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FIELD SAMPLING PLAN
FOR THE
DRUM REMOVAL AT SITE #6
MARINE CORPS BASE
CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Submitted to:

Commanding Officer
Atlantic Division
Naval Facilities Engineering Command
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1.0 INTRODUCTION

OHM Remediation Services Corp. (OHM) has been contracted by the Naval Facilities Engineering Services Center (NFESC) under contract N47408-92-D-3042, Delivery Order No. 32 to perform a removal action at the Marine Corps Base, Camp Lejeune (MCB Camp Lejeune) in Jacksonville, North Carolina.

The Sampling and Analysis Plan (SAP) has been prepared to describe the sampling, analytical, and quality control procedures for the performance of work specified in the contract. The SAP will detail the sampling quantities, acquisition procedures and data collection methods employed during this removal action.

Although the SAP is considered as one document, it will be submitted as two documents. The SAP will consist of the Field Sampling Plan (FSP) and the Quality Assurance Project Plan (QAPP). This FSP will provide guidance for all field work by defining in detail the sampling and data gathering methods to be used on this project.

OHM is committed to providing a high quality of service. The SAP outlines the methods used that underlies OHM's commitment to deliver a precise, accurate and complete product.

2.0 SITE BACKGROUND

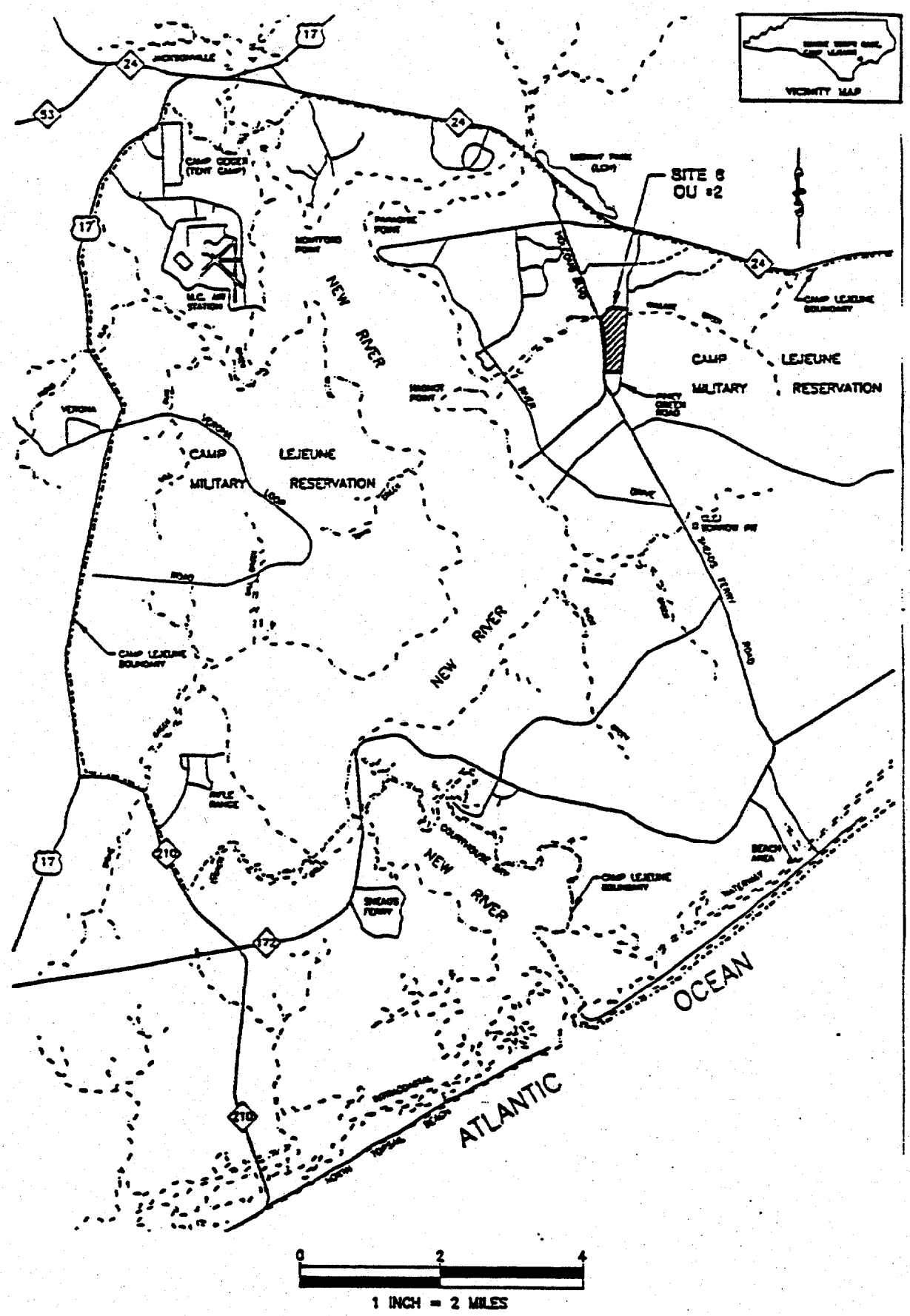
The primary objective of this project is to remove, transport, and dispose of all drums, storage tanks, and containers located at MCB Camp Lejeune. The scope includes the removal, transportation and disposal of all surficial and buried drums, storage tanks, containers, their associated contents, and any impacted soils.

