800 U
CHLOROFORM	4800 U	4800 U	96000 U	48000 U	4800 U
1,2-DICHLOROETHANE	4800 U	4800 U	96000 U	48000 U	4800 U
2-BUTANONE (MEK)	4800 U	4800 U	96000 U	48000 U	560 J
1,1,1-TRICHLOROETHANE	4800 U	4800 U	96000 U	48000 U	4800 U
CARBON TETRACHLORIDE	4800 U	4800 U	96000 U	48000 U	4800 U
BROMODICHLOROMETHANE	4800 U	4800 U	96000 U	48000 U	4800 U
1,2-DICHLOROPROPANE	4800 U	4800 U	96000 U	48000 U	4800 U
CIS-1,3-DICHLOROPROPENE	4800 U	4800 U	96000 U	48000 U	4800 U
TRICHLOROETHENE	4800 U	4800 U	96000 U	48000 U	4800 U
DIBROMOCHLOROMETHANE	4800 U	4800 U	96000 U	48000 U	4800 U
1,1,2-TRICHLOROETHANE	4800 U	4800 U	96000 U	48000 U	4800 U
BENZENE	4800 U	4800 U	96000 U	48000 U	4800 U
TRANS-1,3-DICHLOROPROPENE	4800 U	4800 U	96000 U	48000 U	4800 U
BROMOFORM	4800 U	4800 U	96000 U	48000 U	4800 U
4-METHYL-2-PENTANONE (MIBK)	4800 U	4800 U	96000 U	48000 U	4800 U
2-HEXANONE	4800 U	4800 U	96000 U	48000 U	4800 U
TETRACHLOROETHENE	4800 U	4800 U	96000 U	48000 U	4800 U
1,1,2,2-TETRACHLOROETHANE	4800 U	4800 U	96000 U	48000 U	4800 U
TOLUENE	4800 U	4800 U	96000 U	5000 J	4800 U
CHLOROBENZENE	4800 U	4800 U	96000 U	48000 U	4800 U
ETHYLBENZENE	4800 U	4800 U	96000 U	48000 U	4800 U
STYRENE	4800 U	4800 U	96000 U	48000 U	4800 U
XYLENES (TOTAL)	4800 U	4800 U	96000 U	48000 U	4800 U

FREQUENCY OF DETECTION
FISH TISSUE - WHOLE BODY
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

SAMPLE ID. DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
VOLATILES (ug/kg)						
CHLOROMETHANE	4800 U	96000 U	ND	ND		0/5
BROMOMETHANE	4800 U	96000 U	ND	ND		0/5
VINYL CHLORIDE	4800 U	96000 U	ND	ND		0/5
CHLOROETHANE	4800 U	96000 U	ND	ND		0/5
METHYLENE CHLORIDE	4800 U	96000 U	1000 J	1000 J	65-FS04-RS01W	1/5
ACETONE	4800 U	4800 U	27000	1400000 J	65-FS05-BG01W	3/5
CARBON DISULFIDE	4800 U	96000 U	ND	ND		0/5
1,1-DICHLOROETHENE	4800 U	96000 U	ND	ND		0/5
1,1-DICHLOROETHANE	4800 U	96000 U	ND	ND		0/5
1,2-DICHLOROETHENE (TOTAL)	4800 U	96000 U	ND	ND		0/5
CHLOROFORM	4800 U	96000 U	ND	ND		0/5
1,2-DICHLOROETHANE	4800 U	96000 U	ND	ND		0/5
2-BUTANONE (MEK)	4800 U	96000 U	560 J	560 J	65-FS05-RS01W	1/5
1,1,1-TRICHLOROETHANE	4800 U	96000 U	ND	ND		0/5
CARBON TETRACHLORIDE	4800 U	96000 U	ND	ND		0/5
BROMODICHLOROMETHANE	4800 U	96000 U	ND	ND		0/5
1,2-DICHLOROPROPANE	4800 U	96000 U	ND	ND		0/5
CIS-1,3-DICHLOROPROPENE	4800 U	96000 U	ND	ND		0/5
TRICHLOROETHENE	4800 U	96000 U	ND	ND		0/5
DIBROMOCHLOROMETHANE	4800 U	96000 U	ND	ND		0/5
1,1,2-TRICHLOROETHANE	4800 U	96000 U	ND	ND		0/5
BENZENE	4800 U	96000 U	ND	ND		0/5
TRANS-1,3-DICHLOROPROPENE	4800 U	96000 U	ND	ND		0/5
BROMOFORM	4800 U	96000 U	ND	ND		0/5
4-METHYL-2-PENTANONE (MIBK)	4800 U	96000 U	ND	ND		0/5
2-HEXANONE	4800 U	96000 U	ND	ND		0/5
TETRACHLOROETHENE	4800 U	96000 U	ND	ND		0/5
1,1,2,2-TETRACHLOROETHANE	4800 U	96000 U	ND	ND		0/5
TOLUENE	4800 U	96000 U	5000 J	5000 J	65-FS05-LB01W	1/5
CHLOROBENZENE	4800 U	96000 U	ND	ND		0/5
ETHYLBENZENE	4800 U	96000 U	ND	ND		0/5
STYRENE	4800 U	96000 U	ND	ND		0/5
XYLENES (TOTAL)	4800 U	96000 U	ND	ND		0/5

FREQUENCY OF DETECTION
FISH TISSUE - WHOLE BODY
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

SAMPLE ID.	65-FS04-BG01W	65-FS04-RS01W	65-FS05-BG01W	65-FS05-LB01W	65-FS05-RS01W
DATE COLLECTED	05/17/95	05/17/95	05/16/95	05/16/95	05/16/95
SEMIVOLATILES (ug/kg)					
PHENOL	8000 U	1000 U	4000 U	4000 U	4000 U
2-CHLOROPHENOL	8000 U	1000 U	4000 U	4000 U	4000 U
1,3-DICHLOROBENZENE	8000 U	1000 U	4000 U	4000 U	4000 U
1,4-DICHLOROBENZENE	8000 U	1000 U	4000 U	4000 U	4000 U
1,2-DICHLOROBENZENE	8000 U	1000 U	4000 U	4000 U	4000 U
2-METHYLPHENOL	8000 U	1000 U	4000 U	4000 U	4000 U
2,2'-OXYBIS(1-CHLOROPROPANE)	8000 U	1000 U	4000 U	4000 U	4000 U
4-METHYLPHENOL	8000 U	1000 U	4000 U	4000 U	4000 U
N-NITROSO-DI-N-PROPYLAMINE	8000 U	1000 U	4000 U	4000 U	4000 U
HEXACHLOROETHANE	8000 U	1000 U	4000 U	4000 U	4000 U
NITROBENZENE	8000 U	1000 U	4000 U	4000 U	4000 U
ISOPHORONE	8000 U	1000 U	4000 U	4000 U	4000 U
2-NITROPHENOL	8000 U	1000 U	4000 U	4000 U	4000 U
2,4-DIMETHYLPHENOL	8000 U	1000 U	4000 U	4000 U	4000 U
2,4-DICHLOROPHENOL	8000 U	1000 U	4000 U	4000 U	4000 U
1,2,4-TRICHLOROBENZENE	8000 U	1000 U	4000 U	4000 U	4000 U
NAPHTHALENE	8000 U	1000 U	4000 U	4000 U	4000 U
4-CHLOROANILINE	8000 U	1000 U	4000 U	4000 U	4000 U
HEXACHLOROBUTADIENE	8000 U	1000 U	4000 U	4000 U	4000 U
4-CHLORO-3-METHYLPHENOL	8000 U	1000 U	4000 U	4000 U	4000 U
2-METHYLNAPHTHALENE	8000 U	1000 U	4000 U	4000 U	4000 U
HEXACHLOROCYCLOPENTADIENE	8000 U	1000 U	4000 U	4000 U	4000 U
2,4,6-TRICHLOROPHENOL	8000 U	1000 U	4000 U	4000 U	4000 U
2,4,5-TRICHLOROPHENOL	20000 U	2500 U	10000 U	10000 U	10000 U
2-CHLORONAPHTHALENE	8000 U	1000 U	4000 U	4000 U	4000 U
2-NITROANILINE	20000 U	2500 U	10000 U	10000 U	10000 U
DIMETHYL PHTHALATE	8000 U	1000 U	4000 U	4000 U	4000 U
ACENAPHTHYLENE	8000 U	1000 U	4000 U	4000 U	4000 U
2,6-DINITROTOLUENE	8000 U	1000 U	4000 U	4000 U	4000 U
3-NITROANILINE	20000 U	2500 U	10000 UJ	10000 UJ	10000 U
ACENAPHTHENE	8000 U	1000 U	4000 U	4000 U	4000 U
2,4-DINITROPHENOL	20000 U	2500 U	10000 U	10000 U	10000 U
4-NITROPHENOL	20000 U	2500 U	10000 U	10000 U	10000 U
DIBENZOFURAN	8000 U	1000 U	4000 U	4000 U	4000 U

FREQUENCY OF DETECTION
FISH TISSUE - WHOLE BODY
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

SAMPLE ID.	65-FS04-BG01W	65-FS04-RS01W	65-FS05-BG01W	65-FS05-LB01W	65-FS05-RS01W
DATE COLLECTED	05/17/95	05/17/95	05/16/95	05/16/95	05/16/95
SEMIVOLATILES (ug/kg) cont.					
2,4-DINITROTOLUENE	8000 U	1000 U	4000 U	4000 U	4000 U
DIETHYL PHTHALATE	8000 U	1000 U	4000 U	4000 U	4000 U
FLUORENE	8000 U	1000 U	4000 U	4000 U	4000 U
4-NITROANILINE	20000 U	2500 U	10000 U	10000 U	10000 U
4,6-DINITRO-2-METHYLPHENOL	20000 U	2500 U	10000 U	10000 U	10000 U
N-NITROSODIPHENYLAMINE	8000 U	1000 U	4000 U	4000 U	4000 U
4-BROMOPHENYL PHENYL ETHER	8000 U	1000 U	4000 U	4000 U	4000 U
HEXACHLOROBENZENE	8000 U	1000 U	4000 U	4000 U	4000 U
PENTACHLOROPHENOL	20000 U	2500 U	10000 U	10000 U	10000 U
PHENANTHRENE	8000 U	1000 U	4000 U	4000 U	4000 U
ANTHRACENE	8000 U	1000 U	4000 U	4000 U	4000 U
CARBAZOLE	8000 U	1000 U	4000 U	4000 U	4000 U
DI-N-BUTYL PHTHALATE	8000 U	1000 U	4000 U	4000 U	4000 U
FLUORANTHENE	8000 U	1000 U	4000 U	4000 U	4000 U
PYRENE	8000 U	1000 U	4000 U	4000 U	4000 U
BUTYL BENZYL PHTHALATE	8000 U	1000 U	4000 U	4000 U	4000 U
3,3'-DICHLOROBENZIDINE	8000 U	1000 U	4000 U	4000 U	4000 U
BENZO(A)ANTHRACENE	8000 U	1000 U	4000 U	4000 U	4000 U
CHRYSENE	8000 U	1000 U	4000 U	4000 U	4000 U
BIS(2-ETHYLHEXYL)PHTHALATE	8000 U	1000 U	4000 U	4000 U	4000 U
DI-N-OCTYL PHTHALATE	8000 U	1000 U	4000 U	4000 U	4000 U
BENZO(B)FLUORANTHENE	8000 U	1000 U	4000 U	4000 U	4000 U
BENZO(K)FLUORANTHENE	8000 U	1000 U	4000 U	4000 U	4000 U
BENZO(A)PYRENE	8000 U	1000 U	4000 U	4000 U	4000 U
INDENO(1,2,3-CD)PYRENE	8000 U	1000 U	4000 U	4000 U	4000 U
DIBENZO(A,H)ANTHRACENE	8000 U	1000 U	4000 U	4000 U	4000 U
BENZO(G,H,I)PERYLENE	8000 U	1000 U	4000 U	4000 U	4000 U
BIS(2-CHLOROETHOXY)-METHANE	8000 U	1000 U	4000 U	4000 U	4000 U
BIS(2-CHLOROETHYL) ETHER	8000 U	1000 U	4000 U	4000 U	4000 U
4-CHLOROPHENYL PHENYL ETHER	8000 U	1000 U	4000 U	4000 U	4000 U

FREQUENCY OF DETECTION
FISH TISSUE - WHOLE BODY
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

SAMPLE ID. DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/kg)						
PHENOL	1000 U	8000 U	ND	ND		0/5
2-CHLOROPHENOL	1000 U	8000 U	ND	ND		0/5
1,3-DICHLOROBENZENE	1000 U	8000 U	ND	ND		0/5
1,4-DICHLOROBENZENE	1000 U	8000 U	ND	ND		0/5
1,2-DICHLOROBENZENE	1000 U	8000 U	ND	ND		0/5
2-METHYLPHENOL	1000 U	8000 U	ND	ND		0/5
2,2'-OXYBIS(1-CHLOROPROPANE)	1000 U	8000 U	ND	ND		0/5
4-METHYLPHENOL	1000 U	8000 U	ND	ND		0/5
N-NITROSO-DI-N-PROPYLAMINE	1000 U	8000 U	ND	ND		0/5
HEXACHLOROETHANE	1000 U	8000 U	ND	ND		0/5
NITROBENZENE	1000 U	8000 U	ND	ND		0/5
ISOPHORONE	1000 U	8000 U	ND	ND		0/5
2-NITROPHENOL	1000 U	8000 U	ND	ND		0/5
2,4-DIMETHYLPHENOL	1000 U	8000 U	ND	ND		0/5
2,4-DICHLOROPHENOL	1000 U	8000 U	ND	ND		0/5
1,2,4-TRICHLOROBENZENE	1000 U	8000 U	ND	ND		0/5
NAPHTHALENE	1000 U	8000 U	ND	ND		0/5
4-CHLOROANILINE	1000 U	8000 U	ND	ND		0/5
HEXACHLOROBUTADIENE	1000 U	8000 U	ND	ND		0/5
4-CHLORO-3-METHYLPHENOL	1000 U	8000 U	ND	ND		0/5
2-METHYLNAPHTHALENE	1000 U	8000 U	ND	ND		0/5
HEXACHLOROCYCLOPENTADIENE	1000 U	8000 U	ND	ND		0/5
2,4,6-TRICHLOROPHENOL	1000 U	8000 U	ND	ND		0/5
2,4,5-TRICHLOROPHENOL	2500 U	20000 U	ND	ND		0/5
2-CHLORONAPHTHALENE	1000 U	8000 U	ND	ND		0/5
2-NITROANILINE	2500 U	20000 U	ND	ND		0/5
DIMETHYL PHTHALATE	1000 U	8000 U	ND	ND		0/5
ACENAPHTHYLENE	1000 U	8000 U	ND	ND		0/5
2,6-DINITROTOLUENE	1000 U	8000 U	ND	ND		0/5
3-NITROANILINE	2500 U	20000 U	ND	ND		0/5
ACENAPHTHENE	1000 U	8000 U	ND	ND		0/5
2,4-DINITROPHENOL	2500 U	20000 U	ND	ND		0/5
4-NITROPHENOL	2500 U	20000 U	ND	ND		0/5
DIBENZOFURAN	1000 U	8000 U	ND	ND		0/5

FREQUENCY OF DETECTION
FISH TISSUE - WHOLE BODY
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

SAMPLE ID. DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/kg) cont.						
2,4-DINITROTOLUENE	1000 U	8000 U	ND	ND		0/5
DIETHYL PHTHALATE	1000 U	8000 U	ND	ND		0/5
FLUORENE	1000 U	8000 U	ND	ND		0/5
4-NITROANILINE	2500 U	20000 U	ND	ND		0/5
4,6-DINITRO-2-METHYLPHENOL	2500 U	20000 U	ND	ND		0/5
N-NITROSODIPHENYLAMINE	1000 U	8000 U	ND	ND		0/5
4-BROMOPHENYL PHENYL ETHER	1000 U	8000 U	ND	ND		0/5
HEXACHLOROBENZENE	1000 U	8000 U	ND	ND		0/5
PENTACHLOROPHENOL	2500 U	20000 U	ND	ND		0/5
PHENANTHRENE	1000 U	8000 U	ND	ND		0/5
ANTHRACENE	1000 U	8000 U	ND	ND		0/5
CARBAZOLE	1000 U	8000 U	ND	ND		0/5
DI-N-BUTYL PHTHALATE	1000 U	8000 U	ND	ND		0/5
FLUORANTHENE	1000 U	8000 U	ND	ND		0/5
PYRENE	1000 U	8000 U	ND	ND		0/5
BUTYL BENZYL PHTHALATE	1000 U	8000 U	ND	ND		0/5
3,3'-DICHLOROBENZIDINE	1000 U	8000 U	ND	ND		0/5
BENZO(A)ANTHRACENE	1000 U	8000 U	ND	ND		0/5
CHRYSENE	1000 U	8000 U	ND	ND		0/5
BIS(2-ETHYLHEXYL)PHTHALATE	1000 U	8000 U	ND	ND		0/5
DI-N-OCTYL PHTHALATE	1000 U	8000 U	ND	ND		0/5
BENZO(B)FLUORANTHENE	1000 U	8000 U	ND	ND		0/5
BENZO(K)FLUORANTHENE	1000 U	8000 U	ND	ND		0/5
BENZO(A)PYRENE	1000 U	8000 U	ND	ND		0/5
INDENO(1,2,3-CD)PYRENE	1000 U	8000 U	ND	ND		0/5
DIBENZO(A,H)ANTHRACENE	1000 U	8000 U	ND	ND		0/5
BENZO(G,H,I)PERYLENE	1000 U	8000 U	ND	ND		0/5
BIS(2-CHLOROETHOXY)-METHANE	1000 U	8000 U	ND	ND		0/5
BIS(2-CHLOROETHYL) ETHER	1000 U	8000 U	ND	ND		0/5
4-CHLOROPHENYL PHENYL ETHER	1000 U	8000 U	ND	ND		0/5

FREQUENCY OF DETECTION
FISH TISSUE - WHOLE BODY
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

SAMPLE ID.	65-FS04-BG01W	65-FS04-RS01W	65-FS05-BG01W	65-FS05-LB01W	65-FS05-RS01W
DATE COLLECTED	05/17/95	05/17/95	05/16/95	05/16/95	05/16/95
PESTICIDE/PCBS (ug/kg)					
ALPHA-BHC	5.1 UJ	5.1 UJ	5 UJ	5.1 UJ	5.1 UJ
BETA-BHC	5.1 UJ	5.1 UJ	5 UJ	5.1 UJ	5.1 UJ
DELTA-BHC	5.1 UJ	5.1 UJ	5 UJ	5.1 UJ	5.1 UJ
GAMMA-BHC(LINDANE)	5.1 UJ	5.1 UJ	5 UJ	5.1 UJ	5.1 UJ
HEPTACHLOR	5.1 UJ	5.1 UJ	5 UJ	5.1 UJ	5.1 UJ
ALDRIN	5.1 UJ	5.1 UJ	5 UJ	5.1 UJ	5.1 UJ
HEPTACHLOR EPOXIDE	5.1 UJ	5.1 UJ	5 UJ	5.1 UJ	5.1 UJ
ENDOSULFAN I	5.1 UJ	5.1 UJ	5 UJ	5.1 UJ	5.1 UJ
DIELDRIN	9.9 UJ	9.9 UJ	9.8 UJ	9.9 UJ	9.9 UJ
4,4'-DDE	15 J	9.9 UJ	9.8 UJ	9.9 UJ	9.9 UJ
ENDRIN	9.9 UJ	9.9 UJ	9.8 UJ	9.9 UJ	9.9 UJ
ENDOSULFAN II	9.9 UJ	9.9 UJ	9.8 UJ	9.9 UJ	9.9 UJ
4,4'-DDD	40 J	6.9 J	9.8 UJ	9.9 UJ	9.9 UJ
ENDOSULFAN SULFATE	9.9 UJ	9.9 UJ	9.8 UJ	9.9 UJ	9.9 UJ
4,4'-DDT	9.9 UJ	9.9 UJ	9.8 UJ	9.9 UJ	9.9 UJ
METHOXYCHLOR	51 UJ	51 UJ	50 UJ	51 UJ	51 UJ
ENDRIN KETONE	9.9 UJ	9.9 UJ	9.8 UJ	9.9 UJ	9.9 UJ
ENDRIN ALDEHYDE	9.9 UJ	9.9 UJ	9.8 UJ	9.9 UJ	9.9 UJ
ALPHA CHLORDANE	5.1 UJ	5.1 UJ	5 UJ	5.1 UJ	5.1 UJ
GAMMA CHLORDANE	5.1 UJ	5.1 UJ	5 UJ	5.1 UJ	5.1 UJ
TOXAPHENE	510 UJ	510 UJ	500 UJ	510 UJ	510 UJ
AROCLOR 1016	99 UJ	99 UJ	98 UJ	99 UJ	99 UJ
AROCLOR 1221	200 UJ	200 UJ	200 UJ	200 UJ	200 UJ
AROCLOR 1232	99 UJ	99 UJ	98 UJ	99 UJ	99 UJ
AROCLOR 1242	99 UJ	99 UJ	98 UJ	99 UJ	99 UJ
AROCLOR 1248	99 UJ	99 UJ	98 UJ	99 UJ	99 UJ
AROCLOR 1254	99 UJ	99 UJ	98 UJ	99 UJ	99 UJ
AROCLOR 1260	99 UJ	99 UJ	98 UJ	99 UJ	99 UJ

FREQUENCY OF DETECTION
FISH TISSUE - WHOLE BODY
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

SAMPLE ID. DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
PESTICIDE/PCBS (ug/kg)						
ALPHA-BHC	5 UJ	5.1 UJ	ND	ND		0/5
BETA-BHC	5 UJ	5.1 UJ	ND	ND		0/5
DELTA-BHC	5 UJ	5.1 UJ	ND	ND		0/5
GAMMA-BHC(LINDANE)	5 UJ	5.1 UJ	ND	ND		0/5
HEPTACHLOR	5 UJ	5.1 UJ	ND	ND		0/5
ALDRIN	5 UJ	5.1 UJ	ND	ND		0/5
HEPTACHLOR EPOXIDE	5 UJ	5.1 UJ	ND	ND		0/5
ENDOSULFAN I	5 UJ	5.1 UJ	ND	ND		0/5
DIELDRIN	9.8 UJ	9.9 UJ	ND	ND		0/5
4,4'-DDE	9.8 UJ	9.9 UJ	15 J	15 J	65-FS04-BG01W	1/5
ENDRIN	9.8 UJ	9.9 UJ	ND	ND		0/5
ENDOSULFAN II	9.8 UJ	9.9 UJ	ND	ND		0/5
4,4'-DDD	9.8 UJ	9.9 UJ	6.9 J	40 J	65-FS04-BG01W	2/5
ENDOSULFAN SULFATE	9.8 UJ	9.9 UJ	ND	ND		0/5
4,4'-DDT	9.8 UJ	9.9 UJ	ND	ND		0/5
METHOXYCHLOR	50 UJ	51 UJ	ND	ND		0/5
ENDRIN KETONE	9.8 UJ	9.9 UJ	ND	ND		0/5
ENDRIN ALDEHYDE	9.8 UJ	9.9 UJ	ND	ND		0/5
ALPHA CHLORDANE	5 UJ	5.1 UJ	ND	ND		0/5
GAMMA CHLORDANE	5 UJ	5.1 UJ	ND	ND		0/5
TOXAPHENE	500 UJ	510 UJ	ND	ND		0/5
AROCLOR 1016	98 UJ	99 UJ	ND	ND		0/5
AROCLOR 1221	200 UJ	200 UJ	ND	ND		0/5
AROCLOR 1232	98 UJ	99 UJ	ND	ND		0/5
AROCLOR 1242	98 UJ	99 UJ	ND	ND		0/5
AROCLOR 1248	98 UJ	99 UJ	ND	ND		0/5
AROCLOR 1254	98 UJ	99 UJ	ND	ND		0/5
AROCLOR 1260	98 UJ	99 UJ	ND	ND		0/5

FREQUENCY OF DETECTION
FISH TISSUE - WHOLE BODY
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA
TAL METALS

SAMPLE ID.	65-FS04-BG01W	65-FS04-RS01W	65-FS05-BG01W	65-FS05-LB01W	65-FS05-RS01W
DATE COLLECTED	05/17/95	05/17/95	05/16/95	05/16/95	05/16/95
ANALYTES (mg/kg)					
ALUMINUM	18.8 J	18 J	3.3 U	9.6 J	2.1 U
ANTIMONY	1 U	1.5	1.1	1.4	1.1
ARSENIC	0.15 J	0.08 UJ	0.08 UJ	0.08 UJ	0.08 UJ
BARIUM	1.8 J	2.9 J	1.8 J	1.3 J	0.44 J
BERYLLIUM	0.02 U	0.015 U	0.028	0.015 U	0.015 U
BORON	0.72 U	0.71 U	0.82 U	0.88 U	0.71 U
CADMIUM	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
CALCIUM	19600 J	42500 J	22600 J	22400 J	8840 J
CHROMIUM	0.7 U	0.89 U	0.57 U	0.55 U	0.34 U
COBALT	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
COPPER	1.1	0.68 U	0.5 U	0.58 U	8.6
CYANIDE, TOTAL	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
IRON	22.9 J	24.4 J	7.8 J	26.1 J	11.8 J
LEAD	0.17	0.49	0.055 U	0.054 U	0.33
MAGNESIUM	557 J	951 J	538 J	593 J	370 J
MANGANESE	3.6 J	4.1 J	4.9 J	2.3 J	1 J
MERCURY	0.04 UJ	0.11 J	0.04 UJ	0.11 J	0.04 UJ
MOLYBDENUM	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
NICKEL	0.88 U	0.87 U	0.87 U	0.87 U	0.87 U
POTASSIUM	2580 J	1850 J	2790 J	2860 J	2740 J
SELENIUM	0.42	0.17	0.16	0.33	0.32
SILVER	0.1 U	0.094 U	0.094 U	0.094 U	0.094 U
SODIUM	1260	2400	1250	1160	992
THALLIUM	0.12	0.11	0.11	0.11	0.11
TIN	9.6 U	9.6 U	9.6 U	9.6 U	9.6 U
VANADIUM	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
ZINC	26.2 J	31.5 J	26.6 J	14.8 J	23.3 J

FREQUENCY OF DETECTION
FISH TISSUE - WHOLE BODY
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA
TAL METALS

SAMPLE ID. DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
ANALYTES (mg/kg)						
ALUMINUM	2.1 U	3.3 U	9.6 J	18.8 J	65-FS04-BG01W	3/5
ANTIMONY	1 U	1 U	1.1	1.5	65-FS04-RS01W	4/5
ARSENIC	0.08 UJ	0.08 UJ	0.15 J	0.15 J	65-FS04-BG01W	1/5
BARIUM	NA	NA	0.44 J	2.9 J	65-FS04-RS01W	5/5
BERYLLIUM	0.015 U	0.02 U	0.028	0.028	65-FS05-BG01W	1/5
BORON	0.71 U	0.88 U	ND	ND		0/5
CADMIUM	0.1 U	0.1 U	ND	ND		0/5
CALCIUM	NA	NA	8840 J	42500 J	65-FS04-RS01W	5/5
CHROMIUM	0.34 U	0.89 U	ND	ND		0/5
COBALT	0.32 U	0.32 U	ND	ND		0/5
COPPER	0.5 U	0.68 U	1.1	8.6	65-FS05-RS01W	2/5
CYANIDE, TOTAL	0.5 U	0.5 U	ND	ND		0/5
IRON	NA	NA	7.8 J	26.1 J	65-FS05-LB01W	5/5
LEAD	0.054 U	0.055 U	0.17	0.49	65-FS04-RS01W	3/5
MAGNESIUM	NA	NA	370 J	951 J	65-FS04-RS01W	5/5
MANGANESE	NA	NA	1 J	4.9 J	65-FS05-BG01W	5/5
MERCURY	0.04 UJ	0.04 UJ	0.11 J	0.11 J	65-FS05-LB01W	2/5
MOLYBDENUM	0.12 U	0.12 U	ND	ND		0/5
NICKEL	0.87 U	0.88 U	ND	ND		0/5
POTASSIUM	NA	NA	1850 J	2860 J	65-FS05-LB01W	5/5
SELENIUM	NA	NA	0.16	0.42	65-FS04-BG01W	5/5
SILVER	0.094 U	0.1 U	ND	ND		0/5
SODIUM	NA	NA	992	2400	65-FS04-RS01W	5/5
THALLIUM	NA	NA	0.11	0.12	65-FS04-BG01W	5/5
TIN	9.6 U	9.6 U	ND	ND		0/5
VANADIUM	0.12 U	0.12 U	ND	ND		0/5
ZINC	NA	NA	14.8 J	31.5 J	65-FS04-RS01W	5/5

APPENDIX O.13
RESULT OF ENGINEERING PARAMETERS

CTO 312 SITE 65 SOIL

LOCATION	65-SB06
DATE SAMPLED	04/10/95
UNITS	MG/KG
ENGINEERING	
PHOSPHORUS	70
TOTAL KJELDAHL NITROGEN (TKN)	220
ALKALINITY, AS CACO3	680
CHEMICAL OXYGEN DEMAND (COD)	2140
HETEROTROPHIC PLATE COUNT (GM)	500,000
CARBON, TOTAL ORGANIC	3,290

ALKALINITY ANALYSIS

Laboratory Name:	Quanterra-Knoxville	Job Number:	3333
Contract Name:	Baker Camp Lejeune	Analysis Date:	04/13/95
Sample Matrix:	Soil	Concentration Units:	mg/kg (dry weight)

Client Sample ID	Lab Sample ID	Result	Qualifier
Method Blank	AE9732	200	U
65-SB06	AE9676	680	+

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

CHEMICAL OXYGEN DEMAND ANALYSIS

Laboratory Name:	Quanterra-Knoxville	Job Number:	3333
Contract Name:	Baker Camp Lejeune	Analysis Date:	04/14/95
Sample Matrix:	Soil	Concentration Units:	mg/kg (dry weight)

Client Sample ID	Lab Sample ID	Result	Qualifier
Method Blank	AE9743	400	U
65-SB06	AE9676	2140	+

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

TOTAL KJELDAHL NITROGEN ANALYSIS

Laboratory Name:	Quanterra-Knoxville	Job Number:	3333
Contract Name:	Baker Camp Lejeune	Analysis Date:	04/18/95
Sample Matrix:	Soil	Concentration Units:	mg/kg (dry weight)

Client Sample ID	Lab Sample ID	Result	Qualifier
Method Blank	AE9736	10	U
65-SB06	AE9676	220	+

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

TOTAL PHOSPHOROUS ANALYSIS

Laboratory Name:	Quanterra-Knoxville	Job Number:	3333
Contract Name:	Baker Camp Lejeune	Analysis Date:	05/04/95
Sample Matrix:	Soil	Concentration Units:	mg/kg (dry weight)

Client Sample ID	Lab Sample ID	Result	Qualifier
Method Blank	AF2049	0.20	U
65-SB06	AE9676	70	+

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

QUANTERRA

65-SB06

WO #: A40JT
LAB #: C5D130061-001
MATRIX: SOLID

DATE SAMPLED: 4/10/95
DATE RECEIVED: 4/13/95

- - - - - - - - - - - - - - - - - - INORGANIC ANALYTICAL REPORT - - - - - - - - - - - - - - - -

PARAMETER	RESULT	REPORTING LIMIT	UNIT	METHOD	PREPARATION - ANALYSIS DATE	QC BATCH
Solids, Total (TS)	88.7		%	MCAWW 160.3 M	4/25/95	5117046
Carbon, Total Organic	3,290	56.4	mg/kg	MOSA WALKLEY-	4/23/95	5114121

NOTE: DRY WEIGHT

0005003A

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CERTIFICATE OF ANALYSIS

QUANTERRA ENVIRONMENTAL SERV.
5815 MIDDLEBROOK PIKE

KNOXVILLE TN 37921
ATTN: JAIME MCKINNEY

DATE SAMPLED	4/10/95	DATE RECEIVED	4/13/95
TIME SAMPLED	16:50	TIME RECEIVED	00:00
SAMPLER	CUST	DATE REPORTED	4/17/95
PERMIT NO.		ORDER NO.	9504-00388
		INVOICE NO.	015738
		CUST. NO.	Q003
		CUST. P.O.	2369

SUBJECT: SPECIAL TESTING

SAMPLE #	TEST PERFORMED	METHOD	RESULT	UNITS
1 65-SB06 AE9678 SOIL 4-10-95 1650 PROJ.#3333/BAKER				
	HETEROTROPHIC PLATE COUNT	SMEWW 9215C	500,000	GM

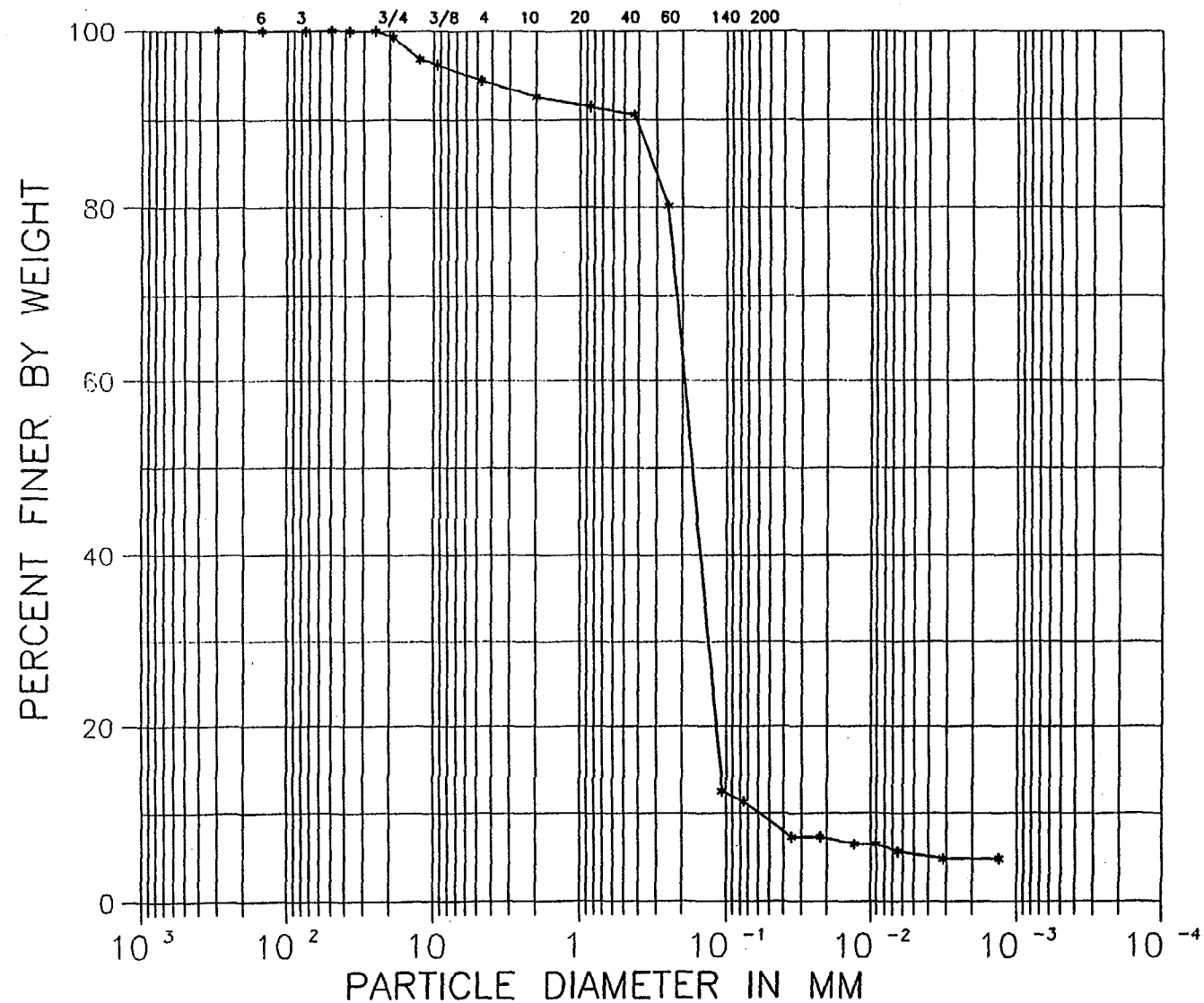
mark A. Mattozzi
MANAGING DIRECTOR

Client QUANTERRA
Client Project 3333 / BAKER
Project No. 95105
USCS Classification SP-SM
Soil Description BROWN POORLY GRADED SAND WITH SILT (NON-PLASTIC FINES)

Boring No. AE9679
Depth(ft) NA
Sample No. 65-SB06
USDA Classification SAND

SIEVE ANALYSIS HYDROMETER

USCS	GRAVEL	SAND	SILT AND CLAY FRACTION	
USDA	GRAVEL	SAND	SILT	CLAY



Geotechnics

Geotechnics

WASH SIEVE ANALYSIS

Client	QUANTERRA	Tested By	JP	Date	04-18-95
Client Project	3333 / BAKER	Checked By	JPM	Date	5.2.95
Project No.	95105				
Boring No.	AE9679				
Depth(ft.)	NA				
Sample No.	65-SB06				
Soil Description	BROWN POORLY GRADED SAND WITH SILT (NON-PLASTIC FINES)				

Wt. of Total Sample(dry) (2)	1058.2 gm.	Wt of Grand Total (1)	8478.29
Wt. of +#200 Sample	937.2 gm.		
Wt. of -#200 Sample	121.0 gm.	J Factor	0.9924
		(Percent finer than 3/4")	

Sieve	Sieve Opening (mm)	Wt. of Soil Retained (gm.)		Percent Retained	Accumulate Percent Retained	Percent Finer	**Final Percent Finer (3)**
12"	300.0	0.00		0.00	0.00	100.00	**100.0**
6"	150.0	0.00		0.00	0.00	100.00	**100.0**
3"	75.0	0.00		0.00	0.00	100.00	**100.0**
2"	50.0	0.00		0.00	0.00	100.00	**100.0**
1 1/2"	37.5	0.00	+ 3/4"	0.00	0.00	100.00	**100.0**
1"	25.0	0.00	SIEVE	0.00	0.00	100.00	**100.0**
3/4"	19.0	64.59	ANALYSIS	0.76	0.76	99.24	**99.2**
1/2"	12.5	27.12	- 3/4"	2.56	2.56	97.44	**96.7**
3/8"	9.5	6.78	SIEVE	0.64	3.20	96.80	**96.1**
#4	4.75	17.84	ANALYSIS	1.69	4.89	95.11	**94.4**
#10	2.00	19.82		1.87	6.76	93.24	**92.5**
#20	0.85	12.08		1.14	7.90	92.10	**91.4**
#40	0.425	9.42		0.89	8.79	91.21	**90.5**
#60	0.250	110.54		10.45	19.24	80.76	**80.1**
#140	0.106	720.40		68.08	87.31	12.69	**12.6**
#200	0.075	13.24		1.25	88.57	11.43	**11.3**
Pan	-	121.00		11.43	100.00	-	-

Water Content

Tare No.	1082
Wgt. Tare + WS.	1331.80
Wgt. Tare + DS.	1163.60
Wgt. Tare	105.36
Wgt. Of Water	168.20
Wgt. Of DS.	1058.24
% Water	15.9

TOTAL WET WGHT. -3/4 SIEVE
9751

TOTAL DRY WGHT. -3/4 SIEVE
8414

Note: 1) The +3/4" sieve analysis is based on the grand total dry weight of material.
2) The -3/4" sieve analysis is based on the total dry weight of the split portion of sample.
3) The final percent finer combines the two analysis.

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HYDROMETER ANALYSIS

Client	QUANTERRA	Tested By	TO	Date	04-18-95
Client Project	3333 / BAKER	Checked By	JCM	Date	5.2.95
Project No.	95105				
Boring No.	AE9679				
Depth(ft.)	NA				
Sample No.	65-SB06				

Soil Sample Weight			
Container No.	1133		
Wt. Contain. & Dry Soil	117.83 gm.	K Factor	0.01308
		Composite Correction	6.63
Wt. Contain.	106.07 gm.	a Factor	0.99
Wt. Dispers.	5.00 gm.		
Wt. Dry Soil	6.76 gm.	% Finer Than No. 200	11.35

Temperature C	22.3	Measured
Specific Gravity	2.70	Assumed

Elapsed Time (min.)	R Measured		R Corrected	N (%)	D (mm)	N' (%)
0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
2	10.5	11.0	4.4	64.0	0.0352	7.3
5		11.0	4.4	64.0	0.0223	7.3
15		10.5	3.9	56.7	0.0129	6.4
30		10.5	3.9	56.7	0.0091	6.4
60		10.0	3.4	49.4	0.0065	5.6
250		9.5	2.9	42.0	0.0032	4.8
1440		9.5	2.9	42.0	0.0013	4.8

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Client	QUANTERRA
Client Project	3333 / BAKER
Project No.	95105
Boring No.	AE9679
Depth(ft.)	NA
Sample No.	65-SB06

DIAMETER (mm)	PERCENT FINER
300.00	100.0
150.00	100.0
75.000	100.0
50.000	100.0
37.500	100.0
25.000	100.0
19.000	99.2
12.500	96.7
9.5000	96.1
4.7500	94.4
2.0000	92.5
0.8500	91.4
0.4250	90.5
0.2500	80.1
0.1060	12.6
0.0750	11.3
0.0352	7.3
0.0223	7.3
0.0129	6.4
0.0091	6.4
0.0065	5.6
0.0032	4.8
0.0013	4.8

SIEVE OPENING (mm)	PERCENT FINER
100.00	100.00
2.00	92.53
0.05	9.16
0.002	4.77

PERCENT OF EACH COMPONENT		CORRECTED PERCENT -2.0 mm MATERIAL FOR USDA DETERMINATION
GRAVEL	7.47	0.00
SAND	83.37	90.10
SILT	4.39	4.74
CLAY	4.77	5.16

USDA CLASSIFICATION SAND

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ATTERBERG LIMITS TEST

Client	QUANTERRA	Tested By	BS	Date	04-26-95
Client Project	3333 / BAKER	Checked By	JCM	Date	5-2-95
Project No.	95105				
Boring No.	AE9679				
Depth(ft.)	NA				
Sample No.	65-SB06				
Soil Description	NON PLASTIC (-40)				

Liquid Limit

Tare Number
Wt. Tare & WS (gm)
Wt. Tare & DS (gm)
Wt. Water (gm)
Wt. Tare (gm)
Wt. DS (gm)
No. of Blows
Water Content (%)

Plastic Limit

Tare Number
Wt. Tare & WS (gm)
Wt. Tare & DS (gm)
Wt. Water (gm)
Wt. Tare (gm)
Wt. DS (gm)
Moisture Content (%)

Non Plastic Fines

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CTO 312 SITE 65 GROUNDWATER

LOCATION	65-MW07A-01	
DATE SAMPLED	05/19/95	
UNITS	MG/L	
ENGINEERING		
PHOSPHORUS	0.01	U
TOTAL KJELDAHL NITROGEN (TKN)	0.18	
ALKALINITY ANALYSIS	91	
CHEMICAL OXYGEN DEMAND (COD)	20	U
TOTAL DISSOLVED SOLIDS ANALYSIS	194	
TOTAL ORGANIC CARBON (TOC)	2	
HETEROTROPHIC PLATE COUNT (PER ML)	950	

ALKALINITY ANALYSIS

Laboratory Name:	Quanterra-Knoxville	Job Number:	3565
Contract Name:	Baker Camp Lejeune	Analysis Date:	05/19/95
Sample Matrix:	Water	Concentration Units:	mg/l

Client Sample ID	Lab Sample ID	Result	Qualifier
Method Blank	AF4545	2	U
65-MW07A-01	AF3040	91	+

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

CHEMICAL OXYGEN DEMAND ANALYSIS

Laboratory Name:	Quanterra-Knoxville	Job Number:	3565
Contract Name:	Baker Camp Lejeune	Analysis Date:	05/30/95
Sample Matrix:	Water	Concentration Units:	mg/l

Client Sample ID	Lab Sample ID	Result	Qualifier
Method Blank	AF5465	20	U
65-MW07A-01	AF3041	20	U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

TOTAL DISSOLVED SOLIDS ANALYSIS

Laboratory Name:	Quanterra-Knoxville	Job Number:	3565
Contract Name:	Baker Camp Lejeune	Analysis Date:	05/16/95
Sample Matrix:	Water	Concentration Units:	mg/l

Client Sample ID	Lab Sample ID	Result	Qualifier
Method Blank	AF3672	10	U
65-MW07A-01	AF3039	194	+

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

TOTAL KJELDAHL NITROGEN ANALYSIS

Laboratory Name:	Quanterra-Knoxville	Job Number:	3565
Contract Name:	Baker Camp Lejeune	Analysis Date:	05/16/95
Sample Matrix:	Water	Concentration Units:	mg/l

Client Sample ID	Lab Sample ID	Result	Qualifier
Method Blank	AF3632	0.1	U
65-MW07A-01	AF3041	0.18	+

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

TOTAL ORGANIC CARBON ANALYSIS

Laboratory Name:	Quanterra-Knoxville	Job Number:	3565
Contract Name:	Baker Camp Lejeune	Analysis Date:	05/26/95
Sample Matrix:	Water	Concentration Units:	mg/l

Client Sample ID	Lab Sample ID	Result	Qualifier
Method Blank	AF5238	1	U
65-MW07A-01	AF3043	2	+

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

TOTAL PHOSPHOROUS ANALYSIS

Laboratory Name:	Quanterra-Knoxville	Job Number:	3565
Contract Name:	Baker Camp Lejeune	Analysis Date:	06/01/95
Sample Matrix:	Water	Concentration Units:	mg/l

Client Sample ID	Lab Sample ID	Result	Qualifier
Method Blank	AF5490	0.01	U
65-MW07A-01	AF3041	0.01	U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

TOTAL SUSPENDED SOLIDS ANALYSIS

Laboratory Name:	Quanterra-Knoxville	Job Number:	3565
Contract Name:	Baker Camp Lejeune	Analysis Date:	05/15/95
Sample Matrix:	Water	Concentration Units:	mg/l

Client Sample ID	Lab Sample ID	Result	Qualifier
Method Blank	AF3660	1	U
65-DW02-01	AF3034	4	+
65-MW02A-01	AF3051	3	+
65-MW03-01	AF3055	1	U
65-MW05A-01	AF3047	1	U
65-MW06A-01	AF3059	1	+
65-MW07A-01	AF3030	1	U

+ - Positive result.
U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

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CERTIFICATE OF ANALYSIS

QUANTERRA ENVIRONMENTAL SERV.
5815 MIDDLEBROOK PIKE

KNOXVILLE TN 37921
ATTN: JAIME MCKINNEY

DATE SAMPLED	5/09/95	DATE RECEIVED	5/12/95
TIME SAMPLED	09:45	TIME RECEIVED	09:55
SAMPLER	CUST	DATE REPORTED	5/15/95
PERMIT NO.		ORDER NO.	9505-00477
		INVOICE NO.	016834
		CUST. NO.	Q003
		CUST. P.O.	DOC. NO. 2540

SUBJECT: SPECIAL WATER TESTING 5/12/95

SAMPLE #	TEST PERFORMED	METHOD	RESULT	UNITS
1 65-MW07A-01 AF3042 WATER				
	HETEROTROPHIC PLATE COUNT	SMEWW 9215	950	PER ML

REGIONAL DIRECTOR

ACCREDITED

CTO 312 SITE 65 SEDIMENT

LOCATION	65-SD04-06	65-SD04-612	65-SD05-06	65-SD05-612
DATE SAMPLED	05/16/95	05/16/95	05/17/95	05/17/95
DEPTH	0-6"	0-6"	0-6"	0-6"
UNITS	MG/KG	MG/KG	MG/KG	MG/KG
ENGINEERING				
CARBON (TOC) IN SOLIDS	24,900	200,000	173,000	44,700

QUANTERRA

65-SD04-06

WO #: A4LVJ
LAB #: C5E190037-001
MATRIX: SOLID

DATE SAMPLED: 5/16/95
TIME SAMPLED: 9:15
DATE RECEIVED: 5/19/95

- - - - - - - - - - - - - - - - - - INORGANIC ANALYTICAL REPORT - - - - - - - - - - - - - - - - -

PARAMETER	RESULT	REPORTING LIMIT	UNIT	METHOD	PREPARATION - ANALYSIS DATE	QC BATCH
Solids, Total (TS)	**25.7**		**%**	**MCAWW 160.3 M**	**5/22/95**	**5143045**
Carbon, Total Organic	**24,900**	**202**	**mg/kg**	**MOSA WALKLEY-**	**6/02/95**	**5153062**

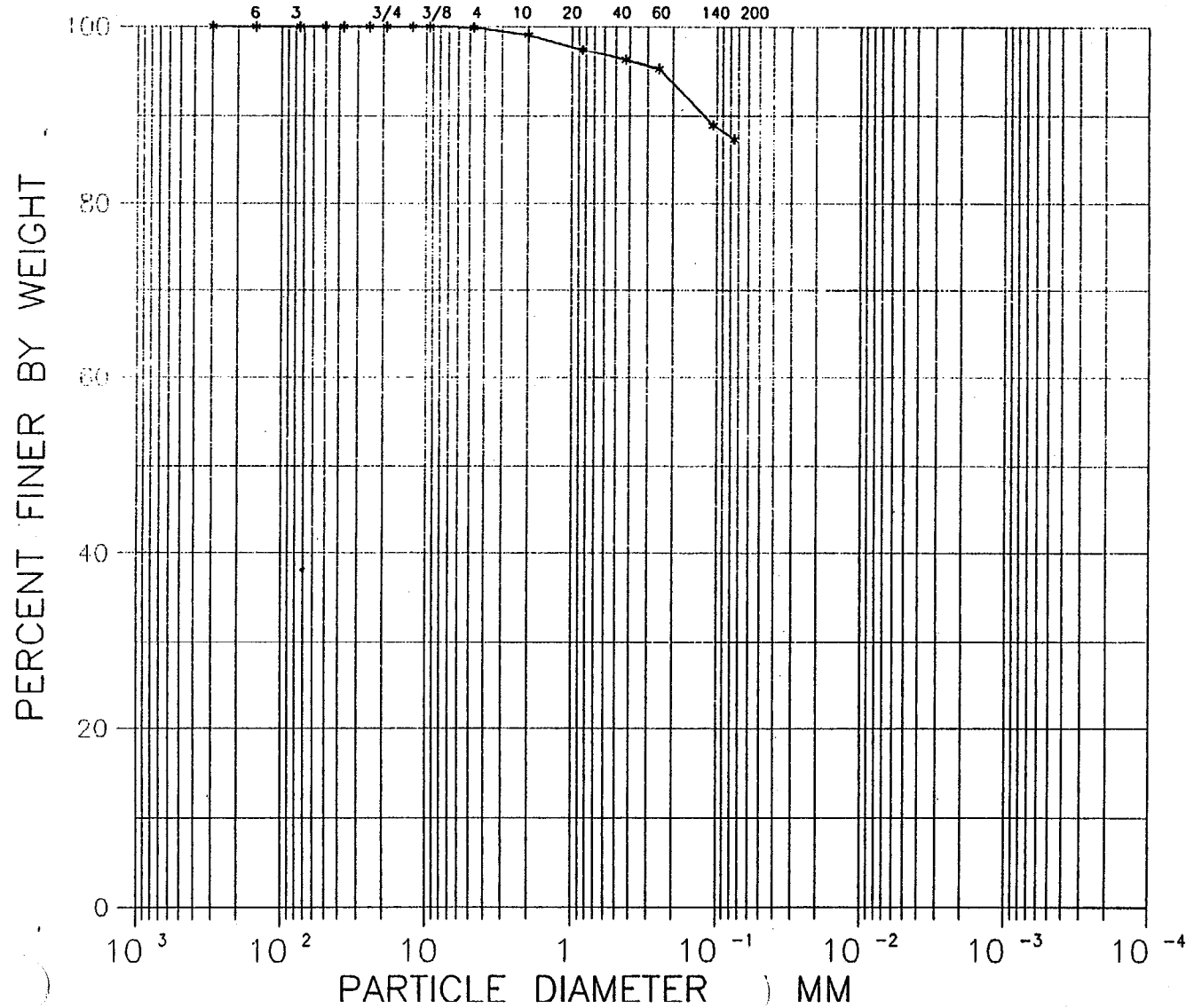
NOTE: DRY WEIGHT

Client QUANTERRA
Client Project 3653 / BAKER
Project No. 95151
USCS Classification cl
Soil Description GRAY LEAN CLAY (SOME ORGANIC MATERIAL)

Boring No. AF 4039
Depth(ft) NA
Sample No. 65-SD04-06
USDA Classification NA

SIEVE ANALYSIS HYDROMETER

USCS	GRAVEL	SAND	SILT AND CLAY FRACTION	
USDA	GRAVEL	SAND	SILT	CLAY



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WASH SIEVE ANALYSIS

Client	QUANTERRA	Tested By	VG	Date	05-21-95
Client Project	3653 / BAKER	Checked By	JCM	Date	5.25.95
Project No.	95151				
Boring No.	AF 4039				
Depth(ft.)	NA				
Sample No.	65-SD04-06				
Soil Description	GRAY LEAN CLAY (SOME ORGANIC MATERIAL)				

Wt. of Total Sample(dry)	297.05 gm.
Wt. of +#200 Sample	37.45 gm.
Wt. of -#200 Sample	259.60 gm.