MCB Camp Lejeune was placed on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), National Priorities List (NPL) that became effective on October 4, 1989. The United States Environmental Protection Agency (EPA) Region IV, the North Carolina Department Of Environmental, Health and Natural Resources (NCDEHNR) and the United States Department of the Navy (Navy) then entered into a Federal Facilities Agreement (FFA) for the site. The primary purpose of the FFA was to ensure that environmental impacts associated with past and present activities at the site were thoroughly investigated and appropriate CERCLA response/Resource Conservation and Recovery Act (RCRA) corrective actions alternatives were developed and implemented as necessary to protect public health and the environment.

2.1 SITE LOCATION

Operable Unit No. 2 (OU No. 2) is located approximately 1.75 miles east of the New River and 2 miles south of State Route 24 on the main-side portion of MCB Camp Lejeune (see Figure 2.1). The unit is bordered by Holcomb Boulevard on the west, Sneads Ferry Road on the south, Piney Green Road on the east, and by Wallace Creek on the north. Camp Lejeune Railroad operates rail lines parallel to Holcomb Boulevard bordering OU No. 2 on the west. OU No. 2 covers an area of approximately 210 acres (see Figure 2.2). OU No. 2 consists of three sites: Sites 6, 9, and 82.

Site 6 is bounded on the north by Site 82, on the east by Piney Green Road, on the south by Site 9, and on the west by Holcomb Boulevard. Site 6 covers an area of