Sieve	Sieve Opening (mm)	Wt. of Soil Retained (gm.)	Percent Retained	Accumulated Percent Retained	Percent Finer
12"	300.00	0.00	0.0	0.0	100.0
6"	150.00	0.00	0.0	0.0	100.0
3"	75.00	0.00	0.0	0.0	100.0
2"	50.00	0.00	0.0	0.0	100.0
1 1/2"	37.50	0.00	0.0	0.0	100.0
1"	25.00	0.00	0.0	0.0	100.0
3/4"	19.00	0.00	0.0	0.0	100.0
1/2"	12.50	0.00	0.0	0.0	100.0
3/8"	9.50	0.00	0.0	0.0	100.0
#4	4.75	0.26	0.1	0.1	99.9
#10	2.00	2.51	0.8	0.9	99.1
#20	0.85	4.99	1.7	2.6	97.4
#40	0.425	3.38	1.1	3.8	96.2
#60	0.250	3.06	1.0	4.8	95.2
#140	0.106	18.57	6.3	11.0	89.0
#200	0.075	4.68	1.6	12.6	87.4
Pan	-	259.60	87.4	100.0	-

Water Content	
Tare No.	1649
Wgt. Tare + WS.	1310.00
Wgt. Tare + DS.	397.00
Wgt. Tare	99.95
Wgt. Of Water	913.00
Wgt. Of DS.	297.05
% Water	307.4

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QUANTERRA

65-SD04-612

WO #: A4M76
LAB #: C5E200017-001
MATRIX: SOLID

DATE SAMPLED: 5/16/95
TIME SAMPLED: 9:10
DATE RECEIVED: 5/20/95

- - - - - - - - - - - - - - - - - - INORGANIC ANALYTICAL REPORT - - - - - - - - - - - - - - - - -

PARAMETER	RESULT	REPORTING LIMIT	UNIT	METHOD	PREPARATION - ANALYSIS DATE	QC BATCH
Solids, Total (TS)	18.0		%	MCAWW 160.3 M	5/23/95	5144031
Carbon, Total Organic	200,000	1,390	mg/kg	MOSA WALKLEY-	6/06/95	5157101

NOTE: DRY WEIGHT

0005003A

QUANTERRA

65-SD05-06

WO #: A4M74
LAB #: C5E200015-002
MATRIX: SOLID

DATE SAMPLED: 5/17/95
TIME SAMPLED: 11:45
DATE RECEIVED: 5/20/95

INORGANIC ANALYTICAL REPORT

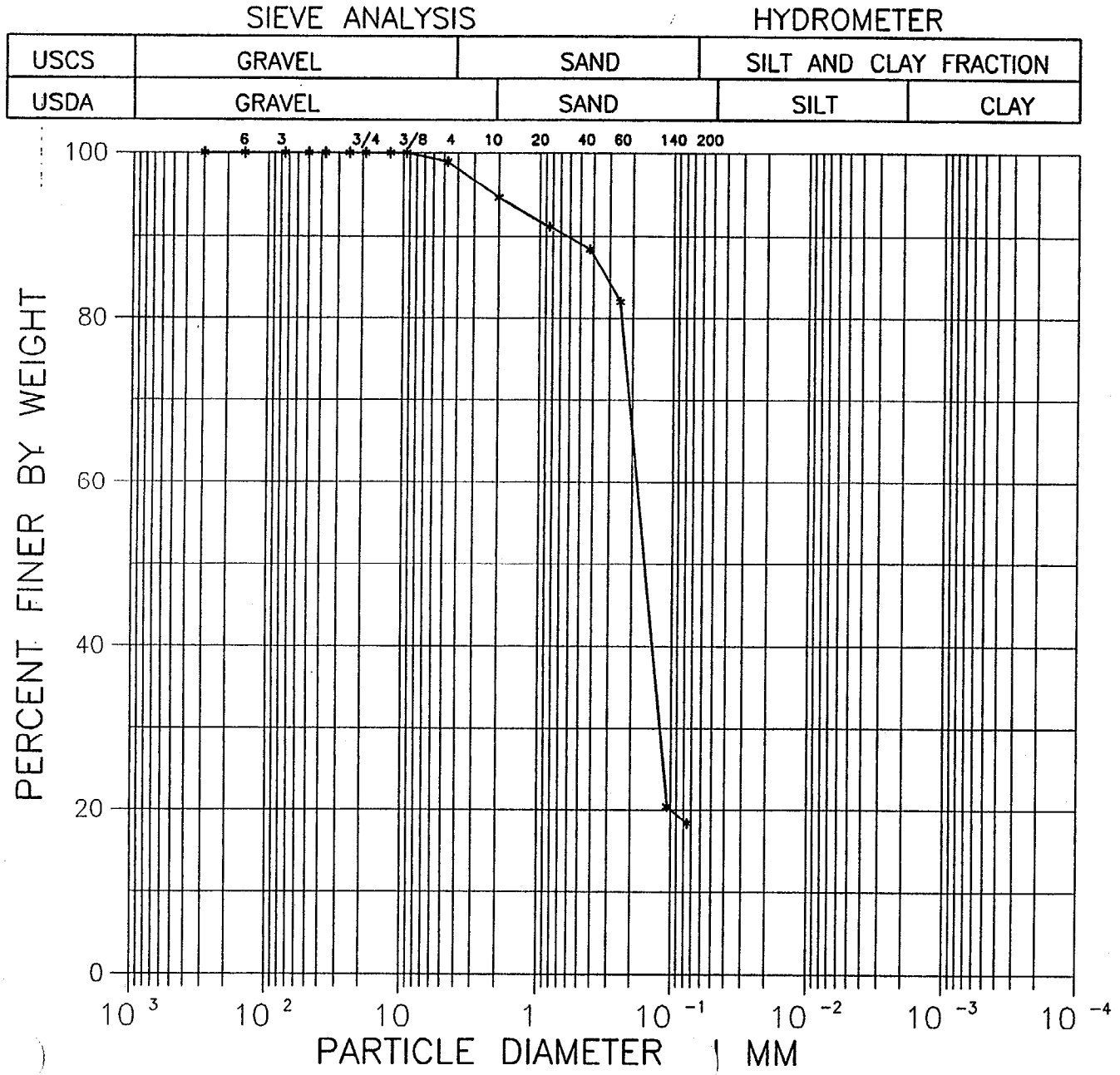
PARAMETER	RESULT	REPORTING LIMIT	UNIT	METHOD	PREPARATION - ANALYSIS DATE	QC BATCH
Solids, Total (TS)	17.4		%	MCAWW 160.3 M	5/23/95	5144031
Carbon, Total Organic	173,000	695	mg/kg	MOSA WALKLEY-	6/07/95	5158007

NOTE: DRY WEIGHT

0005004A

Client QUANTERRA
Client Project 3666 / BAKER
Project No. 95154
USCS Classification sc
Soil Description DARK GRAY CLAYEY SAND

Boring No. AF 4246
Depth(ft) NA
Sample No. 65-SD05-06
USDA Classification NA



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Geotechnics

Geotechnics

WASH SIEVE ANALYSIS

Client	QUANTERRA	Tested By	VG	Date	05-21-95
Client Project	3666 / BAKER	Checked By	JCM	Date	5-31-95
Project No.	95154				
Boring No.	AF 4246				
Depth(ft.)	NA				
Sample No.	65-SD05-06				
Soil Description	DARK GRAY CLAYEY SAND				

Wt. of Total Sample(dry)	347.60 gm.
Wt. of +#200 Sample	283.91 gm.
Wt. of -#200 Sample	63.69 gm.

Sieve	Sieve Opening (mm)	Wt. of Soil Retained (gm.)	Percent Retained	Accumulated Percent Retained	Percent Finer
12"	300.00	0.00	0.0	0.0	100.0
6"	150.00	0.00	0.0	0.0	100.0
3"	75.00	0.00	0.0	0.0	100.0
2"	50.00	0.00	0.0	0.0	100.0
1 1/2"	37.50	0.00	0.0	0.0	100.0
1"	25.00	0.00	0.0	0.0	100.0
3/4"	19.00	0.00	0.0	0.0	100.0
1/2"	12.50	0.00	0.0	0.0	100.0
3/8"	9.50	0.00	0.0	0.0	100.0
#4	4.75	3.63	1.0	1.0	99.0
#10	2.00	14.81	4.3	5.3	94.7
#20	0.85	12.09	3.5	8.8	91.2
#40	0.425	9.63	2.8	11.6	88.4
#60	0.250	22.61	6.5	18.1	81.9
#140	0.106	213.86	61.5	79.6	20.4
#200	0.075	7.28	2.1	81.7	18.3
Pan	-	63.69	18.3	100.0	-

Water Content	
Tare No.	1058
Wgt. Tare + WS.	1081.20
Wgt. Tare + DS.	452.60
Wgt. Tare	105.00
Wgt. Of Water	628.60
Wgt. Of DS.	347.60
% Water	180.8

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QUANTERRA

65-SD05-612

WO #: A4M73
LAB #: C5E200015-001
MATRIX: SOLID

DATE SAMPLED: 5/17/95
TIME SAMPLED: 11:40
DATE RECEIVED: 5/20/95

INORGANIC ANALYTICAL REPORT

PARAMETER	RESULT	REPORTING LIMIT	UNIT	METHOD	PREPARATION - ANALYSIS DATE	QC BATCH
Solids, Total (TS)	64.8		%	MCAWW 160.3 M	5/23/95	5144031
Carbon, Total Organic	44,700	193	mg/kg	MOSA WALKLEY-	6/07/95	5158007

NOTE: DRY WEIGHT

0005003A

APPENDIX P
FIELD DUPLICATE SUMMARIES

FIELD DUPLICATE SUMMARY
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
VOLATILE ORGANICS

LOCATION	65-DW01-04D	65-MW01A-01D	65-MW06A-00D	65-SB07-00D	65-SB11-04D	65-SD04-06D
DATE COLLECTED	04/10/95	05/08/95	04/08/95	04/08/95	04/08/95	05/16/95
DEPTH	7-9'	NA	0-1'	0-1'	7-9'	0-6"
UNITS	UG/KG	UG/L	UG/KG	UG/KG	UG/KG	UG/KG
CHLOROMETHANE	11 U	10 U	12 U	11 U	12 U	12 J
BROMOMETHANE	11 U	10 U	12 U	11 U	12 U	56 U
VINYL CHLORIDE	11 U	10 U	12 U	11 U	12 U	56 U
CHLOROETHANE	11 U	10 UJ	12 U	11 U	12 U	56 U
METHYLENE CHLORIDE	11 U	10 U	12 U	11 U	12 U	56 U
ACETONE	24	10 U	12 U	11 U	63	250 J
CARBON DISULFIDE	11 U	10 U	12 U	11 U	12 U	56 UJ
1,1-DICHLOROETHENE	11 U	10 U	12 U	11 U	12 U	56 U
1,1-DICHLOROETHANE	11 U	10 U	12 U	11 U	12 U	56 U
1,2-DICHLOROETHENE	11 U	10 U	12 U	11 U	12 U	56 U
CHLOROFORM	11 U	10 U	12 U	11 U	12 U	6 J
1,2-DICHLOROETHANE	11 U	1 J	12 U	11 U	12 U	56 U
2-BUTANONE	11 U	10 U	3 J	11 U	1 J	56 U
1,1,1-TRICHLOROETHANE	11 U	10 U	12 U	11 U	12 U	56 U
CARBON TETRACHLORIDE	11 U	10 U	12 U	11 U	12 U	56 U
BROMODICHLOROMETHANE	11 U	10 U	12 U	11 U	12 U	56 U
1,2-DICHLOROPROPANE	11 U	10 U	12 U	11 U	12 U	56 U
CIS-1,3-DICHLOROPROPENE	11 U	10 U	12 U	11 U	12 U	56 U
TRICHLOROETHENE	11 U	10 U	12 U	11 U	12 U	56 U
DIBROMOCHLOROMETHANE	11 U	10 U	12 U	11 U	12 U	56 U
1,1,2-TRICHLOROETHANE	11 U	10 U	12 U	11 U	12 U	56 U
BENZENE	11 U	10 U	12 U	11 U	12 U	56 U
TRANS-1,3-DICHLOROPROPENE	11 U	10 U	12 U	11 U	12 U	56 U
BROMOFORM	11 U	10 U	12 U	11 U	12 U	56 U
4-METHYL-2-PENTANONE	11 U	10 U	12 U	11 U	12 U	56 U
2-HEXANONE	11 U	10 U	12 U	11 U	12 U	56 U
TETRACHLOROETHENE	11 U	10 U	12 U	11 U	12 U	26 J
1,1,2,2-TETRACHLOROETHANE	11 U	10 U	12 U	11 U	12 U	56 U
TOLUENE	11 U	10 U	12 U	11 U	12 U	11 J
CHLOROBENZENE	11 U	10 U	12 U	11 U	12 U	56 U
ETHYLBENZENE	11 U	10 U	12 U	11 U	12 U	56 U
STYRENE	11 U	10 U	12 U	11 U	12 U	56 U
TOTAL XYLENES	2 J	10 U	12 U	2 J	2 J	56 U

FIELD DUPLICATE SUMMARY
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
VOLATILE ORGANICS

LOCATION	65-SW04-01D
DATE COLLECTED	05/15/95
DEPTH	NA
UNITS	UG/L

CHLOROMETHANE	10 U
BROMOMETHANE	10 U
VINYL CHLORIDE	10 U
CHLOROETHANE	10 UJ
METHYLENE CHLORIDE	10 U
ACETONE	10 U
CARBON DISULFIDE	10 U
1,1-DICHLOROETHENE	10 U
1,1-DICHLOROETHANE	10 U
1,2-DICHLOROETHENE	10 U
CHLOROFORM	10 U
1,2-DICHLOROETHANE	10 U
2-BUTANONE	10 U
1,1,1-TRICHLOROETHANE	10 U
CARBON TETRACHLORIDE	10 U
BROMODICHLOROMETHANE	10 U
1,2-DICHLOROPROPANE	10 U
CIS-1,3-DICHLOROPROPENE	10 U
TRICHLOROETHENE	10 U
DIBROMOCHLOROMETHANE	10 U
1,1,2-TRICHLOROETHANE	10 U
BENZENE	10 U
TRANS-1,3-DICHLOROPROPENE	10 U
BROMOFORM	10 U
4-METHYL-2-PENTANONE	10 U
2-HEXANONE	10 U
TETRACHLOROETHENE	10 U
1,1,2,2-TETRACHLOROETHANE	10 U
TOLUENE	10 U
CHLOROBENZENE	10 U
ETHYLBENZENE	10 U
STYRENE	10 U
TOTAL XYLENES	10 U

FIELD DUPLICATE SUMMARY
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
SEMIVOLATILE ORGANICS

LOCATION	65-DW01-04D	65-MW01A-01D	65-MW06A-00D	65-SB07-00D	65-SB11-04D	65-SD04-06D
DATE COLLECTED	04/10/95	05/08/95	04/08/95	04/08/95	04/08/95	05/16/95
DEPTH	7-9'	NA	0-1'	0-1'	7-9'	0-6"
UNITS	UG/KG	UG/L	UG/KG	UG/KG	UG/KG	UG/KG
PHENOL	370 U	10 U	380 U	370 U	390 U	9100 U
BIS(2-CHLOROETHYL)ETHER	370 U	10 U	380 U	370 U	390 U	9100 U
2-CHLOROPHENOL	370 U	10 U	380 U	370 U	390 U	9100 U
1,3-DICHLOROBENZENE	370 U	10 U	380 U	370 U	390 U	9100 U
1,4-DICHLOROBENZENE	370 U	10 U	380 U	370 U	390 U	9100 U
1,2-DICHLOROBENZENE	370 U	10 U	380 U	370 U	390 U	9100 U
2-METHYLPHENOL	370 U	10 U	380 U	370 U	390 U	9100 U
2,2'-OXYBIS(1-CHLOROPROPANE)	370 U	10 U	380 U	370 U	390 U	9100 U
4-METHYLPHENOL	370 U	10 U	380 U	370 U	390 U	9100 U
N-NITROSO-DI-N-PROPYLAMINE	370 U	10 U	380 U	370 U	390 U	9100 U
HEXACHLOROETHANE	370 U	10 U	380 U	370 U	390 U	9100 U
NITROBENZENE	370 U	10 U	380 U	370 U	390 U	9100 U
ISOPHORONE	370 U	10 U	380 U	370 U	390 U	9100 U
2-NITROPHENOL	370 U	10 U	380 U	370 U	390 U	9100 U
2,4-DIMETHYLPHENOL	370 U	10 U	380 U	370 U	390 U	9100 U
BIS(2-CHLOROETHOXY)METHANE	370 U	10 U	380 U	370 U	390 U	9100 U
2,4-DICHLOROPHENOL	370 U	10 U	380 U	370 U	390 U	9100 U
1,2,4-TRICHLOROBENZENE	370 U	10 U	380 U	370 U	390 U	9100 U
NAPHTHALENE	370 U	10 U	380 U	370 U	390 U	9100 U
4-CHLOROANILINE	370 U	10 U	380 U	370 U	390 U	9100 U
HEXACHLOROBUTADIENE	370 U	10 U	380 U	370 U	390 U	9100 U
4-CHLORO-3-METHYLPHENOL	370 U	10 U	380 U	370 U	390 U	9100 U
2-METHYLNAPHTHALENE	370 U	10 U	380 U	370 U	390 U	9100 U
HEXACHLOROCYCLOPENTADIENE	370 UJ	10 U	380 UJ	370 U	390 UJ	9100 U
2,4,6-TRICHLOROPHENOL	370 U	10 U	380 U	370 U	390 U	9100 U
2,4,5-TRICHLOROPHENOL	890 U	25 U	930 U	900 U	950 U	22000 U
2-CHLORONAPHTHALENE	370 U	10 U	380 U	370 U	390 U	9100 U
2-NITROANILINE	890 U	25 U	930 U	900 U	950 U	22000 U
DIMETHYL PHTHALATE	370 U	10 U	380 U	370 U	390 U	9100 U
ACENAPHTHYLENE	370 U	10 U	380 U	370 U	390 U	9100 U
2,6-DINITROTOLUENE	370 U	10 U	380 U	370 U	390 U	9100 U
3-NITROANILINE	890 U	25 U	930 U	900 U	950 U	22000 U
ACENAPHTHENE	370 U	10 U	380 U	370 U	390 U	9100 U
2,4-DINITROPHENOL	890 U	25 UJ	930 U	900 U	950 U	22000 U

FIELD DUPLICATE SUMMARY
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
SEMIVOLATILE ORGANICS

LOCATION	65-DW01-04D	65-MW01A-01D	65-MW06A-00D	65-SB07-00D	65-SB11-04D	65-SD04-06D
DATE COLLECTED	04/10/95	05/08/95	04/08/95	04/08/95	04/08/95	05/16/95
DEPTH	7-9'	NA	0-1'	0-1'	7-9'	0-6"
UNITS	UG/KG	UG/L	UG/KG	UG/KG	UG/KG	UG/KG
4-NITROPHENOL	890 U	25 U	930 U	900 U	950 U	22000 U
DIBENZOFURAN	370 U	10 U	380 U	370 U	390 U	9100 U
2,4-DINITROTOLUENE	370 U	10 U	380 U	370 U	390 U	9100 U
DIETHYL PHTHALATE	370 U	10 U	380 U	370 U	390 U	9100 U
4-CHLOROPHENYLPHENYL ETHER	370 U	10 U	380 U	370 U	390 U	9100 U
FLUORENE	370 U	10 U	380 U	370 U	390 U	9100 U
4-NITROANILINE	890 U	25 U	930 U	900 U	950 U	22000 U
4,6-DINITRO-2-METHYLPHENOL	890 U	25 U	930 U	900 U	950 U	22000 U
N-NITROSODIPHENYLAMINE	370 U	10 U	380 U	370 U	390 U	9100 U
4-BROMOPHENYL PHENYL ETHER	370 U	10 U	380 U	370 U	390 U	9100 U
HEXACHLOROBENZENE	370 U	10 U	380 U	370 U	390 U	9100 U
PENTACHLOROPHENOL	890 U	25 U	930 U	900 U	950 U	22000 U
PHENANTHRENE	370 U	10 U	380 U	370 U	390 U	9100 U
ANTHRACENE	370 U	10 U	380 U	370 U	390 U	9100 U
CARBAZOLE	370 U	10 U	380 U	370 U	390 U	9100 UJ
DI-N-BUTYL PHTHALATE	370 U	10 U	380 U	370 U	390 U	2400 J
FLUORANTHENE	370 U	10 U	380 U	370 U	390 U	9100 U
PYRENE	370 U	10 U	380 U	370 U	390 U	9100 U
BUTYL BENZYL PHTHALATE	370 U	10 U	380 U	370 U	390 U	9100 U
3,3'-DICHLOROBENZIDINE	370 U	10 U	380 U	370 U	390 U	9100 U
BENZO(A)ANTHRACENE	370 U	10 U	380 U	370 U	390 U	9100 U
CHRYSENE	370 U	10 U	380 U	370 U	390 U	9100 U
BIS(2-ETHYLHEXYL)PHTHALATE	130 J	10 U	380 U	120 J	300 J	9100 U
DI-N-OCTYL PHTHALATE	370 U	10 U	380 U	370 U	390 U	9100 U
BENZO(B)FLUORANTHENE	370 U	10 U	380 U	370 U	390 U	9100 U
BENZO(K)FLUORANTHENE	370 U	10 U	380 U	370 U	390 U	9100 U
BENZO(A)PYRENE	370 U	10 U	380 U	370 U	390 U	9100 U
INDENO(1,2,3-CD)PYRENE	370 U	10 U	380 U	370 U	390 U	9100 U
DIBENZO(A,H)ANTHRACENE	370 U	10 U	380 U	370 U	390 U	9100 U
BENZO(G,H,I)PERYLENE	370 U	10 U	380 U	370 U	390 U	9100 U

FIELD DUPLICATE SUMMARY
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
SEMIVOLATILE ORGANICS

LOCATION	65-SW04-01D
DATE COLLECTED	05/15/95
DEPTH	NA
UNITS	UG/L

PHENOL	10 U
BIS(2-CHLOROETHYL)ETHER	10 U
2-CHLOROPHENOL	10 U
1,3-DICHLOROBENZENE	10 U
1,4-DICHLOROBENZENE	10 U
1,2-DICHLOROBENZENE	10 U
2-METHYLPHENOL	10 U
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U
4-METHYLPHENOL	10 U
N-NITROSO-DI-N-PROPYLAMINE	10 U
HEXACHLOROETHANE	10 U
NITROBENZENE	10 U
ISOPHORONE	10 U
2-NITROPHENOL	10 U
2,4-DIMETHYLPHENOL	10 U
BIS(2-CHLOROETHOXY)METHANE	10 U
2,4-DICHLOROPHENOL	10 U
1,2,4-TRICHLOROBENZENE	10 U
NAPHTHALENE	10 U
4-CHLOROANILINE	10 U
HEXACHLOROBUTADIENE	10 U
4-CHLORO-3-METHYLPHENOL	10 U
2-METHYLNAPHTHALENE	10 U
HEXACHLOROCYCLOPENTADIENE	10 U
2,4,6-TRICHLOROPHENOL	10 U
2,4,5-TRICHLOROPHENOL	25 U
2-CHLORONAPHTHALENE	10 U
2-NITROANILINE	25 U
DIMETHYL PHTHALATE	10 U
ACENAPHTHYLENE	10 U
2,6-DINITROTOLUENE	10 U
3-NITROANILINE	25 U
ACENAPHTHENE	10 U
2,4-DINITROPHENOL	25 U

FIELD DUPLICATE SUMMARY
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
SEMIVOLATILE ORGANICS

LOCATION	65-SW04-01D
DATE COLLECTED	05/15/95
DEPTH	NA
UNITS	UG/L

4-NITROPHENOL	25 U
DIBENZOFURAN	10 U
2,4-DINITROTOLUENE	10 U
DIETHYL PHTHALATE	10 U
4-CHLOROPHENYLPHENYL ETHER	10 U
FLUORENE	10 U
4-NITROANILINE	25 U
4,6-DINITRO-2-METHYLPHENOL	25 U
N-NITROSODIPHENYLAMINE	10 U
4-BROMOPHENYL PHENYL ETHER	10 U
HEXACHLOROBENZENE	10 U
PENTACHLOROPHENOL	25 U
PHENANTHRENE	10 U
ANTHRACENE	10 U
CARBAZOLE	10 U
DI-N-BUTYL PHTHALATE	10 U
FLUORANTHENE	10 U
PYRENE	10 U
BUTYL BENZYL PHTHALATE	10 U
3,3'-DICHLOROBENZIDINE	10 U
BENZO(A)ANTHRACENE	10 U
CHRYSENE	10 U
BIS(2-ETHYLHEXYL)PHTHALATE	7 J
DI-N-OCTYL PHTHALATE	10 U
BENZO(B)FLUORANTHENE	10 U
BENZO(K)FLUORANTHENE	10 U
BENZO(A)PYRENE	10 U
INDENO(1,2,3-CD)PYRENE	10 U
DIBENZO(A,H)ANTHRACENE	10 U
BENZO(G,H,I)PERYLENE	10 U

FIELD DUPLICATE SUMMARY
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
PESTICIDE/PCBs

LOCATION	65-DW01-04D	65-MW01A-01D	65-MW06A-00D	65-SB07-00D	65-SB07-00DR
DATE COLLECTED	04/10/95	05/08/95	04/08/95	04/08/95	04/08/95
DEPTH	7-9'	NA	0-1'	0-1'	0-1'
UNITS	UG/KG	UG/L	UG/KG	UG/KG	UG/KG
ALPHA-BHC	1.9 U	0.05 U	2 U	1.9 U	4.3 R
BETA-BHC	1.9 U	0.05 U	2 U	1.9 U	4.3 R
DELTA-BHC	1.9 U	0.05 U	2 U	1.9 U	4.3 R
GAMMA-BHC(LINDANE)	1.9 U	0.05 U	2 U	1.9 U	4.3 R
HEPTACHLOR	1.9 U	0.05 U	2 U	1.9 U	4.3 R
ALDRIN	1.9 U	0.05 U	2 U	1.9 U	4.3 R
HEPTACHLOR EPOXIDE	1.9 U	0.05 U	2 U	1.9 U	4.3 R
ENDOSULFAN I	1.9 U	0.05 U	2 U	1.9 U	4.3 R
DIELDRIN	3.7 U	0.1 U	3.8 U	3.8 U	8.4 R
4,4'-DDE	3.7 U	0.1 U	3.8 U	36 J	77 D
ENDRIN	3.7 U	0.1 U	3.8 U	3.8 U	8.4 R
ENDOSULFAN II	3.7 U	0.1 U	3.8 U	3.8 U	8.4 R
4,4'-DDD	3.7 UJ	0.1 U	3.8 UJ	3.8 UJ	8.4 R
ENDOSULFAN SULFATE	3.7 U	0.1 U	3.8 U	3.8 U	8.4 R
4,4'-DDT	3.7 U	0.1 U	3.8 U	29 U	53 R
METHOXYCHLOR	19 U	0.5 U	20 U	19 U	43 R
ENDRIN KETONE	3.7 U	0.1 U	3.8 U	3.8 U	8.4 R
ENDRIN ALDEHYDE	3.7 U	0.1 U	3.8 U	3.8 U	8.4 R
ALPHA CHLORDANE	1.9 U	0.05 U	2 U	1.9 U	4.3 R
GAMMA CHLORDANE	1.9 U	0.05 U	2 U	1.9 U	4.3 R
TOXAPHENE	190 U	5 U	200 U	190 U	430 R
PCB-1016	37 U	1 U	38 U	38 U	84 R
PCB-1221	75 U	2 U	78 U	76 U	170 R
PCB-1232	37 U	1 U	38 U	38 U	84 R
PCB-1242	37 U	1 U	38 U	38 U	84 R
PCB-1248	37 U	1 U	38 U	38 U	84 R
PCB-1254	37 U	1 U	38 U	38 U	84 R
PCB-1260	37 U	1 U	38 U	38 U	84 R

FIELD DUPLICATE SUMMARY
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
PESTICIDE/PCBs

LOCATION	65-SB11-04D	65-SD04-06D	65-SW04-01D
DATE COLLECTED	04/08/95	05/16/95	05/15/95
DEPTH	7-9'	0-6"	NA
UNITS	UG/KG	UG/KG	UG/L
ALPHA-BHC	2 UJ	9.1 U	0.05 UJ
BETA-BHC	2 UJ	9.1 U	0.05 UJ
DELTA-BHC	2 UJ	9.1 U	0.05 UJ
GAMMA-BHC(LINDANE)	2 UJ	9.1 U	0.05 UJ
HEPTACHLOR	2 UJ	9.1 U	0.05 UJ
ALDRIN	2 UJ	9.1 U	0.05 UJ
HEPTACHLOR EPOXIDE	2 UJ	9.1 U	0.05 UJ
ENDOSULFAN I	2 UJ	9.1 U	0.05 UJ
DIELDRIN	3.9 UJ	18 U	0.1 UJ
4,4'-DDE	3.9 UJ	32 J	0.1 UJ
ENDRIN	3.9 UJ	18 U	0.1 UJ
ENDOSULFAN II	3.9 UJ	18 U	0.1 UJ
4,4'-DDD	3.9 UJ	120 J	0.1 UJ
ENDOSULFAN SULFATE	3.9 UJ	18 U	0.1 UJ
4,4'-DDT	3.9 UJ	18 U	0.1 UJ
METHOXYCHLOR	20 UJ	91 U	0.5 UJ
ENDRIN KETONE	3.9 UJ	18 U	0.1 UJ
ENDRIN ALDEHYDE	3.9 UJ	18 U	0.1 UJ
ALPHA CHLORDANE	2 UJ	9.1 U	0.05 UJ
GAMMA CHLORDANE	2 UJ	9.1 U	0.05 UJ
TOXAPHENE	200 UJ	910 U	5 UJ
PCB-1016	39 UJ	180 U	1 UJ
PCB-1221	79 UJ	360 U	2 UJ
PCB-1232	39 UJ	180 U	1 UJ
PCB-1242	39 UJ	180 U	1 UJ
PCB-1248	39 UJ	180 U	1 UJ
PCB-1254	39 UJ	180 U	1 UJ
PCB-1260	39 UJ	180 U	1 UJ

FIELD DUPLICATE SUMMARY
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION	65-DW01-04D	65-MW01A-01D	65-MW06A-00D	65-SB07-00D	65-SB11-04D	65-SD04-06D
DATE COLLECTED	04/10/95	05/08/95	04/08/95	04/08/95	04/08/95	05/16/95
DEPTH	7-9'	NA	0-1'	0-1'	7-9'	0-6"
UNITS	MG/KG	UG/L	MG/KG	MG/KG	MG/KG	MG/KG
ANALYTES						
ALUMINUM	8520	40 U	1760	1230	9310	60500 J
ANTIMONY	11.4 U	50 U	11.9 U	11.4 U	12 U	55.2 UJ
ARSENIC	2.3 U	10 U	2.4 U	2.3 U	2.4 U	11 U
BARIUM	14.4	57.6	4.9	5.2	15.2	170
BERYLLIUM	0.23 U	1 U	0.24 U	0.23 U	0.24 U	1.1 U
CADMIUM	1.1 U	5 U	1.2 U	1.1 U	1.2 U	5.5 U
CALCIUM	371	152000	286	120	554	7290
CHROMIUM	10.5	10	3.5	2.3 U	10.5	73.6 J
COBALT	4.6 UJ	20 U	4.8 UJ	4.6 UJ	4.8 UJ	37.7
COPPER	4.2	10 U	7.2	4.1	2.4 U	159 J
IRON	2960 J	261	2090 J	707 J	2130 J	23200 J
LEAD	18.3 J	3 U	11.6 J	6.8 J	3.5 J	276 J
MAGNESIUM	296	17000	56.9	45.1	408	1910
MANGANESE	15 J	181	8.2 J	5.6 J	4.6 J	215 J
MERCURY	0.11 U	0.2 U	0.12 U	0.11 U	0.12 U	0.55 U
NICKEL	4.6 U	20 U	4.8 U	4.6 U	4.8 U	22.1 U
POTASSIUM	228 U	5610	238 U	229 U	375	2140
SELENIUM	1.1 U	5 U	1.2 U	1.1 U	1.2 U	5.5 U
SILVER	1.1 U	5 U	1.2 U	1.1 U	1.2 U	5.5 U
SODIUM	46.2	11300	47.6 U	45.8 U	48.1 U	257
THALLIUM	2.3 U	10 U	2.4 U	2.3 U	2.4 U	11 U
VANADIUM	15.4	10 U	2.4 U	2.3 U	7.5	66.9
ZINC	32 J	10.7	68 J	7.6 J	6.9 J	420 J

FIELD DUPLICATE SUMMARY
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION	65-SW04-01D	
DATE COLLECTED	05/15/95	
DEPTH	NA	
UNITS	UG/L	
ANALYTES		
ALUMINUM	22600	
ANTIMONY	50	U
ARSENIC	10	U
BARIUM	63.9	
BERYLLIUM	1	U
CADMIUM	5	U
CALCIUM	12600	
CHROMIUM	25.8	
COBALT	20	U
COPPER	54	
IRON	7830	
LEAD	50.5	
MAGNESIUM	2030	
MANGANESE	91.2	
MERCURY	0.2	U
NICKEL	20	U
POTASSIUM	2890	
SELENIUM	5	U
SILVER	5	U
SODIUM	3430	
THALLIUM	10	U
VANADIUM	25.8	
ZINC	128	

FIELD DUPLICATE SUMMARY
FILTERED GROUNDWATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION	5-MW01AF-01D
DATE COLLECTED	05/08/95
DEPTH	NA
ANALYTES (ug/L)	
ALUMINUM	40 U
ANTIMONY	50 U
ARSENIC	10 U
BARIUM	62.8
BERYLLIUM	1 U
CADMIUM	5 U
CALCIUM	167000
CHROMIUM	10.4
COBALT	20 U
COPPER	10 U
IRON	202
LEAD	3 U
MAGNESIUM	18700
MANGANESE	198
MERCURY	0.2 U
NICKEL	20 U
POTASSIUM	6840
SELENIUM	5 U
SILVER	5 U
SODIUM	12300
THALLIUM	10 U
VANADIUM	10 U
ZINC	5.1 U

APPENDIX Q
FREQUENCY OF DETECTION SUMMARY, QA/QC SAMPLES

FREQUENCY OF DETECTION SUMMARY
QA/QC SAMPLES
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-TB-01	65-TB-02	65-TB-03
DATE COLLECTED	04/10/95	04/11/95	05/16/95
VOLATILES (ug/L)			
CHLOROMETHANE	10 U	10 U	10 U
BROMOMETHANE	10 U	10 U	10 U
VINYL CHLORIDE	10 U	10 U	10 U
CHLOROETHANE	10 U	10 U	10 U
METHYLENE CHLORIDE	10 U	1 J	1 J
ACETONE	10 U	8 J	3 J
CARBON DISULFIDE	10 U	10 U	10 U
1,1-DICHLOROETHENE	10 U	10 U	2 J
1,1-DICHLOROETHANE	10 U	10 U	10 U
1,2-DICHLOROETHENE	10 U	10 U	10 U
CHLOROFORM	10 U	10 U	10 U
1,2-DICHLOROETHANE	10 U	2 J	1 J
2-BUTANONE	10 U	10 U	10 U
1,1,1-TRICHLOROETHANE	10 U	10 U	10 U
CARBON TETRACHLORIDE	10 U	10 U	10 U
BROMODICHLOROMETHANE	10 U	10 U	10 U
1,2-DICHLOROPROPANE	10 U	10 U	10 U
CIS-1,3-DICHLOROPROPENE	10 U	10 U	10 U
TRICHLOROETHENE	10 U	10 U	2 J
DIBROMOCHLOROMETHANE	10 U	10 U	10 U
1,1,2-TRICHLOROETHANE	10 U	10 U	10 U
BENZENE	10 U	10 U	10 U
TRANS-1,3-DICHLOROPROPENE	10 U	10 U	10 U
BROMOFORM	10 U	10 U	10 U
4-METHYL-2-PENTANONE	10 U	10 U	10 U
2-HEXANONE	10 U	10 U	10 U
TETRACHLOROETHENE	10 U	10 U	10 U
1,1,2,2-TETRACHLOROETHANE	10 U	10 U	10 U
TOLUENE	10 U	4 J	2 J
CHLOROBENZENE	10 U	10 U	10 U
ETHYLBENZENE	10 U	10 U	10 U
STYRENE	10 U	10 U	10 U
TOTAL XYLENES	10 U	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
QA/QC SAMPLES
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
VOLATILES (ug/L)						
CHLOROMETHANE	10 U	10 U	ND	ND		0/3
BROMOMETHANE	10 U	10 U	ND	ND		0/3
VINYL CHLORIDE	10 U	10 U	ND	ND		0/3
CHLOROETHANE	10 U	10 U	ND	ND		0/3
METHYLENE CHLORIDE	10 U	10 U	1 J	1 J	65-TB-03	2/3
ACETONE	10 U	10 U	3 J	8 J	65-TB-02	2/3
CARBON DISULFIDE	10 U	10 U	ND	ND		0/3
1,1-DICHLOROETHENE	10 U	10 U	2 J	2 J	65-TB-03	1/3
1,1-DICHLOROETHANE	10 U	10 U	ND	ND		0/3
1,2-DICHLOROETHENE	10 U	10 U	ND	ND		0/3
CHLOROFORM	10 U	10 U	ND	ND		0/3
1,2-DICHLOROETHANE	10 U	10 U	1 J	2 J	65-TB-02	2/3
2-BUTANONE	10 U	10 U	ND	ND		0/3
1,1,1-TRICHLOROETHANE	10 U	10 U	ND	ND		0/3
CARBON TETRACHLORIDE	10 U	10 U	ND	ND		0/3
BROMODICHLOROMETHANE	10 U	10 U	ND	ND		0/3
1,2-DICHLOROPROPANE	10 U	10 U	ND	ND		0/3
CIS-1,3-DICHLOROPROPENE	10 U	10 U	ND	ND		0/3
TRICHLOROETHENE	10 U	10 U	2 J	2 J	65-TB-03	1/3
DIBROMOCHLOROMETHANE	10 U	10 U	ND	ND		0/3
1,1,2-TRICHLOROETHANE	10 U	10 U	ND	ND		0/3
BENZENE	10 U	10 U	ND	ND		0/3
TRANS-1,3-DICHLOROPROPENE	10 U	10 U	ND	ND		0/3
BROMOFORM	10 U	10 U	ND	ND		0/3
4-METHYL-2-PENTANONE	10 U	10 U	ND	ND		0/3
2-HEXANONE	10 U	10 U	ND	ND		0/3
TETRACHLOROETHENE	10 U	10 U	ND	ND		0/3
1,1,2,2-TETRACHLOROETHANE	10 U	10 U	ND	ND		0/3
TOLUENE	10 U	10 U	2 J	4 J	65-TB-02	2/3
CHLOROBENZENE	10 U	10 U	ND	ND		0/3
ETHYLBENZENE	10 U	10 U	ND	ND		0/3
STYRENE	10 U	10 U	ND	ND		0/3
TOTAL XYLENES	10 U	10 U	ND	ND		0/3

FREQUENCY OF DETECTION SUMMARY
QA/QC SAMPLES
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-RB-01	65-RB-03	65-RB-23
DATE COLLECTED	04/08/95	04/10/95	05/16/95
VOLATILES (ug/L)			
CHLOROMETHANE	10 U	10 U	10 U
BROMOMETHANE	10 U	10 U	10 U
VINYL CHLORIDE	10 U	10 U	10 U
CHLOROETHANE	10 U	10 U	10 U
METHYLENE CHLORIDE	1 J	1 J	10 U
ACETONE	35	93	44
CARBON DISULFIDE	10 U	10 U	10 U
1,1-DICHLOROETHENE	10 U	10 U	10 U
1,1-DICHLOROETHANE	10 U	10 U	10 U
1,2-DICHLOROETHENE	10 U	10 U	10 U
CHLOROFORM	10 U	10 U	10 U
1,2-DICHLOROETHANE	1 J	1 J	1 J
2-BUTANONE	10 U	7 J	10 U
1,1,1-TRICHLOROETHANE	10 U	10 U	10 U
CARBON TETRACHLORIDE	10 U	10 U	10 U
BROMODICHLOROMETHANE	10 U	10 U	10 U
1,2-DICHLOROPROPANE	10 U	10 U	10 U
CIS-1,3-DICHLOROPROPENE	10 U	10 U	10 U
TRICHLOROETHENE	10 U	10 U	10 U
DIBROMOCHLOROMETHANE	10 U	10 U	10 U
1,1,2-TRICHLOROETHANE	10 U	10 U	10 U
BENZENE	10 U	10 U	10 U
TRANS-1,3-DICHLOROPROPENE	10 U	10 U	10 U
BROMOFORM	10 U	10 U	10 U
4-METHYL-2-PENTANONE	10 U	10 U	10 U
2-HEXANONE	10 U	10 U	10 U
TETRACHLOROETHENE	10 U	10 U	10 U
1,1,2,2-TETRACHLOROETHANE	10 U	10 U	10 U
TOLUENE	10 U	10 U	10 U
CHLOROBENZENE	10 U	10 U	10 U
ETHYLBENZENE	10 U	10 U	10 U
STYRENE	10 U	10 U	10 U
TOTAL XYLENES	10 U	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
QA/QC SAMPLES
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
VOLATILES (ug/L)						
CHLOROMETHANE	10 U	10 U	ND	ND		0/3
BROMOMETHANE	10 U	10 U	ND	ND		0/3
VINYL CHLORIDE	10 U	10 U	ND	ND		0/3
CHLOROETHANE	10 U	10 U	ND	ND		0/3
METHYLENE CHLORIDE	10 U	10 U	1 J	1 J	65-RB-03	2/3
ACETONE	NA	NA	35	93	65-RB-03	3/3
CARBON DISULFIDE	10 U	10 U	ND	ND		0/3
1,1-DICHLOROETHENE	10 U	10 U	ND	ND		0/3
1,1-DICHLOROETHANE	10 U	10 U	ND	ND		0/3
1,2-DICHLOROETHENE	10 U	10 U	ND	ND		0/3
CHLOROFORM	10 U	10 U	ND	ND		0/3
1,2-DICHLOROETHANE	NA	NA	1 J	1 J	65-RB-23	3/3
2-BUTANONE	10 U	10 U	7 J	7 J	65-RB-03	1/3
1,1,1-TRICHLOROETHANE	10 U	10 U	ND	ND		0/3
CARBON TETRACHLORIDE	10 U	10 U	ND	ND		0/3
BROMODICHLOROMETHANE	10 U	10 U	ND	ND		0/3
1,2-DICHLOROPROPANE	10 U	10 U	ND	ND		0/3
CIS-1,3-DICHLOROPROPENE	10 U	10 U	ND	ND		0/3
TRICHLOROETHENE	10 U	10 U	ND	ND		0/3
DIBROMOCHLOROMETHANE	10 U	10 U	ND	ND		0/3
1,1,2-TRICHLOROETHANE	10 U	10 U	ND	ND		0/3
BENZENE	10 U	10 U	ND	ND		0/3
TRANS-1,3-DICHLOROPROPENE	10 U	10 U	ND	ND		0/3
BROMOFORM	10 U	10 U	ND	ND		0/3
4-METHYL-2-PENTANONE	10 U	10 U	ND	ND		0/3
2-HEXANONE	10 U	10 U	ND	ND		0/3
TETRACHLOROETHENE	10 U	10 U	ND	ND		0/3
1,1,2,2-TETRACHLOROETHANE	10 U	10 U	ND	ND		0/3
TOLUENE	10 U	10 U	ND	ND		0/3
CHLOROBENZENE	10 U	10 U	ND	ND		0/3
ETHYLBENZENE	10 U	10 U	ND	ND		0/3
STYRENE	10 U	10 U	ND	ND		0/3
TOTAL XYLENES	10 U	10 U	ND	ND		0/3

FREQUENCY OF DETECTION SUMMARY
QA/QC SAMPLES
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-RB-01	65-RB-03	65-RB-23
DATE COLLECTED	04/08/95	04/10/95	05/16/95
SEMIVOLATILES (ug/L)			
PHENOL	10 U	10 U	10 U
BIS(2-CHLOROETHYL)ETHER	10 U	10 U	10 U
2-CHLOROPHENOL	10 U	10 U	10 U
1,3-DICHLOROBENZENE	10 U	10 U	10 U
1,4-DICHLOROBENZENE	10 U	10 U	10 U
1,2-DICHLOROBENZENE	10 U	10 U	10 U
2-METHYLPHENOL	10 U	10 U	10 U
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	10 U	10 U
4-METHYLPHENOL	10 U	10 U	10 U
N-NITROSO-DI-N-PROPYLAMINE	10 U	10 U	10 U
HEXACHLOROETHANE	10 U	10 U	10 U
NITROBENZENE	10 U	10 U	10 U
ISOPHORONE	10 U	10 U	10 U
2-NITROPHENOL	10 U	10 U	10 U
2,4-DIMETHYLPHENOL	10 U	10 U	10 U
BIS(2-CHLOROETHOXY)METHANE	10 U	10 U	10 U
2,4-DICHLOROPHENOL	10 U	10 U	10 U
1,2,4-TRICHLOROBENZENE	10 U	10 U	10 U
NAPHTHALENE	10 U	10 U	10 U
4-CHLOROANILINE	10 U	10 U	10 U
HEXACHLOROBUTADIENE	10 U	10 U	10 U
4-CHLORO-3-METHYLPHENOL	10 U	10 U	10 U
2-METHYLNAPHTHALENE	10 U	10 U	10 U
HEXACHLOROCYCLOPENTADIENE	10 U	10 U	10 R
2,4,6-TRICHLOROPHENOL	10 U	10 U	10 U
2,4,5-TRICHLOROPHENOL	25 U	25 U	25 U
2-CHLORONAPHTHALENE	10 U	10 U	10 U
2-NITROANILINE	25 U	25 U	25 U
DIMETHYL PHTHALATE	10 U	10 U	10 U
ACENAPHTHYLENE	10 U	10 U	10 U
2,6-DINITROTOLUENE	10 U	10 U	10 U
3-NITROANILINE	25 U	25 U	25 U
ACENAPHTHENE	10 U	10 U	10 U
2,4-DINITROPHENOL	25 U	25 U	25 R
4-NITROPHENOL	25 U	25 U	25 U
DIBENZOFURAN	10 U	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
QA/QC SAMPLES
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-RB-01	65-RB-03	65-RB-23
DATE COLLECTED	04/08/95	04/10/95	05/16/95
SEMIVOLATILES (ug/L) cont.			
2,4-DINITROTOLUENE	10 U	10 U	10 U
DIETHYL PHTHALATE	10 U	10 U	10 U
4-CHLOROPHENYLPHENYL ETHER	10 U	10 U	10 U
FLUORENE	10 U	10 U	10 U
4-NITROANILINE	25 U	25 U	25 U
4,6-DINITRO-2-METHYLPHENOL	25 U	25 U	25 U
N-NITROSODIPHENYLAMINE	10 U	10 U	10 U
4-BROMOPHENYL PHENYL ETHER	10 U	10 U	10 U
HEXACHLOROBENZENE	10 U	10 U	10 U
PENTACHLOROPHENOL	25 U	25 U	25 U
PHENANTHRENE	10 U	10 U	10 U
ANTHRACENE	10 U	10 U	10 U
CARBAZOLE	10 U	10 U	10 U
DI-N-BUTYL PHTHALATE	10 U	10 U	10 U
FLUORANTHENE	10 U	10 U	10 U
PYRENE	10 U	10 U	10 U
BUTYL BENZYL PHTHALATE	10 U	10 U	10 U
3,3'-DICHLOROBENZIDINE	10 U	10 U	10 U
BENZO(A)ANTHRACENE	10 U	10 U	10 U
CHRYSENE	10 U	10 U	10 U
BIS(2-ETHYLHEXYL)PHTHALATE	10 U	10 U	10 U
DI-N-OCTYL PHTHALATE	10 U	10 U	10 U
BENZO(B)FLUORANTHENE	10 U	10 U	10 U
BENZO(K)FLUORANTHENE	10 U	10 U	10 U
BENZO(A)PYRENE	10 U	10 U	10 U
INDENO(1,2,3-CD)PYRENE	10 U	10 U	10 U
DIBENZO(A,H)ANTHRACENE	10 U	10 U	10 U
BENZO(G,H,I)PERYLENE	10 U	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
QA/QC SAMPLES
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/L)						
PHENOL	10 U	10 U	ND	ND		0/3
BIS(2-CHLOROETHYL)ETHER	10 U	10 U	ND	ND		0/3
2-CHLOROPHENOL	10 U	10 U	ND	ND		0/3
1,3-DICHLOROBENZENE	10 U	10 U	ND	ND		0/3
1,4-DICHLOROBENZENE	10 U	10 U	ND	ND		0/3
1,2-DICHLOROBENZENE	10 U	10 U	ND	ND		0/3
2-METHYLPHENOL	10 U	10 U	ND	ND		0/3
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	10 U	ND	ND		0/3
4-METHYLPHENOL	10 U	10 U	ND	ND		0/3
N-NITROSO-DI-N-PROPYLAMINE	10 U	10 U	ND	ND		0/3
HEXACHLOROETHANE	10 U	10 U	ND	ND		0/3
NITROBENZENE	10 U	10 U	ND	ND		0/3
ISOPHORONE	10 U	10 U	ND	ND		0/3
2-NITROPHENOL	10 U	10 U	ND	ND		0/3
2,4-DIMETHYLPHENOL	10 U	10 U	ND	ND		0/3
BIS(2-CHLOROETHOXY)METHANE	10 U	10 U	ND	ND		0/3
2,4-DICHLOROPHENOL	10 U	10 U	ND	ND		0/3
1,2,4-TRICHLOROBENZENE	10 U	10 U	ND	ND		0/3
NAPHTHALENE	10 U	10 U	ND	ND		0/3
4-CHLOROANILINE	10 U	10 U	ND	ND		0/3
HEXACHLOROBUTADIENE	10 U	10 U	ND	ND		0/3
4-CHLORO-3-METHYLPHENOL	10 U	10 U	ND	ND		0/3
2-METHYLNAPHTHALENE	10 U	10 U	ND	ND		0/3
HEXACHLOROCYCLOPENTADIENE	10 U	10 U	ND	ND		0/2
2,4,6-TRICHLOROPHENOL	10 U	10 U	ND	ND		0/3
2,4,5-TRICHLOROPHENOL	25 U	25 U	ND	ND		0/3
2-CHLORONAPHTHALENE	10 U	10 U	ND	ND		0/3
2-NITROANILINE	25 U	25 U	ND	ND		0/3
DIMETHYL PHTHALATE	10 U	10 U	ND	ND		0/3
ACENAPHTHYLENE	10 U	10 U	ND	ND		0/3
2,6-DINITROTOLUENE	10 U	10 U	ND	ND		0/3
3-NITROANILINE	25 U	25 U	ND	ND		0/3
ACENAPHTHENE	10 U	10 U	ND	ND		0/3
2,4-DINITROPHENOL	25 U	25 U	ND	ND		0/2
4-NITROPHENOL	25 U	25 U	ND	ND		0/3
DIBENZOFURAN	10 U	10 U	ND	ND		0/3

FREQUENCY OF DETECTION SUMMARY
QA/QC SAMPLES
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/L) cont.						
2,4-DINITROTOLUENE	10 U	10 U	ND	ND		0/3
DIETHYL PHTHALATE	10 U	10 U	ND	ND		0/3
4-CHLOROPHENYLPHENYL ETHER	10 U	10 U	ND	ND		0/3
FLUORENE	10 U	10 U	ND	ND		0/3
4-NITROANILINE	25 U	25 U	ND	ND		0/3
4,6-DINITRO-2-METHYLPHENOL	25 U	25 U	ND	ND		0/3
N-NITROSODIPHENYLAMINE	10 U	10 U	ND	ND		0/3
4-BROMOPHENYL PHENYL ETHER	10 U	10 U	ND	ND		0/3
HEXACHLOROBENZENE	10 U	10 U	ND	ND		0/3
PENTACHLOROPHENOL	25 U	25 U	ND	ND		0/3
PHENANTHRENE	10 U	10 U	ND	ND		0/3
ANTHRACENE	10 U	10 U	ND	ND		0/3
CARBAZOLE	10 U	10 U	ND	ND		0/3
DI-N-BUTYL PHTHALATE	10 U	10 U	ND	ND		0/3
FLUORANTHENE	10 U	10 U	ND	ND		0/3
PYRENE	10 U	10 U	ND	ND		0/3
BUTYL BENZYL PHTHALATE	10 U	10 U	ND	ND		0/3
3,3'-DICHLOROBENZIDINE	10 U	10 U	ND	ND		0/3
BENZO(A)ANTHRACENE	10 U	10 U	ND	ND		0/3
CHRYSENE	10 U	10 U	ND	ND		0/3
BIS(2-ETHYLHEXYL)PHTHALATE	10 U	10 U	ND	ND		0/3
DI-N-OCTYL PHTHALATE	10 U	10 U	ND	ND		0/3
BENZO(B)FLUORANTHENE	10 U	10 U	ND	ND		0/3
BENZO(K)FLUORANTHENE	10 U	10 U	ND	ND		0/3
BENZO(A)PYRENE	10 U	10 U	ND	ND		0/3
INDENO(1,2,3-CD)PYRENE	10 U	10 U	ND	ND		0/3
DIBENZO(A,H)ANTHRACENE	10 U	10 U	ND	ND		0/3
BENZO(G,H,I)PERYLENE	10 U	10 U	ND	ND		0/3

FREQUENCY OF DETECTION SUMMARY
QA/QC SAMPLES
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	65-RB-01	65-RB-03	65-RB-23
DATE COLLECTED	04/08/95	04/10/95	05/16/95
PESTICIDE/PCB (ug/L)			
ALPHA-BHC	0.05 U	0.05 U	0.05 U
BETA-BHC	0.05 U	0.05 U	0.05 U
DELTA-BHC	0.05 U	0.05 U	0.05 U
GAMMA-BHC(LINDANE)	0.05 U	0.05 U	0.05 U
HEPTACHLOR	0.05 U	0.05 U	0.05 U
ALDRIN	0.05 U	0.05 U	0.05 U
HEPTACHLOR EPOXIDE	0.05 U	0.05 U	0.05 U
ENDOSULFAN I	0.05 U	0.05 U	0.05 U
DIELDRIN	0.1 U	0.1 U	0.1 U
4,4'-DDE	0.1 U	0.1 U	0.1 U
ENDRIN	0.1 U	0.1 U	0.1 U
ENDOSULFAN II	0.1 U	0.1 U	0.1 U
4,4'-DDD	0.1 UJ	0.1 UJ	0.1 U
ENDOSULFAN SULFATE	0.1 U	0.1 U	0.1 U
4,4'-DDT	0.24	0.3	0.1 U
METHOXYCHLOR	0.5 U	0.5 U	0.5 UJ
ENDRIN KETONE	0.1 U	0.1 U	0.1 U
ENDRIN ALDEHYDE	0.1 U	0.1 U	0.1 U
ALPHA CHLORDANE	0.05 U	0.05 U	0.05 U
GAMMA CHLORDANE	0.05 U	0.05 U	0.05 U
TOXAPHENE	5 U	5 U	5 U
PCB-1016	1 U	1 U	1 U
PCB-1221	2 U	2 U	2 U
PCB-1232	1 U	1 U	1 U
PCB-1242	1 U	1 U	1 U
PCB-1248	1 U	1 U	1 U
PCB-1254	1 U	1 U	1 U
PCB-1260	1 U	1 U	1 U

FREQUENCY OF DETECTION SUMMARY
QA/QC SAMPLES
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
PESTICIDE/PCB (ug/L)						
ALPHA-BHC	0.05 U	0.05 U	ND	ND		0/3
BETA-BHC	0.05 U	0.05 U	ND	ND		0/3
DELTA-BHC	0.05 U	0.05 U	ND	ND		0/3
GAMMA-BHC(LINDANE)	0.05 U	0.05 U	ND	ND		0/3
HEPTACHLOR	0.05 U	0.05 U	ND	ND		0/3
ALDRIN	0.05 U	0.05 U	ND	ND		0/3
HEPTACHLOR EPOXIDE	0.05 U	0.05 U	ND	ND		0/3
ENDOSULFAN I	0.05 U	0.05 U	ND	ND		0/3
DIELDRIN	0.1 U	0.1 U	ND	ND		0/3
4,4'-DDE	0.1 U	0.1 U	ND	ND		0/3
ENDRIN	0.1 U	0.1 U	ND	ND		0/3
ENDOSULFAN II	0.1 U	0.1 U	ND	ND		0/3
4,4'-DDD	0.1 UJ	0.1 UJ	ND	ND		0/3
ENDOSULFAN SULFATE	0.1 U	0.1 U	ND	ND		0/3
4,4'-DDT	0.1 U	0.1 U	0.24	0.3	65-RB-03	2/3
METHOXYCHLOR	0.5 U	0.5 U	ND	ND		0/3
ENDRIN KETONE	0.1 U	0.1 U	ND	ND		0/3
ENDRIN ALDEHYDE	0.1 U	0.1 U	ND	ND		0/3
ALPHA CHLORDANE	0.05 U	0.05 U	ND	ND		0/3
GAMMA CHLORDANE	0.05 U	0.05 U	ND	ND		0/3
TOXAPHENE	5 U	5 U	ND	ND		0/3
PCB-1016	1 U	1 U	ND	ND		0/3
PCB-1221	2 U	2 U	ND	ND		0/3
PCB-1232	1 U	1 U	ND	ND		0/3
PCB-1242	1 U	1 U	ND	ND		0/3
PCB-1248	1 U	1 U	ND	ND		0/3
PCB-1254	1 U	1 U	ND	ND		0/3
PCB-1260	1 U	1 U	ND	ND		0/3

FREQUENCY OF DETECTION SUMMARY
QA/QC SAMPLES
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION	65-RB-01	65-RB-03	65-RB-23
DATE COLLECTED	04/08/95	04/10/95	05/16/95
ANALYTES (ug/L)			
ALUMINUM	40 U	40 U	65.2
ANTIMONY	50 U	50 U	50 U
ARSENIC	10 U	10 U	10 U
BARIUM	2.5	2.5	2 U
BERYLLIUM	1 U	1 U	1 U
CADMIUM	5 U	5 U	5 U
CALCIUM	98.8	110	598
CHROMIUM	10 U	10 U	10 U
COBALT	20 UJ	20 UJ	20 U
COPPER	10 U	10 U	10 U
IRON	10 U	10 U	58.9 U
LEAD	3 U	3 U	3 U
MAGNESIUM	50 U	50 U	120
MANGANESE	2 U	2 U	2 U
MERCURY	0.2 U	0.2 U	0.2 U
NICKEL	20 U	20 U	20 U
POTASSIUM	1000 U	1000 U	1000 U
SELENIUM	5 U	5 U	5 U
SILVER	5 U	5 U	5 U
SODIUM	200 U	200 U	290
THALLIUM	10 U	10 U	10 U
VANADIUM	10 U	10 U	10 U
ZINC	13.8	13	11.7 U

FREQUENCY OF DETECTION SUMMARY
QA/QC SAMPLES
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
ANALYTES (ug/L)						
ALUMINUM	40 U	40 U	65.2	65.2	65-RB-23	1/3
ANTIMONY	50 U	50 U	ND	ND		0/3
ARSENIC	10 U	10 U	ND	ND		0/3
BARIUM	2 U	2 U	2.5	2.5	65-RB-03	2/3
BERYLLIUM	1 U	1 U	ND	ND		0/3
CADMIUM	5 U	5 U	ND	ND		0/3
CALCIUM	NA	NA	98.8	598	65-RB-23	3/3
CHROMIUM	10 U	10 U	ND	ND		0/3
COBALT	20 UJ	20 UJ	ND	ND		0/3
COPPER	10 U	10 U	ND	ND		0/3
IRON	10 U	58.9 U	ND	ND		0/3
LEAD	3 U	3 U	ND	ND		0/3
MAGNESIUM	50 U	50 U	120	120	65-RB-23	1/3
MANGANESE	2 U	2 U	ND	ND		0/3
MERCURY	0.2 U	0.2 U	ND	ND		0/3
NICKEL	20 U	20 U	ND	ND		0/3
POTASSIUM	1000 U	1000 U	ND	ND		0/3
SELENIUM	5 U	5 U	ND	ND		0/3
SILVER	5 U	5 U	ND	ND		0/3
SODIUM	200 U	200 U	290	290	65-RB-23	1/3
THALLIUM	10 U	10 U	ND	ND		0/3
VANADIUM	10 U	10 U	ND	ND		0/3
ZINC	11.7 U	11.7 U	13	13.8	65-RB-01	2/3

FREQUENCY OF DETECTION SUMMARY
QA/QC SAMPLES
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	73-FB-01	73-FB-02	73-FB-03
DATE COLLECTED	04/20/95	04/20/95	04/20/95
VOLATILES (ug/L)			
CHLOROMETHANE	10 U	10 U	10 U
BROMOMETHANE	10 U	10 U	10 U
VINYL CHLORIDE	10 U	10 U	10 U
CHLOROETHANE	10 U	10 U	10 U
METHYLENE CHLORIDE	10 U	16	10 U
ACETONE	12	56	7 J
CARBON DISULFIDE	10 U	10 U	10 U
1,1-DICHLOROETHENE	10 U	10 U	10 U
1,1-DICHLOROETHANE	10 U	10 U	10 U
1,2-DICHLOROETHENE	10 U	10 U	10 U
CHLOROFORM	10 U	10 U	30
1,2-DICHLOROETHANE	10 U	10 U	10 U
2-BUTANONE	10 U	10 U	10 U
1,1,1-TRICHLOROETHANE	10 U	10 U	10 U
CARBON TETRACHLORIDE	10 U	10 U	10 U
BROMODICHLOROMETHANE	10 U	10 U	18
1,2-DICHLOROPROPANE	10 U	10 U	10 U
CIS-1,3-DICHLOROPROPENE	10 U	10 U	10 U
TRICHLOROETHENE	10 U	10 U	10 U
DIBROMOCHLOROMETHANE	10 U	10 U	6 J
1,1,2-TRICHLOROETHANE	10 U	10 U	10 U
BENZENE	10 U	10 U	10 U
TRANS-1,3-DICHLOROPROPENE	10 U	10 U	10 U
BROMOFORM	10 U	10 U	10 U
4-METHYL-2-PENTANONE	10 U	10 U	10 U
2-HEXANONE	10 U	10 U	10 U
TETRACHLOROETHENE	10 U	10 U	10 U
1,1,2,2-TETRACHLOROETHANE	10 U	10 U	10 U
TOLUENE	10 U	10 U	10 U
CHLOROBENZENE	10 U	10 U	10 U
ETHYLBENZENE	10 U	10 U	10 U
STYRENE	10 U	10 U	10 U
TOTAL XYLENES	10 U	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
QA/QC SAMPLES
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
VOLATILES (ug/L)						
CHLOROMETHANE	10 U	10 U	ND	ND		0/3
BROMOMETHANE	10 U	10 U	ND	ND		0/3
VINYL CHLORIDE	10 U	10 U	ND	ND		0/3
CHLOROETHANE	10 U	10 U	ND	ND		0/3
METHYLENE CHLORIDE	10 U	10 U	16	16	73-FB-02	1/3
ACETONE	NA	NA	7 J	56	73-FB-02	3/3
CARBON DISULFIDE	10 U	10 U	ND	ND		0/3
1,1-DICHLOROETHENE	10 U	10 U	ND	ND		0/3
1,1-DICHLOROETHANE	10 U	10 U	ND	ND		0/3
1,2-DICHLOROETHENE	10 U	10 U	ND	ND		0/3
CHLOROFORM	10 U	10 U	30	30	73-FB-03	1/3
1,2-DICHLOROETHANE	10 U	10 U	ND	ND		0/3
2-BUTANONE	10 U	10 U	ND	ND		0/3
1,1,1-TRICHLOROETHANE	10 U	10 U	ND	ND		0/3
CARBON TETRACHLORIDE	10 U	10 U	ND	ND		0/3
BROMODICHLOROMETHANE	10 U	10 U	18	18	73-FB-03	1/3
1,2-DICHLOROPROPANE	10 U	10 U	ND	ND		0/3
CIS-1,3-DICHLOROPROPENE	10 U	10 U	ND	ND		0/3
TRICHLOROETHENE	10 U	10 U	ND	ND		0/3
DIBROMOCHLOROMETHANE	10 U	10 U	6 J	6 J	73-FB-03	1/3
1,1,2-TRICHLOROETHANE	10 U	10 U	ND	ND		0/3
BENZENE	10 U	10 U	ND	ND		0/3
TRANS-1,3-DICHLOROPROPENE	10 U	10 U	ND	ND		0/3
BROMOFORM	10 U	10 U	ND	ND		0/3
4-METHYL-2-PENTANONE	10 U	10 U	ND	ND		0/3
2-HEXANONE	10 U	10 U	ND	ND		0/3
TETRACHLOROETHENE	10 U	10 U	ND	ND		0/3
1,1,2,2-TETRACHLOROETHANE	10 U	10 U	ND	ND		0/3
TOLUENE	10 U	10 U	ND	ND		0/3
CHLOROBENZENE	10 U	10 U	ND	ND		0/3
ETHYLBENZENE	10 U	10 U	ND	ND		0/3
STYRENE	10 U	10 U	ND	ND		0/3
TOTAL XYLENES	10 U	10 U	ND	ND		0/3

FREQUENCY OF DETECTION SUMMARY
QA/QC SAMPLES
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	73-FB-01	73-FB-02	73-FB-03
DATE COLLECTED	04/20/95	04/20/95	04/20/95
SEMIVOLATILES (ug/L)			
PHENOL	10 U	10 U	10 U
BIS(2-CHLOROETHYL)ETHER	10 U	10 U	10 U
2-CHLOROPHENOL	10 U	10 U	10 U
1,3-DICHLOROBENZENE	10 U	10 U	10 U
1,4-DICHLOROBENZENE	10 U	10 U	10 U
1,2-DICHLOROBENZENE	10 U	10 U	10 U
2-METHYLPHENOL	10 U	10 U	10 U
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	10 U	10 U
4-METHYLPHENOL	10 U	10 U	10 U
N-NITROSO-DI-N-PROPYLAMINE	10 U	10 U	10 U
HEXACHLOROETHANE	10 U	10 U	10 U
NITROBENZENE	10 U	10 U	10 U
ISOPHORONE	10 U	10 U	10 U
2-NITROPHENOL	10 U	10 U	10 U
2,4-DIMETHYLPHENOL	10 U	10 U	10 U
BIS(2-CHLOROETHOXY)METHANE	10 U	10 U	10 U
2,4-DICHLOROPHENOL	10 U	10 U	10 U
1,2,4-TRICHLOROBENZENE	10 U	10 U	10 U
NAPHTHALENE	10 U	10 U	10 U
4-CHLOROANILINE	10 U	10 U	10 U
HEXACHLOROBUTADIENE	10 U	10 U	10 U
4-CHLORO-3-METHYLPHENOL	10 U	10 U	10 U
2-METHYLNAPHTHALENE	10 U	10 U	10 U
HEXACHLOROCYCLOPENTADIENE	10 U	10 U	10 U
2,4,6-TRICHLOROPHENOL	10 U	10 U	10 U
2,4,5-TRICHLOROPHENOL	25 U	25 U	25 U
2-CHLORONAPHTHALENE	10 U	10 U	10 U
2-NITROANILINE	25 U	25 U	25 U
DIMETHYL PHTHALATE	10 U	10 U	10 U
ACENAPHTHYLENE	10 U	10 U	10 U
2,6-DINITROTOLUENE	10 U	10 U	10 U
3-NITROANILINE	25 U	25 U	25 U
ACENAPHTHENE	10 U	10 U	10 U
2,4-DINITROPHENOL	25 U	25 U	25 U
4-NITROPHENOL	25 U	25 U	25 U

FREQUENCY OF DETECTION SUMMARY
QA/QC SAMPLES
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	73-FB-01	73-FB-02	73-FB-03
DATE COLLECTED	04/20/95	04/20/95	04/20/95
SEMIVOLATILES (ug/L) cont.			
DIBENZOFURAN	10 U	10 U	10 U
2,4-DINITROTOLUENE	10 U	10 U	10 U
DIETHYL PHTHALATE	10 U	10 U	10 U
4-CHLOROPHENYLPHENYL ETHER	10 U	10 U	10 U
FLUORENE	10 U	10 U	10 U
4-NITROANILINE	25 U	25 U	25 U
4,6-DINITRO-2-METHYLPHENOL	25 U	25 U	25 U
N-NITROSODIPHENYLAMINE	10 U	10 U	10 U
4-BROMOPHENYL PHENYL ETHER	10 U	10 U	10 U
HEXACHLOROBENZENE	10 U	10 U	10 U
PENTACHLOROPHENOL	25 U	25 U	25 U
PHENANTHRENE	10 U	10 U	10 U
ANTHRACENE	10 U	10 U	10 U
CARBAZOLE	10 U	10 U	10 U
DI-N-BUTYL PHTHALATE	1 J	10 U	10 U
FLUORANTHENE	10 U	10 U	10 U
PYRENE	10 U	10 U	10 U
BUTYL BENZYL PHTHALATE	10 U	10 U	10 U
3,3'-DICHLOROBENZIDINE	10 U	10 U	10 U
BENZO(A)ANTHRACENE	10 U	10 U	10 U
CHRYSENE	10 U	10 U	10 U
BIS(2-ETHYLHEXYL)PHTHALATE	2 J	10 U	10 U
DI-N-OCTYL PHTHALATE	10 U	10 U	10 U
BENZO(B)FLUORANTHENE	10 U	10 U	10 U
BENZO(K)FLUORANTHENE	10 U	10 U	10 U
BENZO(A)PYRENE	10 U	10 U	10 U
INDENO(1,2,3-CD)PYRENE	10 U	10 U	10 U
DIBENZO(A,H)ANTHRACENE	10 U	10 U	10 U
BENZO(G,H,I)PERYLENE	10 U	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
QA/QC SAMPLES
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/L)						
PHENOL	10 U	10 U	ND	ND		0/3
BIS(2-CHLOROETHYL)ETHER	10 U	10 U	ND	ND		0/3
2-CHLOROPHENOL	10 U	10 U	ND	ND		0/3
1,3-DICHLOROBENZENE	10 U	10 U	ND	ND		0/3
1,4-DICHLOROBENZENE	10 U	10 U	ND	ND		0/3
1,2-DICHLOROBENZENE	10 U	10 U	ND	ND		0/3
2-METHYLPHENOL	10 U	10 U	ND	ND		0/3
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	10 U	ND	ND		0/3
4-METHYLPHENOL	10 U	10 U	ND	ND		0/3
N-NITROSO-DI-N-PROPYLAMINE	10 U	10 U	ND	ND		0/3
HEXACHLOROETHANE	10 U	10 U	ND	ND		0/3
NITROBENZENE	10 U	10 U	ND	ND		0/3
ISOPHORONE	10 U	10 U	ND	ND		0/3
2-NITROPHENOL	10 U	10 U	ND	ND		0/3
2,4-DIMETHYLPHENOL	10 U	10 U	ND	ND		0/3
BIS(2-CHLOROETHOXY)METHANE	10 U	10 U	ND	ND		0/3
2,4-DICHLOROPHENOL	10 U	10 U	ND	ND		0/3
1,2,4-TRICHLOROBENZENE	10 U	10 U	ND	ND		0/3
NAPHTHALENE	10 U	10 U	ND	ND		0/3
4-CHLOROANILINE	10 U	10 U	ND	ND		0/3
HEXACHLOROBUTADIENE	10 U	10 U	ND	ND		0/3
4-CHLORO-3-METHYLPHENOL	10 U	10 U	ND	ND		0/3
2-METHYLNAPHTHALENE	10 U	10 U	ND	ND		0/3
HEXACHLOROCYCLOPENTADIENE	10 U	10 U	ND	ND		0/3
2,4,6-TRICHLOROPHENOL	10 U	10 U	ND	ND		0/3
2,4,5-TRICHLOROPHENOL	25 U	25 U	ND	ND		0/3
2-CHLORONAPHTHALENE	10 U	10 U	ND	ND		0/3
2-NITROANILINE	25 U	25 U	ND	ND		0/3
DIMETHYL PHTHALATE	10 U	10 U	ND	ND		0/3
ACENAPHTHYLENE	10 U	10 U	ND	ND		0/3
2,6-DINITROTOLUENE	10 U	10 U	ND	ND		0/3
3-NITROANILINE	25 U	25 U	ND	ND		0/3
ACENAPHTHENE	10 U	10 U	ND	ND		0/3
2,4-DINITROPHENOL	25 U	25 U	ND	ND		0/3
4-NITROPHENOL	25 U	25 U	ND	ND		0/3

FREQUENCY OF DETECTION SUMMARY
QA/QC SAMPLES
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/L) cont.						
DIBENZOFURAN	10 U	10 U	ND	ND		0/3
2,4-DINITROTOLUENE	10 U	10 U	ND	ND		0/3
DIETHYL PHTHALATE	10 U	10 U	ND	ND		0/3
4-CHLOROPHENYLPHENYL ETHER	10 U	10 U	ND	ND		0/3
FLUORENE	10 U	10 U	ND	ND		0/3
4-NITROANILINE	25 U	25 U	ND	ND		0/3
4,6-DINITRO-2-METHYLPHENOL	25 U	25 U	ND	ND		0/3
N-NITROSODIPHENYLAMINE	10 U	10 U	ND	ND		0/3
4-BROMOPHENYL PHENYL ETHER	10 U	10 U	ND	ND		0/3
HEXACHLOROBENZENE	10 U	10 U	ND	ND		0/3
PENTACHLOROPHENOL	25 U	25 U	ND	ND		0/3
PHENANTHRENE	10 U	10 U	ND	ND		0/3
ANTHRACENE	10 U	10 U	ND	ND		0/3
CARBAZOLE	10 U	10 U	ND	ND		0/3
DI-N-BUTYL PHTHALATE	10 U	10 U	1 J	1 J	73-FB-01	1/3
FLUORANTHENE	10 U	10 U	ND	ND		0/3
PYRENE	10 U	10 U	ND	ND		0/3
BUTYL BENZYL PHTHALATE	10 U	10 U	ND	ND		0/3
3,3'-DICHLOROBENZIDINE	10 U	10 U	ND	ND		0/3
BENZO(A)ANTHRACENE	10 U	10 U	ND	ND		0/3
CHRYSENE	10 U	10 U	ND	ND		0/3
BIS(2-ETHYLHEXYL)PHTHALATE	10 U	10 U	2 J	2 J	73-FB-01	1/3
DI-N-OCTYL PHTHALATE	10 U	10 U	ND	ND		0/3
BENZO(B)FLUORANTHENE	10 U	10 U	ND	ND		0/3
BENZO(K)FLUORANTHENE	10 U	10 U	ND	ND		0/3
BENZO(A)PYRENE	10 U	10 U	ND	ND		0/3
INDENO(1,2,3-CD)PYRENE	10 U	10 U	ND	ND		0/3
DIBENZO(A,H)ANTHRACENE	10 U	10 U	ND	ND		0/3
BENZO(G,H,I)PERYLENE	10 U	10 U	ND	ND		0/3

FREQUENCY OF DETECTION SUMMARY
QA/QC SAMPLES
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION	73-FB-01	73-FB-02	73-FB-03
DATE COLLECTED	04/20/95	04/20/95	04/20/95
PESTICIDE/PCBS (ug/L)			
ALPHA-BHC	0.05 U	0.05 U	0.05 U
BETA-BHC	0.05 U	0.05 U	0.05 U
DELTA-BHC	0.05 U	0.05 U	0.05 U
HEPTACHLOR	0.05 U	0.05 U	0.05 U
ALDRIN	0.05 U	0.05 U	0.05 U
HEPTACHLOR EPOXIDE	0.05 U	0.05 U	0.05 U
ENDOSULFAN I	0.05 U	0.05 U	0.05 U
DIELDRIN	0.1 U	0.1 U	0.1 U
4,4'-DDE	0.1 U	0.1 U	0.1 U
ENDRIN	0.1 U	0.1 U	0.1 U
4,4'-DDD	0.1 U	0.1 U	0.1 U
ENDOSULFAN SULFATE	0.1 U	0.1 U	0.1 U
4,4'-DDT	0.1 U	0.1 U	0.1 U
METHOXYCHLOR	0.5 U	0.5 U	0.5 U
ENDRIN KETONE	0.1 U	0.1 U	0.1 U
ENDRIN ALDEHYDE	0.1 U	0.1 U	0.1 U
ALPHA CHLORDANE	0.05 U	0.05 U	0.05 U
GAMMA CHLORDANE	0.05 U	0.05 U	0.05 U
TOXAPHENE	5 U	5 U	5 U
PCB-1016	1 U	1 U	1 U
PCB-1221	2 U	2 U	2 U
PCB-1232	1 U	1 U	1 U
PCB-1242	1 U	1 U	1 U
PCB-1248	1 U	1 U	1 U
PCB-1254	1 U	1 U	1 U
PCB-1260	1 U	1 U	1 U

FREQUENCY OF DETECTION SUMMARY
QA/QC SAMPLES
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
PESTICIDE/PCBS (ug/L)						
ALPHA-BHC	0.05 U	0.05 U	ND	ND		0/3
BETA-BHC	0.05 U	0.05 U	ND	ND		0/3
DELTA-BHC	0.05 U	0.05 U	ND	ND		0/3
HEPTACHLOR	0.05 U	0.05 U	ND	ND		0/3
ALDRIN	0.05 U	0.05 U	ND	ND		0/3
HEPTACHLOR EPOXIDE	0.05 U	0.05 U	ND	ND		0/3
ENDOSULFAN I	0.05 U	0.05 U	ND	ND		0/3
DIELDRIN	0.1 U	0.1 U	ND	ND		0/3
4,4'-DDE	0.1 U	0.1 U	ND	ND		0/3
ENDRIN	0.1 U	0.1 U	ND	ND		0/3
4,4'-DDD	0.1 U	0.1 U	ND	ND		0/3
ENDOSULFAN SULFATE	0.1 U	0.1 U	ND	ND		0/3
4,4'-DDT	0.1 U	0.1 U	ND	ND		0/3
METHOXYCHLOR	0.5 U	0.5 U	ND	ND		0/3
ENDRIN KETONE	0.1 U	0.1 U	ND	ND		0/3
ENDRIN ALDEHYDE	0.1 U	0.1 U	ND	ND		0/3
ALPHA CHLORDANE	0.05 U	0.05 U	ND	ND		0/3
GAMMA CHLORDANE	0.05 U	0.05 U	ND	ND		0/3
TOXAPHENE	5 U	5 U	ND	ND		0/3
PCB-1016	1 U	1 U	ND	ND		0/3
PCB-1221	2 U	2 U	ND	ND		0/3
PCB-1232	1 U	1 U	ND	ND		0/3
PCB-1242	1 U	1 U	ND	ND		0/3
PCB-1248	1 U	1 U	ND	ND		0/3
PCB-1254	1 U	1 U	ND	ND		0/3
PCB-1260	1 U	1 U	ND	ND		0/3

FREQUENCY OF DETECTION SUMMARY
QA/QC SAMPLES
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION	73-FB-01	73-FB-02	73-FB-03
DATE COLLECTED	04/20/95	04/20/95	04/20/95
ANALYTES (ug/L)			
ALUMINUM	73.6	40 U	40 U
ANTIMONY	50 U	50 U	50 U
ARSENIC	10 U	10 U	10 U
BARIUM	2.7	2.1	3
BERYLLIUM	1 U	1 U	1 U
CADMIUM	5 U	5 U	5 U
CALCIUM	138	102	21400
CHROMIUM	10 U	10 U	10 U
COBALT	20 U	20 U	20 U
COPPER	16.1	10 U	10 U
IRON	20.4	73.1	13.6
LEAD	3 U	3 U	6.2
MAGNESIUM	50 U	69.1	855
MANGANESE	2 U	2 U	2 U
MERCURY	0.2 U	0.2 U	0.2 U
NICKEL	20 U	20 U	20 U
POTASSIUM	1000 U	2410	1020
SELENIUM	5 U	5 U	5 U
SILVER	5 U	5 U	5 U
SODIUM	200 U	246	60700
THALLIUM	10 U	10 U	10 U
VANADIUM	10 U	10 U	10 U
ZINC	20.3	13.4	28

FREQUENCY OF DETECTION SUMMARY
QA/QC SAMPLES
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION DATE COLLECTED	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
ANALYTES (ug/L)						
ALUMINUM	40 U	40 U	73.6	73.6	73-FB-01	1/3
ANTIMONY	50 U	50 U	ND	ND		0/3
ARSENIC	10 U	10 U	ND	ND		0/3
BARIUM	NA	NA	2.1	3	73-FB-03	3/3
BERYLLIUM	1 U	1 U	ND	ND		0/3
CADMIUM	5 U	5 U	ND	ND		0/3
CALCIUM	NA	NA	102	21400	73-FB-03	3/3
CHROMIUM	10 U	10 U	ND	ND		0/3
COBALT	20 U	20 U	ND	ND		0/3
COPPER	10 U	10 U	16.1	16.1	73-FB-01	1/3
IRON	NA	NA	13.6	73.1	73-FB-02	3/3
LEAD	3 U	3 U	6.2	6.2	73-FB-03	1/3
MAGNESIUM	50 U	50 U	69.1	855	73-FB-03	2/3
MANGANESE	2 U	2 U	ND	ND		0/3
MERCURY	0.2 U	0.2 U	ND	ND		0/3
NICKEL	20 U	20 U	ND	ND		0/3
POTASSIUM	1000 U	1000 U	1020	2410	73-FB-02	2/3
SELENIUM	5 U	5 U	ND	ND		0/3
SILVER	5 U	5 U	ND	ND		0/3
SODIUM	200 U	200 U	246	60700	73-FB-03	2/3
THALLIUM	10 U	10 U	ND	ND		0/3
VANADIUM	10 U	10 U	ND	ND		0/3
ZINC	NA	NA	13.4	28	73-FB-03	3/3

APPENDIX R
STATISTICAL SUMMARIES

APPENDIX R.1
SURFACE SOIL ORGANICS

STATISTICAL SUMMARY
SURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED DEPTH	NORMAL ARITHMETIC MEAN	NORMAL STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG ARITHMETIC MEAN	LOG STANDARD DEVIATION	LOG UPPER 95% CONFIDENCE INTERVAL
VOLATILES (ug/kg)						
METHYLENE CHLORIDE	4.85	1.85	5.76	1.46	0.59	7.51
ACETONE	6.15	1.21	6.75	1.80	0.16	6.70
TRICHLOROETHENE	5.35	1.34	6.01	1.61	0.49	7.55
TOLUENE	4.85	1.85	5.76	1.46	0.59	7.51
ETHYLBENZENE	5.31	1.32	5.96	1.60	0.48	7.48
TOTAL XYLENES	5.42	0.79	5.81	1.68	0.18	5.99
SEMIVOLATILES (ug/kg)						
ACENAPHTHENE	183.85	19.27	193.37	5.21	0.12	195.66
2,4-DINITROPHENOL	431.92	88.31	475.57	6.03	0.31	525.39
DIBENZOFURAN	178.31	37.64	196.91	5.15	0.33	219.77
FLUORENE	181.54	26.64	194.71	5.19	0.18	200.73
PHENANTHRENE	220.62	197.56	318.26	5.19	0.61	330.06
ANTHRACENE	188.46	10.49	193.64	5.24	0.05	193.81
CARBAZOLE	187.69	10.73	192.99	5.23	0.06	193.14
DI-N-BUTYL PHTHALATE	208.46	58.79	237.52	5.31	0.22	235.01
FLUORANTHENE	234.23	180.09	323.24	5.33	0.44	295.38
PYRENE	241.15	184.64	332.41	5.36	0.43	304.11
BENZO(A)ANTHRACENE	197.77	100.84	247.61	5.20	0.42	255.60
CHRYSENE	194.23	91.28	239.35	5.19	0.42	252.01
BIS(2-ETHYLHEXYL)PHTHALATE	100.08	55.55	127.53	4.48	0.52	140.37
BENZO(B)FLUORANTHENE	186.15	63.75	217.66	5.17	0.34	228.46
BENZO(K)FLUORANTHENE	206.54	93.48	252.74	5.27	0.32	246.30
BENZO(A)PYRENE	196.54	66.31	229.31	5.24	0.29	230.48
INDENO(1,2,3-CD)PYRENE	188.69	46.46	211.66	5.21	0.27	219.61
DIBENZO(A,H)ANTHRACENE	173.08	40.85	193.27	5.10	0.40	223.95
BENZO(G,H,I)PERYLENE	182.69	39.19	202.06	5.18	0.29	217.36
PESTICIDE/PCBS (ug/kg)						
HEPTACHLOR EPOXIDE	1.07	0.38	1.25	0.03	0.25	1.22
4,4'-DDE	25.08	33.23	41.50	1.99	1.73	280.72
ENDOSULFAN II	2.19	0.74	2.56	0.74	0.27	2.54
4,4'-DDD	12.53	16.85	20.86	1.75	1.29	54.52
4,4'-DDT	13.38	20.07	23.30	1.63	1.38	60.59
PCB-1260	21.27	9.30	25.86	3.01	0.29	24.72

APPENDIX R.2
SURFACE SOIL METALS

STATISTICAL SUMMARY
SURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION DATE_STAMP DEPTH MOISTURE	NORMAL ARITHMETIC MEAN	NORMAL STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG ARITHMETIC MEAN	LOG STANDARD DEVIATION	LOG UPPER 95% CONFIDENCE INTERVAL
ALUMINUM	2445.31	1487.21	3180.34	7.61	0.68	4022.67
BARIUM	11.75	8.76	16.08	2.26	0.66	18.66
CALCIUM	633.02	880.48	1068.19	5.95	0.98	1384.31
CHROMIUM	4.00	2.27	5.12	1.21	0.65	6.48
COPPER	15.32	20.20	25.30	1.79	1.50	119.72
IRON	3031.77	4435.91	5224.17	7.41	1.03	7567.30
LEAD	38.98	55.65	66.49	2.71	1.46	217.05
MAGNESIUM	81.73	53.60	108.22	4.21	0.64	129.09
MANGANESE	35.69	51.07	60.93	2.80	1.22	111.48
NICKEL	2.76	1.09	3.30	0.96	0.31	3.28
POTASSIUM	125.12	37.42	143.61	4.80	0.22	140.80
SODIUM	27.90	11.61	33.64	3.27	0.32	33.43
THALLIUM	1.24	0.32	1.40	0.19	0.20	1.38
VANADIUM	3.92	3.09	5.44	1.09	0.79	7.21
ZINC	63.57	108.61	117.24	3.03	1.52	439.65

APPENDIX R.3
SUBSURFACE SOIL ORGANICS

STATISTICAL SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED DEPTH	NORMAL ARITHMETIC MEAN	NORMAL STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG ARITHMETIC MEAN	LOG STANDARD DEVIATION	LOG UPPER 95% CONFIDENCE INTERVAL
VOLATILES (ug/kg)						
ACETONE	57.61	97.34	96.33	3.09	1.33	165.26
CARBON DISULFIDE	5.66	1.00	6.06	1.71	0.26	6.40
2-BUTANONE	6.74	5.49	8.92	1.77	0.47	8.20
TRICHLOROETHENE	5.58	0.95	5.96	1.70	0.25	6.29
TOLUENE	5.58	1.20	6.06	1.67	0.41	7.05
TOTAL XYLENES	4.89	1.89	5.65	1.46	0.61	7.20
SEMIVOLATILES (ug/kg)						
NAPHTHALENE	183.68	34.39	197.37	5.18	0.29	212.08
2-METHYLNAPHTHALENE	183.95	33.36	197.22	5.19	0.27	210.08
ACENAPHTHENE	180.05	32.99	193.17	5.17	0.23	200.12
DIBENZOFURAN	183.00	37.12	197.77	5.17	0.35	220.57
FLUORENE	185.26	23.18	194.49	5.21	0.14	197.23
PHENANTHRENE	241.05	232.83	333.67	5.33	0.44	280.43
ANTHRACENE	194.74	27.16	205.54	5.26	0.12	205.06
CARBAZOLE	185.79	21.43	194.31	5.22	0.13	196.27
DI-N-BUTYL PHTHALATE	211.32	45.58	229.45	5.33	0.19	229.53
FLUORANTHENE	282.11	392.15	438.11	5.38	0.53	327.62
PYRENE	253.68	277.95	364.26	5.35	0.46	294.04
BENZO(A)ANTHRACENE	222.63	165.93	288.64	5.29	0.40	261.85
CHRYSENE	217.89	142.85	274.72	5.29	0.37	251.81
BIS(2-ETHYLHEXYL)PHTHALATE	121.58	83.57	154.82	4.60	0.64	173.03
BENZO(B)FLUORANTHENE	212.42	123.22	261.44	5.28	0.36	246.21
BENZO(K)FLUORANTHENE	208.42	102.32	249.13	5.28	0.31	238.09
BENZO(A)PYRENE	209.42	118.13	256.41	5.26	0.39	248.50
INDENO(1,2,3-CD)PYRENE	204.74	68.18	231.86	5.29	0.23	224.99
BENZO(G,H,I)PERYLENE	192.47	51.38	212.91	5.22	0.30	221.03
PESTICIDE/PCBS (ug/kg)						
ENDOSULFAN I	1.08	0.49	1.28	0.03	0.27	1.21
4,4'-DDE	12.75	16.67	19.38	1.66	1.35	40.93
4,4'-DDD	40.82	83.74	74.13	1.93	1.85	280.81
4,4'-DDT	7.46	11.10	11.88	1.28	1.10	14.91
ENDRIN ALDEHYDE	2.29	1.73	2.98	0.72	0.38	2.63
ALPHA CHLORDANE	1.37	1.68	2.03	0.09	0.50	1.58
GAMMA CHLORDANE	1.54	1.58	2.17	0.21	0.57	1.94

APPENDIX R.4
SUBSURFACE SOIL METALS

STATISTICAL SUMMARY
SUBSURFACE SOIL
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION DATE COLLECTED DEPTH MOISTURE	NORMAL ARITHMETIC MEAN	NORMAL STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG ARITHMETIC MEAN	LOG STANDARD DEVIATION	LOG UPPER 95% CONFIDENCE INTERVAL
ANALYTES (mg/kg)						
ALUMINUM	4282.63	2204.29	5159.51	8.21	0.61	6197.29
ANTIMONY	6.20	1.44	6.77	1.81	0.18	6.67
ARSENIC	1.43	0.67	1.70	0.29	0.35	1.67
BARIUM	14.73	11.94	19.48	2.37	0.85	25.60
CADMIUM	0.66	0.23	0.75	-0.45	0.27	0.74
CALCIUM	495.85	446.01	673.28	5.70	1.15	1356.48
CHROMIUM	6.21	4.03	7.82	1.58	0.78	10.41
COBALT	3.07	2.12	3.91	1.01	0.39	3.58
COPPER	70.57	181.59	142.81	1.73	2.17	1022.74
IRON	4630.63	7201.83	7495.57	7.65	1.28	14060.35
LEAD	62.56	130.59	114.51	2.45	1.84	452.54
MAGNESIUM	159.34	93.88	196.69	4.89	0.67	238.87
MANGANESE	58.82	116.48	105.16	2.62	1.67	278.09
NICKEL	15.49	55.12	37.41	1.20	1.10	13.72
POTASSIUM	158.87	93.63	196.11	4.96	0.43	193.35
SELENIUM	0.63	0.22	0.72	-0.49	0.23	0.70
SILVER	0.78	0.83	1.11	-0.43	0.46	0.90
SODIUM	39.13	32.25	51.96	3.46	0.60	51.48
THALLIUM	1.33	0.70	1.61	0.22	0.30	1.50
VANADIUM	6.38	6.02	8.78	1.50	0.89	11.45
ZINC	121.50	214.71	206.92	3.08	1.99	1319.18

APPENDIX R.5
GROUNDWATER ORGANICS

STATISTICAL SUMMARY
GROUNDWATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED	NORMAL ARITHMETIC MEAN	NORMAL STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG ARITHMETIC MEAN	LOG STANDARD DEVIATION	LOG UPPER 95% CONFIDENCE INTERVAL
VOLATILES (ug/L)						
METHYLENE CHLORIDE	2.91	2.02	4.01	0.79	0.81	6.28
ACETONE	5.55	0.93	6.06	1.70	0.16	6.09
CARBON DISULFIDE	5.00	0.00	5.00	1.61	0.00	5.00
1,2-DICHLOROETHANE	2.82	1.40	3.58	0.94	0.43	3.78
2-BUTANONE	3.91	1.87	4.93	1.17	0.75	8.01
SEMIVOLATILES (ug/L)						
NAPHTHALENE	4.82	0.60	5.15	1.56	0.15	5.29
DI-N-BUTYL PHTHALATE	4.64	1.12	5.25	1.50	0.32	5.76
BIS(2-ETHYLHEXYL)PHTHALATE	4.00	1.79	4.98	1.23	0.67	7.25

APPENDIX R.6
GROUNDWATER METALS

STATISTICAL SUMMARY
GROUNDWATER
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION DATE COLLECTED	NORMAL ARITHMETIC MEAN	NORMAL STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG ARITHMETIC MEAN	LOG STANDARD DEVIATION	LOG UPPER 95% CONFIDENCE INTERVAL
ANALYTES (ug/L)						
ALUMINUM	129.44	138.75	205.24	4.26	1.20	550.36
BARIUM	41.05	38.60	62.14	3.45	0.73	75.90
CALCIUM	56392.73	47322.85	82247.03	10.39	1.36	466625.67
CHROMIUM	5.93	2.06	7.05	1.74	0.28	7.05
COBALT	18.53	14.71	26.56	2.71	0.62	29.76
IRON	1269.70	1963.09	2342.21	5.91	1.81	36460.00
LEAD	1.67	0.57	1.99	0.48	0.25	1.94
MAGNESIUM	5544.55	4282.71	7884.36	8.37	0.76	10817.02
MANGANESE	68.63	74.90	109.55	3.41	1.52	878.28
NICKEL	18.43	18.81	28.70	2.62	0.70	30.20
POTASSIUM	3148.18	2153.59	4324.77	7.82	0.76	6312.14
SODIUM	9381.82	3258.31	11161.96	9.09	0.34	11772.95
ZINC	22.76	13.82	30.32	2.99	0.55	34.34

APPENDIX R.7
SEDIMENT ORGANICS

STATISTICAL SUMMARY
SEDIMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

LOCATION DATE COLLECTED DEPTH	NORMAL ARITHMETIC MEAN	NORMAL STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG ARITHMETIC MEAN	LOG STANDARD DEVIATION	LOG UPPER 95% CONFIDENCE INTERVAL
VOLATILES (ug/kg)						
ACETONE	280.00	116.90	417.54	5.58	0.38	668.43
CHLOROFORM	32.75	30.98	69.20	3.22	0.78	903.82
2-BUTANONE	83.25	9.71	94.67	4.42	0.12	100.51
CARBON TETRACHLORIDE	15.38	2.14	17.89	2.73	0.14	19.21
TETRACHLOROETHENE	12.88	4.63	18.32	2.49	0.47	47.58
TOLUENE	9.38	8.26	19.09	1.98	0.82	458.95
SEMIVOLATILES (ug/kg)						
DI-N-BUTYL PHTHALATE	1285.00	282.08	1616.86	7.14	0.23	1987.62
PESTICIDE/PCBS (ug/kg)						
BETA-BHC	4.16	2.78	7.43	1.29	0.56	25.97
4,4'-DDE	12.18	7.37	20.85	2.33	0.70	170.77
4,4'-DDD	42.93	42.95	93.45	3.06	1.53	64285790.52

APPENDIX R.8
SEDIMENT METALS

FREQUENCY OF DETECTION SUMMARY
SEDIMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TAL METALS

LOCATION DATE COLLECTED DEPTH	NORMAL ARITHMETIC MEAN	NORMAL STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG ARITHMETIC MEAN	LOG STANDARD DEVIATION	LOG UPPER 95% CONFIDENCE INTERVAL
ANALYTES (mg/kg)						
ALUMINUM	12846.00	16707.63	32502.52	8.46	1.94	1.35E+13
ANTIMONY	24.79	14.91	42.33	3.09	0.53	138.92
BARIUM	75.98	42.75	126.27	4.08	0.98	15688.63
CALCIUM	2975.50	2024.90	5357.80	7.61	1.26	7.17E+07
CHROMIUM	14.88	19.41	37.71	2.07	1.26	302239.18
COBALT	14.33	14.71	31.63	2.34	0.85	805.37
COPPER	33.11	45.27	86.37	2.71	1.51	3.67E+07
IRON	4812.25	6639.10	12623.16	7.65	1.54	7.37E+09
LEAD	59.81	78.99	152.75	2.96	2.25	7.65E+14
MAGNESIUM	535.95	472.27	1091.58	5.89	1.11	846361.48
MANGANESE	56.93	46.43	111.54	3.84	0.69	754.50
POTASSIUM	615.00	534.09	1243.36	6.19	0.73	13444.80
SODIUM	144.00	63.68	218.92	4.87	0.57	951.84
VANADIUM	12.75	18.51	34.53	1.85	1.25	42666.91
ZINC	95.18	124.81	242.01	3.83	1.47	11164392.69

APPENDIX R.9
FISH FILLET

STATISTICAL SUMMARY
FISH TISSUE - FILLET
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA
TCL ORGANICS

	NORMAL ARITHMETIC MEAN	NORMAL STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG ARITHMETIC MEAN	LOG STANDARD DEVIATION	LOG UPPER 95% CONFIDENCE INTERVAL
VOLATILES (ug/kg)						
ACETONE	4912.50	2384.80	7718.22	8.40	0.51	26445.71
PESTICIDE/PCBs (ug/kg)						
4,4'-DDD	5.14	0.38	5.58	1.63	0.07	5.67

STATISTICAL SUMMARY
FISH TISSUE - FILLET
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA
TAL METALS

	NORMAL ARITHMETIC MEAN	NORMAL STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG ARITHMETIC MEAN	LOG STANDARD DEVIATION	LOG UPPER 95% CONFIDENCE INTERVAL
ANALYTES (mg/kg)						
ALUMINUM	1.02	0.53	1.64	-0.08	0.52	5.51
BARIUM	0.08	0.09	0.18	-2.97	0.99	14.15
CALCIUM	861.00	829.81	1837.27	6.48	0.80	25241.39
COPPER	0.33	0.18	0.54	-1.25	0.67	4.28
MAGNESIUM	295.00	4.24	299.99	5.69	0.01	300.94
MANGANESE	0.23	0.16	0.41	-1.67	0.68	2.92
MERCURY	0.16	0.12	0.30	-2.09	0.86	10.13
POTASSIUM	3245.00	391.71	3705.84	8.08	0.13	3973.70
SELENIUM	0.17	0.04	0.21	-1.80	0.20	0.23
SODIUM	659.50	178.46	869.46	6.46	0.28	1139.28
THALLIUM	0.10	0.03	0.13	-2.38	0.35	0.22
ZINC	7.63	1.22	9.06	2.02	0.18	10.12

APPENDIX R.10
FISH WHOLE BODY

STATISTICAL SUMMARY
FISH TISSUE - WHOLE BODY
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJUENE, NORTH CAROLINA
TCL ORGANICS

	NORMAL ARITHMETIC MEAN	NORMAL STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG ARITHMETIC MEAN	LOG STANDARD DEVIATION	LOG UPPER 95% CONFIDENCE INTERVAL
VOLATILES (ug/kg)						
METHYLENE CHLORIDE	15560.00	20505.80	35111.45	8.67	1.67	2.27E+07
ACETONE	424360.00	619764.77	1015280.54	10.67	3.03	2.14E+17
2-BUTANONE (MEK)	15472.00	20584.70	35098.68	8.55	1.83	1.51E+08
TOLUENE	12040.00	20133.75	31236.72	8.53	1.30	1.19E+06
PESTICIDE/PCBs (ug/kg)						
4,4'-DDE	6.95	4.50	11.24	1.82	0.50	14.51
4,4'-DDD	12.34	15.49	27.11	2.08	0.91	113.06

STATISTICAL SUMMARY
FISH TISSUE - WHOLE BODY
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA
TAL METALS

	NORMAL ARITHMETIC MEAN	NORMAL STANDARD DEVIATION	NORMAL UPPER 95% CONFIDENCE INTERVAL	LOG ARITHMETIC MEAN	LOG STANDARD DEVIATION	LOG UPPER 95% CONFIDENCE INTERVAL
ANALYTES (mg/kg)						
ALUMINUM	9.82	8.53	17.96	1.73	1.36	1810.63
ANTIMONY	1.12	0.39	1.49	0.05	0.44	2.20
ARSENIC	0.06	0.05	0.11	-2.95	0.59	0.16
BARIUM	1.65	0.89	2.50	0.34	0.71	7.56
BERYLLIUM	0.01	0.01	0.02	-4.57	0.57	0.03
CALCIUM	23188.00	12172.29	34793.79	9.93	0.56	60663.04
COPPER	2.12	3.64	5.59	-0.29	1.49	447.31
IRON	18.60	8.23	26.45	2.82	0.53	46.68
LEAD	0.21	0.20	0.40	-2.16	1.37	38.77
MAGNESIUM	601.80	213.21	805.08	6.35	0.34	950.10
MANGANESE	3.18	1.54	4.65	1.02	0.64	10.92
MERCURY	0.06	0.05	0.10	-3.23	0.93	0.60
POTASSIUM	2564.00	412.23	2957.04	7.84	0.18	3137.21
SELENIUM	0.28	0.11	0.39	-1.34	0.43	0.54
SODIUM	1412.40	562.45	1948.67	7.20	0.34	2227.13
THALLIUM	0.11	0.00	0.12	-2.19	0.04	0.12
ZINC	24.48	6.16	30.35	3.17	0.29	34.87

APPENDIX S
COPC SELECTION WORKSHEETS

Surface) Soil

(1)

CONTAMINANT	RANGE	LOG 95% UCL	FREQUENCY	(µg/L) BLANK	2 x Ave. BACKGROUND	HISTORY	ANTHROPOGENIC	NUTRIENT	TOXICITY	RBC	ARAR	COPC
Volatiles:	(µg/kg)									(µg/kg)		
Methylene Chloride	2J-2J		2/13	16	NA				C	85,000		
Acetone	10J		1/13	93	NA					~~780,000~~	780,000	
Trichloroethene	1J		1/13	ND	NA				C	58,000		
Toluene	1J-2J		3/13	4J	NA					~~16,000,000~~	7,600,000	
Ethylbenzene	1J		1/13	ND	NA					~~7,800,000~~	780,000	
Xylenes (Total)	3J-5J		2/13	ND	NA					~~160,000,000~~	1.6×10^7	
Semivolatiles:												
2,4-Dinitrophenol	150J		1/13	ND	NA					~~160,000~~	16,000	
Acenaphthene	130J		1/13		NA					~~4,700,000~~	470,000	
Dibenzofuran	58J		1/13		NA					~~310,000~~	31,000	
Fluorene	100J		1/13		NA					~~3,100,000~~	310,000	
Phenanthrene(b)	59J-860	223.38	3/13		NA					230,000		
Anthracene	190J		1/13		NA					~~2,300,000~~	230,000	
Carbazole	180J		1/13	V	NA				C	32,000		
Di-n-butylphalate	260J-390J		2/13	1J	NA					~~7,800,000~~	780,000	
Fluoranthene	130J-830		3/13	ND	NA					~~3,100,000~~	310,000	
Pyrene	150J-850		3/13		NA					~~2,300,000~~	230,000	
Benzo(a)anthracene	76J-510		3/13		NA				C	880		
Chrysene	70J-470		3/13	V	NA				C	88,000		
Bis(2-ethylhexyl)phthalate	48J-87J		9/13	2J	NA				C	46,000		
Benzo(b)fluoranthene	89J-360J		3/13	ND	NA				C	880		
Benzo(k)fluoranthene	120J-510	230.48	2/13		NA				C	8,800		
Benzo(a)pyrene	100J-400	~~199.98~~	2/13	V	NA				C	88		X
Indeno(1,2,3-cd)pyrene	88J-310J		2/13	V	NA				C	880		

(b) USEPA - Region III RBC for pyrene used as a surrogate.

· Surface Soil

(2)

CONTAMINANT	RANGE	223.95 95% UCL	FREQUENCY	BLANK	2X Ave. BACKGROUND	HISTORY	ANTHROPOGENIC	NUTRIENT	TOXICITY	RBC	ARAR	COPC
Dibenzo(a,h)anthracene	45J-150J	~~235.77~~	2/13	ND	NA				C	88		X
Benzo(g,h,i)perylene(6)	70J-250J	211.76	2/13	ND	NA					230,000		~~X~~
Pest / PCBs:												
Heptachlor Epoxide	2.3		1/13	ND	NA				C	~~70~~		
4,4'-DDE	4.3-83J		6/13	ND	NA				C	1,900		
Endosulfan II(1)	3.8NJ-3.9NJ		2/13	ND	NA					~~47,000~~	47,000	
4,4'-DDD	3.8NJ-59J		7/13	ND	NA				C	2,700		
4,4'-DDT	25-56J		3/13	0.3	NA				C	1,900		
PCB-1260(2)	52J		1/13	ND					C	83		
Inorganics:	(mg/kg)									(mg/kg)		
Aluminum	656-5040		13/13	73.6	5,940,594					~~76,000~~	7,800	
Barium	2.7-36.3		13/13	3	17.36					~~5,500~~	550	
Calcium	79.3-3460		13/13	21,400	1,396,788			X		NA		
Chromium(3)	2.3-8.6		11/13		6.693					~~390~~	39	
Copper	2.5-55.6		9/13	16.1	7.2					~~2,400~~	290	
Iron	509-16,400		13/13	73.1	3,755,063			X		~~NA~~	2,300	X
Lead	2-178J		13/13	1.2	23.749					400(4)		
Magnesium	28.5-187		13/13	855	205,751			X		NA	180	
Manganese	2.9-163J	111.48	13/13		18.497					~~390~~	~~[redacted]~~	~~[redacted]~~
Nickel	4.6-5.7		2/13		3.434					~~1,200~~	160	
Potassium	248		1/13	2,410	199.61			X		NA		
Sodium	51.3-56.3		2/13	60,700	59.298			X		NA		
Thallium(5)	2.3	1.38	1/13		0.899					~~[redacted]~~	0.63	X
Vanadium	2.8-12		9/13		11.628					~~550~~	55	
Zinc	37-377J		11/13	28	13.88					23,000	2,300	

(1) USEPA Region III RBC for endosulfan used as a surrogate.
(2) USEPA Region III RBC for PCBs used as a surrogate.
(3) Chromium evaluated as hexavalent state.

CTO 0512 Site 65
Subsurface Soil
(revised)

CONTAMINANT	RANGE	95% UCL	FREQUENCY	BLANK	BACKGROUND	HISTORY	ANTHROPOGENIC	NUTRIENT	TOXICITY	RBC	ARAR	COPC
				(ug/L)	2 x Ave.							
Volatiles:	(ug/kg)									(ug/kg)		
Acetone	7J-380		13/19	93	N/A					780,000		
Carbon Disulfide	2J		1/19							780,000		
2-Butanone	2J-29		3/19	7J						4,700,000		
Trichloroethene	2J		1/19						C	58,000		
Toluene	1J		1/19	4J						1,600,000		
total Xylenes	1J-3J		5/19							4.6 x 10^7		
Semivolatiles:												
Naphthalene	55J		1/19							310,000		
2-Methylnaphthalene (1)	60J		1/19							310,000		
Acenaphthene	94J-97J		2/19							470,000		
Fluorene	~~1900~~ 110J		1/19							310,000		
Dibenzofuran	42J		1/19							31,000		
Phenanthrene (2)	150J-1200		2/19							230,000		
Anthracene	290J		1/19							2,300,000		
Carbazole	120J		1/19						C	32,000		
Di-n-butylphthalate	160J-340J		8/19	1J						780,000		
Fluoranthene	230J-1900		2/19							310,000		
Pyrene	190J-1400		2/19							230,000		
Benzo(a)anthracene	100J-900 ~~261.45 UL~~		2/19						C	880		X
Chrysene	110J-800		2/19						C	88,000		
Bis(2-ethylhexyl)phthalate	37J-370		15/19	2J					C	46,000		
Benzo(b)fluoranthene	96J-710		2/19						C	880		
Benzo(k)fluoranthene	110J-620		2/19						C	8,800		
Benzo(a)pyrene	69J-680 ~~218.5 UL~~		2/19						C	88		X

(1) USEPA Region III RBC for β naphthalene used as a surrogate.

(2) USEPA Region III RBC for pyrene used as a surrogate.

Subsurface Soil

(4) USEPA Region III RBC for chlordane used as a surrogate.
(5) Chromium evaluated as hexavalent state.
(6) Lead Action Level for residential soil.
(7) USEPA Region III RBC for endosulfan used as a surrogate.

CONTAMINANT	RANGE	95% UCL	FREQUENCY	BLANK	BACKGROUND	HISTORY	ANTHROPOGENIC	NUTRIENT	TOXICITY	RBC	ARAR	COPC
4'4-DDT	9.6-40		4/19						C	1,900		
Indeno(1,2,3-cd)pyrene	480J		1/19		NA				C	880		
Benzo(g,h,i)perylene(2)	67J-360J		2/19							230,000		
Pest/PCBs:	(ug/kg)											
Endosulfan I(7)	3.1NJ		1/19							47,000		
4,4'-DDE	4.6-45J		8/19						C	1,900		
4,4'-DDD	4.4J-340J		8/19						C	2,700		
Endrin Aldehyde(3)	9.4J		1/19							2,300		
Alpha Chlordane(4)	8.3J		1/19						C	490		
Gamma Chlordane(4)	3J-7.5J		3/19						C	490		
Inorganics:	(mg/kg)									(mg/kg)		
Aluminum	1000-6000	6997.27	19/19	73.6	7375.302					7,800		X
Antimony	11.8	6.67	1/19		6.409					3.1		X
Arsenic	2.6-3.3	1.67	3/19		1.968				C	0.37		X (NC 2.3/C 0.37)
Barium	27-38.3		19/19	3	14.204					550		
Cadmium	1.3		2/19		0.712					3.9		
Calcium	49.8-1350		18/19	21,400	391.509			X		NA		
Chromium(5)	2.6-17.3		16/19		12.562					39		
Cobalt	11.5		1/19		1.504					470		
Copper	7.7-672	1022.74	8/19	16.1	2.416					290		X
Iron	2360J-31300		17/19	73.1	7252.076			X		[redacted]	2,300	X
Lead	1.6-539	452.54	19/19	6.2	8.327					400(6)		X
Magnesium	23.8-410		19/19	855	260.718			X		NA		
Manganese	2-471	278.09	19/19		7.919					[redacted]	180	X
Nickel	4.8-24.3	13.72	3/19		3.714					160		X
Potassium	253-453		4/19	2,410	347.286			X		NA		
Sodium	50.8-130		5/19	60,700	52.676			X		NA		
Thallium	4.2	1.5	1/19		0.955					[redacted]	0.63	X
Vanadium	3.1-27.2		15/19		13.454					55		
Zinc	2.5-764		16/19	28	66.62					2,300		
Selenium	1.5		1/19		0.801					39		
Silver												

Groun Water

CONTAMINANT	RANGE	95% UCL	FREQUENCY	BLANK (µg/L)	BACKGROUND	HISTORY	ANTHROPOGENIC	NUTRIENT	TOXICITY	Tap H_2O (µg/L) RBC	ARAR	COPC	
Volatiles:	(µg/L)												
Methylene Chloride	1J-2J		6/11	16					C	4.1			
Acetone	5J-7J		7/11	56						~~3,400~~	370		
Carbon Disulfide	5J		1/11							~~21~~	21	X	
1,2-Dichloroethane	2J-2J	3.78	8/11	1J					C	0.12		[crossed out]	detected in blank
2-Butanone	1J-1J		3/11							~~1900~~	190		
Semivolatiles:													
Naphthalene	3J		1/11							~~1,500~~	150		
Di-n-butylphthalate	2J-6J		3/11	1J						~~3,700~~	370		
bis(2-Ethylhexyl)phthalate	1J-6J	7.25	5/11	2J	(field blank)				C	4.8		[crossed out]	detected in blank
Inorganics:	(µg/L)												
Aluminum	40.3-421		7/11	73.6						~~37000~~	3,700		
Barium	17.7-151		10/11	3						~~2600~~	260		
Calcium	2700-146,000		11/11	21,400				X		NA			
Chromium(1) (VI)	10-10.2		2/11							~~180~~	18		
Cobalt	20.1-52.4		4/11							~~2,200~~	220	[crossed out]	
Iron	41.9-6580		10/11	73.1				X		[crossed out]	1,100	X	
reinclude Lead	3.4	1.94	1/11	[crossed out]							not X	[crossed out]	[crossed out]
Magnesium	1200-16200		11/11	855				X		NA	84		
Manganese	3-186	878.28	11/11							~~180~~	[crossed out]	X	
Sodium	5620-16400		11/11	60,700				X		NA			
Zinc	11-58.9		10/11							~~11,000~~	1,100		
Nickel	53.1-59.6		2/11							~~730~~	~~73~~		
Potassium	1200-7940		10/11	2,410				X		NA			

(1) Chromium evaluated as hexavalent state.

Surface Water

Site 65
UPSTREAM

CONTAMINANT	RANGE	USE MAX (n=2) 95% UCL	FREQUENCY	(ug/L) BLANK	(upstream) Ave. BACKGROUND	HISTORY	ANTHROPC	NUTRIENT	TOXICITY	RBC	NC WQS ARAR	COPC
Volatiles:	(ug/L)											
Acetone	5J		1/2	56								
1,2-Dichloroethane	1J-1J		2/2	1J								
Inorganics:	(ug/L)											
Aluminum	25,800		1/2	73.6	333.17							X
Barium	36.7-69.3		2/2	3	25.67							X
Calcium	12,000-26800		2/2	2,485	17,566.67			X				
Chromium	27.6		1/2								50	
Copper	41.1		1/2								7 X	X
Iron	348-7,870		2/2	73.1	575.67			X			1,000	X
Lead	45.8		1/2	6.2							25	X
Magnesium	2060-2520		2/2	855	1744.67			X				
Manganese	57.3-88.4		2/2									X
Potassium	2970-		1/2	2,410				X				
Sodium	3330-6320		2/2	6700	9,830.00			X				
Vanadium	26.2		1/2									X
Zinc	33.6-144		2/2	28							50	X

Sedime

CONTAMINANT	RANGE	LOG 95% UCL	FREQUENCY	µg/L BLANK	(mean) BACKGROUND	HISTORY	ANTHROPOGENIC	NUTRIENT	TOXICITY	resid. Soil RBC	ARAR	COPC
Volatiles:	(µg/kg)											
Acetone	190J-490J	668.43	4/4	12 (distilled)						780,020	µg/kg	detected in blank
Chloroform	79J	903.82	1/4							100,000		
2-Butanone	72J-94J	100.51	4/4							4700,000		
Carbon Tetrachloride	13J-18J	19.21	2/4							4,900		
Tetrachloroethene	6J-15J	47.58	2/4							12,000		
Toluene	3J-7J	458.95	3/4	2J						1,600,000		
Semivolatiles:												
Di-n-butylphthalate	940J-1600J	1987.62	4/4	1J						780,000		
Pest/PCBs:												
beta-BHC	8.3NJ	25.97	1/4		2.51					350		
4,4'-DDE	18J-19NJ	170.77	2/4		2.42					2,700		
4,4'-DDD	76J-84J	6.4E+7	2/4		1.57					1,900	↓	
Inorganics:	(mg/kg)											
Aluminum	394-37000J	1.35E+18	4/4	73.6						7,800	mg/kg	
Antimony	46.6J	138.92	1/4							3.1		
Barium	13.6-170	15688.63	4/4	3						550		
Calcium	322-9640		4/4	21,400				X		--		
Chromium	9.8J-43.6J	302251.18	2/4							39		
Cobalt	36.3	805.37	1/4							470		
Copper	8.2-100J	3.67E+7	3/4	16.1						290		
Iron	414-14,600J		4/4	73.1				X		2,300		
Lead	23.9-176J	7.65E+14	3/4	6.2						400*		
Magnesium	84.8-1140		3/4	855				X		--		

* Action level for soils.

CTO 312, Site 65
Sediment

(2)

CONTAMINANT	RANGE	95% UCL	FREQUENCY	BLANK	BACKGROUND	HISTORY	ANTHROPOGENIC	NUTRIENT	TOXICITY	resid. soil RBC	ARAR	COPC
Manganese	25.6-126 J	754.5	4/4							180	(mg/kg)	~~X~~
Potassium	1410		1/4	2410				X		—		
Sodium	139-203		3/4	60,700				X		--		
Vanadium	40.5	42666.91	1/4							55		~~X~~
Zinc	7.9-28.0 J	1.12E+7	4/4	28						2,300		~~X~~

CTO 317) SITE 60
Fish - fillet

CONTAMINANT	RANGE	95% UCL	FREQUENCY	BLANK	BACKGROUND	HISTORY	ANTHROPOGENIC	NUTRIENT	TOXICITY	mg/kg RBC	ARAR	COPC
Volatiles:	(ug/kg)	(ug/kg)										
Acetone	5600J-7900J	26,445.71	2/4							14,000		
Pesticide/PCBs:												
4,4'-DDD	5.7J	5.67	1/4						C	13		
Inorganics:	(mg/kg)	(mg/kg)										
Aluminum	0.99	5.51	1/4							140		
Barium	0.21J	14.15	4/4					X		9.5		
Calcium	385J-2100J	25241.39	4/4							NA		
Copper	0.46-0.49	4.28	2/4					X		5		
Magnesium	290J-299J	300.94	4/4							NA		
Manganese	0.095J-0.45J	2.92	4/4							0.68		
Mercury	0.051J-0.3J	10.13	4/4							[illegible]	0.014	X
Potassium	2700J-3500J	3973.7	4/4					X		NA		
Selenium	0.14-0.22	0.23	4/4							0.68		
Sodium	441-869	1139.28	4/4					X		NA		
Thallium	0.11-0.1	0.22	3/4							[illegible]	0.011	X
Zinc	5.8J-8.4J	10.12	4/4							41		

APPENDIX T
CDI HUMAN HEALTH RISK SPREADSHEETS

Computed by: KTW Checked by: MDB Date: 10/95

EXAMPLE SOIL INGESTION CALCULATIONS
SITE 65 - ENGINEER AREA DUMP
CONTRACT TASK ORDER 0312

Purpose: Estimate intake/risk from ingestion of soil

$$Intake\ (mg/kg{\cdot}day) = \frac{C \times CF \times EF \times ED \times IR}{BW \times AT}$$

Where:	C	=	Contaminant concentration in soil (mg/kg)
	CF	=	Conversion factor (kg/mg)
	EF	=	Exposure frequency (days/year)
	ED	=	Exposure duration (years)
	IR	=	Ingestion rate (mg/day)
	BW	=	Body weight (kg)
	AT_c	=	Averaging time carcinogen (days)
	AT_{nc}	=	Averaging time noncarcinogen (days)

Risks:

Carcinogens = Intake (mg/kg·day) x CSF $(mg/kg{\cdot}day)^{-1}$
Noncarcinogens = Intake (mg/kg·day)/RfD (mg/kg·day)

Example Carcinogen: Benzo(a)pyrene

$$Intake\ (mg/kg{\cdot}day) = \frac{0.230\ mg/kg \times 100\ mg/day \times 350\ days/yr \times 24\ yrs \times 1.0E{-}6\ kg/mg}{70\ kg \times 25{,}550\ days}$$

$$= 1.1E{-}07$$

Risk = 1.1E-07 mg/kg·day x 7.3 $mg/kg{\cdot}day^{-1}$ = 7.9E-07

Example Noncarcinogen: Thallium

$$Intake\ (mg/kg{\cdot}day) = \frac{1.38\ mg/kg \times 100\ mg/day \times 350\ days/yr \times 24\ yrs \times 1.0E{-}6\ kg/mg}{70\ kg \times 8{,}760\ days}$$

$$= 1.9E{-}06$$

$$Risk = \frac{1.9E{-}06\ mg/kg{\cdot}day}{8.0E{-}05\ mg/kg{\cdot}day} = 2.4E{-}02$$

* This example calculation also is applicable for sediment ingestion.

Re: Site 65 Future Residential Adult

SURFACE SOIL INGESTION EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL ADULT

Intake from ingestion of soil is calculated as follows:

Intake (mg/kg-day) = C * CF * EF * ED * IR/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	specific
CF = conversion for kg to mg	1E-06
EF = adult exposure frequency (days/yr)	350
ED = adult exposure duration (yr)	24
IR = adult soil ingestion rate (mg/day)	100
BW = adult body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	24
DY = days per year (days/year)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	specific

COPC	Concentration (mg/kg)	Exposure Frequency (days/yr) Adult	Exposure Duration (yr) Adult	Conversion Factor (kg/mg)	Ingestion Rate (mg/day) Adult	Body Weight (kg) Adult	Average Carc Time (days)	Carc Dose (mg/kg/day) Adult	Slope Factor (mg/kg/day)-1	Carcinogenic Risk Adult	Percent Carcinogenic Risk Adult	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Adult	Reference Dose (mg/kg/day)	Noncarcinogenic Risk Adult	Percent Noncarcinogenic Risk Adult
Benzo(a)pyrene	0.230	350	24	1E-06	100	70	25550	1.1E-07	7.3E+00	7.9E-07	61%	8760	3.2E-07	0.0E+00	0.0E+00	0%
Dibenzo(a,h)anthracene	0.150	350	24	1E-06	100	70	25550	7.0E-08	7.3E+00	5.1E-07	39%	8760	2.1E-07	0.0E+00	0.0E+00	0%
Iron	7567.300	350	24	1E-06	100	70	25550	3.6E-03	0.0E+00	0.0E+00	0%	8760	1.0E-02	3.0E-01	3.5E-02	59%
Thallium	1.380	350	24	1E-06	100	70	25550	6.5E-07	0.0E+00	0.0E+00	0%	8760	1.9E-06	8.0E-05	2.4E-02	41%
TOTAL										1.3E-06					5.8E-02	

SURFACE SOIL INGESTION EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL CHILD

Intake from ingestion of soil is calculated as follows:

Intake (mg/kg-day) = C * CF * EF * ED * IR/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	specific
CF = conversion for kg to mg	1E-06
EF = child exposure frequency (days/yr)	350
ED = child exposure duration (yr)	6
IR = child soil ingestion rate (mg/day)	200
BW = child body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = days per year (days/year)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	specific

COPC	Concentration (mg/kg)	Exposure Frequency (days/yr) Child	Exposure Duration (yr) Child	Conversion Factor (kg/mg)	Ingestion Rate (mg/day) Child	Body Weight (kg) Child	Average Carc Time (days)	Carc Dose (mg/kg/day) Child	Slope Factor (mg/kg/day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Child	Reference Dose (mg/kg/day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk Child
Benzo(a)pyrene	0.230	350	6	1E-06	200	15	25550	2.5E-07	7.30E+00	1.8E-06	61%	2190	2.9E-06	0.00E+00	0.0E+00	0%
Dibenzo(a,h)anthracene	0.150	350	6	1E-06	200	15	25550	1.6E-07	7.30E+00	1.2E-06	39%	2190	1.9E-06	0.00E+00	0.0E+00	0%
Iron	7567.300	350	6	1E-06	200	15	25550	8.3E-03	0.00E+00	0.0E+00	0%	2190	9.7E-02	3.00E-01	3.2E-01	59%
Thallium	1.380	350	6	1E-06	200	15	25550	1.5E-06	0.00E+00	0.0E+00	0%	2190	1.8E-05	8.00E-05	2.2E-01	41%
TOTAL										3.0E-06					5.4E-01	

SURFACE SOIL INGESTION EXPOSURE ASSESSMENT - CT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL CHILD

Intake from ingestion of soil is calculated as follows:

Intake (mg/kg-day) = C * CF * EF * ED * IR/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	specific
CF = conversion for kg to mg	1E-06
EF = child exposure frequency (days/yr)	234
ED = child exposure duration (yr)	6
IR = child soil ingestion rate (mg/day)	100
BW = child body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = days per year (days/year)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	specific

COPC	Concentration (mg/kg)	Exposure Frequency (days/yr) Child	Exposure Duration (yr) Child	Conversion Factor (kg/mg)	Ingestion Rate (mg/day) Child	Body Weight (kg) Child	Average Carc Time (days)	Carc Dose (mg/kg/day) Child	Slope Factor (mg/kg/day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Child	Reference Dose (mg/kg/day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk Child
Benzo(a)pyrene	0.230	234	6	1E-06	100	15	25550	8.4E-08	7.30E+00	6.2E-07	61%	2190	9.9E-07	0.00E+00	0.0E+00	0%
Dibenzo(a,h)anthracene	0.150	234	6	1E-06	100	15	25550	5.5E-08	7.30E+00	4.0E-07	39%	2190	6.4E-07	0.00E+00	0.0E+00	0%
Iron	7567.300	234	6	1E-06	100	15	25550	2.8E-03	0.00E+00	0.0E+00	0%	2190	3.2E-02	3.00E-01	1.1E-01	59%
Thallium	1.380	234	6	1E-06	100	15	25550	5.1E-07	0.00E+00	0.0E+00	0%	2190	5.9E-06	8.00E-05	7.4E-02	41%
TOTAL										1.0E-06					1.8E-01	

SURFACE SOIL INGESTION EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT MILITARY PERSONNEL - TRAINEE

Intake from ingestion of soil is calculated as follows:

Intake (mg/kg-day) = C * CF * EF * ED * IR/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	specific
CF = conversion for kg to mg	1E-06
EF = adult exposure frequency (days/yr)	260
ED = adult exposure duration (yr)	4
IR = adult soil ingestion rate (mg/day)	100
BW = adult body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	4
DY = days per year (days/year)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	specific

COPC	Concentration (mg/kg)	Exposure Frequency (days/yr) Adult	Exposure Duration (yr) Adult	Conversion Factor (kg/mg)	Ingestion Rate (mg/day) Adult	Body Weight (kg) Adult	Average Carc Time (days)	Carc Dose (mg/kg/day) Adult	Slope Factor (mg/kg/day)-1	Carcinogenic Risk Adult	Percent Carcinogenic Risk Adult	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Adult	Reference Dose (mg/kg/day)	Noncarcinogenic Risk Adult	Percent Noncarcinogenic Risk Adult
Benzo(a)pyrene	0.230	260	4	1E-06	100	70	25550	1.3E-08	7.3E+00	9.8E-08	61%	1460	2.3E-07	0.0E+00	0.0E+00	0%
Dibenzo(a,h)anthracene	0.150	260	4	1E-06	100	70	25550	8.7E-09	7.3E+00	6.4E-08	39%	1460	1.5E-07	0.0E+00	0.0E+00	0%
Iron	7567.300	260	4	1E-06	100	70	25550	4.4E-04	0.0E+00	0.0E+00	0%	1460	7.7E-03	3.0E-01	2.6E-02	59%
Thallium	1.380	260	4	1E-06	100	70	25550	8.0E-08	0.0E+00	0.0E+00	0%	1460	1.4E-06	8.0E-05	1.8E-02	41%
TOTAL										1.6E-07					4.3E-02	

SUBSURFACE SOIL INGESTION EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT MILITARY PERSONNEL - TRAINEE

Intake from ingestion of soil is calculated as follows:

Intake (mg/kg-day) = C * CF * EF * ED * IR/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	specific
CF = conversion for kg to mg	1E-06
EF = adult exposure frequency (days/yr)	260
ED = adult exposure duration (yr)	4
IR = adult soil ingestion rate (mg/day)	100
BW = adult body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	4
DY = days per year (days/year)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	specific

COPC	Concentration (mg/kg)	Exposure Frequency (days/yr) Adult	Exposure Duration (yr) Adult	Conversion Factor (kg/mg)	Ingestion Rate (mg/day) Adult	Body Weight (kg) Adult	Average Carc Time (days)	Carc Dose (mg/kg/day) Adult	Slope Factor (mg/kg/day)-1	Carcinogenic Risk Adult	Percent Carcinogenic Risk Adult	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Adult	Reference Dose (mg/kg/day)	Noncarcinogenic Risk Adult	Percent Noncarcinogenic Risk Adult
Benzo(a)anthracene	0.262	260	4	1E-06	100	70	25550	1.5E-08	7.3E-01	1.1E-08	4%	1460	2.7E-07	0.0E+00	0.0E+00	0%
Benzo(a)pyrene	0.249	260	4	1E-06	100	70	25550	1.4E-08	7.3E+00	1.1E-07	37%	1460	2.5E-07	0.0E+00	0.0E+00	0%
Aluminum	6197.290	260	4	1E-06	100	70	25550	3.6E-04	0.0E+00	0.0E+00	0%	1460	6.3E-03	1.0E+00	6.3E-03	5%
Antimony	6.670	260	4	1E-06	100	70	25550	3.9E-07	0.0E+00	0.0E+00	0%	1460	6.8E-06	4.0E-04	1.7E-02	13%
Arsenic	1.670	260	4	1E-06	100	70	25550	9.7E-08	1.8E+00	1.7E-07	59%	1460	1.7E-06	3.0E-04	5.7E-03	4%
Copper	672.000	260	4	1E-06	100	70	25550	3.9E-05	0.0E+00	0.0E+00	0%	1460	6.8E-04	3.7E-02	1.8E-02	14%
Iron	14060.350	260	4	1E-06	100	70	25550	8.2E-04	0.0E+00	0.0E+00	0%	1460	1.4E-02	3.0E-01	4.8E-02	38%
Lead	452.540	260	4	1E-06	100	70	25550	2.6E-06	0.0E+00	0.0E+00	0%	1460	4.6E-04	0.0E+00	0.0E+00	0%
Manganese (soil)	278.090	260	4	1E-06	100	70	25550	1.6E-05	0.0E+00	0.0E+00	0%	1460	2.8E-04	2.3E-02	1.2E-02	10%
Nickel	13.720	260	4	1E-06	100	70	25550	8.0E-07	0.0E+00	0.0E+00	0%	1460	1.4E-05	2.0E-02	7.0E-04	1%
Thallium	1.500	260	4	1E-06	100	70	25550	8.7E-08	0.0E+00	0.0E+00	0%	1460	1.5E-06	8.0E-05	1.9E-02	15%
TOTAL										2.9E-07					1.3E-01	

SURFACE SOIL INGESTION EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT MILITARY PERSONNEL - RECREATIONAL USER

Intake from ingestion of soil is calculated as follows:

Intake (mg/kg-day) = C * CF * EF * ED * IR/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	
CF = conversion for kg to mg	1E-06
EF = adult exposure frequency (days/yr)	260
ED = adult exposure duration (yr)	4
IR = adult soil ingestion rate (mg/day)	100
BW = adult body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	4
DY = days per year (days/year)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	specific

COPC	Concentration (mg/kg)	Exposure Frequency (days/yr) Adult	Exposure Duration (yr) Adult	Conversion Factor (kg/mg)	Ingestion Rate (mg/day) Adult	Body Weight (kg) Adult	Average Carc Time (days)	Carc Dose (mg/kg/day) Adult	Slope Factor (mg/kg/day)-1	Carcinogenic Risk Adult	Percent Carcinogenic Risk Adult	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Adult	Reference Dose (mg/kg/day)	Noncarcinogenic Risk Adult	Percent Noncarcinogenic Risk Adult
Benzo(a)pyrene	0.23	260	4	1E-06	100	70	25550	1.3E-08	7.3E+00	9.8E-08	61%	1460	2.3E-07	0.0E+00	0.0E+00	0%
Dibenzo(a,h)anthracene	0.15	260	4	1E-06	100	70	25550	8.7E-09	7.3E+00	6.4E-08	39%	1460	1.5E-07	0.0E+00	0.0E+00	0%
Iron	7567.30	260	4	1E-06	100	70	25550	4.4E-04	0.0E+00	0.0E+00	0%	1460	7.7E-03	3.0E-01	2.6E-02	59%
Thallium	1.38	260	4	1E-06	100	70	25550	8.0E-08	0.0E+00	0.0E+00	0%	1460	1.4E-06	8.0E-05	1.8E-02	41%
TOTAL										1.6E-07					4.3E-02	

SUBSURFACE SOIL INGESTION EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE CONSTRUCTION WORKER

Intake from ingestion of soil is calculated as follows:

Intake (mg/kg-day) = C * CF * EF * ED * IR/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	
CF = conversion for kg to mg	1E-06
EF = adult exposure frequency (days/yr)	90
ED = adult exposure duration (yr)	1
IR = adult soil ingestion rate (mg/day)	480
BW = adult body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	1
DY = days per year (days/year)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	specific

COPC	Concentration Carcinogen (mg/kg)	Exposure Frequency (days/yr) Adult	Exposure Duration (yr) Adult	Conversion Factor (kg/mg)	Ingestion Rate (mg/day) Adult	Body Weight (kg) Adult	Average Carc Time (days)	Carc Dose (mg/kg/day) Adult	Slope Factor (mg/kg/day)-1	Carcinogenic Risk Adult	Percent Carcinogenic Risk Adult	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Adult	Reference Dose (mg/kg/day)	Noncarcinogenic Risk Adult	Percent Noncarcinogenic Risk Adult
Benzo(a)anthracene	0.262	90	1	1E-06	480	70	25550	6.3E-09	7.3E-01	4.6E-09	4%	365	4.4E-07	0.0E+00	0.0E+00	0%
Benzo(a)pyrene	0.249	90	1	1E-06	480	70	25550	6.0E-09	7.3E+00	4.4E-08	37%	365	4.2E-07	0.0E+00	0.0E+00	0%
Aluminum	6197.290	90	1	1E-06	480	70	25550	1.5E-04	0.0E+00	0.0E+00	0%	365	1.0E-02	1.0E+00	1.0E-02	5%
Antimony	6.670	90	1	1E-06	480	70	25550	1.6E-07	0.0E+00	0.0E+00	0%	365	1.1E-05	4.0E-04	2.8E-02	13%
Arsenic	1.670	90	1	1E-06	480	70	25550	4.0E-08	1.8E+00	7.1E-08	59%	365	2.8E-06	3.0E-04	9.4E-03	4%
Copper	672.000	90	1	1E-06	480	70	25550	1.6E-05	0.0E+00	0.0E+00	0%	365	1.1E-03	3.7E-02	3.1E-02	14%
Iron	14060.350	90	1	1E-06	480	70	25550	3.4E-04	0.0E+00	0.0E+00	0%	365	2.4E-02	3.0E-01	7.9E-02	38%
Lead	452.540	90	1	1E-06	480	70	25550	1.1E-05	0.0E+00	0.0E+00	0%	365	7.7E-04	0.0E+00	0.0E+00	0%
Manganese (soil)	278.090	90	1	1E-06	480	70	25550	6.7E-06	0.0E+00	0.0E+00	0%	365	4.7E-04	2.3E-02	2.0E-02	10%
Nickel	13.720	90	1	1E-06	480	70	25550	3.3E-07	0.0E+00	0.0E+00	0%	365	2.3E-05	2.0E-02	1.2E-03	1%
Thallium	1.500	90	1	1E-06	480	70	25550	3.6E-08	0.0E+00	0.0E+00	0%	365	2.5E-06	8.0E-05	3.2E-02	15%
TOTAL										1.2E-07					2.1E-01	

SEDIMENT INGESTION EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL ADULT

Intake from ingestion of sediment is calculated as follows:

Intake (mg/kg-day) = C * IR * CF * EF * ED/ BW * ATC or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in sediment (mg/kg)	Specific
CF = conversion for kg to mg	1E-06
EF = exposure frequency (days/yr)	48
ED = exposure duration (yr)	30
IR = soil ingestion rate (mg/day)	100
BW = body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	30
DY = days per year (days/year)	365
CSF = cancer slope factor (mg/kg-day)-1	Specific
RfD = reference dose (mg/kg-day)	Specific

COPC	Concentration (mg/kg)	Exposure Frequency (days/yr)	Exposure Duration (yr)	Ingestion Rate (mg/day)	Conversion Factor (kg/mg)	Body Weight (kg)	Average Carc Time (days)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg/day)-1	Carcinogenic Risk	Percent Carcinogenic Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg/day)	Noncarcinogenic Risk	Percent Noncarcinogenic Risk
Aluminum	37000.000	48	30	100	1E-06	70	25550	3.0E-03	0.0E+00	0.0E+00	0%	10950	7.0E-03	1.0E+00	7.0E-03	18%
Antimony	46.600	48	30	100	1E-06	70	25550	3.8E-06	0.0E+00	0.0E+00	0%	10950	8.8E-06	4.0E-04	2.2E-02	58%
Chromium	43.600	48	30	100	1E-06	70	25550	3.5E-06	0.0E+00	0.0E+00	0%	10950	8.2E-06	1.0E+00	8.2E-06	0%
Iron	14600.000	48	30	100	1E-06	70	25550	1.2E-03	0.0E+00	0.0E+00	0%	10950	2.7E-03	3.0E-01	9.1E-03	24%
TOTAL										0.0E+00					3.8E-02	

SEDIMENT INGESTION EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL CHILD

Intake from ingestion of sediment is calculated as follows:

Intake (mg/kg-day) = C * IR * CF * EF * ED/ BW * ATC or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in sediment (mg/kg)	Specific
CF = conversion for kg to mg	1E-06
EF = exposure frequency for child (days/yr)	48
ED = exposure duration for child (yr)	6
IR = soil ingestion rate for child (mg/day)	200
BW = body weight for child (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = days per year (days/year)	365
CSF = cancer slope factor (mg/kg-day)-1	Specific
RfD = reference dose (mg/kg-day)	Specific

COPC	Concentration (mg/kg)	Exposure Frequency (days/yr) Child	Exposure Duration (yr) Child	Ingestion Rate (mg/day) Child	Conversion Factor (kg/mg)	Body Weight (kg) Child	Average Carc Time (days)	Carc Dose (mg/kg/day) Child	Slope Factor (mg/kg/day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Child	Reference Dose (mg/kg/day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk Child
Aluminum	37000.000	48	6	200	1E-06	15	25550	5.6E-03	0.0E+00	0.0E+00	0%	2190	6.5E-02	1.0E+00	6.5E-02	18%
Antimony	46.600	48	6	200	1E-06	15	25550	7.0E-06	0.0E+00	0.0E+00	0%	2190	8.2E-05	4.0E-04	2.0E-01	58%
Chromium	43.600	48	6	200	1E-06	15	25550	6.6E-06	0.0E+00	0.0E+00	0%	2190	7.6E-05	1.0E+00	7.6E-05	0%
Iron	14600.000	48	6	200	1E-06	15	25550	2.2E-03	0.0E+00	0.0E+00	0%	2190	2.6E-02	3.0E-01	8.5E-02	24%
TOTAL										0.0E+00					3.5E-01	

SEDIMENT INGESTION EXPOSURE ASSESSMENT - CT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL CHILD

Intake from ingestion of sediment is calculated as follows:

Intake (mg/kg-day) = C * IR * CF * EF * ED/ BW * ATC or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	*INPUTS*
C = contaminant concentration in sediment (mg/kg)	Specific
CF = conversion for kg to mg	1E-06
EF = exposure frequency for child (days/yr)	48
ED = exposure duration for child (yr)	6
IR = soil ingestion rate for child (mg/day)	100
BW = body weight for child (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = days per year (days/year)	365
CSF = cancer slope factor (mg/kg-day)-1	Specific
RfD = reference dose (mg/kg-day)	Specific

COPC	Concentration (mg/kg)	Exposure Frequency (days/yr) Child	Exposure Duration (yr) Child	Ingestion Rate (mg/day) Child	Conversion Factor (kg/mg)	Body Weight (kg) Child	Average Carc Time (days)	Carc Dose (mg/kg/day) Child	Slope Factor (mg/kg/day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Child	Reference Dose (mg/kg/day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk Child
Aluminum	12846.000	48	6	100	1E-06	15	25550	9.7E-04	0.0E+00	0.0E+00	0%	2190	1.1E-02	1.0E+00	1.1E-02	14%
Antimony	24.790	48	6	100	1E-06	15	25550	1.9E-06	0.0E+00	0.0E+00	0%	2190	2.2E-05	4.0E-04	5.4E-02	68%
Chromium	14.880	48	6	100	1E-06	15	25550	1.1E-06	0.0E+00	0.0E+00	0%	2190	1.3E-05	1.0E+00	1.3E-05	0%
Iron	4812.250	48	6	100	1E-06	15	25550	3.6E-04	0.0E+00	0.0E+00	0%	2190	4.2E-03	3.0E-01	1.4E-02	18%
TOTAL										0.0E+00					8.0E-02	

SEDIMENT INGESTION EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FISHERMAN - ADULT RECEPTOR

Intake from ingestion of sediment is calculated as follows:

Intake (mg/kg-day) = C * IR * CF * EF * ED/ BW * ATC or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in sediment (mg/kg)	
CF = conversion for kg to mg	1E-06
EF = exposure frequency (days/yr)	48
ED = exposure duration (yr)	30
IR = soil ingestion rate (mg/day)	100
BW = body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	30
DY = days per year (days/year)	365
CSF = cancer slope factor (mg/kg-day)-1	Specific
RfD = reference dose (mg/kg-day)	Specific

COPC	Concentration (mg/kg)	Exposure Frequency (days/yr)	Exposure Duration (yr)	Ingestion Rate (mg/day)	Conversion Factor (kg/mg)	Body Weight (kg)	Average Carc Time (days)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg/day)-1	Carcinogenic Risk	Percent Carcinogenic Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg/day)	Noncarcinogenic Risk	Percent Noncarcinogenic Risk
Aluminum	37000.000	48	30	100	1E-06	70	25550	3.0E-03	0.00E+00	0.0E+00	0%	10950	7.0E-03	1.00E+00	7.0E-03	18%
Antimony	46.600	48	30	100	1E-06	70	25550	3.8E-06	0.00E+00	0.0E+00	0%	10950	8.8E-06	4.00E-04	2.2E-02	58%
Chromium	43.600	48	30	100	1E-06	70	25550	3.5E-06	0.00E+00	0.0E+00	0%	10950	8.2E-06	1.00E+00	8.2E-06	0%
Iron	14600.000	48	30	100	1E-06	70	25550	1.2E-03	0.00E+00	0.0E+00	0%	10950	2.7E-03	3.00E-01	9.1E-03	24%
TOTAL										0.0E+00					3.8E-02	

SEDIMENT INGESTION EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FISHERMAN - CHILD RECEPTOR

Intake from ingestion of sediment is calculated as follows:

Intake (mg/kg-day) = C * IR * CF * EF * ED/ BW * ATC or ATnc * DY

*Risk = Intake * CSF or /RfD*

Where:	INPUTS
C = contaminant concentration in sediment (mg/kg)	Specific
CF = conversion for kg to mg	1E-06
EF = exposure frequency for child (days/yr)	48
ED = exposure duration for child (yr)	6
IR = soil ingestion rate for child (mg/day)	200
BW = body weight for child (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = days per year (days/year)	365
CSF = cancer slope factor (mg/kg-day)-1	Specific
RfD = reference dose (mg/kg-day)	Specific

COPC	Concentration (mg/kg)	Exposure Frequency (days/yr) Child	Exposure Duration (yr) Child	Ingestion Rate (mg/day) Child	Conversion Factor (kg/mg)	Body Weight (kg) Child	Average Carc Time (days)	Carc Dose (mg/kg/day) Child	Slope Factor (mg/kg/day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Child	Reference Dose (mg/kg/day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk Child
Aluminum	37000.000	48	6	200	1E-06	15	25550	5.6E-03	0.0E+00	0.0E+00	0%	2190	6.5E-02	1.0E+00	6.5E-02	18%
Antimony	46.600	48	6	200	1E-06	15	25550	7.0E-06	0.0E+00	0.0E+00	0%	2190	8.2E-05	4.0E-04	2.0E-01	58%
Chromium	43.600	48	6	200	1E-06	15	25550	6.6E-06	0.0E+00	0.0E+00	0%	2190	7.6E-05	1.0E+00	7.6E-05	0%
Iron	14600.000	48	6	200	1E-06	15	25550	2.2E-03	0.0E+00	0.0E+00	0%	2190	2.6E-02	3.0E-01	8.5E-02	24%
TOTAL										0.0E+00					3.5E-01	

EXAMPLE DERMAL CONTACT WITH SOIL CALCULATIONS
SITE 65 - ENGINEER AREA DUMP
CONTRACT TASK ORDER 0312

Purpose: Estimate intake/risk from dermal contact with soil

$$Intake\ (mg/kg{\cdot}day) = \frac{C \times CF \times SA \times AF \times Abs \times EF \times ED}{BW \times AT}$$

Where:	C	=	Contaminant concentration in soil (mg/kg)
	CF	=	Conversion factor (kg/mg)
	SA	=	Surface available for contact (cm^2/event)
	AF	=	Soil to skin adherence factor (mg/cm^2)
	Abs	=	Fraction absorbed (percent)
	EF	=	Exposure frequency (days/year)
	ED	=	Exposure duration (years)
	IR	=	Ingestion rate (mg/day)
	BW	=	Body weight (kg)
	AT_c	=	Averaging time carcinogen (days)
	AT_{nc}	=	Averaging time noncarcinogen (days)

Risks:

Carcinogens = Intake (mg/kg·day) x CSF $(mg/kg{\cdot}day)^{-1}$
Noncarcinogens = Intake (mg/kg·day)/RfD (mg/kg·day)

Example Carcinogen: Benzo(a)pyrene

$$Intake\ (mg/kg{\cdot}day) = \frac{0.23\ mg/kg \times 1.0E{-}06\ kg/mg \times 5{,}800\ cm^2/event \times 1\% \times 1\ mg/cm^2 \times 350\ event/yr \times 24\ yrs}{70\ kg \times 25{,}550\ days}$$

$$= 6.3E{-}08$$

Risk = 6.3E-08 mg/kg·day x 1.5E-01 $mg/kg{\cdot}day^{-1}$ = 9.2E-07

Example Noncarcinogen: Thallium

$$Intake\ (mg/kg{\cdot}day) = \frac{1.38\ mg/kg \times 1.0E{-}06\ kg/mg \times 5{,}800\ cm^2/event \times 1\ mg/cm^2 \times 0.1\% \times 350\ event/yr \times 24\ yrs}{70\ kg \times 8{,}760\ days}$$

$$= 1.1E{-}07$$

$$Risk = \frac{1.1E{-}07\ mg/kg{\cdot}day}{1.6E{-}05\ mg/kg{\cdot}day} = 1.0E{-}02$$

* This example calculation also is applicable for sediment dermal contact.

Re: Site 65 Future Residential Adult

SURFACE SOIL DERMAL CONTACT EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL ADULT

Dermal contact with soil is calculated as follows:

Intake (mg/kg-day) = C * CF * SA * AF * Abs * EF * ED/(BW * ATc or ATnc * DY)

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	Specific
CF = conversion factor (kg/mg)	1E-06
SA = adult exposed skin surface area (cm2)	5800
AF = soil to skin adherence factor (mg/cm2)	1
Abs = fraction absorbed (unitless)	Specific
EF = adult exposure frequency (events/yr)	350
ED = adult exposure duration (years)	24
BW = adult body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	24
DY = day per year (day/yr)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	specific

COPC	Concentration (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm2) Adult	Adherence Factor (mg/cm2)	Fraction Absorbed (%)	Exposure Frequency (events/yr) Adult	Exposure Duration (yrs) Adult	Body Weight (kg) Adult	Average Carc Time (days)	Carc Dose (mg/kg/day) Adult	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Adult	Percent Carcinogenic Risk Adult	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Adult	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarcinogenic Risk Adult	Percent Noncarcinogenic Risk Adult
Benzo(a)pyrene	0.230	1E-06	5800	1	0.01	350	24	70	25550	6.3E-08	1.5E+01	9.2E-07	61%	8760	1.8E-07	0.0E+00	0.0E+00	0%
Dibenzo(a,h)anthracene	0 150	1E-06	5800	1	0.01	350	24	70	25550	4.1E-08	1.5E+01	6.0E-07	39%	8760	1.2E-07	0.0E+00	0.0E+00	0%
Iron	7567 300	1E-06	5800	1	0.001	350	24	70	25550	2.1E-04	0.0E+00	0.0E+00	0%	8760	6.0E-04	6.0E-02	1.0E-02	59%
Thallium	1.380	1E-06	5800	1	0.001	350	24	70	25550	3.8E-08	0.0E+00	0.0E+00	0%	8760	1.1E-07	1.6E-05	6.9E-03	41%
TOTAL												1.5E-06					1.7E-02	

SURFACE SOIL DERMAL CONTACT EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL CHILD

Dermal contact with soil is calculated as follows:

Intake (mg/kg-day) = C * CF * SA * AF * Abs * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	specific
CF = conversion factor (kg/mg)	1E-06
SA = child exposed skin surface area (cm2)	2300
AF = soil to skin adherence factor (mg/cm2)	1
Abs = fraction absorbed (unitless)	specific
EF = child exposure frequency (events/yr)	350
ED = child exposure duration (years)	6
BW = child body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = day per year (day/yr)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	specific

COPC	Concentration (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm2) Child	Adherence Factor (mg/cm2)	Fraction Absorbed (%)	Exposure Frequency (events/yr) Child	Exposure Duration (yrs) Child	Body Weight (kg) Child	Average Carc Time (days)	Carc Dose (mg/kg/day) Child	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Child	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarcinogeni Risk Child	Percent Noncarcinoge Risk Child
Benzo(a)pyrene	0.230	1E-06	2300	1	0.01	350	6	15	25550	2.9E-08	1.5E+01	4.2E-07	61%	2190	3.4E-07	0.0E+00	0.0E+00	0%
Dibenzo(a,h)anthracene	0.150	1E-06	2300	1	0.01	350	6	15	25550	1.9E-08	1.5E+01	2.8E-07	39%	2190	2.2E-07	0.0E+00	0.0E+00	0%
Iron	7567.300	1E-06	2300	1	0.001	350	6	15	25550	9.5E-05	0.0E+00	0.0E+00	0%	2190	1.1E-03	6.0E-02	1.9E-02	59%
Thallium	1.380	1E-06	2300	1	0.001	350	6	15	25550	1.7E-08	0.0E+00	0.0E+00	0%	2190	2.0E-07	1.6E-05	1.3E-02	41%
TOTAL												7.0E-07					3.1E-02	

SURFACE SOIL DERMAL CONTACT EXPOSURE ASSESSMENT - CT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL CHILD

Dermal contact with soil is calculated as follows:

Intake (mg/kg-day) = C * CF * SA * AF * Abs * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	specific
CF = conversion factor (kg/mg)	1E-06
SA = child exposed skin surface area (cm2)	1745
AF = soil to skin adherence factor (mg/cm2)	0.2
Abs = fraction absorbed (unitless)	specific
EF = child exposure frequency (events/yr)	234
ED = child exposure duration (years)	6
BW = child body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = day per year (day/yr)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	specific

COPC	Concentration (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm2) Child	Adherence Factor (mg/cm2)	Fraction Absorbed (%)	Exposure Frequency (events/yr) Child	Exposure Duration (yrs) Child	Body Weight (kg) Child	Average Carc Time (days)	Carc Dose (mg/kg/day) Child	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Child	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk Child
Benzo(a)pyrene	0.230	1E-06	1745	0.2	0.01	234	6	15	25550	2.9E-09	1.5E+01	4.3E-08	61%	2190	3.4E-08	0.0E+00	0.0E+00	0%
Dibenzo(a,h)anthracene	0.150	1E-06	1745	0.2	0.01	234	6	15	25550	1.9E-09	1.5E+01	2.8E-08	39%	2190	2.2E-08	0.0E+00	0.0E+00	0%
Iron	7567.300	1E-06	1745	0.2	0.001	234	6	15	25550	9.7E-06	0.0E+00	0.0E+00	0%	2190	1.1E-04	6.0E-02	1.9E-03	59%
Thallium	1.380	1E-06	1745	0.2	0.001	234	6	15	25550	1.8E-09	0.0E+00	0.0E+00	0%	2190	2.1E-08	1.6E-05	1.3E-03	41%
TOTAL												7.1E-08					3.2E-03	

SURFACE SOIL DERMAL CONTACT EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT MILITARY PERSONNEL - TRAINEE

Dermal contact with soil is calculated as follows:

Intake (mg/kg-day) = C * CF * SA * AF * Abs * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	specific
CF = conversion factor (kg/mg)	1E-06
SA = adult exposed skin surface area (cm2)	4300
AF = soil to skin adherence factor (mg/cm2)	1
Abs = fraction absorbed (unitless)	specific
EF = adult exposure frequency (events/yr)	260
ED = adult exposure duration (years)	4
BW = adult body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	4
DY = day per year (day/yr)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	specific

Note: Inputs are scenario and site specific

COPC	Concentration (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm2) Adult	Adherence Factor (mg/cm2)	Fraction Absorbed (%)	Exposur Frequen (events/y Adult	Exposure Duration (yrs) Adult	Body Weight (kg) Adult	Average Carc Time (days)	Carc Dose (mg/kg/day) Adult	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Adult	Percent Carcinogeni Risk Adult	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Adult	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarcinogenic Risk Adult	Percent Noncarcinogenic Risk Adult
Benzo(a)pyrene	0.230	1E-06	4300	1	0.01	260	4	70	25550	5.8E-09	1.46E+01	8.4E-08	61%	1460	1.0E-07	0.00E+00	0.0E+00	0%
Dibenzo(a,h)anthracene	0.150	1E-06	4300	1	0.01	260	4	70	25550	3.8E-09	1.46E+01	5.5E-08	39%	1460	6.6E-08	0.00E+00	0.0E+00	0%
Iron	7567.300	1E-06	4300	1	0.001	260	4	70	25550	1.9E-05	0.00E+00	0.0E+00	0%	1460	3.3E-04	6.00E-02	5.5E-03	59%
Thallium	1.380	1E-06	4300	1	0.001	260	4	70	25550	3.5E-09	0.00E+00	0.0E+00	0%	1460	6.0E-08	1.60E-05	3.8E-03	41%
TOTAL												1.4E-07					9.3E-03	

SUBSURFACE SOIL DERMAL CONTACT EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT MILITARY PERSONNEL - TRAINEE

Dermal contact with soil is calculated as follows:

Intake (mg/kg-day) = C * CF * SA * AF * Abs * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	specific
CF = conversion factor (kg/mg)	1E-06
SA = adult exposed skin surface area (cm2)	4300
AF = soil to skin adherence factor (mg/cm2)	1
Abs = fraction absorbed (unitless)	specific
EF = adult exposure frequency (events/yr)	260
ED = adult exposure duration (years)	4
BW = adult body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	4
DY = day per year (day/yr)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	specific

Note: Inputs are scenario and site specific

COPC	Concentration (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm2) Adult	Adherence Factor (mg/cm2)	Fraction Absorbed (%)	Exposure Frequency (events/yr) Adult	Exposure Duration (yrs) Adult	Body Weight (kg) Adult	Average Carc Time (days)	Carc Dose (mg/kg/day) Adult	Dermal Adjust Slope Factor (mg/kg-day)-1	Carcinogenic Risk Adult	Percent Carcinogenic Risk Adult	Average Noncarc Tim (days)	Noncarc Dose (mg/kg/day) Adult	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarcino Risk Adult	Percent Noncarcinogenic Risk Adult
Benzo(a)anthracene	0.262	1E-06	4300	1	0.01	260	4	70	25550	6.5E-09	1.46E+00	9.6E-09	7%	1460	1.1E-07	0.00E+00	0.0E+00	0%
Benzo(a)pyrene	0.249	1E-06	4300	1	0.01	260	4	70	25550	6.2E-09	1.46E+01	9.1E-08	66%	1460	1.1E-07	0.00E+00	0.0E+00	0%
Aluminum	6197.290	1E-06	4300	1	0.001	260	4	70	25550	1.5E-05	0.00E+00	0.0E+00	0%	1460	2.7E-04	2.00E-01	1.4E-03	5%
Antimony	6.670	1E-06	4300	1	0.001	260	4	70	25550	1.7E-08	0.00E+00	0.0E+00	0%	1460	2.9E-07	8.00E-05	3.6E-03	13%
Arsenic	1.670	1E-06	4300	1	0.001	260	4	70	25550	4.2E-09	8.75E+00	3.7E-08	27%	1460	7.3E-08	6.00E-05	1.2E-03	4%
Copper	672.000	1E-06	4300	1	0.001	260	4	70	25550	1.7E-06	0.00E+00	0.0E+00	0%	1460	2.9E-05	7.42E-03	4.0E-03	14%
Iron	14060.350	1E-06	4300	1	0.001	260	4	70	25550	3.5E-05	0.00E+00	0.0E+00	0%	1460	6.2E-04	6.00E-02	1.0E-02	38%
Lead	452.540	1E-06	4300	1	0.001	260	4	70	25550	1.1E-06	0.00E+00	0.0E+00	0%	1460	2.0E-05	0.00E+00	0.0E+00	0%
Manganese (soil)	278.090	1E-06	4300	1	0.001	260	4	70	25550	7.0E-07	0.00E+00	0.0E+00	0%	1460	1.2E-05	4.60E-03	2.6E-03	10%
Nickel	13.720	1E-06	4300	1	0.001	260	4	70	25550	3.4E-08	0.00E+00	0.0E+00	0%	1460	6.0E-07	4.00E-03	1.5E-04	1%
Thallium	1.500	1E-06	4300	1	0.001	260	4	70	25550	3.8E-09	0.00E+00	0.0E+00	0%	1460	6.6E-08	1.60E-05	4.1E-03	15%
TOTAL												1.4E-07					2.7E-02	

SURFACE SOIL DERMAL CONTACT EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT MILITARY PERSONNEL - RECREATIONAL USER

Dermal contact with soil is calculated as follows:

Intake (mg/kg-day) = C * CF * SA * AF * Abs * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	specific
CF = conversion factor (kg/mg)	1E-06
SA = adult exposed skin surface area (cm2)	5800
AF = soil to skin adherence factor (mg/cm2)	1
Abs = fraction absorbed (unitless)	specific
EF = adult exposure frequency (events/yr)	260
ED = adult exposure duration (years)	4
BW = adult body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	4
DY = day per year (day/yr)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	specific

COPC	Concentration (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm2) Adult	Adherence Factor (mg/cm2)	Fraction Absorbed (%)	Exposure Frequency (events/yr) Adult	Exposure Duration (yrs) Adult	Body Weight (kg) Adult	Average Carc Time (days)	Carc Dose (mg/kg/day) Adult	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Adult	Percent Carcinogenic Risk Adult	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Adult	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarcinogenic Risk Adult	Percent Noncarcinogenic Risk Adult
Benzo(a)pyrene	0.23	1E-06	5800	1	0.01	260	4	70	25550	7.8E-09	1.5E+01	1.1E-07	61%	1460	1.4E-07	0.0E+00	0.0E+00	0%
Dibenzo(a,h)anthracene	0.15	1E-06	5800	1	0.01	260	4	70	25550	5.1E-09	1.5E+01	7.4E-08	39%	1460	8.9E-08	0.0E+00	0.0E+00	0%
Iron	7567.30	1E-06	5800	1	0.001	260	4	70	25550	2.6E-05	0.0E+00	0.0E+00	0%	1460	4.5E-04	6.0E-02	7.4E-03	59%
Thallium	1.38	1E-06	5800	1	0.001	260	4	70	25550	4.7E-09	0.0E+00	0.0E+00	0%	1460	8.1E-08	1.6E-05	5.1E-03	41%
TOTAL												1.9E-07					1.3E-02	

SUBSURFACE SOIL DERMAL CONTACT EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE CONSTRUCTION WORKER

Dermal contact with soil is calculated as follows:

Intake (mg/kg-day) = C * CF * SA * AF * Abs * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	
CF = conversion factor (kg/mg)	1E-06
SA = adult exposed skin surface area (cm2)	4300
AF = soil to skin adherence factor (mg/cm2)	1
Abs = fraction absorbed (unitless)	Specific
EF = adult exposure frequency (events/yr)	90
ED = adult exposure duration (years)	1
BW = adult body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	1
DY = day per year (day/yr)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	specific

COPC	Concentration Carcinogen (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm2) Adult	Adherence Factor (mg/cm2)	Fraction Absorbed (%)	Exposure Frequency (events/yr) Adult	Exposure Duration (yrs) Adult	Body Weight (kg) Adult	Average Carc Time (days)	Carc Dose (mg/kg/day) Adult	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Adult	Percent Carcinogenic Risk Adult	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Adult	Dermally-Adjusted Reference Dose (mg/kg-day)	Noncarcinogenic Risk Adult	Percent Noncarcinogenic Risk Adult
Benzo(a)anthracene	0.262	1E-06	4300	1	0.01	90	1	70	25550	5.7E-10	1.5E+00	8.3E-10	7%	365	4.0E-08	0.0E+00	0.0E+00	0%
Benzo(a)pyrene	0.249	1E-06	4300	1	0.01	90	1	70	25550	5.4E-10	1.5E+01	7.9E-09	66%	365	3.8E-08	0.0E+00	0.0E+00	0%
Aluminum	6197.290	1E-06	4300	1	0.001	90	1	70	25550	1.3E-06	0.0E+00	0.0E+00	0%	365	9.4E-05	2.0E-01	4.7E-04	5%
Antimony	6.670	1E-06	4300	1	0.001	90	1	70	25550	1.4E-09	0.0E+00	0.0E+00	0%	365	1.0E-07	8.0E-05	1.3E-03	13%
Arsenic	1.670	1E-06	4300	1	0.001	90	1	70	25550	3.6E-10	8.8E+00	3.2E-09	27%	365	2.5E-08	6.0E-05	4.2E-04	4%
Copper	672.000	1E-06	4300	1	0.001	90	1	70	25550	1.5E-07	0.0E+00	0.0E+00	0%	365	1.0E-05	7.4E-03	1.4E-03	14%
Iron	14060.350	1E-06	4300	1	0.001	90	1	70	25550	3.0E-06	0.0E+00	0.0E+00	0%	365	2.1E-04	6.0E-02	3.5E-03	36%
Lead	452.540	1E-06	4300	1	0.001	90	1	70	25550	9.8E-08	0.0E+00	0.0E+00	0%	365	6.9E-06	0.0E+00	0.0E+00	0%
Manganese (soil)	278.090	1E-06	4300	1	0.001	90	1	70	25550	6.0E-08	0.0E+00	0.0E+00	0%	365	4.2E-06	4.6E-03	9.2E-04	10%
Nickel	13.720	1E-06	4300	1	0.001	90	1	70	25550	3.0E-09	0.0E+00	0.0E+00	0%	365	2.1E-07	4.0E-03	5.2E-05	1%
Thallium	1.500	1E-06	4300	1	0.001	90	1	70	25550	3.2E-10	0.0E+00	0.0E+00	0%	365	2.3E-08	1.6E-05	1.4E-03	15%
TOTAL												1.2E-08					9.5E-03	

SEDIMENT DERMAL CONTACT EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL ADULT

The intake from dermal contact to sediment is calculated as follows:

Intake (mg/kg-day) = C * CF * SA * AF * Abs * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in sediment (mg/kg)	Specific
CF = conversion factor (kg/mg)	1.00E-06
SA = exposed skin surface area (cm2)	8300
AF = sediment to skin adherence factor (mg/cm2)	1
Abs = fraction absorbed (unitless) (contaminant specific)	Specific
EF = exposure frequency (events/yr)	48
ED = exposure duration (years)	30
BW = body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	30
DY = day per year (day/yr)	365
CSF = cancer slope factor (mg/kg-day)-1	Specific
RfD = reference dose (mg/kg-day)	Specific

COPC	Concentration (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm2)	Adherence Factor (mg/cm2)	ABS Factor (%)	Exposure Frequency (events/yr)	Exposure Duration (yrs)	Body Weight (kg)	Average Carc Time (days)	Carc Dose (mg/kg/day)	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk	Percent Carcinogenic Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day)	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarcinogenic Risk	Percent Noncarcinogenic Risk
Aluminum	37000.000	1E-06	8300	1	0.001	48	30	70	25550	2.5E-04	0.0E+00	0.0E+00	0%	10950	5.8E-04	2.0E-01	2.9E-03	18%
Antimony	46.600	1E-06	8300	1	0.001	48	30	70	25550	3.1E-07	0.0E+00	0.0E+00	0%	10950	7.3E-07	8.0E-05	9.1E-03	58%
Chromium	43.600	1E-06	8300	1	0.001	48	30	70	25550	2.9E-07	0.0E+00	0.0E+00	0%	10950	6.8E-07	2.0E-01	3.4E-06	0%
Iron	14600.000	1E-06	8300	1	0.001	48	30	70	25550	9.8E-05	0.0E+00	0.0E+00	0%	10950	2.3E-04	6.0E-02	3.8E-03	24%
TOTAL												0.0E+00					1.6E-02	

SEDIMENT DERMAL CONTACT EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL CHILD

The intake from dermal contact to sediment is calculated as follows:

Intake (mg/kg-day) = C * CF * SA * AF * Abs * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	Specific
CF = conversion factor (kg/mg)	1.00E-06
SA = child exposed skin surface area (cm2)	2100
AF = sediment to skin adherence factor (mg/cm2)	1
Abs = fraction absorbed (unitless) (contaminant specific)	Specific
EF = child exposure frequency (events/yr)	48
ED = child expsosure duration (years)	6
BW = child body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = day per year (day/yr)	365
CSF = cancer slope factor (mg/kg-day)-1	Specific
RfD = reference dose (mg/kg-day)	Specific

COPC	Concentration Carcinogen (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm2) Child	Adherence Factor (mg/cm2)	ABS Factor (%)	Exposure Frequency (events/yr) Child	Exposure Duration (yrs) Child	Body Weight (kg) Child	Average Carc Time (days)	Carc Dose (mg/kg/day) Child	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Child	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk Child
Aluminum	37000.000	1E-06	2100	1	0.001	48	6	15	25550	5.8E-05	0.0E+00	0.0E+00	0%	2190	6.8E-04	2.0E-01	3.4E-03	18%
Antimony	46.600	1E-06	2100	1	0.001	48	6	15	25550	7.4E-08	0.0E+00	0.0E+00	0%	2190	8.6E-07	8.0E-05	1.1E-02	58%
Chromium	43.600	1E-06	2100	1	0.001	48	6	15	25550	6.9E-08	0.0E+00	0.0E+00	0%	2190	8.0E-07	2.0E-01	4.0E-06	0%
Iron	14600.000	1E-06	2100	1	0.001	48	6	15	25550	2.3E-05	0.0E+00	0.0E+00	0%	2190	2.7E-04	6.0E-02	4.5E-03	24%
TOTAL												0.0E+00					1.9E-02	

SEDIMENT DERMAL CONTACT EXPOSURE ASSESSMENT - CT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL CHILD

The intake from dermal contact to sediment is calculated as follows:

Intake (mg/kg-day) = C * CF * SA * AF * Abs * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	Specific
CF = conversion factor (kg/mg)	1.00E-06
SA = child exposed skin surface area (cm2)	1745
AF = sediment to skin adherence factor (mg/cm2)	0.2
Abs = fraction absorbed (unitless) (contaminant specific)	Specific
EF = child exposure frequency (events/yr)	48
ED = child expsosure duration (years)	6
BW = child body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = day per year (day/yr)	365
CSF = cancer slope factor (mg/kg-day)-1	Specific
RfD = reference dose (mg/kg-day)	Specific

COPC	Concentration Carcinogen (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm2) Child	Adherence Factor (mg/cm2)	ABS Factor (%)	Exposure Frequency (events/yr) Child	Exposure Duration (yrs) Child	Body Weight (kg) Child	Average Carc Time (days)	Carc Dose (mg/kg/day) Child	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Child	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk Child
Aluminum	12846.000	1E-06	1745	0.2	0.001	48	6	15	25550	3.4E-06	0.0E+00	0.0E+00	0%	2190	3.9E-05	2.0E-01	2.0E-04	14%
Antimony	24.790	1E-06	1745	0.2	0.001	48	6	15	25550	6.5E-09	0.0E+00	0.0E+00	0%	2190	7.6E-08	8.0E-05	9.5E-04	68%
Chromium	14.880	1E-06	1745	0.2	0.001	48	6	15	25550	3.9E-09	0.0E+00	0.0E+00	0%	2190	4.6E-08	2.0E-01	2.3E-07	0%
Iron	4812.250	1E-06	1745	0.2	0.001	48	6	15	25550	1.3E-06	0.0E+00	0.0E+00	0%	2190	1.5E-05	6.0E-02	2.5E-04	18%
TOTAL												0.0E+00					1.4E-03	

SEDIMENT DERMAL CONTACT EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FISHERMAN - ADULT RECEPTOR

The intake from dermal contact to sediment is calculted as follows:

Intake (mg/kg-day) = C * CF * SA * AF * Abs * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	
CF = conversion factor (kg/mg)	1.00E-06
SA = exposed skin surface area (cm2)	8300
AF = sediment to skin adherence factor (mg/cm2)	1
Abs = fraction absorbed (unitless) (contaminant specific)	Specific
EF = exposure frequency (events/yr)	48
ED = expsosure duration (years)	30
BW = body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	30
DY = day per year (day/yr)	365
CSF = cancer slope factor (mg/kg-day)-1	Specific
RfD = reference dose (mg/kg-day)	Specific

COPC	Concentration (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm2)	Adherence Factor (mg/cm2)	ABS Factor (%)	Exposure Frequency (events/yr)	Exposure Duration (yrs)	Body Weight (kg)	Average Carc Time (days)	Carc Dose (mg/kg/day)	Dermal Adjusted Slope Factor (mg/kg-day)-1	Carcinogenic Risk	Percent Carcinogenic Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day)	Dermally-Adjusted Reference Dose (mg/kg-day)	Noncarcinogenic Risk	Percent Noncarcinogenic Risk
Aluminum	37000.000	1E-06	8300	1	0.001	48	30	70	25550	2.5E-04	0.00E+00	0.0E+00	0%	10950	5.8E-04	2.00E-01	2.9E-03	18%
Antimony	46.600	1E-06	8300	1	0.001	48	30	70	25550	3.1E-07	0.00E+00	0.0E+00	0%	10950	7.3E-07	8.00E-05	9.1E-03	58%
Chromium	43.600	1E-06	8300	1	0.001	48	30	70	25550	2.9E-07	0.00E+00	0.0E+00	0%	10950	6.8E-07	2.00E-01	3.4E-06	0%
Iron	14600.000	1E-06	8300	1	0.001	48	30	70	25550	9.8E-05	0.00E+00	0.0E+00	0%	10950	2.3E-04	6.00E-02	3.8E-03	24%
TOTAL												0.0E+00					1.6E-02	

SEDIMENT DERMAL CONTACT EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FISHERMAN - CHILD RECEPTOR

The intake from dermal contact to sediment is calculated as follows:

Intake (mg/kg-day) = C * CF * SA * AF * Abs * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	Specific
CF = conversion factor (kg/mg)	1.00E-06
SA = child exposed skin surface area (cm2)	2100
AF = sediment to skin adherence factor (mg/cm2)	1
Abs = fraction absorbed (unitless) (contaminant specific)	Specific
EF = child exposure frequency (events/yr)	48
ED = child expsosure duration (years)	6
BW = child body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = day per year (day/yr)	365
CSF = cancer slope factor (mg/kg-day)-1	Specific
RfD = reference dose (mg/kg-day)	Specific

COPC	Concentration Carcinogen (mg/kg)	Conversion Factor (kg/mg)	Surface Area (cm2) Child	Adherence Factor (mg/cm2)	ABS Factor (%)	Exposure Frequency (events/yr) Child	Exposure Duration (yrs) Child	Body Weight (kg) Child	Average Carc Time (days)	Carc Dose (mg/kg/day) Child	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day) Child	Dermal Adjust Reference Dose (mg/kg-day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk Child
Aluminum	37000.000	1E-06	2100	1	0.001	48	6	15	25550	5.8E-05	0.0E+00	0.0E+00	0%	2190	6.8E-04	2.0E-01	3.4E-03	18%
Antimony	46.600	1E-06	2100	1	0.001	48	6	15	25550	7.4E-08	0.0E+00	0.0E+00	0%	2190	8.6E-07	8.0E-05	1.1E-02	58%
Chromium	43.600	1E-06	2100	1	0.001	48	6	15	25550	6.9E-08	0.0E+00	0.0E+00	0%	2190	8.0E-07	2.0E-01	4.0E-06	0%
Iron	14600.000	1E-06	2100	1	0.001	48	6	15	25550	2.3E-05	0.0E+00	0.0E+00	0%	2190	2.7E-04	6.0E-02	4.5E-03	24%
TOTAL												0.0E+00					1.9E-02	

Computed by: KTW Checked by: MDB Date: 10/95

EXAMPLE INHALATION OF PARTICULATES CALCULATIONS
SITE 65 - ENGINEER AREA DUMP
CONTRACT TASK ORDER 0312

Purpose: Estimate intake/risk from the inhalation of soil particulates

$$Intake\ (mg/kg{\cdot}day) = \frac{C \times IR \times EF \times ED \times 1/PEF}{BW \times AT}$$

Where:

C	=	Contaminant concentration in soil (mg/kg)
IR	=	Inhalation rate (m^3/day)
EF	=	Exposure frequency (days/year)
ED	=	Exposure duration (years)
PEF	=	Particulate Emission Factor (m^3/kg)
BW	=	Body weight (kg)
AT_c	=	Averaging time carcinogen (days)
AT_{nc}	=	Averaging time noncarcinogen (days)

Risks:

Carcinogens = Intake (mg/kg·day) x CSF $(mg/kg{\cdot}day)^{-1}$
Noncarcinogens = Intake (mg/kg·day)/RfD (mg/kg·day)

Example Carcinogen: Benzo(a)pyrene

$$Intake\ (mg/kg{\cdot}day) = \frac{0.23\ mg/kg \times 20\ m^3/day \times 350\ days/yr \times 24\ yrs \times 1/4.6E{+}09\ m^3/kg}{70\ kg \times 25{,}550\ days}$$

$$= 4.7E\text{-}12$$

Risk = 4.7E-12 mg/kg·day x 6.1 $mg/kg{\cdot}day^{-1}$ = 2.9E-11

Example Noncarcinogen: There were no noncarcinogenic COPCs with inhalation RfDs selected as COPCs.

SURFACE SOIL PARTICULATE INHALATION EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL ADULT

Intake from the inhalation of particulates is calculated as follows:

Intake (mg/kg-day) = (C * EF * ED * IR * 1/PEF)/(BW * ATc or ATnc * DY)

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	Calculated
CSF = carcinogenic slope factor	Specific
RfD = reference dose for noncarcinogen	Specific
IR = inhalation rate (m3)	20
EF = adult exposure frequency (days)	350
ED = adult exposure duration (years)	24
BW = adult body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	24
DY = day per year (day/yr)	365
PEF = particulate emission factor (m3/kg)	4.63E+09

COPC	Concentration (mg/kg)	Particulate Emission Factor (m3/kg)	Exposure Frequency (events/yr)	Inhalation Rate (m3/day)	Exposure Duration (yrs)	Body Weight (kg)	Average Carc Time (days)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg-day)-1	Carcinogenic Risk	Percent Contribution to Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk	Percent Noncarcinogenic Risk
Benzo(a)pyrene	0.230	4.63E+09	350	20	24	70	25550	4.7E-12	6.1E+00	2.9E-11	61%	8760	1.4E-11	0.0E+00	0.0E+00	0%
Dibenzo(a,h)anthracene	0.150	4.63E+09	350	20	24	70	25550	3.0E-12	6.1E+00	1.9E-11	39%	8760	8.9E-12	0.0E+00	0.0E+00	0%
Iron	7567.300	4.63E+09	350	20	24	70	25550	1.5E-07	0.0E+00	0.0E+00	0%	8760	4.5E-07	0.0E+00	0.0E+00	0%
Thallium	1.380	4.63E+09	350	20	24	70	25550	2.8E-11	0.0E+00	0.0E+00	0%	8760	8.2E-11	0.0E+00	0.0E+00	0%
TOTAL										4.7E-11					0.0E+00	

SURFACE SOIL PARTICULATE INHALATION EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL CHILD

Intake from the inhalation of particulates is calculated as follows:

Intake (mg/kg-day) = (C * EF * ED * IR * 1/PEF)/(BW * ATc or ATnc * DY)

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	Calculated
CSF = carcinogenic slope factor	Specific
RfD = reference dose for noncarcinogen	Specific
IR = inhalation rate (m3)	15
EF = child exposure frequency (days)	350
ED = child exposure duration (years)	6
BW = child body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = day per year (day/yr)	365
PEF = particulate emission factor (m3/kg)	4.63E+09

COPC	Concentration (mg/kg)	Particulate Emission Factor (m3/kg)	Exposure Frequency (events/yr)	Inhalation Rate (m3/day)	Exposure Duration (yrs)	Body Weight (kg)	Average Carc Time (days)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg-day)-1	Carcinogenic Risk	Percent Conrtribution to Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk	Percent Noncarcinogenic Risk
Benzo(a)pyrene	0.230	4.63E+09	350	15	6	15	25550	4.1E-12	6.1E+00	2.5E-11	61%	2190	4.8E-11	0.0E+00	0.0E+00	0%
Dibenzo(a,h)anthracene	0.150	4.63E+09	350	15	6	15	25550	2.7E-12	6.1E+00	1.6E-11	39%	2190	3.1E-11	0.0E+00	0.0E+00	0%
Iron	7567.300	4.63E+09	350	15	6	15	25550	1.3E-07	0.0E+00	0.0E+00	0%	2190	1.6E-06	0.0E+00	0.0E+00	0%
Thallium	1.380	4.63E+09	350	15	6	15	25550	2.4E-11	0.0E+00	0.0E+00	0%	2190	2.9E-10	0.0E+00	0.0E+00	0%
TOTAL										4.1E-11					0.0E+00	

SURFACE SOIL PARTICULATE INHALATION EXPOSURE ASSESSMENT - CT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL CHILD

Intake from the inhalation of particulates is calculated as follows:

Intake (mg/kg-day) = (C * EF * ED * IR * 1/PEF)/(BW * ATc or ATnc * DY)

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	Calculated
CSF = carcinogenic slope factor	Specific
RfD = reference dose for noncarcinogen	Specific
IR = inhalation rate (m3)	15
EF = child exposure frequency (days)	234
ED = child exposure duration (years)	6
BW = child body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = day per year (day/yr)	365
PEF = particulate emission factor (m3/kg)	4.63E+09

COPC	Concentration (mg/kg)	Particulate Emission Factor (m3/kg)	Exposure Frequency (events/yr)	Inhalation Rate (m3/day)	Exposure Duration (yrs)	Body Weight (kg)	Average Carc Time (days)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg-day)-1	Carcinogenic Risk	Percent Contribution to Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk	Percent Noncarcinogenic Risk
Benzo(a)pyrene	0.230	4.63E+09	234	15	6	15	25550	2.7E-12	6.1E+00	1.7E-11	61%	2190	3.2E-11	0.0E+00	0.0E+00	0%
Dibenzo(a,h)anthracene	0.150	4.63E+09	234	15	6	15	25550	1.8E-12	6.1E+00	1.1E-11	39%	2190	2.1E-11	0.0E+00	0.0E+00	0%
Iron	7567.300	4.63E+09	234	15	6	15	25550	9.0E-08	0.0E+00	0.0E+00	0%	2190	1.0E-08	0.0E+00	0.0E+00	0%
Thallium	1.360	4.63E+09	234	15	6	15	25550	1.6E-11	0.0E+00	0.0E+00	0%	2190	1.9E-10	0.0E+00	0.0E+00	0%
TOTAL										2.8E-11					0.0E+00	

SURFACE SOIL PARTICULATE INHALATION EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT MILITARY PERSONNEL - TRAINEE

Intake from the inhalation of particulates is calculated as follows:

Intake (mg/kg-day) = (C * EF * ED * IR * 1/PEF)/(BW * ATc or ATnc * DY)

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	Calculated
CSF = carcinogenic slope factor	Specific
RfD = reference dose for noncarcinogen	Specific
IR = inhalation rate (m3)	20
EF = adult exposure frequency (days)	260
ED = adult exposure duration (years)	4
BW = adult body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	4
DY = day per year (day/yr)	365
PEF = particulate emission factor (m3/kg)	4.63E+09

COPC	Concentration (mg/kg)	Particulate Emission Factor (m3/kg)	Exposure Frequency (events/yr)	Inhalation Rate (m3/day)	Exposure Duration (yrs)	Body Weight (kg)	Average Carc Time (days)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg-day)-1	Carcinogenic Risk	Percent Contribution to Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk	Percent Noncarcinogenic Risk
Benzo(a)pyrene	0.230	4.63E+09	260	20	4	70	25550	5.8E-13	6.10E+00	3.5E-12	61%	1460	1.0E-11	0.00E+00	0.0E+00	0%
Dibenzo(a,h)anthracene	0.150	4.63E+09	260	20	4	70	25550	3.8E-13	6.10E+00	2.3E-12	39%	1460	6.6E-12	0.00E+00	0.0E+00	0%
Iron	7567.300	4.63E+09	260	20	4	70	25550	1.9E-08	0.00E+00	0.0E+00	0%	1460	3.3E-07	0.00E+00	0.0E+00	0%
Thallium	1.380	4.63E+09	260	20	4	70	25550	3.5E-12	0.00E+00	0.0E+00	0%	1460	6.1E-11	0.00E+00	0.0E+00	0%
TOTAL										5.8E-12					0.0E+00	

SUBSURFACE SOIL PARTICULATE INHALATION EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT MILITARY PERSONNEL - TRAINEE

Intake from the inhalation of particulates is calculated as follows:

Intake (mg/kg-day) = (C * EF * ED * IR * 1/PEF)/(BW * ATc or ATnc * DY)

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	Calculated
CSF = carcinogenic slope factor	Specific
RfD = reference dose for noncarcinogen	Specific
IR = inhalation rate (m3)	20
EF = adult exposure frequency (days)	260
ED = adult exposure duration (years)	4
BW = adult body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	4
DY = day per year (day/yr)	365
PEF = particulate emission factor (m3/kg)	4.63E+09

COPC	Concentration (mg/kg)	Particulate Emission Factor (m3/kg)	Exposure Frequency (events/yr)	Inhalation Rate (m3/day)	Exposure Duration (yrs)	Body Weight (kg)	Average Carc Time (days)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg-day)-1	Carcinogenic Risk	Percent Contribution to Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk	Percent Noncarcinogenic Risk
Benzo(a)anthracene	0.262	4.63E+09	260	20	4	70	25550	6.6E-13	6.10E-01	4.0E-13	1%	1460	1.2E-11	0.00E+00	0.0E+00	0%
Benzo(a)pyrene	0.249	4.63E+09	260	20	4	70	25550	6.2E-13	6.10E+00	3.8E-12	6%	1460	1.1E-11	0.00E+00	0.0E+00	0%
Aluminum	6197.290	4.63E+09	260	20	4	70	25550	1.6E-08	0.00E+00	0.0E+00	0%	1460	2.7E-07	0.00E+00	0.0E+00	0%
Antimony	6.670	4.63E+09	260	20	4	70	25550	1.7E-11	0.00E+00	0.0E+00	0%	1460	2.9E-10	0.00E+00	0.0E+00	0%
Arsenic	1.670	4.63E+09	260	20	4	70	25550	4.2E-12	1.51E+01	6.3E-11	94%	1460	7.3E-11	0.00E+00	0.0E+00	0%
Copper	672.000	4.63E+09	260	20	4	70	25550	1.7E-09	0.00E+00	0.0E+00	0%	1460	3.0E-08	0.00E+00	0.0E+00	0%
Iron	14060.350	4.63E+09	260	20	4	70	25550	3.5E-08	0.00E+00	0.0E+00	0%	1460	6.2E-07	0.00E+00	0.0E+00	0%
Lead	452.540	4.63E+09	260	20	4	70	25550	1.1E-09	0.00E+00	0.0E+00	0%	1460	2.0E-08	0.00E+00	0.0E+00	0%
Manganese (soil)	278.090	4.63E+09	260	20	4	70	25550	7.0E-10	0.00E+00	0.0E+00	0%	1460	1.2E-08	1.43E-05	8.5E-04	100%
Nickel	13.720	4.63E+09	260	20	4	70	25550	3.4E-11	0.00E+00	0.0E+00	0%	1460	6.0E-10	0.00E+00	0.0E+00	0%
Thallium	1.500	4.63E+09	260	20	4	70	25550	3.8E-12	0.00E+00	0.0E+00	0%	1460	6.6E-11	0.00E+00	0.0E+00	0%
TOTAL										6.8E-11					8.5E-04	

SURFACE SOIL PARTICULATE INHALATION EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
CURRENT MILITARY PERSONNEL - RECREATIONAL USER

Intake from the inhalation of particulates is calculated as follows:

Intake (mg/kg-day) = (C * EF * ED * IR * 1/PEF)/(BW * ATc or ATnc * DY)

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	Specific
CSF = carcinogenic slope factor	Specific
RfD = reference dose for noncarcinogen	Specific
IR = inhalation rate (m3)	20
EF = adult exposure frequency (days)	260
ED = adult exposure duration (years)	4
BW = adult body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	4
DY = day per year (day/yr)	365
PEF = particulate emission factor (m3/kg)	4.63E+09

COPC	Concentration Carcinogen (mg/kg)	Particulate Emission Factor (m3/kg)	Exposure Frequency (events/yr)	Inhalation Rate (m3/day)	Exposure Duration (yrs)	Body Weight (kg)	Average Carc Time (days)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg-day)-1	Carcinogenic Risk	Percent Contribution to Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk	Percent Noncarcinogenic Risk
Benzo(a)pyrene	0.23	4.63E+09	260	20	4	70	25550	5.8E-13	6.1E+00	3.5E-12	61%	1460	1.0E-11	0.0E+00	0.0E+00	0%
Dibenzo(a,h)anthracene	0.15	4.63E+09	260	20	4	70	25550	3.8E-13	6.1E+00	2.3E-12	39%	1460	6.6E-12	0.0E+00	0.0E+00	0%
Iron	7567.30	4.63E+09	260	20	4	70	25550	1.9E-08	0.0E+00	0.0E+00	0%	1460	3.3E-07	0.0E+00	0.0E+00	0%
Thallium	1.38	4.63E+09	260	20	4	70	25550	3.5E-12	0.0E+00	0.0E+00	0%	1460	6.1E-11	0.0E+00	0.0E+00	0%
TOTAL										5.8E-12					0.0E+00	

SUBSURFACE SOIL PARTICULATE INHALATION EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE CONSTRUCTION WORKER

Intake from the inhalation of particulates is calculated as follows:

Intake (mg/kg-day) = (C * EF * ED * IR * 1/PEF)/(BW * ATc or ATnc * DY)

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in soil (mg/kg)	Specific
CSF = carcinogenic slope factor	Specific
RfD = reference dose for noncarcinogen	Specific
IR = inhalation rate (m3)	20
EF = adult exposure frequency (days)	90
ED = adult exposure duration (years)	1
BW = adult body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	1
DY = day per year (day/yr)	365
PEF = particulate emission factor (m3/kg)	4.63E+09

COPC	Concentration Carcinogen (mg/kg)	Particulate Emission Factor (m3/kg)	Exposure Frequency (events/yr)	Inhalation Rate (m3/day)	Exposure Duration (yrs)	Body Weight (kg)	Average Carc Time (days)	Carc Dose (mg/kg/day)	Slope Factor (mg/kg-day)-1	Carcinogenic Risk	Percent Contribution to Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg/day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk	Percent Noncarcinogenic Risk
Benzo(a)anthracene	0.262	4.63E+09	90	20	1	70	25550	5.7E-14	6.1E-01	3.5E-14	1%	365	4.0E-12	0.0E+00	0.0E+00	0%
Benzo(a)pyrene	0.249	4.63E+09	90	20	1	70	25550	5.4E-14	6.1E+00	3.3E-13	6%	365	3.8E-12	0.0E+00	0.0E+00	0%
Aluminum	6197.290	4.63E+09	90	20	1	70	25550	1.3E-09	0.0E+00	0.0E+00	0%	365	9.4E-08	0.0E+00	0.0E+00	0%
Antimony	6.670	4.63E+09	90	20	1	70	25550	1.4E-12	0.0E+00	0.0E+00	0%	365	1.0E-10	0.0E+00	0.0E+00	0%
Arsenic	1.670	4.63E+09	90	20	1	70	25550	3.6E-13	1.5E+01	5.5E-12	94%	365	2.5E-11	0.0E+00	0.0E+00	0%
Copper	672.000	4.63E+09	90	20	1	70	25550	1.5E-10	0.0E+00	0.0E+00	0%	365	1.0E-08	0.0E+00	0.0E+00	0%
Iron	14060.350	4.63E+09	90	20	1	70	25550	3.1E-09	0.0E+00	0.0E+00	0%	365	2.1E-07	0.0E+00	0.0E+00	0%
Lead	452.540	4.63E+09	90	20	1	70	25550	9.8E-11	0.0E+00	0.0E+00	0%	365	6.9E-09	0.0E+00	0.0E+00	0%
Manganese (soil)	278.090	4.63E+09	90	20	1	70	25550	6.0E-11	0.0E+00	0.0E+00	0%	365	4.2E-09	1.4E-05	3.0E-04	100%
Nickel	13.720	4.63E+09	90	20	1	70	25550	3.0E-12	0.0E+00	0.0E+00	0%	365	2.1E-10	0.0E+00	0.0E+00	0%
Thallium	1.500	4.63E+09	90	20	1	70	25550	3.3E-13	0.0E+00	0.0E+00	0%	365	2.3E-11	0.0E+00	0.0E+00	0%
TOTAL										5.8E-12					3.0E-04	

EXAMPLE GROUNDWATER INGESTION CALCULATIONS
SITE 65 - ENGINEER AREA DUMP
CONTRACT TASK ORDER 0312

Purpose: Estimate intake/risk from ingestion of groundwater

$$Intake\ (mg/kg{\cdot}day) = \frac{C \times IR \times EF \times ED}{BW \times AT}$$

Where:	C	=	Contaminant concentration in groundwater (mg/L)
	IR	=	Daily intake ingestion rate (L/day)
	EF	=	Exposure frequency (days/year)
	ED	=	Exposure duration (years)
	BW	=	Body weight (kg)
	AT_c	=	Averaging time carcinogen (days)
	AT_{nc}	=	Averaging time noncarcinogen (days)

Risks:

Carcinogens = Intake (mg/kg·day) x CSF $(mg/kg{\cdot}day)^{-1}$
Noncarcinogens = Intake (mg/kg·day)/RfD (mg/kg·day)

Example Carcinogen: No carcinogenic COPCs in groundwater.

Example Noncarcinogen: Manganese

$$Intake\ (mg/kg{\cdot}day) = \frac{0.186\ mg/L \times 2\ L/day \times 350\ days/yr \times 30\ yrs}{70\ kg \times 10{,}950\ days}$$

= 5.1E-03

$$Risk = \frac{5.1E{-}03\ mg/kg{\cdot}day}{2.3E{-}02\ mg/kg{\cdot}day} = 2.2E{-}01$$

GROUNDWATER INGESTION EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL ADULT

Intake from drinking water is calculated as follows:

Intake (mg/kg-day) = C * IRw * EF * ED/BW * AT or ATnc * DY

Risk = Intake * CSF or /RfD

Where:		INPUTS
C = contaminant concentration in water (mg/l)	specific	
IRw = adult daily water ingestion rate (L/Day)		2
EF = adult exposure frequency (days/yr)		350
ED = adult exposure duration (yr)		30
BW = adult body weight (kg)		70
ATc = averaging time for carcinogen (yr)		70
ATnc = averaging time for noncarcinogen (yr)		30
DY = days per year (day/year)		365
CSF = cancer slope factor (mg/kg-day)-1	specific	
RfD = reference dose (mg/kg-day)	specific	

COPC	Concentration (mg/l)	Ingestion Rate (L/day) Adult	Exposure Frequency (day/year) Adult	Exposure Duration (year) Adult	Body Weight (kg) Adult	Average Carc Time (days)	Carc Dose (mg/kg-day) Adult	Slope Factor (mg/kg-day)-1	Carcinogenic Risk Adult	Percent Carcinogenic Risk Adult	Average Noncarc Time (days)	Noncarc Dose (mg/kg-day) Adult	Reference Dose (mg/kg-day)	Noncarcinogenic Risk Adult	Percent Noncarcinogenic Risk Adult
Carbon Disulfide	0.005	2	350	30	70	25550	5.9E-05	0.0E+00	0.0E+00	0%	10950	1.4E-04	1.0E-01	1.4E-03	0%
Iron	6.58	2	350	30	70	25550	7.7E-02	0.0E+00	0.0E+00	0%	10950	1.8E-01	3.0E-01	6.0E-01	73%
Manganese (water)	0.186	2	350	30	70	25550	2.2E-03	0.0E+00	0.0E+00	0%	10950	5.1E-03	2.3E-02	2.2E-01	27%
TOTAL									0.0E+00					8.2E-01	

GROUNDWATER INGESTION EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL CHILD

Intake from drinking water is calculated as follows:

Intake (mg/kg-day) = C * IRw * EF * ED/BW * AT or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in water (mg/l)	specific
IRw = child daily water ingestion rate (L/Day)	1
EF = child exposure frequency (days/yr)	350
ED = child exposure duration (yr)	6
BW = child body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = days per year (day/year)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	specific

COPC	Concentration (mg/l)	Ingestion Rate (L/day) Child	Exposure Frequency (day/year) Child	Exposure Duration (year) Child	Body Weight (kg) Child	Average Carc Time (days)	Carc Dose (mg/kg-day) Child	Slope Factor (mg/kg-day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg-day) Child	Reference Dose (mg/kg-day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk Child
Carbon Disulfide	0.005	1	350	6	15	25550	2.7E-05	0.0E+00	0.0E+00	0%	2190	3.2E-04	1.0E-01	3.2E-03	0%
Iron	6.580	1	350	6	15	25550	3.6E-02	0.0E+00	0.0E+00	0%	2190	4.2E-01	3.0E-01	1.4E+00	73%
Manganese (water)	0.186	1	350	6	15	25550	1.0E-03	0.0E+00	0.0E+00	0%	2190	1.2E-02	2.3E-02	5.2E-01	27%
TOTAL									0.0E+00					1.9E+00	

GROUNDWATER INGESTION EXPOSURE ASSESSMENT - CT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL CHILD

Intake from drinking water is calculated as follows:

Intake (mg/kg-day) = C * IRw * EF * ED/BW * AT or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
C = contaminant concentration in water (mg/l)	specific
IRw = child daily water ingestion rate (L/Day)	1
EF = child exposure frequency (days/yr)	234
ED = child exposure duration (yr)	6
BW = child body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = days per year (day/year)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	specific

COPC	Concentration (mg/l)	Ingestion Rate (L/day) Child	Exposure Frequency (day/year) Child	Exposure Duration (year) Child	Body Weight (kg) Child	Average Carc Time (days)	Carc Dose (mg/kg-day) Child	Slope Factor (mg/kg-day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg-day) Child	Reference Dose (mg/kg-day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk Child
Carbon Disulfide	0.005	1	234	6	15	25550	1.8E-05	0.0E+00	0.0E+00	0%	2190	2.1E-04	1.0E-01	2.1E-03	1%
Iron	1.270	1	234	6	15	25550	4.7E-03	0.0E+00	0.0E+00	0%	2190	5.4E-02	3.0E-01	1.8E-01	58%
Manganese (water)	0.069	1	234	6	15	25550	2.5E-04	0.0E+00	0.0E+00	0%	2190	2.9E-03	2.3E-02	1.3E-01	41%
TOTAL									0.0E+00					3.1E-01	

Computed by: KTW Checked by: MDB Date: 10/95

EXAMPLE DERMAL CONTACT WITH GROUNDWATER CALCULATIONS
SITE 65 - ENGINEER AREA DUMP
CONTRACT TASK ORDER 0312

Purpose: Estimate intake/risk from dermal contact with groundwater

$$Intake\ (mg/kg{\cdot}day) = \frac{C \times SA \times PC \times ET \times EF \times ED \times CF}{BW \times AT}$$

Where:	C	=	Contaminant concentration in groundwater (mg/L)
	SA	=	Exposed skin surface available for contact (cm^2)
	PC	=	Permeability constant (cm/hr)
	ET	=	Exposure time (hr/day)
	EF	=	Exposure frequency (days/year)
	ED	=	Exposure duration (years)
	CF	=	Conversion factor (1 L/1,000 cm^3)
	BW	=	Body weight (kg)
	AT_c	=	Averaging time carcinogen (days)
	AT_{nc}	=	Averaging time noncarcinogen (days)

Risks:

Carcinogens = Intake (mg/kg·day) x CSF $(mg/kg{\cdot}day)^{-1}$
Noncarcinogens = Intake (mg/kg·day)/RfD (mg/kg·day)

Example Carcinogen: No carcinogenic COPCs in groundwater.

Example Noncarcinogen: Manganese

$$Intake\ (mg/kg{\cdot}day) = \frac{0.186\ mg/L \times 23{,}000\ cm^2/hr \times 1.0E{-}03\ cm/hr \times 0.25\ hr/day \times 350\ days/yr \times 30\ yrs \times 1\ L/1{,}000\ cm^3}{70\ kg \times 10{,}950\ days}$$

$$= 1.5E\text{-}05$$

$$Risk = \frac{1.5E{-}05\ mg/kg{\cdot}day}{4.6E{-}03\ mg/kg{\cdot}day} = 3.2E{-}03$$

GROUNDWATER DERMAL CONTACT EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL ADULT

Dermal Contact from groundwater is calcuated as follows:

Intake (mg/kg-day) = CW * SA * PC * ET * EF * ED * CF/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
CW = contaminant concentration in water (mg/l)	
SA = adult skin surface available for contact (cm2)	23000
PC = contaminant specific dermal permability (cm/hr)	Specific
ET = adult exposure time (hours/day)	0.25
EF = adult exposure frequency (days/yr)	350
ED = adult exposure duration (years)	30
CF = volumetric conversion factor for water (1liter/1000 cm3)	0.001
BW = adult body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	30
DY = days per year (days)	365

Note: Inputs are site and scenario specific

COPC	Concentration (mg/l)	Surface Area (cm2) Adult	Dermal Permeability (cm/hr)	Exposure Time (hours/day) Adult	Exposure Frequency (days/yr) Adult	Exposure Duration (years) Adult	Volumetric Conversion (L/m3)	Body Weight (kg) Adult	Averaging Carc Time (years)	Carc Dose (mg/kg-day) Adult	Derm. Adj. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Adult	Percent Carcinogenic Risk Adult	Average Noncarc Time (years)	Noncarc Dose (mg/kg-day) Adult	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarc Risk Adult	Percent Noncarcinogenic Risk Adult
Carbon Disulfide	0.005	23000	5.30E-01	0.25	350	30	0.001	70	25550	8.9E-05	0.0E+00	0.0E+00	0%	10950	2.1E-04	8.0E-02	2.6E-03	18%
Iron	6.58	23000	1.00E-03	0.25	350	30	0.001	70	25550	2.2E-04	0.0E+00	0.0E+00	0%	10950	5.2E-04	6.0E-02	8.6E-03	60%
Manganese (water)	0.186	23000	1.00E-03	0.25	350	30	0.001	70	25550	6.3E-06	0.0E+00	0.0E+00	0%	10950	1.5E-05	4.6E-03	3.2E-03	22%
TOTAL												0.0E+00					1.4E-02	

GROUNDWATER DERMAL CONTACT EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL CHILD

Dermal Contact from groundwater is calcuated as follows:

Intake (mg/kg-day) = CW * SA * PC * ET * EF * ED * CF/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
CW = contaminant concentration in water (mg/l)	
SA = child skin surface available for contact (cm2)	10000
PC = contaminant specific dermal permability (cm/hr)	Specific
ET = child exposure time (hours/day)	0.25
EF = child exposure frequency (days/yr)	350
ED = child exposure duration (years)	6
CF = volumetric conversion factor for water (1liter/1000 cm3)	0.001
BW = child body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = days per year (days)	365

COPC	Concentration (mg/l)	Surface Area (cm2) Child	Dermal Permeability (cm/hr)	Exposure Time (hours/day) Child	Exposure Frequency (days/yr) Child	Exposure Duration (years) Child	Volumetric Conversion (L/m3)	Body Weight (kg) Child	Averaging Carc Time (days)	Carc Dose (mg/kg-day) Child	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg-day) Child	Dermal. Adjust. Reference Dose (mg/kg-day)	Noncarc Risk Child	Percent Noncarcinogenic Risk Child
Carbon Disulfide	0.005	10000	5.30E-01	0.25	350	6	0.001	15	25550	3.6E-05	0.0E+00	0.0E+00	0%	2190	4.2E-04	8.0E-02	5.3E-03	18%
Iron	6.580	10000	1.00E-03	0.25	350	6	0.001	15	25550	9.0E-05	0.0E+00	0.0E+00	0%	2190	1.1E-03	6.0E-02	1.8E-02	60%
Manganese (water)	0.186	10000	1.00E-03	0.25	350	6	0.001	15	25550	2.5E-06	0.0E+00	0.0E+00	0%	2190	3.0E-05	4.6E-03	6.5E-03	22%
TOTAL												0.0E+00					2.9E-02	

GROUNDWATER DERMAL CONTACT EXPOSURE ASSESSMENT - CT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL CHILD

Dermal Contact from groundwater is calcuated as follows:

Intake (mg/kg-day) = CW * SA * PC * ET * EF * ED * CF/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
CW = contaminant concentration in water (mg/l)	
SA = child skin surface available for contact (cm2)	6978
PC = contaminant specific dermal permability (cm/hr)	Specific
ET = child exposure time (hours/day)	0.25
EF = child exposure frequency (days/yr)	234
ED = child exposure duration (years)	6
CF = volumetric conversion factor for water (1liter/1000 cm3)	0.001
BW = child body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = days per year (days)	365

COPC	Concentration (mg/l)	Surface Area (cm2) Child	Dermal Permeability (cm/hr)	Exposure Time (hours/day) Child	Exposure Frequency (days/yr) Child	Exposure Duration (years) Child	Volumetric Conversion (L/m3)	Body Weight (kg) Child	Averaging Carc Time (days)	Carc Dose (mg/kg-day) Child	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg-day) Child	Dermal. Adjust. Reference Dose (mg/kg-day)	Noncarc Risk Child	Percent Noncarcinogenic Risk Child
Carbon Disulfide	0.005	6978	5.30E-01	0.25	234	6	0.001	15	25550	1.7E-05	0.0E+00	0.0E+00	0%	2190	2.0E-04	8.0E-02	2.5E-03	48%
Iron	1.270	6978	1.00E-03	0.25	234	6	0.001	15	25550	8.1E-06	0.0E+00	0.0E+00	0%	2190	9.5E-05	6.0E-02	1.6E-03	31%
Manganese (water)	0.069	6978	1.00E-03	0.25	234	6	0.001	15	25550	4.4E-07	0.0E+00	0.0E+00	0%	2190	5.1E-06	4.6E-03	1.1E-03	22%
TOTAL												0.0E+00					5.2E-03	

Computed by: KTW Checked by: MDB Date: 10/95

EXAMPLE INHALATION OF VOLATILE ORGANICS CALCULATIONS
SITE 65 - ENGINEER AREA DUMP
CONTRACT TASK ORDER 0312

Purpose: Estimate intake/risk from the inhalation of volatile organics

$$Intake\ (mg/kg{\cdot}day) = \frac{Cs\ x\ IR\ x\ ET\ x\ EF\ x\ ED\ x\ 1.0}{BW\ x\ AT}$$

Where:	Cs	=	Shower air concentration (mg/m^3)
	IR	=	Inhalation rate (m^3/hr)
	ET	=	Exposure time (hrs/day)
	EF	=	Exposure frequency (days/year)
	ED	=	Exposure duration (years)
	1.0	=	Absorbed fraction
	BW	=	Body weight (kg)
	AT	=	Averaging time (days)

Risks:

Carcinogens = Intake (mg/kg·day) x CSF $(mg/kg{\cdot}day)^{-1}$
Noncarcinogens = Intake (mg/kg·day)/RfD (mg/kg·day)

Example Carcinogen: No carcinogenic COPCs in groundwater.

Example Noncarcinogen: Carbon Disulfide

$$Intake\ (mg/kg{\cdot}day) = \frac{0.01\ mg/m^3\ x\ 0.6\ m^3/hr\ x\ 0.25\ hrs/d\ x\ 350\ days/yr\ x\ 30\ yrs\ x\ 1.0}{70\ kg\ x\ 10{,}950\ days}$$

$$= 2.1E\text{-}05$$

$$Risk = \frac{2.1E{-}05\ mg/kg{\cdot}day}{1.0E{-}01\ mg/kg{\cdot}day} = 2.1E{-}04$$

VOLITILZATION OF COPCs FROM WATER DURING SHOWERING
SITE 65 - ENGINEER AREA DUMP
GROUNDWATER
CONTRACT TASK ORDER 0312

This spreadsheet calculates the average concentration of a volatile organic compound in shower air (mg/m3) over the duration of the shower. The air concentration is estimated by a balance between the rate of chemical release from the shower and the rate of air exchange between the shower and the bathroom and the rest of the house. The calculations are based on the efficiency of the volatilization of trichloroethene from shower water as observed in model showers, as well as in several homes. The model was developed by Dr. Julian B. Andelman at the Graduate School of Public Health, University of Pittsburgh.

$$Ca = Cinf[1+((1/kts))(exp(-kts)-1))]$$

Where:

$Cinf = [(E)(Fw)(Ct/1000)]/Fa$

$k = Fa/Vb$

$E = (ETCE)(H)/(HTCE)$

The following defines the parameters used in the Andelman Shower Model:

Parameter	Constant	Units	Description
Ca	Chem. Specific	mg/m3	Avg. Air Conc. over Shower Duration
Cinf	Chem. Specific	mg/m3	Asymptotic Conc. in Air
E	Chem. Specific	unitless	Efficiency of Release-Water to Air
H	Chem. Specific	m3-atm/mol	Henry's Constant for Chemical (i)
Ct	Chem. Specific	ug/L	Conc. of Chemical (i) in Shower Water
ETCE	0.6	unitless	Efficiency of Release of TCE
HTCE	9.1E-03	m3-atm/mol	Henry's Constant for TCE
Fa	2.4	m3/min	Flow Rate of Air in the Shower
Vb	12	m3	Volume of Average Bathroom
k	0.2	1/min	Rate Constant
Fw	8	L/min	Flow Rate of Water in Shower
ts	12	min	Showering Time

Volatile Organic COPCs	H (atm-m3/mol)	E	Ct (ug/L)	Cinf (mg/m3)	Ca (mg/m3)
Carbon Disulfide	1.23E-02	8.1E-01	5	1.4E-02	0.01

GROUNDWATER INHALATION EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL ADULT

CDI (mg/kg/d)= (CA*IR*ET*EF*ED)/(BW*AT)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Description	Adult	
CDI	Chronic daily intake (mg/kg/d)	CS	(Chemical Specific)
ILCR	Incremental lifetime cancer risk	CS	
CSFi	Oral cancer slope factor (1/(mg/kg/d))	CS	
HQ	Hazard quotient	CS	
RfDi	Oral reference dose (mg/kg/d)	CS	
C	Concentration of volatilized chemical in shower air, Andelman Model (mg/m3)	CS	
IR	Inhalation rate (m3/hr)	0.6	
ET	Exposure time (hrs/d)	0.25	
EF	Exposure Frequency (d/yr)	350	
ED	Exposure Duration (yrs)	30	
BW	Body weight (kg)	70	
ATc	Averaging time, carcinogens (d)	25550	
ATn	Averaging time, noncarcinogens (d)	10950	

				Adult Residents					
				Carcinogens			Noncarcinogens		
Parameter	C (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
Carbon Disulfide	0.01	NA	0.1	8.8E-06	--	--	2.1E-05	2.1E-04	100.0%
				Total ILCR:	0.0E+00	0.0%	HI:	2.1E-04	100.0%

NOTES:
NA - Toxicity criterion not available.
-- Not applicable.

GROUNDWATER INHALATION EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE RESIDENTIAL CHILD

CDI (mg/kg/d)= (CA*RR*ET*EF*ED)/(BW*AT)

ILCR = CDI*CSFi
HQ = CDI/RfDi

Parameter	Description	Young Child (1-6 Yrs Old)	
CDI	Chronic daily intake (mg/kg/d)	CS	(Chemical Specific)
ILCR	Incremental lifetime cancer risk	CS	
CSFi	Oral cancer slope factor (1/(mg/kg/d))	CS	
HQ	Hazard quotient	CS	
RfDi	Oral reference dose (mg/kg/d)	CS	
C	Concentration of volatilized chemical in shower air, Andelman Model (mg/m3)	CS	
IR	Inhalation rate (m3/hr)	0.6	
ET	Exposure time (hrs/d)	0.25	
EF	Exposure Frequency (d/yr)	350	
ED	Exposure Duration (yrs)	6	
BW	Body weight (kg)	15	
ATc	Averaging time, carcinogens (d)	25550	
ATn	Averaging time, noncarcinogens (d)	2190	

				Young Child (ages 1-6 Yrs.)					
				Carcinogens			Noncarcinogens		
Parameter	C (mg/m3)	CSFi 1/(mg/kg/d)	RfDi (mg/kg/d)	CDI (mg/kg/d)	ILCR	% Contrib. Total ILCR	CDI (mg/kg/d)	HQ	% Contrib. HI
Carbon Disulfide	0.01	NA	0.1	8.2E-06	--	--	9.6E-05	9.6E-04	100.0%
				Total ILCR:	0.0E+00	0.0%	HI:	9.6E-04	100.0%

NOTES:
NA - Toxicity criterion not available.
-- Not applicable.

Computed by: KTW Checked by: MDB Date: 10/95

EXAMPLE INGESTION OF SURFACE WATER CALCULATIONS
SITE 65 - ENGINEER AREA DUMP
CONTRACT TASK ORDER 0312

Purpose: Estimate intake/risk from ingestion of surface water

$$Intake\ (mg/kg{\cdot}day) = \frac{C \times IR \times ET \times EF \times ED}{BW \times AT}$$

Where:	C	=	Contaminant concentration in surface water (mg/L)
	CR	=	Contact rate (L/hr)
	ET	=	Exposure time (hrs/event)
	EF	=	Exposure frequency (events/year)
	ED	=	Exposure duration (years)
	BW	=	Body weight (kg)
	AT	=	Averaging time (years)
	DY	=	Days per year (days)

Risks:

Carcinogens = Intake (mg/kg·day) x CSF $(mg/kg{\cdot}day)^{-1}$
Noncarcinogens = Intake (mg/kg·day)/RfD (mg/kg·day)

Example Carcinogen: No carcinogenic COPCs in surface water

Example Noncarcinogen: Aluminum

$$Intake\ (mg/kg{\cdot}day) = \frac{25.8\ mg/L \times 0.05\ L/hr \times 2.6\ hrs/event \times 48\ events/yr \times 30\ years}{70\ kg \times 10{,}950\ days}$$

$$= 6.3E\text{-}03$$

$$Risk = \frac{6.3E\text{-}03\ mg/kg{\cdot}day}{1.0\ mg/kg{\cdot}day} = 6.3E\text{-}03$$

SURFACE WATER INGESTION EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE ADULT RESIDENT

The intake from the ingestion of surface water is calculated as follows:

Intake (mg/kg-day) = Cw * CR * ET * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUT
Cw = contaminant concentration in surface water (mg/l)	specific
CR = ingestion rate (Liter/hour)	0.05
ET = exposure time (hours/event)	2.6
EF = exposure frequency (events/yr)	48
ED = exposure duration (yrs)	30
BW = body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	30
DY = days per year (days)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	specific

COPC	Concentration (mg/l)	Contact Rate (l/hour)	Exposure Time (hrs/event)	Exposure Frequency (events/yr)	Exposure Duration (years)	Body Weight (kg)	Average Carc Time (days)	Carc Dose (mg/kg-day)	Cancer Slope Factor (mg/kg-day)-1	Carcinogenic Risk	Percent Carcinogenic Risk	Averaging Time Noncarc. (days)	Noncarc Dose (mg/kg-day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk	Percent Noncarcinogenic Risk
Aluminum	25.800	0.05	2.6	48	30	70	25550	2.7E-03	0.0E+00	0.0E+00	0%	10950	6.3E-03	1.0E+00	6.3E-03	41%
Barium	0.069	0.05	2.6	48	30	70	25550	7.3E-06	0.0E+00	0.0E+00	0%	10950	1.7E-05	7.0E-02	2.4E-04	2%
Copper	0.041	0.05	2.6	48	30	70	25550	4.3E-06	0.0E+00	0.0E+00	0%	10950	1.0E-05	3.7E-02	2.7E-04	2%
Iron	7.890	0.05	2.6	48	30	70	25550	8.3E-04	0.0E+00	0.0E+00	0%	10950	1.9E-03	3.0E-01	6.4E-03	42%
Lead	0.046	0.05	2.6	48	30	70	25550	4.8E-06	0.0E+00	0.0E+00	0%	10950	1.1E-05	0.0E+00	0.0E+00	0%
Manganese (water)	0.088	0.05	2.6	48	30	70	25550	9.3E-06	0.0E+00	0.0E+00	0%	10950	2.2E-05	2.3E-02	9.4E-04	6%
Vanadium	0.026	0.05	2.6	48	30	70	25550	2.7E-06	0.0E+00	0.0E+00	0%	10950	6.4E-06	7.0E-03	9.1E-04	6%
Zinc	0.144	0.05	2.6	48	30	70	25550	1.5E-05	0.0E+00	0.0E+00	0%	10950	3.5E-05	3.0E-01	1.2E-04	1%
TOTAL										0.0E+00					1.5E-02	

SURFACE WATER INGESTION EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE CHILD RESIDENT

The intake from the ingestion of surface water is calculated as follows:

Intake (mg/kg-day) = Cw * CR * ET * EF * ED/BW * ATc or ATnc * DY

Risk = intake * CSF or /RfD

Where:	INPUT
Cw = contaminant concentration in surface water (mg/l)	
CR = contact rate (Liter/hour)	0.05
ET = child exposure time (hours/event)	2.6
EF = child exposure frequency (events/yr)	48
ED = child exposure duration (yrs)	6
BW = child body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = days per year (days)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	specific

COPC	Concentration Carcinogen (mg/l)	Contact Rate (l/hour)	Exposure Time (hrs/event) Child	Exposure Frequency (events/yr) Child	Exposure Duration (years) Child	Body Weight (kg) Child	Averaging Carc. Time (days)	Carc Dose (mg/kg-da Child	Cancer Slop Factor (mg/kg-day)-	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Averaging Time Noncarc (days)	Noncarc Dose (mg/kg-day) Child	Reference Dose (mg/kg-day)	Noncarcinogen Risk Child	Percent Noncarcinogeni Risk Child
Aluminum	25.800	0.05	2.6	48	6	15	25550	2.5E-03	0.0E+00	0.0E+00	0%	2190	2.9E-02	1.0E+00	2.9E-02	41%
Barium	0.069	0.05	2.6	48	6	15	25550	6.8E-06	0.0E+00	0.0E+00	0%	2190	7.9E-05	7.0E-02	1.1E-03	2%
Copper	0.041	0.05	2.6	48	6	15	25550	4.0E-06	0.0E+00	0.0E+00	0%	2190	4.7E-05	3.7E-02	1.3E-03	2%
Iron	7.890	0.05	2.6	48	6	15	25550	7.7E-04	0.0E+00	0.0E+00	0%	2190	9.0E-03	3.0E-01	3.0E-02	42%
Lead	0.046	0.05	2.6	48	6	15	25550	4.5E-06	0.0E+00	0.0E+00	0%	2190	5.2E-05	0.0E+00	0.0E+00	0%
Manganese (water)	0.088	0.05	2.6	48	6	15	25550	8.6E-06	0.0E+00	0.0E+00	0%	2190	1.0E-04	2.3E-02	4.4E-03	6%
Vanadium	0.026	0.05	2.6	48	6	15	25550	2.6E-06	0.0E+00	0.0E+00	0%	2190	3.0E-05	7.0E-03	4.3E-03	6%
Zinc	0.144	0.05	2.6	48	6	15	25550	1.4E-05	0.0E+00	0.0E+00	0%	2190	1.6E-04	3.0E-01	5.5E-04	1%
TOTAL										0.0E+00					7.1E-02	

SURFACE WATER INGESTION EXPOSURE ASSESSMENT - CT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE CHILD RESIDENT

The intake from the ingestion of surface water is calculated as follows:

Intake (mg/kg-day) = Cw * CR * ET * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUT
Cw = contaminant concentration in surface water (mg/l)	
CR = contact rate (Liter/hour)	0.05
ET = child exposure time (hours/event)	2.6
EF = child exposure frequency (events/yr)	48
ED = child exposure duration (yrs)	6
BW = child body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = days per year (days)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	specific

COPC	Concentration Carcinogen (mg/l)	Contact Rate (l/hour)	Exposure Time (hrs/event) Child	Exposure Frequency (events/yr) Child	Exposure Duration (years) Child	Body Weight (kg) Child	Averaging Carc. Time (days)	Carc Dose (mg/kg-day) Child	Cancer Slope Factor (mg/kg-day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Averaging Time Noncarc (days)	Noncarc Dose (mg/kg-day) Child	Reference Dose (mg/kg-day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk Child
Aluminum	25.800	0.05	2.6	48	6	15	25550	2.5E-03	0.0E+00	0.0E+00	0%	2190	2.9E-02	1.0E+00	2.9E-02	41%
Barium	0.069	0.05	2.6	48	6	15	25550	6.8E-06	0.0E+00	0.0E+00	0%	2190	7.9E-05	7.0E-02	1.1E-03	2%
Copper	0.041	0.05	2.6	48	6	15	25550	4.0E-06	0.0E+00	0.0E+00	0%	2190	4.7E-05	3.7E-02	1.3E-03	2%
Iron	7.890	0.05	2.6	48	6	15	25550	7.7E-04	0.0E+00	0.0E+00	0%	2190	9.0E-03	3.0E-01	3.0E-02	42%
Lead	0.046	0.05	2.6	48	6	15	25550	4.5E-06	0.0E+00	0.0E+00	0%	2190	5.2E-05	0.0E+00	0.0E+00	0%
Manganese (water)	0.088	0.05	2.6	48	6	15	25550	8.6E-06	0.0E+00	0.0E+00	0%	2190	1.0E-04	2.3E-02	4.4E-03	6%
Vanadium	0.026	0.05	2.6	48	6	15	25550	2.6E-06	0.0E+00	0.0E+00	0%	2190	3.0E-05	7.0E-03	4.3E-03	6%
Zinc	0.144	0.05	2.6	48	6	15	25550	1.4E-05	0.0E+00	0.0E+00	0%	2190	1.6E-04	3.0E-01	5.5E-04	1%
TOTAL										0.0E+00					7.1E-02	

SURFACE WATER INGESTION EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FISHERMAN - ADULT RECEPTOR

The intake from the ingestion of surface water is calculated as follows:

Intake (mg/kg-day) = Cw * CR * ET * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:		INPUT
Cw = contaminant concentration in surface water (mg/l)		
IR = ingestion rate (Liter/hour)		0.05
ET = exposure time (hours/event)		2.6
EF = exposure frequency (events/yr)		48
ED = exposure duration (yrs)		30
BW = body weight (kg)		70
ATc = averaging time for carcinogen (yr)		70
ATnc = averaging time for noncarcinogen (yr)		30
DY = days per year (days)		365
CSF = cancer slope factor (mg/kg-day)-1	specific	
RfD = reference dose (mg/kg-day)	specific	

COPC	Concentration (mg/l)	Contact Rate (l/hour)	Exposure Time (hrs/event)	Exposure Frequency (events/yr)	Exposure Duration (years)	Body Weight (kg)	Average Carc Time (days)	Carc Dose (mg/kg-day)	Cancer Slope Factor (mg/kg-day)-1	Carcinogenic Risk	Percent Carcinogenic Risk	Averaging Time Noncarc. (years)	Noncarc Dose (mg/kg-day)	Reference Dose (mg/kg-day)	Noncarcinogenic Risk	Percent Noncarcinogenic Risk
Aluminum	25.800	0.05	2.6	48	30	70	25550	2.7E-03	0.00E+00	0.0E+00	0%	10950	6.3E-03	1.00E+00	6.3E-03	41%
Barium	0.069	0.05	2.6	48	30	70	25550	7.3E-06	0.00E+00	0.0E+00	0%	10950	1.7E-05	7.00E-02	2.4E-04	2%
Copper	0.041	0.05	2.6	48	30	70	25550	4.3E-06	0.00E+00	0.0E+00	0%	10950	1.0E-05	3.71E-02	2.7E-04	2%
Iron	7.890	0.05	2.6	48	30	70	25550	8.3E-04	0.00E+00	0.0E+00	0%	10950	1.9E-03	3.00E-01	6.4E-03	42%
Lead	0.046	0.05	2.6	48	30	70	25550	4.8E-06	0.00E+00	0.0E+00	0%	10950	1.1E-05	0.00E+00	0.0E+00	0%
Manganese (water)	0.088	0.05	2.6	48	30	70	25550	9.3E-06	0.00E+00	0.0E+00	0%	10950	2.2E-05	2.30E-02	9.4E-04	6%
Vanadium	0.026	0.05	2.6	48	30	70	25550	2.7E-06	0.00E+00	0.0E+00	0%	10950	6.4E-06	7.00E-03	9.1E-04	6%
Zinc	0.144	0.05	2.6	48	30	70	25550	1.5E-05	0.00E+00	0.0E+00	0%	10950	3.5E-05	3.00E-01	1.2E-04	1%
TOTAL										0.0E+00					1.5E-02	

SURFACE WATER INGESTION EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FISHERMAN - CHILD RECEPTOR

The intake from the ingestion of surface water is calculated as follows:

Intake (mg/kg-day) = Cw * CR * ET * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUT
Cw = contaminant concentration in surface water (mg/l)	
CR = contact rate (Liter/hour)	0.05
ET = child exposure time (hours/event)	2.6
EF = child exposure frequency (events/yr)	48
ED = child exposure duration (yrs)	6
BW = child body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = days per year (days)	365
CSF = cancer slope factor (mg/kg-day)-1	specific
RfD = reference dose (mg/kg-day)	specific

COPC	Concentration Carcinogen (mg/l)	Contact Rate (l/hour)	Exposure Time (hrs/event) Child	Exposure Frequency (events/yr) Child	Exposure Duration (years) Child	Body Weight (kg) Child	Averaging Carc. Time (days)	Carc Dose (mg/kg-day) Child	Cancer Slope Factor (mg/kg-day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Averaging Time Noncarc (days)	Noncarc Dose (mg/kg-day) Child	Reference Dose (mg/kg-day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk Child
Aluminum	25.800	0.05	2.6	48	6	15	25550	2.5E-03	0.0E+00	0.0E+00	0%	2190	2.9E-02	1.0E+00	2.9E-02	41%
Barium	0.089	0.05	2.6	48	6	15	25550	6.8E-06	0.0E+00	0.0E+00	0%	2190	7.9E-05	7.0E-02	1.1E-03	2%
Copper	0.041	0.05	2.6	48	6	15	25550	4.0E-06	0.0E+00	0.0E+00	0%	2190	4.7E-05	3.7E-02	1.3E-03	2%
Iron	7.890	0.05	2.6	48	6	15	25550	7.7E-04	0.0E+00	0.0E+00	0%	2190	9.0E-03	3.0E-01	3.0E-02	42%
Lead	0.046	0.05	2.6	48	6	15	25550	4.5E-06	0.0E+00	0.0E+00	0%	2190	5.2E-05	0.0E+00	0.0E+00	0%
Manganese (water)	0.088	0.05	2.6	48	6	15	25550	8.6E-06	0.0E+00	0.0E+00	0%	2190	1.0E-04	2.3E-02	4.4E-03	6%
Vanadium	0.026	0.05	2.6	48	6	15	25550	2.6E-06	0.0E+00	0.0E+00	0%	2190	3.0E-05	7.0E-03	4.3E-03	6%
Zinc	0.144	0.05	2.6	48	6	15	25550	1.4E-05	0.0E+00	0.0E+00	0%	2190	1.6E-04	3.0E-01	5.5E-04	1%
TOTAL										0.0E+00					7.1E-02	

Computed by: KTW Checked by: MDB Date: 10/95

EXAMPLE DERMAL CONTACT WITH SURFACE WATER CALCULATIONS
SITE 65 - ENGINEER AREA DUMP
CONTRACT TASK ORDER 0312

Purpose: Estimate intake/risk from dermal contact with surface water

$$Intake\ (mg/kg{\cdot}day) = \frac{C\ x\ SA\ x\ PC\ x\ ET\ x\ EF\ x\ ED\ x\ CF}{BW\ x\ AT}$$

Where:	C	=	Contaminant concentration in groundwater (mg/L)
	SA	=	Exposed skin surface available for contact (cm^2)
	PC	=	Permeability constant (cm/hr)
	ET	=	Exposure time (hr/day)
	EF	=	Exposure frequency (days/year)
	ED	=	Exposure duration (years)
	CF	=	Conversion factor (1 L/1,000 cm^3)
	BW	=	Body weight (kg)
	AT_c	=	Averaging time carcinogen (days)
	AT_{nc}	=	Averaging time noncarcinogen (days)

Risks:

Carcinogens = Intake (mg/kg·day) x CSF $(mg/kg{\cdot}day)^{-1}$
Noncarcinogens = Intake (mg/kg·day)/RfD (mg/kg·day)

Example Carcinogen: No Carcinogenic COPCs in Surface Water

Example Noncarcinogen: Aluminum

$$Intake\ (mg/kg{\cdot}day) = \frac{25.8\ mg/L\ x\ 8.300\ cm^2\ x\ 1.0E{-}03\ cm\ hr\ x\ 2.6\ hr/day\ x\ 48\ days/yr\ x\ 30\ yrs\ x\ 1\ L/1{,}000\ cm^3}{70\ kg\ x\ 10{,}950\ days}$$

$$= 1.0E{-}03$$

$$Risk = \frac{1.0E{-}03\ mg/kg{\cdot}day}{2.0E{-}01\ mg/kg{\cdot}day} = 5.2E{-}03$$

SURFACE WATER DERMAL CONTACT EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE ADULT RESIDENT

The intake from dermal contact with surface water is calculated as follows:

Intake (mg/kg-day) = Cw * SA * PC * ET * EF * ED * CF/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
CW = contaminant concentration in water (mg/l)	
SA = skin surface available for contact (cm2)	8300
PC = contaminant specific dermal permability (cm/hr)	Specific
ET = exposure time (hours/day)	2.6
EF = exposure frequency (days/yr)	48
ED = exposure duration (years)	30
CF = volumetric conversion factor for water (1liter/1000 cm3)	0.001
BW = body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	30
DY = days per year (days)	365
CSF = cancer slope factor (mg/kg-day)-1	Specific
RfD = reference dose (mg/kg-day)	Specific

COPC	Concentration (mg/l)	Surface Area (cm2)	Dermal Permeability (cm/hr)	Exposure Time (hours/day)	Exposure Frequency (days/yr)	Exposure Duration (years)	Volumetric Conversion (L/m3)	Body Weight (kg)	Averaging Carc Time (days)	Carc Dose (mg/kg-day)	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk	Percent Carcinogenic Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg-day)	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarc Risk	Percent Noncarcinogenic Risk
Aluminum	25.800	8300	1.0E-03	2.6	48	30	0.001	70	25550	4.5E-04	0.0E+00	0.0E+00	0%	10950	1.0E-03	2.0E-01	5.2E-03	42%
Barium	0.069	8300	1.0E-03	2.6	48	30	0.001	70	25550	1.2E-06	0.0E+00	0.0E+00	0%	10950	2.8E-06	1.4E-02	2.0E-04	2%
Copper	0.041	8300	1.0E-03	2.6	48	30	0.001	70	25550	7.1E-07	0.0E+00	0.0E+00	0%	10950	1.7E-06	7.4E-03	2.2E-04	2%
Iron	7.890	8300	1.0E-03	2.6	48	30	0.001	70	25550	1.4E-04	0.0E+00	0.0E+00	0%	10950	3.2E-04	6.0E-02	5.3E-03	42%
Lead	0.046	8300	4.0E-06	2.6	48	30	0.001	70	25550	3.2E-09	0.0E+00	0.0E+00	0%	10950	7.4E-09	0.0E+00	0.0E+00	0%
Manganese (water)	0.088	8300	1.0E-03	2.6	48	30	0.001	70	25550	1.5E-06	0.0E+00	0.0E+00	0%	10950	3.6E-06	4.6E-03	7.8E-04	6%
Vanadium	0.026	8300	1.0E-03	2.6	48	30	0.001	70	25550	4.6E-07	0.0E+00	0.0E+00	0%	10950	1.1E-06	1.4E-03	7.6E-04	6%
Zinc	0.144	8300	6.0E-04	2.6	48	30	0.001	70	25550	1.5E-06	0.0E+00	0.0E+00	0%	10950	3.5E-06	6.0E-02	5.8E-05	0%
TOTAL												0.0E+00					1.3E-02	

SURFACE WATER DERMAL CONTACT EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FISHERMAN - ADULT RECEPTOR

The intake from dermal contact with surface water is calculated as follows:

Intake (mg/kg-day) = Cw * SA * PC * ET * EF * ED * CF/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
CW = contaminant concentration in water (mg/l)	
SA = skin surface available for contact (cm2)	8300
PC = contaminant specific dermal permability (cm/hr	Specific
ET = exposure time (hours/day)	2.6
EF = exposure frequency (days/yr)	48
ED = exposure duration (years)	30
CF = volumetric conversion factor for water (1liter/1	0.001
BW = body weight (kg)	70
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	30
DY = days per year (days)	365
CSF = cancer slope factor (mg/kg-day)-1	Specific
RfD = reference dose (mg/kg-day)	Specific

COPC	Concentration Carcinogen (mg/l)	Surface Area (cm2)	Dermal Permeability (cm/hr)	Exposure Time (hours/day)	Exposure Frequency (days/yr)	Exposure Duration (years)	Volumetric Conversion (L/m3)	Body Weight (kg)	Averaging Carc Time (days)	Carc Dose (mg/kg-day)	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk	Percent Carcinogenic Risk	Average Noncarc Time (days)	Noncarc Dose (mg/kg-day)	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarc. Risk	Percent Noncarcinogenic Risk
Aluminum	25.800	8300	1.0E-03	2.6	48	30	0.001	70	25550	4.5E-04	0.00E+00	0.0E+00	0%	10950	1.0E-03	2.00E-01	5.2E-03	42%
Barium	0.069	8300	1.0E-03	2.6	48	30	0.001	70	25550	1.2E-06	0.00E+00	0.0E+00	0%	10950	2.8E-06	1.40E-02	2.0E-04	2%
Copper	0.041	8300	1.0E-03	2.6	48	30	0.001	70	25550	7.1E-07	0.00E+00	0.0E+00	0%	10950	1.7E-06	7.42E-03	2.2E-04	2%
Iron	7.890	8300	1.0E-03	2.6	48	30	0.001	70	25550	1.4E-04	0.00E+00	0.0E+00	0%	10950	3.2E-04	6.00E-02	5.3E-03	42%
Lead	0.046	8300	4.0E-06	2.6	48	30	0.001	70	25550	3.2E-09	0.00E+00	0.0E+00	0%	10950	7.4E-09	0.00E+00	0.0E+00	0%
Manganese (water)	0.088	8300	1.0E-03	2.6	48	30	0.001	70	25550	1.5E-06	0.00E+00	0.0E+00	0%	10950	3.6E-06	4.60E-03	7.8E-04	6%
Vanadium	0.026	8300	1.0E-03	2.6	48	30	0.001	70	25550	4.6E-07	0.00E+00	0.0E+00	0%	10950	1.1E-06	1.40E-03	7.6E-04	6%
Zinc	0.144	8300	6.0E-04	2.6	48	30	0.001	70	25550	1.5E-06	0.00E+00	0.0E+00	0%	10950	3.5E-06	6.00E-02	5.8E-05	0%
TOTAL												0.0E+00					1.3E-02	

SURFACE WATER DERMAL CONTACT EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FISHERMAN - CHILD RECEPTOR

The intake from dermal contact with surface water is calculated as follows:

Intake (mg/kg-day) = Cw * SA * PC * ET * EF * ED * CF/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
CW = contaminant concentration in water (mg/l)	Specific
SA = child skin surface available for contact (cm2)	2100
PC = contaminant specific dermal permability (cm/hr)	Specific
ET = child exposure time (hours/day)	2.6
EF = child exposure frequency (days/yr)	48
ED = child exposure duration (years)	6
CF = volumetric conversion factor for water (1liter/1000 cm3)	0.001
BW = child body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = days per year (days)	365
CSF = cancer slope factor (mg/kg-day)-1	Specific
RfD = reference dose (mg/kg-day)	Specific

COPC	Concentration (mg/l)	Surface Area (cm2) Child	Dermal Permeability (cm/hr)	Exposure Time (hours/day) Child	Exposure Frequency (days/yr) Child	Exposure Duration (years) Child	Volumetric Conversion (L/m3)	Body Weight (kg) Child	Averaging Carc Time (days)	Carc Dose (mg/kg-day) Child	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg-day) Child	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarc. Risk Child	Percent Noncarcinogenic Risk Child
Aluminum	25.800	2100	1.0E-03	2.6	48	6	0.001	15	25550	1.1E-04	0.0E+00	0.0E+00	0%	2190	1.2E-03	2.0E-01	6.2E-03	42%
Barium	0.069	2100	1.0E-03	2.6	48	6	0.001	15	25550	2.8E-07	0.0E+00	0.0E+00	0%	2190	3.3E-06	1.4E-02	2.4E-04	2%
Copper	0.041	2100	1.0E-03	2.6	48	6	0.001	15	25550	1.7E-07	0.0E+00	0.0E+00	0%	2190	2.0E-06	7.4E-03	2.7E-04	2%
Iron	7.890	2100	1.0E-03	2.6	48	6	0.001	15	25550	3.2E-05	0.0E+00	0.0E+00	0%	2190	3.8E-04	6.0E-02	6.3E-03	42%
Lead	0.046	2100	4.0E-06	2.6	48	6	0.001	15	25550	7.5E-10	0.0E+00	0.0E+00	0%	2190	8.8E-09	0.0E+00	0.0E+00	0%
Manganese (water)	0.088	2100	1.0E-03	2.6	48	6	0.001	15	25550	3.6E-07	0.0E+00	0.0E+00	0%	2190	4.2E-06	4.6E-03	9.2E-04	6%
Vanadium	0.026	2100	1.0E-03	2.6	48	6	0.001	15	25550	1.1E-07	0.0E+00	0.0E+00	0%	2190	1.3E-06	1.4E-03	9.0E-04	6%
Zinc	0.144	2100	6.0E-04	2.6	48	6	0.001	15	25550	3.5E-07	0.0E+00	0.0E+00	0%	2190	4.1E-06	6.0E-02	6.9E-05	0%
TOTAL												0.0E+00					1.5E-02	

SURFACE WATER DERMAL CONTACT EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE CHILD RESIDENT

The intake from dermal contact with surface water is calculated as follows:

Intake (mg/kg-day) = Cw * SA * PC * ET * EF * ED * CF/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
CW = contaminant concentration in water (mg/l)	Specific
SA = child skin surface available for contact (cm2)	2100
PC = contaminant specific dermal permability (cm/	Specific
ET = child exposure time (hours/day)	2.6
EF = child exposure frequency (days/yr)	48
ED = child exposure duration (years)	6
CF = volumetric conversion factor for water (1liter/1	0.001
BW = child body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = days per year (days)	365
CSF = cancer slope factor (mg/kg-day)-1	Specific
RfD = reference dose (mg/kg-day)	Specific

COPC	Concentration (mg/l)	Surface Area (cm2) Child	Dermal Permeability (cm/hr)	Exposure Time (hours/day) Child	Exposure Frequency (days/yr) Child	Exposure Duration (years) Child	Volumetric Conversion (L/m3)	Body Weight (kg) Child	Averaging Carc Time (days)	Carc Dose (mg/kg-day) Child	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg-day) Child	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarc. Risk Child	Percent Noncarcinogenic Risk Child
Aluminum	25.800	2100	1.0E-03	2.6	48	6	0.001	15	25550	1.1E-04	0.0E+00	0.0E+00	0%	2190	1.2E-03	2.0E-01	6.2E-03	42%
Barium	0.069	2100	1.0E-03	2.6	48	6	0.001	15	25550	2.8E-07	0.0E+00	0.0E+00	0%	2190	3.3E-06	1.4E-02	2.4E-04	2%
Copper	0.041	2100	1.0E-03	2.6	48	6	0.001	15	25550	1.7E-07	0.0E+00	0.0E+00	0%	2190	2.0E-06	7.4E-03	2.7E-04	2%
Iron	7.890	2100	1.0E-03	2.6	48	6	0.001	15	25550	3.2E-05	0.0E+00	0.0E+00	0%	2190	3.8E-04	6.0E-02	6.3E-03	42%
Lead	0.046	2100	4.0E-06	2.6	48	6	0.001	15	25550	7.5E-10	0.0E+00	0.0E+00	0%	2190	8.8E-09	0.0E+00	0.0E+00	0%
Manganese (water)	0.088	2100	1.0E-03	2.6	48	6	0.001	15	25550	3.6E-07	0.0E+00	0.0E+00	0%	2190	4.2E-06	4.6E-03	9.2E-04	6%
Vanadium	0.026	2100	1.0E-03	2.6	48	6	0.001	15	25550	1.1E-07	0.0E+00	0.0E+00	0%	2190	1.3E-06	1.4E-03	9.0E-04	6%
Zinc	0.144	2100	6.0E-04	2.6	48	6	0.001	15	25550	3.5E-07	0.0E+00	0.0E+00	0%	2190	4.1E-06	6.0E-02	6.9E-05	0%
TOTAL												0.0E+00					1.5E-02	

SURFACE WATER DERMAL CONTACT EXPOSURE ASSESSMENT - CT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FUTURE CHILD RESIDENT

The intake from dermal contact with surface water is calculated as follows:

Intake (mg/kg-day) = Cw * SA * PC * ET * EF * ED * CF/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
CW = contaminant concentration in water (mg/l)	Specific
SA = child skin surface available for contact (cm2)	1745
PC = contaminant specific dermal permability (cm/hr)	Specific
ET = child exposure time (hours/day)	2.6
EF = child exposure frequency (days/yr)	48
ED = child exposure duration (years)	6
CF = volumetric conversion factor for water (1liter/1000 c	0.001
BW = child body weight (kg)	15
ATc = averaging time for carcinogen (yr)	70
ATnc = averaging time for noncarcinogen (yr)	6
DY = days per year (days)	365
CSF = cancer slope factor (mg/kg-day)-1	Specific
RfD = reference dose (mg/kg-day)	Specific

COPC	Concentration (mg/l)	Surface Area (cm2) Child	Dermal Permeability (cm/hr)	Exposure Time (hours/day) Child	Exposure Frequency (days/yr) Child	Exposure Duration (years) Child	Volumetric Conversion (L/m3)	Body Weight (kg) Child	Averaging Carc Time (days)	Carc Dose (mg/kg-day) Child	Dermal Adjust. Slope Factor (mg/kg-day)-1	Carcinogenic Risk Child	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg-day) Child	Dermal Adjust. Reference Dose (mg/kg-day)	Noncarc. Risk Child	Percent Noncarcinogenic Risk Child
Aluminum	25.800	1745	1.0E-03	2.6	48	6	0.001	15	25550	8.8E-05	0.0E+00	0.0E+00	0%	2190	1.0E-03	2.0E-01	5.1E-03	42%
Barium	0.069	1745	1.0E-03	2.6	48	6	0.001	15	25550	2.4E-07	0.0E+00	0.0E+00	0%	2190	2.8E-06	1.4E-02	2.0E-04	2%
Copper	0.041	1745	1.0E-03	2.6	48	6	0.001	15	25550	1.4E-07	0.0E+00	0.0E+00	0%	2190	1.6E-06	7.4E-03	2.2E-04	2%
Iron	7.890	1745	1.0E-03	2.6	48	6	0.001	15	25550	2.7E-05	0.0E+00	0.0E+00	0%	2190	3.1E-04	6.0E-02	5.2E-03	42%
Lead	0.046	1745	4.0E-06	2.6	48	6	0.001	15	25550	8.2E-10	0.0E+00	0.0E+00	0%	2190	7.3E-09	0.0E+00	0.0E+00	0%
Manganese (water)	0.088	1745	1.0E-03	2.6	48	6	0.001	15	25550	3.0E-07	0.0E+00	0.0E+00	0%	2190	3.5E-06	4.6E-03	7.6E-04	6%
Vanadium	0.026	1745	1.0E-03	2.6	48	6	0.001	15	25550	8.9E-08	0.0E+00	0.0E+00	0%	2190	1.0E-06	1.4E-03	7.4E-04	6%
Zinc	0.144	1745	6.0E-04	2.6	48	6	0.001	15	25550	2.9E-07	0.0E+00	0.0E+00	0%	2190	3.4E-06	6.0E-02	5.7E-05	0%
TOTAL												0.0E+00					1.2E-02	

Computed by: KTW Checked by: MDB Date: 10/95

EXAMPLE FISH INGESTION CALCULATIONS
SITE 65 - ENGINEER AREA DUMP
CONTRACT TASK ORDER 0312

Purpose: Estimate intake/risk from ingestion of fish

$$Intake\ (mg/kg{\cdot}day) = \frac{C \times CF \times EF \times ED \times IR}{BW \times AT}$$

Where:

C	=	Contaminant concentration in fish (mg/kg)
FI	=	Fraction ingested (unitless)
EF	=	Exposure frequency (meals/year)
ED	=	Exposure duration (years)
IR	=	Ingestion rate (kg/meal)
BW	=	Body weight (kg)
AT_c	=	Averaging time carcinogen (days)
AT_{nc}	=	Averaging time noncarcinogen (days)

Risks:

Carcinogens = Intake (mg/kg·day) x CSF $(mg/kg{\cdot}day)^{-1}$
Noncarcinogens = Intake (mg/kg·day)/RfD (mg/kg·day)

Example Carcinogen: No carcinogenic COPCs in fish tissue

Example Noncarcinogen: Mercury

$$Intake\ (mg/kg{\cdot}day) = \frac{0.3\ mg/kg \times 0.145\ kg/meal \times 48\ meals/yr \times 30\ yrs \times 1.0}{70\ kg \times 10{,}950\ days}$$

$$= 8.2E\text{-}05$$

$$Risk = \frac{8.2E{-}05\ mg/kg{\cdot}day}{1.0E{-}04\ mg/kg{\cdot}day} = 8.2E{-}01$$

FISH INGESTION EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FISHERMAN - ADULT RECEPTOR

Intake (mg/kg-day) = CF * IR * FI * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
CF = contaminant concentration in fish (mg/kg)	
IR = adult ingestion rate (kg/meal)	0.145
FI = fraction ingested from contaminated source (unitless)	1
EF = adult exposure frequency (meals/yr)	48
ED = adult exposure duration (years)	30
BW = adult body weight (kg)	70
ATc = averaging time for carcinogen (years)	70
ATnc = averaging time for noncarcinogen (years)	30
DY = days per year (days/yr)	365

COPC	Concentration Carcinogen (mg/kg)	Ingestion Rate (kg/meal) Adult	Fraction Ingestion (%)	Exposure Frequency (meals/yr) Adult	Exposure Duration (years) Adult	Body Weight (kg) Adult	Average Carc Time (days)	Carc Dose (mg/kg-day) Adult	Slope Factor (mg/kg-day)-1	Carcinogenic Risk Adult	Percent Carcinogenic Risk Adult	Average Noncarc Time (days)	Noncarc Dose (mg/kg-day) Adult	Reference Dose (mg/kg-day)	Noncarcinogenic Risk Adult	Percent Noncarcinogenic Risk Adult
Mercury	0.300	0.145	1	48	30	70	25550	3.5E-05	0.0E+00	0.0E+00	0%	10950	8.2E-05	1.0E-04	8.2E-01	69%
Thallium	0.11	0.145	1	48	30	70	25550	1.3E-05	0.0E+00	0.0E+00	0%	10950	3.0E-05	8.0E-05	3.7E-01	31%
TOTAL										0.0E+00					1.2E+00	

FISH INGESTION EXPOSURE ASSESSMENT
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION CTO-0312
MCB CAMP LEJEUNE, NORTH CAROLINA
FISHERMAN - CHILD RECEPTOR

Intake (mg/kg-day) = CF * IR * FI * EF * ED/BW * ATc or ATnc * DY

Risk = Intake * CSF or /RfD

Where:	INPUTS
CF = contaminant concentration in fish (mg/kg)	
IR = child ingestion rate (kg/meal)	0.145
FI = fraction ingested from contaminated source (unitless)	1
EF = child exposure frequency (meals/yr)	48
ED = child exposure duration (years)	6
BW = child body weight (kg)	15
ATc = averaging time for carcinogen (years)	70
ATnc = averaging time for noncarcinogen (years)	6
DY = days per year (days/yr)	365

COPC	Concentration (mg/kg)	Ingestion Rate (kg/meal) Child	Fraction Ingestion (%)	Exposure Frequency (days/yr) Child	Exposure Duration (years) Child	Body Weight (kg) Child	Average Carc Time (days)	Carc Dose (mg/kg-day) Child	Slope Factor (mg/kg-day)-1	Carcinogenic Risk Adult	Percent Carcinogenic Risk Child	Average Noncarc Time (days)	Noncarc Dose (mg/kg-day) Child	Reference Dose (mg/kg-day)	Noncarcinogenic Risk Child	Percent Noncarcinogenic Risk Child
Mercury	0.300	0.145	1	48	6	15	25550	3.3E-05	0.0E+00	0.0E+00	0%	2190	3.8E-04	1.0E-04	3.8E+00	69%
Thallium	0.11	0.145	1	48	6	15	25550	1.2E-05	0.0E+00	0.0E+00	0%	2190	1.4E-04	8.0E-05	1.7E+00	31%
TOTAL										0.0E+00					5.6E+00	

APPENDIX U
TERRESTRIAL REFERENCE VALUES AND CDI ECOLOGICAL RISK SPREADSHEETS

TOXICITY DATA USED TO CALCULATE TERRESTRIAL REFERENCE VALUES
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Chemical	Substitute Chemical Used	Cattle (mg/kg/day)	Poultry (mg/kg/day)	Rabbit (mg/kg/day)	Dog (mg/kg/day)	Rat (mg/kg/day)	Mouse (mg/kg/day)	Guinea Pig (mg/kg/day)	Mink (mg/kg/day)
Aluminum		5 (1)	10 (1)	11.61 (1)	15 (1)	NA	1.93 (60)	NA	NA
Antimony		NA	NA	4.06 (1)	NA	0.035 (12)	NA	NA	NA
Arsenic		0.25 (1)	5.135 (61) Mallard	2.90 (1)	NA	NA	0.1261 (13)	NA	NA
Barium		0.1 (1)	1 (1)	1.16 (1)	NA	0.25 (4)	NA	NA	NA
Beryllium		NA	NA	NA	NA	0.54 (4)	NA	NA	NA
Cadmium		0.0025 (1)	1.45 (63) Mallard	0.03 (1)	0.075 (14)	0.004 (15)	NA	NA	NA
Chromium		5 (1)	50 (1)	58.03 (1)	NA	2.41 (5)	NA	NA	NA
Cobalt		0.05 (1)	0.5 (1)	0.58 (1)	NA	NA	NA	NA	NA
Copper		0.5 (1)	15 (1)	11.61 (1)	NA	NA	NA	NA	12.9 (17)
Iron		5 (1)	50 (1)	29.02 (1)	NA	NA	NA	NA	NA
Lead		0.15 (1)	3.85 (65) A. kestr	1.74 (1)	NA	8 (6)	NA	NA	NA
Manganese		1 (24)	100 (1)	23.21 (1)	NA	8.8 (66)	NA	NA	NA
Mercury		0.01 (1)	0.1 (1)	0.12 (1)	NA	0.32 (18)	NA	NA	NA
Molydenum		NA	NA	NA	NA	0.02 (82)	NA	NA	NA
Nickel		0.25 (1)	15 (1)	2.90 (1)	25 (2)	5 (2)	NA	NA	NA
Selenium		0.01 (1)	0.5 (67) Mallard	0.12 (1)	NA	0.04 (19)	NA	NA	NA
Silver		NA	5 (1)	NA	NA	NA	0.181 (20)	NA	NA
Thallium		NA	NA	NA	NA	0.023 (54)	NA	NA	NA
Vanadium		0.25 (1)	11.38 (68) Mallard	0.06 (1)	NA	0.65 (58)	NA	NA	NA
Zinc		2.5 (1)	50 (1)	29.02 (1)	1 (3)	160 (69)	NA	NA	NA
Cyanide		NA	4.5 (21)	NA	0.375 (22)	10.8 (23)	NA	NA	NA
Acenaphthene		NA	NA	NA	NA	17.5 (56)	NA	NA	NA
Acenaphthylene		NA	NA	NA	NA	17.5 Acen.	NA	NA	NA
Anthracene		NA	NA	NA	NA	NA	100 (33)	NA	NA
Benzo(a)anthracene	(Benzo(a)pyrene	NA	NA	NA	NA	NA	1	NA	NA
Benzo(b)fluoranthene	(Benzo(a)pyrene	NA	NA	NA	NA	NA	1	NA	NA
Benzo(k)fluoranthene	(Benzo(a)pyrene	NA	NA	NA	NA	NA	1	NA	NA
Benzo(ghi)perylene	(Benzo(a)pyrene	NA	NA	NA	NA	NA	1	NA	NA
Benzo(g,h,i)perylene	(Benzo(a)pyrene	NA	NA	NA	NA	NA	1	NA	NA
Benzo(a)pyrene		NA	NA	NA	NA	NA	1 (7)	NA	NA
beta-BHC		NA	NA	NA	NA	5 (51)	NA	NA	NA
gamma-BHC	(beta-BHC)	NA	NA	NA	NA	5 (51)	NA	NA	NA
Bis(2-ethylhexyl)phthalate		NA	1.11 (16) Ringed	NA	NA	NA	NA	0.1833 (11)	NA
Butylbenzylphthalate		NA	NA	NA	NA	15.9 (52)	NA	NA	NA
Carbazole	(Benzo(a)pyrene	NA	NA	NA	NA	NA	1	NA	NA
Chrysene	(Benzo(a)pyrene	NA	NA	NA	NA	NA	1	NA	NA
Dibenzofuran	(Benzo(a)pyrene	NA	NA	NA	NA	NA	1	NA	NA
Dibenzo(a,h)anthracene	(Benzo(a)pyrene	NA	NA	NA	NA	NA	1	NA	NA
Dibenz(a,h)anthracene	(Benzo(a)pyrene	NA	NA	NA	NA	NA	1	NA	NA
Diethylphthalate		NA	NA	NA	NA	NA	4583 (53)	NA	NA
2,4-Dimethylphenol		NA	NA	NA	NA	NA	5 (85)	NA	NA
Di-n-butylphthalate		NA	0.11 (16) Ringed	NA	NA	125 (63)	NA	NA	NA
Di-n-octylphthalate		NA	NA	NA	NA	17.5 (79)	NA	NA	NA
2,4-Dinitrophenol		NA	NA	NA	1 (86)	20 (87)	NA	NA	NA
2,6-Dinitrotoluene		NA	NA	NA	0.4 (84)	NA	NA	NA	NA
Fluoranthene		NA	NA	NA	NA	NA	12.5 (8)	NA	NA
Fluorene		NA	NA	NA	NA	12.5 (56)	NA	NA	NA
Indeno(1,2,3-cd)pyrene	(Benzo(a)pyrene	NA	NA	NA	NA	NA	1	NA	NA
2-Methylnaphthalene	(Naphthalene)	NA	NA	NA	NA	41	NA	NA	NA
Naphthalene		NA	NA	NA	NA	41 (9)	NA	NA	NA
Nitrobenzene		NA	NA	NA	NA	0.25 (80)	NA	NA	NA
n-Nitrosodiphenylamine		NA	NA	NA	NA	50 (81)	NA	NA	NA
Phenanthrene	(Naphthalene)	NA	NA	NA	NA	41	NA	NA	NA
Phenol		NA	NA	NA	NA	6 (57)	NA	NA	NA
Pyrene		NA	NA	NA	NA	NA	7.5 (10)	NA	NA

TOXICITY DATA USED TO CALCULATE TERRESTRIAL REFERENCE VALUES
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Chemical	Cattle (mg/kg/day)	Poultry (mg/kg/day)	Rabbit (mg/kg/day)	Dog (mg/kg/day)	Rat (mg/kg/day)	Mouse (mg/kg/day)	Guinea Pig (mg/kg/day)	Mink (mg/kg/day)
Aldrin	0.5 (24)	NA	NA	0.025 (77)	0.025 (77)	NA	NA	NA
Alpha-chlordane	1 (24)	2.14 (70) Blackbi	NA	0.075 (48)	0.055 (49)	NA	NA	NA
Gamma-chlordane	1 (24)	2.14 (70) Blackbi	NA	0.075 (48)	0.055 (49)	NA	NA	NA
Dieldrin	0.5 (24)	0.03 (71) Mallard	NA	0.005 (25)	0.005 (25)	NA	NA	NA
4,4'-DDD	NA	0.088 (DDT)	NA	NA	0.8 DDT	NA	NA	NA
4,4'-DDE	NA	0.088 (24) Quail	NA	NA	0.8 (47)	NA	NA	NA
4,4'-DDT	NA	0.088 (24) Quail	NA	NA	0.8 (47)	NA	NA	NA
Endosulfan	NA	10 (72) Partridg	NA	0.57 (26)	0.6 (26)	NA	NA	NA
Endosulfan II	NA	10 (72) Partridg	NA	0.57 (26)	0.6 (26)	NA	NA	NA
Endosulfan sulfate	NA	10 (72) Partridg	NA	0.57 (26)	0.6 (26)	NA	NA	NA
Endrin	NA	0.3 (73) Mallard	NA	0.025 (27)	0.25 (28)	NA	NA	NA
Endrin aldehyde	NA	0.3 (73) Mallard	NA	0.025 (27)	0.25 (28)	NA	NA	NA
Endrin ketone	NA	0.3 (73) Mallard	NA	0.025 (27)	0.25 (28)	NA	NA	NA
Heptachlor	NA	NA	NA	NA	0.15 (45)	NA	NA	0.057 (29)
Heptachlor Epoxide	NA	NA	NA	0.000125 (24)	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	3.5 (30)	NA	NA	NA
Aroclor-1232	NA	0.41 (78) Owl	NA	NA	0.15 (31)	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	0.005 (32)	NA	NA	NA
Aroclor-1254	NA	0.18 (76) Pheasa	1 (75)	NA	NA	NA	NA	0.1 (50)
Aroclor-1248	NA	NA	0.28 (77)	NA	NA	0.13 (62)	NA	NA
Methylene chloride	NA	NA	NA	NA	5.85 (34)	NA	NA	NA
Carbon disulfide	NA	NA	1.1 (35)	NA	NA	NA	NA	NA
1,1-Dichloroethene	NA	NA	NA	NA	28 (59)	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA	5 (44)	NA	NA	NA
Chloroform	NA	NA	NA	30 (36)	38 (37)	NA	NA	NA
2-Butanone	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	NA	NA	NA	NA	NA	1000 (38)	NA	NA
Trichloroethene	NA	NA	NA	NA	100 (39)	NA	NA	NA
1,1,2-Trichloroethane	NA	NA	NA	NA	NA	0.39 (40)	NA	NA
Benzene	NA	NA	NA	NA	0.1 (41)	NA	NA	NA
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	76 (85)	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	1.4 (42)	NA	NA	NA
Toluene	NA	NA	NA	NA	22.3 (38)	NA	NA	NA
Ethylbenzene	NA	NA	NA	NA	9.71 (41)	NA	NA	NA
Xylenes	NA	NA	NA	NA	179 (43)	NA	NA	NA
Xylenes (total)	NA	NA	NA	NA	179 (43)	NA	NA	NA
Vinyl chloride	NA	NA	NA	NA	0.17 (83)	NA	NA	NA
Acetone	NA	NA	NA	NA	10 (46)	NA	NA	NA

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(75) Villeneuve, et.al., 1972
(76) Dahlgren, et.al., 1972
(77) FAO/WHO, 1978
(78) McLane and Hughes, 1980
(79) Piekacz, 1971
(80) CIIT, 1984
(81) NCI, 1979
(82) Jeter et.al., 1954
(83) Til et.al., 1983
(84) Lee et.al., 1976
(85) USEPA, 1989c
(86) Tainter et.al., 1934
(87) Tainter et.al., 1938

BODY WEIGHTS FOR TERRESTRIAL REFERENCE VALUE CALCULATION
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Body Weight (kg)		
Cattle	100	(IT Corp, 1992)
Whitetailed Deer	45.4	(Dee, 1991)
Bobwhite Quail	0.0174	(USEPA, 1993b)
Eastern Cottontail	1.2285	(USEPA, 1993b)
Lab Rat	0.35	(USEPA, 1988)
Lab Dog	10	(USEPA, 1988)
Poultry	0.5	(IT Corp, 1992)
Red Fox	4.535	(Storm et.al., 1976)
Racoon	5.12	(USEPA, 1993b)
Lab Mouse	0.03	(USEPA, 1988)
Guinea pig	0.86	(USEPA, 1988)
Mink	1	(USEPA, 1993b)
Mallard Duck	1	(Heinze et.al., 1989)
Short-tailed Shrew	0.017	(Schlesinger and Potter, 1974)
Americal Kestral	0.13	(Pattee, 1984)
Blackbird	0.064	(Stickel, 1983)
Pheasant	1	(USEPA, 1993b)
Ringed Dove	0.155	(Terres, 1980)
Screech Owl	0.181	(Dunning, 1984)
Partridge	0.4	(Abiola, 1992)

REGION IV TERRESTRIAL REFERENCE VALUES
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Chemical	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 (ct)	3.06E+01 (bl)	1.16E+01 (rb)	1.95E+01 (dg)	3.48E-01 (mo)
Antimony	6.91E-03 (rt)	9.52E-02 (rt)	4.06E+00 (rb)	1.49E-02 (rt)	1.43E-02 (rt)
Arsenic	3.25E-01 (ct)	1.98E+01 (bl)	2.90E+00 (rb)	2.37E-02 (mo)	2.27E-02 (mo)
Barium	1.30E-01 (ct)	3.06E+00 (bl)	1.16E+00 (rb)	1.07E-01 (rt)	1.02E-01 (rt)
Beryllium	1.07E-01 (rt)	1.47E+00 (rt)	3.55E-01 (rt)	2.30E-01 (rt)	2.21E-01 (rt)
Cadmium	3.25E-03 (ct)	5.59E+00 (bl)	2.90E-02 (rb)	9.76E-02 (dg)	1.64E-03 (rt)
Chromium	6.51E+00 (ct)	1.53E+02 (bl)	5.80E+01 (rb)	1.03E+00 (rt)	9.86E-01 (rt)
Cobalt	6.51E-02 (ct)	1.53E+00 (bl)	5.80E-01 (rb)	3.75E-01 (rb)	3.61E-01 (rb)
Copper	6.51E-01 (ct)	4.59E+01 (bl)	1.16E+01 (rb)	7.80E+00 (mk)	7.49E+00 (mk)
Iron	6.51E+00 (ct)	1.53E+02 (bl)	2.90E+01 (rb)	1.88E+01 (rb)	1.80E+01 (rb)
Lead	1.95E-01 (ct)	7.52E+00 (bl)	1.74E+00 (rb)	3.41E+00 (rt)	3.27E+00 (rt)
Manganese	1.30E+00 (ct)	3.06E+02 (bl)	2.32E+01 (rb)	3.75E+00 (rt)	3.60E+00 (rt)
Mercury	1.30E-02 (ct)	3.06E-01 (bl)	1.20E-01 (rb)	1.36E-01 (rt)	1.31E-01 (rt)
Molybdenum	3.95E-03 (rt)	5.44E-02 (rt)	1.32E-02 (rt)	8.52E-03 (rt)	8.18E-03 (rt)
Nickel	3.25E-01 (ct)	4.59E+01 (bl)	2.90E+00 (rb)	3.25E+01 (dg)	2.05E+00 (rt)
Selenium	1.30E-02 (ct)	1.93E+00 (bl)	1.20E-01 (rb)	1.70E-02 (rt)	1.64E-02 (rt)
Silver	1.58E-02 (mo)	1.53E+01 (bl)	5.25E-02 (mo)	3.40E-02 (mo)	3.26E-02 (mo)
Thallium	4.54E-03 (rt)	6.26E-02 (rt)	1.51E-02 (rt)	9.79E-03 (rt)	9.40E-03 (rt)
Vanadium	3.25E-01 (ct)	4.39E+01 (bl)	5.80E-02 (rb)	2.77E-01 (rt)	2.66E-01 (rt)
Zinc	3.25E+00 (ct)	1.53E+02 (bl)	2.90E+01 (rb)	1.30E+00 (dg)	6.54E+01 (rt)
Cyanide	2.13E+00 (rt)	1.38E+01 (bl)	7.11E+00 (rt)	4.88E-01 (dg)	4.42E+00 (rt)
Acenaphthene	3.46E+00 (rt)	4.76E+01 (rt)	1.15E+01 (rt)	7.45E+00 (rt)	7.16E+00 (rt)
Acenaphthylene	3.46E+00 (rt)	4.76E+01 (rt)	1.15E+01 (rt)	7.45E+00 (rt)	7.16E+00 (rt)
Anthracene	8.71E+00 (mo)	1.20E+02 (mo)	2.90E+01 (mo)	1.88E+01 (mo)	1.80E+01 (mo)
Benzo(a)anthracene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.88E-01 (mo)	1.80E-01 (mo)
Benzo(b)fluoranthene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.88E-01 (mo)	1.80E-01 (mo)
Benzo(k)fluoranthene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.88E-01 (mo)	1.80E-01 (mo)
Benzo(ghi)perylene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.88E-01 (mo)	1.80E-01 (mo)
Benzo(g,h,i)perylene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.88E-01 (mo)	1.80E-01 (mo)
Benzo(a)pyrene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.88E-01 (mo)	1.80E-01 (mo)
beta-BHC	9.88E-01 (rt)	1.36E+01 (rt)	3.29E+00 (rt)	2.13E+00 (rt)	2.04E+00 (rt)
gamma-BHC	9.88E-01 (rt)	1.36E+01 (rt)	3.29E+00 (rt)	2.13E+00 (rt)	2.04E+00 (rt)
Bis(2-ethylhexyl)phthalate	4.89E-02 (gp)	2.30E+00 (bi)	1.63E-01 (gp)	1.05E-01 (gp)	1.01E-01 (gp)
Bis(2-chloroethyl)ether	NA	NA	NA	NA	NA
Butylbenzylphthalate	3.14E+00 (rt)	4.32E+01 (rt)	1.05E+01 (rt)	6.77E+00 (rt)	6.50E+00 (rt)
Carbazole	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.88E-01 (mo)	1.80E-01 (mo)
Chrysene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.88E-01 (mo)	1.80E-01 (mo)
Dibenzofuran	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.88E-01 (mo)	1.80E-01 (mo)
Dibenzo(a,h)anthracene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.88E-01 (mo)	1.80E-01 (mo)
Dibenz(a,h)anthracene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.88E-01 (mo)	1.80E-01 (mo)
Diethylphthalate	3.99E+02 (mo)	5.50E+03 (mo)	1.33E+03 (mo)	8.60E+02 (mo)	8.26E+02 (mo)
2,4-Dimethylphenol	4.36E-01 (mo)	6.00E+00 (mo)	1.45E+00 (mo)	9.39E-01 (mo)	9.01E-01 (mo)
Di-n-butylphthalate	2.47E+01 (rt)	2.28E-01 (bi)	8.23E+01 (rt)	5.32E+01 (rt)	5.11E+01 (rt)
Di-n-octylphthalate	3.46E+00 (rt)	4.76E+01 (bi)	1.15E+01 (rt)	7.45E+00 (rt)	7.16E+00 (rt)
2,4-Dinitrophenol	3.95E+00 (rt)	5.44E+01 (bi)	1.32E+01 (rt)	1.30E+00 (dg)	8.18E+00 (rt)
2,6-Dinitrotoluene	2.42E-01 (dg)	3.33E+00 (dg)	8.05E-01 (dg)	5.20E-01 (dg)	5.00E-01 (dg)
Fluoranthene	1.09E+00 (mo)	1.50E+01 (mo)	3.63E+00 (mo)	2.35E+00 (mo)	2.25E+00 (mo)
Fluorene	2.47E+00 (rt)	3.40E+01 (rt)	8.23E+00 (rt)	5.32E+00 (rt)	5.11E+00 (rt)
Indeno(1,2,3-cd)pyrene	8.71E-02 (mo)	1.20E+00 (mo)	2.90E-01 (mo)	1.88E-01 (mo)	1.80E-01 (mo)
2-Methylnaphthalene	8.10E+00 (rt)	1.12E+02 (rt)	2.70E+01 (rt)	1.75E+01 (rt)	1.68E+01 (rt)
Naphthalene	8.10E+00 (rt)	1.12E+02 (rt)	2.70E+01 (rt)	1.75E+01 (rt)	1.68E+01 (rt)
Nitrobenzene	4.94E-02 (rt)	6.80E-01 (rt)	1.65E-01 (rt)	1.06E-01 (rt)	1.02E-01 (rt)
N-Nitrosodiphenylamine	9.88E+00 (rt)	1.36E+02 (rt)	3.29E+01 (rt)	2.13E+01 (rt)	2.04E+01 (rt)
Phenanthrene	8.10E+00 (rt)	1.12E+02 (rt)	2.70E+01 (rt)	1.75E+01 (rt)	1.68E+01 (rt)
Phenol	1.19E+00 (rt)	1.63E+01 (rt)	3.95E+00 (rt)	2.55E+00 (rt)	2.45E+00 (rt)
Pyr	6.53E-01 (mo)	8.99E+00 (mo)	2.18E+00 (mo)	00 (mo)	1.35E+00 (mo)

REGION IV TERRESTRIAL REFERENCE VALUES
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Chemical	Whitetailed Deer (mg/kg/day)	Bobwhite Quail (mg/kg/day)	Eastern Cottontail (mg/kg/day)	Red Fox (mg/kg/day)	Racoon (mg/kg/day)
Aldrin	6.51E-01 (ct)	6.80E-02 (rt)	1.65E-02 (rt)	3.25E-02 (dg)	1.02E-02 (rt)
Alpha-chlordane	1.30E+00 (ct)	3.30E+00 (bi)	3.62E-02 (rt)	9.76E-02 (dg)	2.25E-02 (rt)
Gamma-chlordane	1.30E+00 (ct)	3.30E+00 (bi)	3.62E-02 (rt)	9.76E-02 (dg)	2.25E-02 (rt)
Dieldrin	6.51E-01 (ct)	1.16E-01 (bi)	3.29E-03 (rt)	6.51E-03 (dg)	2.04E-03 (rt)
4,4'-DDD	1.58E-01 (rt)	8.80E-02 (bi)	5.26E-01 (rt)	3.41E-01 (rt)	3.27E-01 (rt)
4,4'-DDE	1.58E-01 (rt)	8.80E-02 (bi)	5.26E-01 (rt)	3.41E-01 (rt)	3.27E-01 (rt)
4,4'-DDT	1.58E-01 (rt)	8.80E-02 (bi)	5.26E-01 (rt)	3.41E-01 (rt)	3.27E-01 (rt)
Endosulfan	1.19E-01 (rt)	2.84E+01 (bi)	3.95E-01 (rt)	7.42E-01 (dg)	2.45E-01 (rt)
Endosulfan II	1.19E-01 (rt)	2.84E+01 (bi)	3.95E-01 (rt)	7.42E-01 (dg)	2.45E-01 (rt)
Endosulfan sulfate	1.19E-01 (rt)	2.84E+01 (bi)	3.95E-01 (rt)	7.42E-01 (dg)	2.45E-01 (rt)
Endrin	4.94E-02 (rt)	1.16E+00 (bi)	1.65E-01 (rt)	3.25E-02 (dg)	1.02E-01 (rt)
Endrin aldehyde	4.94E-02 (rt)	1.16E+00 (bi)	1.65E-01 (rt)	3.25E-02 (dg)	1.02E-01 (rt)
Endrin ketone	4.94E-02 (rt)	1.16E+00 (bi)	1.65E-01 (rt)	3.25E-02 (dg)	1.02E-01 (rt)
Heptachlor	2.96E-02 (rt)	4.08E-01 (rt)	9.87E-02 (rt)	6.39E-02 (rt)	6.13E-02 (rt)
Heptachlor epoxide	7.55E-05 (dg)	1.04E-03 (dg)	2.51E-04 (dg)	1.63E-04 (dg)	1.56E-04 (dg)
Aroclor-1221	6.91E-01 (rt)	9.52E+00 (rt)	2.30E+00 (rt)	1.49E+00 (rt)	1.43E+00 (rt)
Aroclor-1232	2.96E-02 (rt)	8.95E-01 (bi)	9.87E-02 (rt)	6.39E-02 (rt)	6.13E-02 (rt)
Aroclor-1260	9.88E-04 (rt)	1.36E-02 (rt)	3.29E-03 (rt)	2.13E-03 (rt)	2.04E-03 (rt)
Aroclor-1254	2.80E-02 (mk)	6.95E-01 (bi)	1.00E+00 (rb)	6.47E-01 (rb)	6.21E-01 (rb)
Aroclor-1248	1.13E-02 (mo)	1.56E-01 (mo)	2.80E-01 (rb)	1.81E-01 (rb)	2.34E-02 (mo)
Methylene chloride	1.16E+00 (rt)	1.59E+01 (rt)	3.85E+00 (rt)	2.49E+00 (rt)	2.39E+00 (rt)
Carbon disulfide	3.30E-01 (rb)	4.55E+00 (rb)	1.10E+00 (rb)	7.12E-01 (rb)	6.84E-01 (rb)
1,1-Dichloroethene	5.53E+00 (rt)	7.61E+01 (rt)	1.84E+01 (rt)	1.19E+01 (rt)	1.14E+01 (rt)
1,2-Dichloroethene (total)	9.88E-01 (rt)	1.36E+01 (rt)	3.29E+00 (rt)	2.13E+00 (rt)	2.04E+00 (rt)
Chloroform	7.51E+00 (rt)	1.03E+02 (rt)	2.50E+01 (rt)	3.90E+01 (dg)	1.55E+01 (rt)
2-Butanone	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	8.71E+01 (rt)	1.20E+03 (rt)	2.90E+02 (rt)	1.88E+02 (rt)	1.80E+02 (rt)
Trichloroethene	1.98E+01 (rt)	2.72E+02 (rt)	6.58E+01 (rt)	4.26E+01 (rt)	4.09E+01 (rt)
1,1,2-Trichloroethane	3.40E-02 (mo)	4.68E-01 (mo)	1.13E-01 (mo)	7.32E-02 (mo)	7.03E-02 (mo)
Benzene	1.98E-02 (rt)	2.72E-01 (rt)	6.58E-02 (rt)	4.26E-02 (rt)	4.09E-02 (rt)
1,1,2,2-Tetrachloroethane	1.50E+01 (rt)	2.07E+02 (rt)	5.00E+01 (rt)	3.24E+01 (rt)	3.11E+01 (rt)
Tetrachloroethene	2.77E-01 (rt)	3.81E+00 (rt)	9.21E-01 (rt)	5.96E-01 (rt)	5.72E-01 (rt)
Toluene	4.41E+00 (rt)	6.06E+01 (rt)	1.47E+01 (rt)	9.49E+00 (rt)	9.12E+00 (rt)
Ethylbenzene	1.92E+00 (rt)	2.64E+01 (rt)	6.39E+00 (rt)	4.13E+00 (rt)	3.97E+00 (rt)
Xylenes	3.54E+01 (rt)	4.87E+02 (rt)	1.18E+02 (rt)	7.62E+01 (rt)	7.32E+01 (rt)
Xylenes (total)	3.54E+01 (rt)	4.87E+02 (rt)	1.18E+02 (rt)	7.62E+01 (rt)	7.32E+01 (rt)
Vinyl chloride	3.36E-02 (rt)	4.62E-01 (rt)	1.12E-01 (rt)	7.24E-02 (rt)	6.95E-02 (rt)
Acetone	1.98E+00 (rt)	2.72E+01 (rt)	6.58E+00 (rt)	4.26E+00 (rt)	4.09E+00 (rt)
2-Hexanone	NA	NA	NA	NA	NA

Note: The following abbreviations indicate which species was used to develop the Terrestrial Reference Value

(ct) = cattle	(rb) = rabbit
(rt) = rat	(dg) = dog
(bi) = bird	(mo) = mouse
(gp) = guinea pig	(mk) = mink

NA - No Data Available

EQUATIONS USED TO CALCULATE EXPOSURE FOR THE RED FOX
SITE 65, ENGINEERING DUMP AREA
REMEDIAL INVESTIGATION, CTO-312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Food Source ingestion of:	Feeding Rate (I in kg/d)	Incidental Soil Ingestion (Is in kg/d)	Rate of Drinking Water Ingestion (Iw in l/d)	Rate of Worm Ingestion (Iwo in kg/d)	Rate of Fruit Ingestion (Ifr in kg/d)	Rate of Mammal Ingestion (Im in kg/d)	Rate of Vegetation Ingestion (Iv in kg/d)	Body Weight (BW) (kg)	Home Range Size (acres)	Contaminated Area (acres)	H Ratio	Equation Used to Calculate Total Exposure E=total exposure Cw = Constituent concentration in water Iw = Ingestion of water Cm = Constituent concentration in small mammal Im = Ingestion of small mammal Cs = Constituent concentration in soil Bv = Vegetation biotransfer factor Iv = Ingestion of vegetation Is = Incidential ingestion of soil H = Ratio of home range area to site area Bb = Tissue biotransfer factor BW = Body weight
Vegetation (Iv) = 20 percent Small mammals (Im) = 80 percent												
Parameters (Red Fox)	6.009E-01	1.682E-02	3.855E-01	NA	NA	4.807E-01	1.202E-01	4.535E+00	1.245E+03	2.600E+01	2.088E-02	$E=\frac{(Cw)(Iw)+[(cm)(Im)+(Cs)(Bv)(Iv)+(Cs)(Is)][H]}{BW}$
Parameters (Small Mammal)	1.120E-01	2.690E-03	6.520E-02	NA	NA	NA	1.120E-01	3.725E-01	3.200E-02	1.000E+00	1.000E+00	$Cm=\frac{[(Cw)(Iw)+((Cs)(Bv)(Iv)+(Cs)(Is))(H)][Bb]}{BW}$

Constituent of Concern	Soil to Plant Transfer Coefficient (Bv)	Constituent Concentration in Water (mg/L) (Cw)	Constituent Concentration in Soil (mg/kg) (Cs)	Constituent Concentration in Worms (mg/kg) (Cwo)	Ingestion-to-tissue Biotransfer Factor (Bb)	Constituent Concentration in Mammals (mg/kg) (Cm)	Total Exposure (mg/kg/d) (E)	Terrestrial Reference Value (mg/kg/day) (TRV)	Quotient Ratio (= E/TRV)
Acetone	5.330E+01	0.005	6.70E-03	NA	1.45E-08	1.57E-09	6.23E-04	4.26E+00	1.46E-04
2-Butanone	3.731E+01	ND	ND	NA	2.68E-08	0.00E+00	0.00E+00	NA	NA
Ethylbenzene	6.255E-01	ND	1.00E-03	NA	3.16E-05	6.18E-09	4.23E-07	4.13E+00	1.02E-07
Methylene Chloride	6.864E+00	ND	2.00E-03	NA	5.01E-07	2.08E-09	7.75E-06	2.49E+00	NA
Toluene	9.324E-01	ND	2.00E-03	NA	1.58E-05	9.12E-09	1.19E-06	9.49E+00	1.25E-07
Trichloroethene	1.065E+00	ND	1.00E-03	NA	1.26E-05	4.12E-09	6.67E-07	4.26E+01	1.57E-08
Xylenes (total)	5.475E-01	ND	5.00E-03	NA	3.98E-05	3.42E-08	1.90E-06	7.62E+01	2.50E-08
Acenaphthene	2.464E-01	ND	1.30E-01	NA	1.58E-04	1.68E-06	2.78E-05	7.45E+00	3.73E-06
Anthracene	8.496E-02	ND	1.90E-01	NA	1.00E-03	6.23E-06	2.37E-05	1.88E+01	1.26E-06
Benzo(a)anthracene	1.965E-02	ND	2.56E-01	NA	1.26E-02	4.23E-05	2.27E-05	1.88E-01	1.21E-04
Benzo(a)pyrene	1.154E-02	ND	2.30E-01	NA	3.16E-02	7.79E-05	1.95E-05	1.88E-01	1.04E-04
Benzo(b)fluoranthene	5.932E-03	ND	2.28E-01	NA	1.00E-01	2.06E-04	1.89E-05	1.88E-01	1.01E-04
Benzo(g,h,i)perylene	5.193E-03	ND	2.17E-01	NA	1.26E-01	2.40E-04	1.80E-05	1.88E-01	9.58E-05
Benzo(k)fluoranthene	1.010E-02	ND	2.46E-01	NA	3.98E-02	1.01E-04	2.07E-05	1.88E-01	1.10E-04
Bis(2-ethylhexyl)phthalate	2.337E-03	ND	8.70E-02	NA	5.01E-01	3.46E-04	7.62E-06	1.05E-01	7.23E-05
Carbazole	5.500E-01	ND	1.80E-01	NA	1.00E-04	3.11E-06	6.87E-05	1.88E-01	3.66E-04
Chrysene	1.965E-02	ND	2.52E-01	NA	1.26E-02	4.17E-05	2.24E-05	1.88E-01	1.19E-04
Dibenz(a,h)anthracene	5.193E-03	ND	1.50E-01	NA	1.26E-01	1.66E-04	1.24E-05	1.88E-01	6.61E-05
Dibenzofuran	5.500E-01	ND	5.80E-02	NA	3.98E-04	3.99E-06	2.21E-05	1.88E-01	1.18E-04
Di-n-butylphthalate	8.496E-02	ND	2.35E-01	NA	1.00E-03	7.70E-06	2.93E-05	5.32E+01	5.50E-07
2,4-Dinitrophenol	*4.605E+00*	*ND*	1.50E-01	*NA*	*1.00E-06*	*2.09E-07*	*3.94E-04*	*8.52E+00*	*4.62E-05*
Fluoranthene	4.426E-02	ND	2.95E-01	NA	3.09E-03	1.67E-05	3.02E-05	2.35E+00	1.28E-05
Fluorene	1.447E-01	ND	1.00E-01	NA	3.98E-04	2.02E-06	1.58E-05	5.32E+00	2.96E-06
Indeno(1,2,3-cd)pyrene	*5.193E-03*	*ND*	*2.20E-01*	*NA*	*1.26E-01*	*2.43E-04*	*1.82E-05*	*1.88E-01*	*9.68E-05*
Phenanthrene	8.496E-02	ND	3.30E-01	NA	1.00E-03	1.08E-05	4.11E-05	1.75E+01	2.35E-06
Pyrene	4.367E-02	ND	3.04E-01	NA	3.16E-03	1.96E-05	3.09E-05	1.41E+00	2.20E-05
4,4'-DDD	1.154E-02	ND	5.45E-02	NA	3.16E-02	1.84E-05	4.61E-06	3.41E-01	1.35E-05
4,4'-DDE	4.546E-03	ND	8.30E-02	NA	1.58E-01	1.13E-04	6.89E-06	3.41E-01	2.02E-05
4,4'-DDT	6.776E-03	ND	5.60E-02	NA	7.94E-02	4.12E-05	4.64E-06	3.41E-01	1.36E-05
Endosulfan II	1.653E-01	ND	2.54E-03	NA	3.16E-04	4.57E-08	4.29E-07	7.42E-01	5.79E-07
Heptachlor epoxide	4.989E-02	ND	1.22E-03	NA	2.51E-03	6.81E-08	1.28E-07	1.63E-04	7.89E-04
Aroclor-1260	1.318E-02	ND	2.47E-02	NA	2.51E-02	6.95E-06	2.11E-06	2.13E-03	9.91E-04
Aluminum	4.000E-03	25.8	4.02E+03	NA	1.50E-03	5.76E-02	2.51E+00	1.95E+01	1.29E-01
Antimony	2.000E-01	ND	ND	NA	1.00E-03	0.00E+00	0.00E+00	1.49E-02	0.00E+00
Arsenic	4.000E-02	ND	ND	NA	2.00E-03	0.00E+00	0.00E+00	2.37E-02	0.00E+00
Barium	1.500E-01	0.0693	1.87E+01	NA	1.50E-04	1.48E-04	8.88E-03	1.07E-01	8.34E-02
Beryllium	1.000E-02	ND	ND	NA	1.00E-03	0.00E+00	0.00E+00	2.30E-01	0.00E+00
Chromium	7.500E-03	0.0276	6.48E+00	NA	5.50E-03	3.64E-04	2.88E-03	1.03E+00	2.80E-03
Copper	4.000E-01	0.0411	5.56E+01	NA	1.00E-02	7.10E-02	2.03E-02	7.80E+00	2.60E-03
Iron	4.000E-03	7.89	7.57E+03	NA	2.00E-02	1.30E+00	1.28E+00	1.88E+01	6.79E-02
Lead	4.500E-02	0.0458	1.78E+02	NA	3.00E-04	1.11E-03	2.21E-02	3.41E+00	6.49E-03
Manganese	2.500E-01	0.0884	1.11E+02	NA	4.00E-04	3.68E-03	3.16E-02	3.75E+00	8.42E-03
Mercury	9.000E-01	ND	ND	NA	2.50E-01	0.00E+00	0.00E+00	1.36E-01	0.00E+00
Nickel	6.000E-02	ND	3.28E+00	NA	6.00E-03	4.97E-04	3.64E-04	3.25E+01	1.12E-05
Selenium	2.500E-02	ND	ND	NA	1.50E-02	0.00E+00	0.00E+00	1.70E-02	0.00E+00
Thallium	4.000E-03	ND	1.38E+00	NA	4.00E-02	4.65E-04	1.11E-04	9.79E-03	1.13E-02
Vanadium	5.500E-03	0.0262	7.21E+00	NA	2.50E-03	1.71E-04	2.81E-03	2.77E-01	1.01E-02
Zinc	1.500E+00	0.144	3.77E+02	NA	1.00E-01	1.73E+01	3.93E-01	1.30E+00	3.02E-01 6.27E-01

ND - Not Det
NA - Not Appl.

EQUATIONS U[illegible] CALCULATE EXPOSURE FOR THE RACCOON
SITE 65, ENGII[illegible] DUMP AREA
REMEDIAL INVE[illegible]ATION, CTO-312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Food Source Ingestion of: Fruit (Ifr) = 40 percent Fish (If) = 60 percent	Feeding Rate (I in kg/d)	Incidental Soil Ingestion (Is in kg/d)	Rate of Drinking Water Ingestion (Iw in l/d)	Rate of Worm Ingestion (Iwo in kg/d)	Rate of Fruit Ingestion (Ifr in kg/d)	Rate of Fish Ingestion (If in kg/d)	Rate of Vegetation Ingestion (Iv in kg/d)	Body Weight (BW) (kg)	Home Range Size (acres)	Contaminated Area (acres)	H Ratio	Equation Used to Calculate Total Exposure E=total exposure Cw = Constituent concentration in water Iw = Ingestion of water Cf = Constituent concentration in fish If = Ingestion of fish Cs = Constituent concentration in soil Br = Vegetation biotransfer factor (fruit) Ifr = Ingestion of fruit Is = Incidential ingestion of soil H = Ratio of home range area to site area BW = Body weight
Parameters	2.143E-01	2.014E-02	4.224E-01	NA	8.571E-02	1.286E-01	NA	5.120E+00	2.570E+02	2.600E+01	1.012E-01	$E=\frac{(Cw)(Iw) + (Cf)(If) + [(Cs)(Br)(Ifr) + (Cs)(Is)] [}{BW}$

Constituent of Concern	Soil to Plant Transfer Coefficient (fruit) (Br)	Constituent Concentration in Water (mg/L) (Cw)	Constituent Concentration in Soil (mg/kg) (Cs)	Constituent Concentration in Worms (mg/kg) (Cwo)	Fish Bioconcentration Factor (BCF)	Constituent Concentration in Fishes (mg/kg) (Cf)	Total Exposure (mg/kg/d) (E)	Terrestrial Reference Value (mg/kg/day) (TRV)	Quotient Ratio (= E/TRV)
Acetone	5.330E+01	0.005	6.70E-03	NA	0.690	1.40E+03	3.52E+01	4.09E+00	8.60E+00
2-Butanone	3.731E+01	ND	ND	NA	ND	5.60E-01	1.41E-02	NA	NA
Ethylbenzene	6.255E-01	ND	1.00E-03	NA	37.500	ND	1.46E-06	3.97E+00	3.67E-07
Methylene Chloride	6.864E+00	ND	2.00E-03	NA	0.900	ND	2.40E-05	2.39E+00	NA
Toluene	9.324E-01	ND	2.00E-03	NA	10.700	5.00E+00	1.26E-01	9.12E+00	1.38E-02
Trichloroethene	1.065E+00	ND	1.00E-03	NA	10.600	ND	2.20E-06	4.09E+01	5.39E-08
Xylenes (total)	5.475E-01	ND	5.00E-03	NA	2.200	ND	6.63E-06	7.32E+01	9.05E-08
Acenaphthene	2.464E-01	ND	1.30E-01	NA	242.000	ND	1.06E-04	7.16E+00	1.48E-05
Anthracene	8.496E-02	ND	1.90E-01	NA	30.000	ND	1.03E-04	1.80E+01	5.71E-06
Benzo(a)anthracene	1.965E-02	ND	2.56E-01	NA	30.000	ND	1.10E-04	1.80E-01	6.11E-04
Benzo(a)pyrene	1.154E-02	ND	2.30E-01	NA	30.000	ND	9.62E-05	1.80E-01	5.34E-04
Benzo(b)fluoranthene	5.932E-03	ND	2.28E-01	NA	30.000	ND	9.32E-05	1.80E-01	5.17E-04
Benzo(g,h,i)perylene	5.193E-03	ND	2.17E-01	NA	30.000	ND	8.84E-05	1.80E-01	4.90E-04
Benzo(k)fluoranthene	1.010E-02	ND	2.46E-01	NA	30.000	ND	1.02E-04	1.80E-01	5.67E-04
Bis(2-ethylhexyl)phthalate	2.337E-03	ND	8.70E-02	NA	130.000	ND	3.50E-05	1.01E-01	3.46E-04
Carbazole	5.500E-01	ND	1.80E-01	NA	ND	ND	2.39E-04	1.80E-01	1.33E-03
Chrysene	1.965E-02	ND	2.52E-01	NA	30.000	ND	1.09E-04	1.80E-01	6.03E-04
Dibenz(a,h)anthracene	5.193E-03	ND	1.60E-01	NA	30.000	ND	6.10E-05	1.80E-01	3.38E-04
Dibenzofuran	5.500E-01	ND	5.80E-02	NA	ND	ND	7.71E-05	1.80E-01	4.28E-04
Di-n-butylphthalate	8.496E-02	ND	2.35E-01	NA	89.000	ND	1.27E-04	5.11E+01	2.49E-06
2,4-Dinitrophenol	4.605E+00	ND	1.50E-01	NA	1.500	ND	1.23E-03	8.18E+00	1.50E-04
Fluoranthene	4.426E-02	ND	2.95E-01	NA	1150.000	ND	1.40E-04	2.25E+00	6.20E-05
Fluorene	1.447E-01	ND	1.00E-01	NA	30.000	ND	6.43E-05	5.11E+00	1.26E-05
Indeno(1,2,3-cd)pyrene	5.193E-03	ND	2.20E-01	NA	30.000	ND	8.93E-05	1.80E-01	4.96E-04
Phenanthrene	8.496E-02	ND	3.30E-01	NA	30.000	ND	1.79E-04	1.68E+01	1.07E-05
Pyrene	4.367E-02	ND	3.04E-01	NA	30.000	ND	1.44E-04	1.35E+00	1.06E-04
4,4'-DDD	1.154E-02	ND	5.45E-02	NA	53600.000	4.00E-02	1.03E-03	3.27E-01	3.14E-03
4,4'-DDE	4.546E-03	ND	8.30E-02	NA	53600.000	1.45E-02	3.98E-04	3.27E-01	1.22E-03
4,4'-DDT	6.776E-03	ND	5.60E-02	NA	53600.000	ND	2.29E-05	3.27E-01	7.01E-05
Endosulfan II	1.653E-01	ND	2.54E-03	NA	270.000	ND	1.72E-06	2.45E-01	7.02E-06
Heptachlor epoxide	4.989E-02	ND	1.22E-03	NA	11200.000	ND	5.89E-07	1.56E-04	3.77E-03
Aroclor-1260	1.318E-02	ND	2.47E-02	NA	31200.000	ND	1.04E-05	2.04E-03	5.08E-03
Aluminum	6.500E-04	25.8	4.02E+03	NA	231.000	1.88E+01	4.21E+00	3.48E-01	1.21E+01
Antimony	3.000E-02	ND	ND	NA	1.000	1.50E+00	3.77E-02	1.43E-02	2.63E+00
Arsenic	6.000E-03	ND	ND	NA	44.000	1.50E-01	3.77E-03	2.27E-02	1.66E-01
Barium	1.500E-02	0.0693	1.87E+01	NA	8.000	2.90E+00	8.64E-02	1.02E-01	8.45E-01
Beryllium	1.500E-03	ND	ND	NA	19.000	2.80E-02	7.03E-04	2.21E-01	3.18E-03
Chromium	4.500E-03	0.0276	6.48E+00	NA	16.000	ND	4.91E-03	9.86E-01	4.97E-03
Copper	2.500E-01	0.0411	5.56E+01	NA	36.000	8.60E+00	2.65E-01	7.49E+00	3.54E-02
Iron	1.000E-03	7.89	7.57E+03	NA	ND	2.61E+01	4.33E+00	1.80E+01	2.40E-01
Lead	9.000E-03	0.0458	1.78E+02	NA	49.000	4.90E-01	8.96E-02	3.27E+00	2.74E-02
Manganese	5.000E-02	0.0884	1.11E+02	NA	35.000	4.90E+00	1.84E-01	3.60E+00	5.11E-02
Mercury	2.000E-01	ND	ND	NA	5500.000	1.10E-01	2.76E-03	1.31E-01	2.11E-02
Nickel	6.000E-02	ND	3.28E+00	NA	47.000	ND	1.64E-03	2.05E+00	8.01E-04
Selenium	2.500E-02	ND	ND	NA	6.000	4.20E-01	1.05E-02	1.64E-02	6.44E-01
Thallium	4.000E-04	ND	1.38E+00	NA	119.000	4.00E-02	1.55E-03	9.40E-03	1.65E-01
Vanadium	3.000E-03	0.0262	7.21E+00	NA	ND	ND	5.07E-03	2.66E-01	1.91E-02
Zinc	9.000E-01	0.144	3.77E+02	NA	47.000	2.90E-01	7.44E-01	6.54E+01	1.14E-02
									2.56E+01

ND - Not Detected
NA - Not Applicable

EQUATIONS USED TO CALCULATE EXPOSURE FOR THE BOBWHITE QUAIL
SITE 65, ENGINEERING DUMP AREA
REMEDIAL INVESTIGATION, CTO-312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Food Source ingestion of: Vegetation(Iv) = 100 percent	Feeding Rate (I in kg/d)	Incidental Soil Ingestion (Is in kg/d)	Rate of Drinking Water Ingestion (Iw in l/d)	Rate of Worm Ingestion (Iwo in kg/d)	Rate of Fruit Ingestion (Ifr in kg/d)	Rate of Mammal Ingestion (Im in kg/d)	Rate of Vegetation Ingestion (Iv in kg/d)	Body Weight (BW) (kg)	Home Range Size (acres)	Contaminated Area (acres)	H Ratio	Equation Used to Calculate Total Exposur E=total exposure Cw=constituent conc. in water Cs=constituent conc. in soil *Cwo=constituent conc. in worms* Cfr=constituent conc. in fruit H=ratio of home range area to site area
Parameters	1.350E-02	1.107E-03	1.910E-02	NA	NA	NA	1.350E-02	1.736E-01	2.624E+01	2.600E+01	9.908E-01	$E=\frac{(Cw)(Iw)+[(Cs)(Bv)(Iv)+(Cs)(Is)][H]}{BW}$

Constituent of Concern	Soil to Plant Transfer Coefficient (Bv)	Constituent Concentration in Water (mg/L) (Cw)	Constituent Concentration in Soil (mg/kg) (Cs)	Constituent Concentration in Worms (mg/kg) (Cwo)	Constituent Concentration in Fruit (mg/kg) (Cfr)	Constituent Concentration in Mammals (mg/kg) (Cm)	Total Exposure (mg/kg/d) (E)	Terrestrial Reference Value (mg/kg/day) (TRV)	Quotient Ratio (= E/TRV)
Acetone	5.330E+01	0.005	6.70E-03	NA	NA	NA	0.028	1.26E+01	2.23E-03
2-Butanone	3.731E+01	ND	ND	NA	NA	NA	0.000	NA	NA
Ethylbenzene	6.255E-01	ND	1.00E-03	NA	NA	NA	0.000	1.23E+01	4.45E-06
Methylene Chloride	6.864E+00	ND	2.00E-03	NA	NA	NA	0.001	7.38E+00	NA
Toluene	9.324E-01	ND	2.00E-03	NA	NA	NA	0.000	2.81E+01	5.55E-06
Trichloroethene	1.065E+00	ND	1.00E-03	NA	NA	NA	0.000	1.26E+02	7.00E-07
Xylenes (total)	5.475E-01	ND	5.00E-03	NA	NA	NA	0.000	2.26E+02	1.07E-06
Acenaphthene	2.464E-01	ND	1.30E-01	NA	NA	NA	0.003	2.21E+01	1.49E-04
Anthracene	8.496E-02	ND	1.90E-01	NA	NA	NA	0.002	5.57E+01	4.39E-05
Benzo(a)anthracene	1.965E-02	ND	2.56E-01	NA	NA	NA	0.002	5.57E-01	3.60E-03
Benzo(a)pyrene	1.154E-02	ND	2.30E-01	NA	NA	NA	0.002	5.57E-01	2.98E-03
Benzo(b)fluoranthene	5.932E-03	ND	2.28E-01	NA	NA	NA	0.002	5.57E-01	2.78E-03
Benzo(g,h,i)perylene	5.193E-03	ND	2.17E-01	NA	NA	NA	0.001	5.57E-01	2.62E-03
Benzo(k)fluoranthene	1.010E-02	ND	2.46E-01	NA	NA	NA	0.002	5.57E-01	3.14E-03
Bis(2-ethylhexyl)phthalate	2.337E-03	ND	8.70E-02	NA	NA	NA	0.001	1.07E+00	5.29E-04
Carbazole	5.500E-01	ND	1.80E-01	NA	NA	NA	0.009	5.57E-01	1.57E-02
Chrysene	1.965E-02	ND	2.52E-01	NA	NA	NA	0.002	5.57E-01	3.55E-03
Dibenz(a,h)anthracene	5.193E-03	ND	1.50E-01	NA	NA	NA	0.001	5.57E-01	1.81E-03
Dibenzofuran	5.500E-01	ND	5.80E-02	NA	NA	NA	0.003	5.57E-01	5.07E-03
Di-n-butylphthalate	8.496E-02	ND	2.35E-01	NA	NA	NA	0.003	1.06E-01	2.86E-02
2,4-Dinitrophenol	4.605E+00	ND	1.50E-01	NA	NA	NA	0.054	1.44E+01	3.75E-03
Fluoranthene	4.426E-02	ND	2.95E-01	NA	NA	NA	0.003	6.96E+00	4.13E-04
Fluorene	1.447E-01	ND	1.00E-01	NA	NA	NA	0.002	1.58E+01	1.11E-04
Indeno(1,2,3-cd)pyrene	5.193E-03	ND	2.20E-01	NA	NA	NA	0.001	5.57E-01	2.65E-03
Phenanthrene	8.496E-02	ND	3.30E-01	NA	NA	NA	0.004	5.18E+01	8.20E-05
Pyrene	4.367E-02	ND	3.04E-01	NA	NA	NA	0.003	4.17E+00	7.05E-04
4,4'-DDD	1.154E-02	ND	5.45E-02	NA	NA	NA	0.000	8.80E-02	4.46E-03
4,4'-DDE	4.546E-03	ND	8.30E-02	NA	NA	NA	0.001	8.80E-02	6.29E-03
4,4'-DDT	6.776E-03	ND	5.60E-02	NA	NA	NA	0.000	8.80E-02	4.35E-03
Endosulfan II	1.653E-01	ND	2.54E-03	NA	NA	NA	0.000	1.32E+01	3.67E-06
Heptachlor epoxide	4.989E-02	ND	1.22E-03	NA	NA	NA	0.000	4.82E-04	2.57E-02
Aroclor-1260	1.318E-02	ND	2.47E-02	NA	NA	NA	0.000	6.31E-03	2.87E-02
Aluminum	4.000E-03	25.8	4.02E+03	NA	NA	NA	29.488	1.42E+01	2.07E+00
Antimony	2.000E-01	ND	ND	NA	NA	NA	0.000	4.42E-02	0.00E+00
Arsenic	4.000E-02	ND	ND	NA	NA	NA	0.000	9.19E+00	0.00E+00
Barium	1.500E-01	0.0693	1.87E+01	NA	NA	NA	0.341	1.42E+00	2.40E-01
Beryllium	1.000E-02	ND	ND	NA	NA	NA	0.000	6.82E-01	0.00E+00
Chromium	7.500E-03	0.0276	6.48E+00	NA	NA	NA	0.048	7.11E+01	6.71E-04
Copper	4.000E-01	0.0411	5.56E+01	NA	NA	NA	2.069	2.13E+01	9.71E-02
Iron	4.000E-03	7.89	7.57E+03	NA	NA	NA	51.000	7.11E+01	7.18E-01
Lead	4.500E-02	0.0458	1.76E+02	NA	NA	NA	1.746	3.49E+00	5.00E-01
Manganese	2.500E-01	0.0884	1.11E+02	NA	NA	NA	2.861	1.42E+02	2.01E-02
Mercury	9.000E-01	ND	ND	NA	NA	NA	0.000	1.42E-01	0.00E+00
Nickel	6.000E-02	ND	3.28E+00	NA	NA	NA	0.036	2.13E+01	1.68E-03
Selenium	2.500E-02	ND	ND	NA	NA	NA	0.000	8.95E-01	0.00E+00
Thallium	4.000E-03	ND	1.38E+00	NA	NA	NA	0.009	2.90E-02	3.15E-01
Vanadium	5.500E-03	0.0262	7.21E+00	NA	NA	NA	0.051	2.04E+01	2.53E-03
Zinc	1.500E+00	0.144	3.77E+02	NA	NA	NA	45.959	7.11E+01	6.47E-01
									4.77E+00

ND - Not Det
NA - Not App

EQUATIONS TO CALCULATE EXPOSURE FOR THE EASTERN COTTONTAIL RABBIT
SITE 65, EN NG DUMP AREA
REMEDIAL IN GATION, CTO-312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Food Source ingestion of: Vegetation(Iv) = 100 percent	Feeding Rate (I in kg/d)	Incidental Soil Ingestion (Is in kg/d)	Rate of Drinking Water Ingestion (Iw in l/d)	Rate of Worm Ingestion (Iwo in kg/d)	Rate of Fruit Ingestion (Ifr in kg/d)	Rate of Mammal Ingestion (Im in kg/d)	Rate of Vegetation Ingestion (Iv in kg/d)	Body Weight (BW) (kg)	Home Range Size (acres)	Contaminated Area (acres)	H Ratio	Equation Used to Calculate Total Exposure E = Total exposure Cw = Constituent concentration in water Iw = Ingestion of water Cs = Constituent concentration in soil Bv = Vegetation biotransfer factor Iv = Ingestion of vegetation Is = Incidential ingestion of soil H = Ratio of home range area to site area BW = Body weight
Parameters	2.370E-01	5.688E-03	1.192E-01	NA	NA	NA	2.370E-01	1.229E+00	9.297E+00	2.600E+01	1.000E+00	$E=\frac{(Cw)(Iw) + [(Cs)(Bv)(Iv) + (Cs)(Is)] [H]}{BW}$

Constituent of Concern	Soil to Plant Transfer Coefficient (Bv)	Constituent Concentration in Water (mg/L) (Cw)	Constituent Concentration in Soil (mg/kg) (Cs)	Constituent Concentration in Worms (mg/kg) (Cwo)	Constituent Concentration in Fruit (mg/kg) (Cfr)	Constituent Concentration in Mammals (mg/kg) (Cm)	Total Exposure (mg/kg/d) (E)	Terrestrial Reference Value (mg/kg/day) (TRV)	Quotient Ratio (= E/TRV)
Acetone	5.330E+01	0.005	6.70E-03	NA	NA	NA	6.94E-02	6.58E+00	1.05E-02
2-Butanone	3.731E+01	ND	ND	NA	NA	NA	0.00E+00	NA	NA
Ethylbenzene	6.255E-01	ND	1.00E-03	NA	NA	NA	1.25E-04	6.39E+00	1.96E-05
Methylene Chloride	6.864E+00	ND	2.00E-03	NA	NA	NA	2.66E-03	3.85E+00	NA
Toluene	9.324E-01	ND	2.00E-03	NA	NA	NA	3.68E-04	1.47E+01	2.51E-05
Trichloroethene	1.065E+00	ND	1.00E-03	NA	NA	NA	2.10E-04	6.58E+01	3.19E-06
Xylenes (total)	5.475E-01	ND	5.00E-03	NA	NA	NA	5.51E-04	1.18E+02	4.68E-06
Acenaphthene	2.464E-01	ND	1.30E-01	NA	NA	NA	6.78E-03	1.15E+01	5.89E-04
Anthracene	8.496E-02	ND	1.90E-01	NA	NA	NA	3.99E-03	2.90E+01	1.38E-04
Benzo(a)anthracene	1.965E-02	ND	2.56E-01	NA	NA	NA	2.15E-03	2.90E-01	7.42E-03
Benzo(a)pyrene	1.154E-02	ND	2.30E-01	NA	NA	NA	1.58E-03	2.90E-01	5.45E-03
Benzo(b)fluoranthene	5.932E-03	ND	2.28E-01	NA	NA	NA	1.32E-03	2.90E-01	4.55E-03
Benzo(g,h,i)perylene	5.193E-03	ND	2.17E-01	NA	NA	NA	1.22E-03	2.90E-01	4.22E-03
Benzo(k)fluoranthene	1.010E-02	ND	2.46E-01	NA	NA	NA	1.62E-03	2.90E-01	5.59E-03
Bis(2-ethylhexyl)phthalate	2.337E-03	ND	8.70E-02	NA	NA	NA	4.42E-04	1.63E-01	2.72E-03
Carbazole	5.500E-01	ND	1.80E-01	NA	NA	NA	1.99E-02	2.90E-01	6.87E-02
Chrysene	1.965E-02	ND	2.52E-01	NA	NA	NA	2.12E-03	2.90E-01	7.31E-03
Dibenz(a,h)anthracene	5.193E-03	ND	1.50E-01	NA	NA	NA	8.45E-04	2.90E-01	2.91E-03
Dibenzofuran	5.500E-01	ND	5.80E-02	NA	NA	NA	6.42E-03	2.90E-01	2.21E-02
Di-n-butylphthalate	8.496E-02	ND	2.35E-01	NA	NA	NA	4.94E-03	8.23E+01	6.01E-05
2,4-Dinitrophenol	4.605E+00	ND	1.50E-01	NA	NA	NA	1.34E-01	1.32E+01	1.02E-02
Fluoranthene	4.426E-02	ND	2.95E-01	NA	NA	NA	3.89E-03	3.63E+00	1.07E-03
Fluorene	1.447E-01	ND	1.00E-01	NA	NA	NA	3.25E-03	8.23E+00	3.96E-04
Indeno(1,2,3-cd)pyrene	5.193E-03	ND	2.20E-01	NA	NA	NA	1.24E-03	2.90E-01	4.26E-03
Phenanthrene	8.496E-02	ND	3.30E-01	NA	NA	NA	6.94E-03	2.70E+01	2.57E-04
Pyrene	4.367E-02	ND	3.04E-01	NA	NA	NA	3.97E-03	2.18E+00	1.82E-03
4,4'-DDD	1.154E-02	ND	5.45E-02	NA	NA	NA	3.74E-04	5.26E-01	7.10E-04
4,4'-DDE	4.546E-03	ND	8.30E-02	NA	NA	NA	4.57E-04	5.26E-01	8.68E-04
4,4'-DDT	6.776E-03	ND	5.60E-02	NA	NA	NA	3.32E-04	5.26E-01	6.32E-04
Endosulfan II	1.653E-01	ND	2.54E-03	NA	NA	NA	9.27E-05	3.95E-01	2.35E-04
Heptachlor epoxide	4.989E-02	ND	1.22E-03	NA	NA	NA	1.74E-05	2.51E-04	6.92E-02
Aroclor-1260	1.318E-02	ND	2.47E-02	NA	NA	NA	1.77E-04	3.29E-03	5.39E-02
Aluminum	4.000E-03	25.8	4.02E+03	NA	NA	NA	2.42E+01	1.16E+01	2.09E+00
Antimony	2.000E-01	ND	ND	NA	NA	NA	0.00E+00	4.06E+00	0.00E+00
Arsenic	4.000E-02	ND	ND	NA	NA	NA	0.00E+00	2.90E+00	0.00E+00
Barium	1.500E-01	0.0693	1.67E+01	NA	NA	NA	6.33E-01	1.16E+00	5.46E-01
Beryllium	1.000E-02	ND	ND	NA	NA	NA	0.00E+00	3.55E-01	0.00E+00
Chromium	7.500E-03	0.0276	6.48E+00	NA	NA	NA	4.21E-02	5.80E+01	7.25E-04
Copper	4.000E-01	0.0411	5.56E+01	NA	NA	NA	4.55E+00	1.16E+01	3.92E-01
Iron	4.000E-03	7.89	7.57E+03	NA	NA	NA	4.16E+01	2.90E+01	1.43E+00
Lead	4.500E-02	0.0458	1.78E+02	NA	NA	NA	2.37E+00	1.74E+00	1.36E+00
Manganese	2.500E-01	0.0884	1.11E+02	NA	NA	NA	5.90E+00	2.32E+01	2.54E-01
Mercury	9.000E-01	ND	ND	NA	NA	NA	0.00E+00	1.20E-01	0.00E+00
Nickel	6.000E-02	ND	3.28E+00	NA	NA	NA	5.32E-02	2.90E+00	1.83E-02
Selenium	2.500E-02	ND	ND	NA	NA	NA	0.00E+00	1.20E-01	0.00E+00
Thallium	4.000E-03	ND	1.38E+00	NA	NA	NA	7.45E-03	1.51E-02	4.93E-01
Vanadium	5.500E-03	0.0262	7.21E+00	NA	NA	NA	4.36E-02	5.80E-02	7.51E-01
Zinc	1.500E+00	0.144	3.77E+02	NA	NA	NA	1.11E+02	2.90E+01	3.82E+00 1.14E+01

ND - Not Detected
NA - Not Applicable

EQUATIONS USED TO CALCULATE EXPOSURE FOR THE WHITETAILED DEER
SITE 65, ENGINEERING DUMP AREA
REMEDIAL INVESTIGATION, CTO-312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Food Source ingestion of:	*Feeding Rate* (I in kg/d)	*Incidental Soil* Ingestion (Is in kg/d)	*Rate of Drinking* Water Ingestion (Iw in l/d)	*Rate of* Worm Ingestion (Iwo in kg/d)	*Rate of* Fruit Ingestion (Ifr in kg/d)	*Rate of* Mammal Ingestion (Im in kg/d)	*Rate of* Vegetation Ingestion (Iv in kg/d)	*Body Weight* (BW) (kg)	*Home Range* Size (acres)	*Contaminated* Area (acres)	*H Ratio*	Equation Used to Calculate Total Exposure E = Total exposure Cw = Constituent concentration in water Iw = Ingestion of water Cs = Constituent concentration in soil Bv = Vegetation *biotransfer factor* Iv = Ingestion of vegetation Is = Incidential ingestion of soil *H* = Ratio of home range area to site area BW = Body weight
Vegetation(Iv) = 100 percent												
Parameters	1.600E+00	1.850E-02	1.100E+00	NA	NA	NA	1.600E+00	4.540E+01	4.540E+02	2.600E+01	5.727E-02	$E=\frac{(Cw)(Iw) + [(Cs)(Bv)(Iv) + (Cs)(Is)] [H]}{BW}$

Constituent of Concern	Soil to Plant Transfer Coefficient (Bv)	Constituent Concentration in Water (mg/L) (Cw)	Constituent Concentration in Soil (mg/kg) (Cs)	Constituent Concentration in Worms (mg/kg) (Cwo)	Constituent Concentration in Fruit (mg/kg) (Cfr)	Constituent Concentration in Mammals (mg/kg) (Cm)	Total Exposure (mg/kg/d) (E)	Terrestrial Reference Value (mg/kg/day) (TRV)	Quotient Ratio (= E/TRV)
Acetone	5.330E+01	0.005	6.70E-03	NA	NA	NA	8.42E-04	1.98E+00	4.26E-04
2-Butanone	3.731E+01	ND	ND	NA	NA	NA	0.00E+00	NA	NA
Ethylbenzene	6.255E-01	ND	1.00E-03	NA	NA	NA	1.29E-06	1.92E+00	6.70E-07
Methylene Chloride	6.864E+00	ND	2.00E-03	NA	NA	NA	2.78E-05	1.16E+00	NA
Toluene	9.324E-01	ND	2.00E-03	NA	NA	NA	3.81E-06	4.41E+00	8.65E-07
Trichloroethene	1.065E+00	ND	1.00E-03	NA	NA	NA	2.17E-06	1.98E+01	1.10E-07
Xylenes (total)	5.475E-01	ND	5.00E-03	NA	NA	NA	5.64E-06	3.54E+01	1.60E-07
Acenaphthene	2.464E-01	ND	1.30E-01	NA	NA	NA	6.77E-05	3.46E+00	1.96E-05
Anthracene	8.496E-02	ND	1.90E-01	NA	NA	NA	3.70E-05	8.71E+00	4.25E-06
Benzo(a)anthracene	1.965E-02	ND	2.56E-01	NA	NA	NA	1.61E-05	8.71E-02	1.85E-04
Benzo(a)pyrene	1.154E-02	ND	2.30E-01	NA	NA	NA	1.07E-05	8.71E-02	1.23E-04
Benzo(b)fluoranthene	5.932E-03	ND	2.28E-01	NA	NA	NA	8.07E-06	8.71E-02	9.26E-05
Benzo(g,h,i)perylene	5.193E-03	ND	2.17E-01	NA	NA	NA	7.35E-06	8.71E-02	8.44E-05
Benzo(k)fluoranthene	1.010E-02	ND	2.46E-01	NA	NA	NA	1.08E-05	8.71E-02	1.24E-04
Bis(2-ethylhexyl)phthalate	2.337E-03	ND	8.70E-02	NA	NA	NA	2.44E-06	4.89E-02	4.99E-05
Carbazole	5.500E-01	ND	1.80E-01	NA	NA	NA	2.04E-04	8.71E-02	2.34E-03
Chrysene	1.965E-02	ND	2.52E-01	NA	NA	NA	1.59E-05	8.71E-02	1.82E-04
Dibenz(a,h)anthracene	5.193E-03	ND	1.50E-01	NA	NA	NA	5.07E-06	8.71E-02	5.82E-05
Dibenzofuran	5.500E-01	ND	5.80E-02	NA	NA	NA	6.57E-05	8.71E-02	7.55E-04
Di-n-butylphthalate	8.496E-02	ND	2.35E-01	NA	NA	NA	4.58E-05	2.47E+01	1.85E-06
2,4-Dinitrophenol	4.605E+00	ND	1.50E-01	NA	NA	NA	1.40E-03	3.95E+00	3.54E-04
Fluoranthene	4.426E-02	ND	2.95E-01	NA	NA	NA	3.33E-05	1.09E+00	3.06E-05
Fluorene	1.447E-01	ND	1.00E-01	NA	NA	NA	3.15E-05	2.47E+00	1.28E-05
Indeno(1,2,3-cd)pyrene	5.193E-03	ND	2.20E-01	NA	NA	NA	7.43E-06	8.71E-02	8.53E-05
Phenanthrene	8.496E-02	ND	3.30E-01	NA	NA	NA	6.43E-05	8.10E+00	7.94E-06
Pyrene	4.367E-02	ND	3.04E-01	NA	NA	NA	3.39E-05	6.53E-01	5.19E-05
4,4'-DDD	1.154E-02	ND	5.45E-02	NA	NA	NA	2.54E-06	1.58E-01	1.61E-05
4,4'-DDE	4.546E-03	ND	8.30E-02	NA	NA	NA	2.70E-06	1.58E-01	1.71E-05
4,4'-DDT	6.776E-03	ND	5.80E-02	NA	NA	NA	2.07E-06	1.58E-01	1.31E-05
Endosulfan II	1.653E-01	ND	2.54E-03	NA	NA	NA	9.07E-07	1.19E-01	7.65E-06
Heptachlor epoxide	4.989E-02	ND	1.22E-03	NA	NA	NA	1.51E-07	7.55E-05	2.00E-03
Aroclor-1260	1.318E-02	ND	2.47E-02	NA	NA	NA	1.23E-06	9.88E-04	1.25E-03
Aluminum	4.000E-03	25.8	4.02E+03	NA	NA	NA	7.51E-01	6.51E+00	1.16E-01
Antimony	2.000E-01	ND	ND	NA	NA	NA	0.00E+00	6.91E-03	0.00E+00
Arsenic	4.000E-02	ND	ND	NA	NA	NA	0.00E+00	3.25E-01	0.00E+00
Barium	1.500E-01	0.0693	1.87E+01	NA	NA	NA	7.76E-03	1.30E-01	5.97E-02
Beryllium	1.000E-02	ND	ND	NA	NA	NA	0.00E+00	1.07E-01	0.00E+00
Chromium	7.500E-03	0.0276	6.48E+00	NA	NA	NA	9.18E-04	6.51E+00	1.41E-04
Copper	4.000E-01	0.0411	5.56E+01	NA	NA	NA	4.72E-02	6.51E-01	7.25E-02
Iron	4.000E-03	7.89	7.57E+03	NA	NA	NA	4.29E-01	6.51E+00	6.59E-02
Lead	4.500E-02	0.0458	1.78E+02	NA	NA	NA	2.14E-02	1.95E-01	1.10E-01
Manganese	2.500E-01	0.0884	1.11E+02	NA	NA	NA	6.10E-02	1.30E+00	4.69E-02
Mercury	9.000E-01	ND	ND	NA	NA	NA	0.00E+00	1.30E-02	0.00E+00
Nickel	6.000E-02	ND	3.28E+00	NA	NA	NA	4.74E-04	3.25E-01	1.46E-03
Selenium	2.500E-02	ND	ND	NA	NA	NA	0.00E+00	1.30E-02	0.00E+00
Thallium	4.000E-03	ND	1.38E+00	NA	NA	NA	4.33E-05	4.54E-03	9.54E-03
Vanadium	5.500E-03	0.0262	7.21E+00	NA	NA	NA	8.83E-04	3.25E-01	2.71E-03
Zinc	1.500E+00	0.144	3.77E+02	NA	NA	NA	1.15E+00	3.25E+00	3.55E-01
									8.47E-01

ND - Not De
NA - Not App

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NOTE: Some of the references in this list are not specifically referenced in the proceeding table. This reference list also includes other toxicity values not used in the development of the terrestrial reference values.

APPENDIX V
SAMPLING STATION CHARACTERIZATION DATA SHEETS

SAMPLING STATION CHARACTERIZATION DATA SHEET

Station Number: 65-SD/SW04 Date: May 15, '95 Time: 16:50 (SW)

Samplers: AMB, PAM, JLH Date: May 18, '95 (SD/BN) Time: 9:15 (06) 9:10 (

Water Body: COURTHOUSE POND State: NC County: ONSLOW

Sample Type: Fish (Benthic Macroinvertebrate) (Sediment) (Surface Water)

SAMPLING EQUIPMENT: Seine Gill Net (Ponar STD) Kemmerer (Sediment Corer) Spoon Other: SUBSURFACE SAMPLER

Riparian Zone/Instream Features

Predominant Surrounding Land Use: (Forest) Urban Industrial (Other: BULLDOZING TRAINING AREA

Shore Vegetation: BLACK WILLOW, SWEET GUM, TULIP POPLAR, LOBLOLLY PINE, WAX MYRTLE, SWEET BAY, AMERICAN HOLLY, FETTERBUSH

Aquatic Vegetation: NONE WATERSHIELD (Brasenia schreberi)

Estimated Stream Width: NM ft Est. Stream Depth: 3 ft Riffle: / ft Run: / ft Pool: / ft

Stream Type: Cold Water Warm Water Velocity: NONE Channelized: Yes / No /

Canopy Cover: (Open) Partly Open Partly Shaded Shaded

Sediment/Substrate:

Sediment Odors: Normal Sewage Petroleum Chemical Anaerobic Other: DECAYING ORGANICS

Sediment Oils: (Absent) Slight Moderate Profuse HNu

Ponar Grab: Number of Jars Filled with Sediments Replicate: #1: 4 Replicate #2: 3 Replicate #3: 2

Sediment Description: SILT WITH SOME SAND. BELOW 3" - ORGANIC MATERIAL / DECOMPOSING PEAT

Water:

	Depth	Temp. °C	pH (s.u.)	Dissolved Oxygen (mg/L)	Conductivity (micromhos/cm)	Salinity (ppt)
5/15/95	SURFACE	30.4	7.2	10.6	14	
	~4' (BOTTOM)	17.3	6.81	2.9	21.5	
5/16/95	SURFACE	20.9	6.88	7.2	12	
	BOTTOM	17.4	6.7	2.0	18.1	

Water Odors: (Normal) Sewage Petroleum Chemical Other:

Water Surface Oils: Slick Sheen (None) Secchi: ft.

Turbidity: Clear Slightly Turbid (Turbid) Opaque Water Color: GRAY

Weather Conditions: SUNNY, HOT, HUMID 80-90°F Tide: In Out

Comments:

SAMPLING STATION CHARACTERIZATION DATA SHEET

Station Number: 65-SD/SW05 Date: MAY 16, '95 Time: 13:35 (SW)

Samplers: AMB, JLH, PAH Date: MAY 17, '95 (SD/BN) Time: 11:40

Water Body: POWERLINE POND State: N.C. County: ONSLOW

Sample Type: (Fish) (Benthic Macroinvertebrate) (Sediment) (Surface Water)

SAMPLING EQUIPMENT: Seine Gill Net (Ponar - SD) Kemmerer (Sediment Corer) Spoon Other: ELECTROFISH, HOOP NETS

Riparian Zone/Instream Features

Predominant Surrounding Land Use: (Forest) Urban Industrial Other: SOME ADJACENT DIRT RDS

Shore Vegetation: BLACK WILLOW, SWEET GUM, WAX MYRTLE, SMOOTH SUMAC (1) WATER OAK, SPARTINA sp.

Aquatic Vegetation: FRAGRANT POND LILY, WATER PENNYWORT, GREEN ALGAE (UNK) SPARTINA sp.

Estimated Stream Width: ~~~ ft Est. Stream Depth: 4 ft Riffle: ~ ft Run: ~ ft Pool: ~ ft

Stream Type: Cold Water (Warm Water) Velocity: None Channelized: Yes ~ No ~

Canopy Cover: (Open) Partly Open Partly Shaded Shaded

Sediment/Substrate:

Sediment Odors: Normal Sewage Petroleum Chemical (Anaerobic) Other:

Sediment Oils: Absent (Slight) Moderate Profuse HNu

Ponar Grab: Number of Jars Filled with Sediments Replicate: #1: 5 Replicate #2: 3 Replicate #3: 4

Sediment Description: Silt & some sand, some organic material

Water:

Depth	Temp. °C	pH (s.u.)	Dissolved Oxygen (mg/L)	Conductivity (micromhos/cm)	Salinity (ppt)
SURFACE	27.8	7.62	9.0	196	
BOTTOM (~2')	24.1	6.32	3.0	214	

Water Odors: (Normal) Sewage Petroleum Chemical Other:

Water Surface Oils: Slick Sheen (None) Secchi: ft.

Turbidity: (Clear) Slightly Turbid Turbid Opaque Water Color:

Weather Conditions: BREEZY, SUNNY Tide: In Out

Comments:

APPENDIX W
FISH SAMPLING RESULTS

FISH COLLECTION LOG
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Station	Fish Species	Date	Time	Length (cm)	Weight (grams	Comments
FS04	Bluegill	5-17-95	900	12.6	30	
FS04	Bluegill	5-17-95	900	17	65	
FS04	Bluegill	5-17-95	900	11.5	105	
FS04	Bluegill	5-17-95	900	11.6	*	
FS04	Bluegill	5-17-95	900	11.5	*	
FS04	Bluegill	5-17-95	900	10.5	*	
FS04	Bluegill	5-18-95	1600	14	50	
FS04	Bluegill	5-19-95	1130	12.7	210	
FS04	Bluegill	5-19-95	1130	12.2	*	
FS04	Bluegill	5-19-95	1130	12.4	*	
FS04	Bluegill	5-19-95	1130	12	*	
FS04	Bluegill	5-19-95	1130	12	*	
FS04	Bluegill	5-19-95	1130	12.3	*	
FS04	Bluegill	5-19-95	1130	11	*	
FS04	Bluegill	5-19-95	1130	12	*	
FS04	Bluegill	5-22-95	1500	14	80	(Possible hybrid, enlarged
FS04	Bluegill	5-22-95	1500	18	60	dorsal end in front of dorsal
FS04	Bluegill	5-22-95	1500	14	50	fin)
FS04	Bluegill	5-22-95	1500	15	50	
FS04	Bluegill	5-22-95	1500	13	150	
FS04	Bluegill	5-22-95	1500	12	*	
FS04	Bluegill	5-22-95	1500	12.5	*	
FS04	Bluegill	5-22-95	1500	12.5	*	
FS04	Bluegill	5-22-95	1500	11	*	
FS04	Bluegill	5-22-95	1500	12	120	
FS04	Bluegill	5-22-95	1500	12.3	*	
FS04	Bluegill	5-22-95	1500	12	*	
FS04	Bluegill	5-22-95	1500	12.8	*	
FS04	Bluegill	5-22-95	1500	12	120	

FISH COLLECTION LOG
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Station	Fish Species	Date	Time	Length (cm)	Weight (grams	Comments
FS04	Bluegill	5-22-95	1500	12	*	
FS04	Bluegill	5-22-95	1500	12.5	*	
FS04	Bluegill	5-22-95	1500	11	*	
			Minimum	10.5	NA	
			Maximum	18	210	
			Average	12.6	34	
			Count	32		
FS04	Redear Sunfish	5-17-95	900	12.5	60	
FS04	Redear Sunfish	5-17-95	900	12.3	25	
FS04	Redear Sunfish	5-17-95	900	17.5	70	
FS04	Redear Sunfish	5-17-95	900	17	65	
FS04	Redear Sunfish	5-17-95	900	12	25	
FS04	Redear Sunfish	5-22-95	1500	12	80	
FS04	Redear Sunfish	5-22-95	1500	13	*	
FS04	Redear Sunfish	5-22-95	1500	12.5	*	
			Minimum	12	0	
			Maximum	17.5	80	
			Average	13.6	40.625	
			Count	8		
FS05	Largemouth Bass	5-16-95	1600	10.4	15	
FS05	Largemouth Bass	5-16-95	1600	14	35	
FS05	Largemouth Bass	5-16-95	1600	11.7	20	
FS05	Largemouth Bass	5-16-95	1600	14.2	35	
FS05	Largemouth Bass	5-16-95	1600	3.9	NM	
FS05	Largemouth Bass	5-16-95	1600	22	150	

FISH COLLECTION LOG
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Station	Fish Species	Date	Time	Length (cm)	Weight (grams	Comments
FS05	Largemouth Bass	5-17-95	1000	41	1200	
FS05	Largemouth Bass	5-17-95	1000	28.5	300	
FS05	Largemouth Bass	5-17-95	1000	27	225	
			Minimum	3.9	NA	
			Maximum	41	1200	
			Average	19.2	220	
			Count	9		
FS05	Redear Sunfish	5-16-95	1600	11.3	25	
FS05	Redear Sunfish	5-16-95	1600	10.3	20	
FS05	Redear Sunfish	5-16-95	1600	8	10	
FS05	Redear Sunfish	5-16-95	1600	7.9	12	
FS05	Redear Sunfish	5-16-95	1600	11	20	
FS05	Redear Sunfish	5-16-95	1600	11	25	
FS05	Redear Sunfish	5-16-95	1600	10.9	25	
FS05	Redear Sunfish	5-16-95	1600	10.5	25	
FS05	Redear Sunfish	5-16-95	1600	7.4	10	
FS05	Redear Sunfish	5-16-95	1600	10.5	15	
FS05	Redear Sunfish	5-16-95	1600	11.3	20	
FS05	Redear Sunfish	5-16-95	1600	10.5	15	
FS05	Redear Sunfish	5-16-95	1600	7.3	5	
FS05	Redear Sunfish	5-16-95	1600	12.2	18	
FS05	Redear Sunfish	5-16-95	1600	10.5	15	
FS05	Redear Sunfish	5-16-95	1600	11	15	
FS05	Redear Sunfish	5-16-95	1600	12	30	
FS05	Redear Sunfish	5-16-95	1600	7.4	5	
FS05	Redear Sunfish	5-16-95	1600	7.2	5	
FS05	Redear Sunfish	5-16-95	1600	11.7	25	

FISH COLLECTION LOG
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Station	Fish Species	Date	Time	Length (cm)	Weight (grams	Comments
FS05	Redear Sunfish	5-16-95	1600	14.7	95	
FS05	Redear Sunfish	5-16-95	1600	14.2	55	
FS05	Redear Sunfish	5-16-95	1600	15	70	
FS05	Redear Sunfish	5-17-95	1000	20.5	200	
FS05	Redear Sunfish	5-17-95	1000	20	140	
FS05	Redear Sunfish	5-18-95	1500	25	300	
FS05	Redear Sunfish	5-18-95	1500	22.5	220	
FS05	Redear Sunfish	5-18-95	1500	17	100	
FS05	Redear Sunfish	5-18-95	1500	19	120	
FS05	Redear Sunfish	5-18-95	1500	19	130	
FS05	Redear Sunfish	5-18-95	1500	16.5	70	
			Minimum	7.2	5	
			Maximum	25	300	
			Average	13.0	59	
			Count	31		
FS05	Bluegill	5-16-95	1600	12.1	20	
FS05	Bluegill	5-16-95	1600	11.7	25	
FS05	Bluegill	5-16-95	1600	9.2	10	
FS05	Bluegill	5-17-95	1000	13.6	40	
FS05	Bluegill	5-17-95	1000	11.6	35	
FS05	Bluegill	5-17-95	1000	13	35	
FS05	Bluegill	5-17-95	1000	11.4	25	
FS05	Bluegill	5-17-95	1000	11.5	25	
FS05	Bluegill	5-17-95	1000	12.6	35	
FS05	Bluegill	5-17-95	1000	11.7	30	
FS05	Bluegill	5-17-95	1000	11.5	25	
FS05	Bluegill	5-17-95	1000	11.4	25	

FISH COLLECTION LOG
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Station	Fish Species	Date	Time	Length (cm)	Weight (grams	Comments
FS05	Bluegill	5-18-95	1500	15	60	
FS05	Bluegill	5-18-95	1500	14.1	70	
FS05	Bluegill	5-18-95	1500	13.5	75	
FS05	Bluegill	5-18-95	1500	16.2	100	
FS05	Bluegill	5-18-95	1500	13.4	80	
FS05	Bluegill	5-18-95	1500	12	70	
FS05	Bluegill	5-18-95	1500	17.7	140	
FS05	Bluegill	5-16-95	1600	15.5	65	
FS05	Bluegill	5-17-95	1000	16.5	100	
FS05	Bluegill	5-17-95	1000	14.5	65	
FS05	Bluegill	5-17-95	1000	17	120	
FS05	Bluegill	5-17-95	1000	13.5	55	
FS05	Bluegill	5-18-95	1500	18.1	125	
FS05	Bluegill	5-18-95	1500	20	120	
FS05	Bluegill	5-18-95	1500	19.3	145	
FS05	Bluegill	5-18-95	1500	17	110	
FS05	Bluegill	5-18-95	1500	15	60	
FS05	Bluegill	5-18-95	1500	14.5	60	
			Minimum	9.2	10	
			Maximum	20	145	
			Average	14.1	65	
			Count	30		

FISH TISSUE SAMPLE LOG
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Numb	Sample Analysis
5-17-95	900	65-FS04-BG02	11.5	105	65-FS04-BG01W	Whole Body
5-17-95	900	*	11.6	*		
5-17-95	900	*	11.5	*		
5-17-95	900	*	10.5	*		
5-19-95	1130	65-FS04-BG04	12.7	210		
5-19-95	1130	*	12.2	*		
5-19-95	1130	*	12.4	*		
5-19-95	1130	*	12	*		
5-19-95	1130	*	12	*		
5-19-95	1130	*	12.3	*		
5-19-95	1130	*	11	*		
5-19-95	1130	*	12	*		
5-22-95	1500	65-FS04-BG09	13	150		
5-22-95	1500	*	12	*		
5-22-95	1500	*	12.5	*		
5-22-95	1500	*	12.5	*		
5-22-95	1500	*	11	*		
5-22-95	1500	65-FS04-BG11	12	120		
5-22-95	1500	*	12	*		
5-22-95	1500	*	12.5	*		
5-22-95	1500	*	11	*		

FISH TISSUE SAMPLE LOG
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Numb	Sample Analysis
5-17-95	900	65-FS04-BG01	17	65	65-FS04-BG01F	Fillet
5-18-95	1600	65-FS04-BG03	14	50		
5-22-95	1500	65-FS04-BG06	18	60		
5-22-95	1500	65-FS04-BG07	14	50		
5-22-95	1500	65-FS04-BG08	15	50		
5-22-95	1500	65-FS04-BG10	12	120		
5-22-95	1500	*	12.3	*		
5-22-95	1500	*	12	*		
5-22-95	1500	*	12.8	*		

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Numb	Sample Analysis
5-17-95	900	65-FS04-RS01	17.5	70	65-FS04-RS01W	Whole Body
5-17-95	900	65-FS04-RS02	17	65		
5-17-95	900	65-FS04-RS03	12	25		
5-22-95	1500	65-FS04-RS04	12	80		
5-22-95	1500	*	13	*		
5-22-95	1500	*	12.5	*		

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Numb	Sample Analysis
5-16-95	1600	65-FS05-LB01	22	150	65-FS05-LB01W	Whole Body
5-17-95	1000	65-FS05-LB03	28.5	300		
5-17-95	1000	65-FS05-LB04	27	225		

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Numb	Sample Analysis
5-17-95	1000	65-FS05-LB02	41	1200	65-FS05-LB01F	Fillet

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Numb	Sample Analysis
5-16-95	1600	65-FS05-RS01	14.2	55	65-FS05-RS01W	Whole Body
5-16-95	1600	65-FS05-RS02	15	70		
5-18-95	1500	65-FS05-RS07	17	100		
5-18-95	1500	65-FS05-RS10	16.5	70		

FISH TISSUE SAMPLE LOG
SITE 65 - ENGINEER AREA DUMP
REMEDIAL INVESTIGATION, CTO-0312
MCB, CAMP LEJEUNE, NORTH CAROLINA

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Numb	Sample Analysis
5-17-95	1000	65-FS05-RS03	20.5	200	65-FS05-RS01F	Fillet
5-17-95	1000	65-FS05-RS04	20	140		
5-18-95	1500	65-FS05-RS05	25	300		
5-18-95	1500	65-FS05-RS06	22.5	220		
5-18-95	1500	65-FS05-RS08	19	120		
5-18-95	1500	65-FS05-RS09	19	130		

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Numb	Sample Analysis
5-16-95	1600	65-FS05-BG01	15.5	65	65-FS05-BG01W	Whole Body
5-17-95	1000	65-FS05-BG03	14.5	65		
5-17-95	1000	65-FS05-BG05	13.5	55		
5-18-95	1500	65-FS05-BG10	15	60		
5-18-95	1500	65-FS05-BG11	14.5	60		

Date	Collection Time	Sample Number	Length (cm)	Weight (grams)	New Sample Numb	Sample Analysis
5-17-95	1000	65-FS05-BG04	17	120	65-FS05-BG01F	Fillet
5-17-95	1000	65-FS05-BG02	16.5	100		
5-18-95	1500	65-FS05-BG06	18.1	125		
5-18-95	1500	65-FS05-BG07	20	120		
5-18-95	1500	65-FS05-BG08	19.3	145		
5-18-95	1500	65-FS05-BG09	17	110		

* Fish were measured individually but weighed as a group

APPENDIX X
BENTHIC MACROINVERTEBRATE LABORATORY BENCH SHEETS

INVERTEBRATE SECTION
LABORATORY IDENTIFICATION BENCH SHEET

Client: BAKER ENVIRON
Location: SITE 65, CAMP LEJEUNE, NC
Coll Date: 5/95 Prelim. Sorter: MJG Split Sorter: _____
Subsampled Taxa: —
ID Time Budget: 1.5 Presort ID Time: 0.5 Date-Identifier: 6/26/95 MJG
Split/Midge and worm ID Time: _____ Date-Identifier: _____
QA/QC Time: _____

Job Number/Task: 15825.001
Sample ID: 65-BN04-01

QC Check	Taxonomic Order	Taxon	Total Number	=	Presort Number	+	Split/QA/QC Number	Comments
		NO ORGANISMS						

Notes: 6/26 7:00 - 7:30

Page ____ of ____

INVERTEBRATE SECTION
LABORATORY IDENTIFICATION BENCH SHEET

Client: BAKER ENVIRON, INC
Job Number/Task: 15825.00
Location: SITE 65, CAMP LEJEUNE, NC
Sample ID: 65 BN04-L
Coll Date: 5/95
Prelim. Sorter: MJG
Split Sorter: _____
Subsampled Taxa: _____
ID Time Budget: 1.5
Presort ID Time: 0.5
Date-Identifier: 6/26/95 wsm
Split/Midge and worm ID Time: _____
Date-Identifier: _____
QA/QC Time: _____

QC Check	Taxonomic Order	Taxon	Total Number	=	Presort Number	+	Split/QA/QC Number	Comments
	DIPTERA	Chaoborus sp.	2					

Notes: _____
Page ____ of ____

6/26 7:30-8:00

INVERTEBRATE SECTION
LABORATORY IDENTIFICATION BENCH SHEET

Client: BAKER ENVIRON., INC — Job Number/Task: 15825.001

Location: SITE 65 CAMP LEJEUNE NC — Sample ID: 65BV04-03

Coll Date: 5/95 — Prelim. Sorter: MJG — Split Sorter: _____

Subsampled Taxa: —

ID Time Budget: 1.5 — Presort ID Time: 0.5 — Date-Identifier: 6/26/95 mvm

Split/Midge and worm ID Time: _____ — Date-Identifier: _____

QA/QC Time: _____

QC Check	Taxonomic Order	Taxon	Total Number	=	Presort Number	+	Split/QA/QC Number	Comments
	DIPTERA	Chaoborus sp.	4					

Notes: 6/26 8:00-8:30

Page ____ of ____

INVERTEBRATE SECTION
LABORATORY IDENTIFICATION BENCH SHEET

Client: BAKER ENVIRON., INC. Job Number/Task: 15825.001

Location: SITE 65, CAMP LEJEUNE, NC Sample ID: 65 BNOST-

Coll Date: 5/95 Prelim. Sorter: JSB Split Sorter: _____

Subsampled Taxa: —

ID Time Budget: 1.5 Presort ID Time: 0.5 Date-Identifier: 6/26/95 MEG

Split/Midge and worm ID Time: 3.0 Date-Identifier: 6/28/95 MEG

QA/QC Time: .5

QC Check	Taxonomic Order	Taxon	Total Number	=	Presort Number	+	Split/QA/QC Number	Comments
MEG	DIPTERA	Ablabesmyia rampheyi	4					
MEG	"	Cricotopus pleggas	1					NEW
MEG	" Tanyt,	Psectrocladius elatus	1					NEW
MEG	"	Tanytarsus sp.	2					

Notes: 6/26 8:30-9:00 CHILSON 12:30-1:30 6/28 12:00-2:00

Page ____ of ____

INVERTEBRATE SECTION
LABORATORY IDENTIFICATION BENCH SHEET

Client: BAKER ENVIRON, INC. Job Number/Task: 15825.001

Location: SITE 65 CAMP LEJEUNE, NC Sample ID: 65 BNOS-02

Coll Date: _____ Prelim. Sorter: JJD Split Sorter: _____

Subsampled Taxa: —

ID Time Budget: 1.5 Presort ID Time: 1.0 Date-Identifier: 6/26/95 mm

Split/Midge and worm ID Time: _____ Date-Identifier: _____

QA/QC Time: _____

QC Check	Taxonomic Order	Taxon	Total Number	=	Presort Number	+	Split/QA/QC Number	Comments
	EPHEMEROPTERA	Caenis punctata	1					
	DIPTERA	Chrysops sp.	3					

Notes: _____ Page ____ of ____

6/26 0800-1000

INVERTEBRATE SECTION
LABORATORY IDENTIFICATION BENCH SHEET

Client: BAKER ENVIRON., INC. Job Number/Task: 15825,00

Location: SITE 65 CAMP LEJEUNE Sample ID: 65 BN05-

Coll Date: 5/95 Prelim. Sorter: JSD Split Sorter: _____

Subsampled Taxa: _____

ID Time Budget: _____ Presort ID Time: 0.5 Date-Identifier: 6/26/95 mm

Split/Midge and worm ID Time: _____ Date-Identifier: _____

QA/QC Time: _____

QC Check	Taxonomic Order	Taxon	Total Number	=	Presort Number	+	Split/QA/QC Number	Comments
	EPHEMEROPTERA	Caenis punctata	1					
	DIPTERA	Ablabesmyia rhamphe sp.	1					

Notes: _____ Page ____ of ____

6/26 10:00 – 10:30