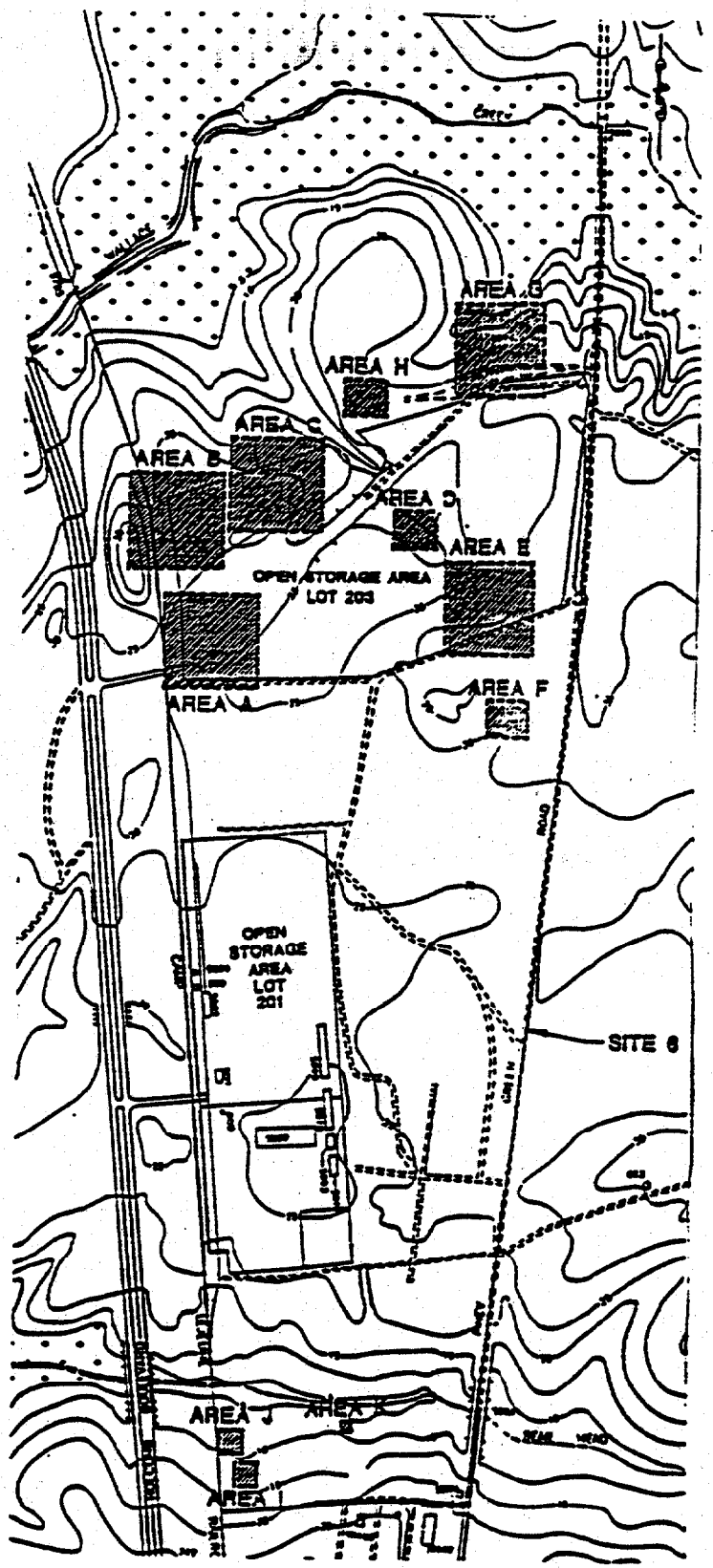
PROJECT: CAMP LEJEUNE REMEDIAL ACTION

PROJECT No.: 15226

LOCATION: CAMP LEJEUNE, N.C.

FIGURE 2.1
GEOGRAPHIC LOCATION MAP

OHM Remediation Services Corp.



0 750 1500

APPROX. SCALE IN FEET

PROJECT: CAMP LEJEUNE
REMEDIAL ACTION

PROJECT No.: 15226

LOCATION: CAMP LEJEUNE, N.C.

FIGURE 2.2
SITE LOCATION MAP

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approximately 177 acres that includes Storage Lots 201 and 203, the wooded area between the storage lots, and a ravine, which begins at Site 6 and bisects Site 82. Three surface water bodies are associated with Site 6: Wallace Creek, Bear Head Creek, and a ravine located in the wooded area north of Lot 203 that drains to Wallace Creek.

Open Storage Lot 201 (Lot 201) is a fenced lot located in the south-central portion of Site 6. It is a flat area with sparse vegetation around the fence lines. Open Storage Lot 203 (Lot 203) is a fenced lot located in the northern portion of Site 6 covering approximately 46 acres. Lot 203 is a relatively flat area with elevation differences of approximately five feet. The ground surface is comprised of both naturally existing soil and fill material. Lot 203 is bordered by Site 82, Piney Green Road to the east, woods to the south, and by Holcomb Boulevard to the west. Lot 203 is currently inactive.

Woods and open fields surround both Storage Lots 201 and 203 and make up the remaining area of Site 6. The topography of the wooded area is relatively flat, but localized trenching and mounding is visible just north of Lot 203 and west of Piney Green Road.

2.2 SITE HISTORY

Site 6 has a long history of various uses including the disposal and storage of wastes and supplies. Approximately 200 drums and containers are present at Site 6. The majority of the drums, if labeled, were identified as containing lubricants, petroleum products, or corrosives. Empty storage tanks are also located at Site 6. They were labeled as containing diesel fuel, gasoline and kerosene.

The wooded areas of Site 6 are randomly littered with debris including spent aluminum casings, and empty or rusted drums. Markings were observed on a few drums (most drums did not contain markings due to their conditions and age) located north of Lot 203. These drums were marked as "lubrication oils". Many of the drums observed were only fragments of drums.

Lot 203 has been used as a disposal area since the 1940s. There is little documentation on the disposal activities at this lot. Lot 203 is not currently active as a storage or disposal area, but the ground surface is littered with various debris. Lot 203 was also used for the storage and disposal of radio and communications parts, shredded tires, lubricants, petroleum products, corrosives, expended demolition kit training materials, ordnance, sheet metal debris, wire cables and wooded pallets. Lot 203 is currently fenced.

3.0 SAMPLING OBJECTIVES

As stated earlier, the objective of this project is to remove and dispose of any drums, storage tanks, containers, their associated contents, and any impacted soils at the site to complete the site ready for use. Samples will be collected and analyzed to determine that the site is ready for use and to determine the proper disposal for the wastestreams encountered at the site.

The samples proposed for collection during the fieldwork are confirmation samples, drum samples, characterization samples, disposal samples and quality control samples. The quality control samples will serve as quality control checks that are part of the quality assurance for the project. Quality assurance provides confidence that the work is performed satisfactorily and conforms to the requirements of the contract. The quality assurance program ensures that the results are scientifically accurate and legally defensible.

All sampling methods employed in the FSP will follow applicable EPA, NFESC and state of North Carolina guidelines and protocols. Any modifications or changes to the established protocols will be approved by the NFESC Contract Representative, OHM Project Manager and the OHM Project Chemist. Changes made in the field will be documented in the sampling field logbook before the actual work begins.

4.0 SAMPLE LOCATION AND FREQUENCY

Site work will generate the need for sampling and analysis to determine if the site has been restored to a satisfactory condition and to determine the proper disposal of the waste generated at the site. Sample matrices proposed for sampling at MCB Lejeune consist of solid, liquid, and waste material. The solid matrix will consist of soil, solid debris samples, and personal protective equipment (PPE). The liquid matrix will consist of decontamination water samples and the waste matrix will consist of samples from the buried drums.

At MCB Camp Lejeune, there will be several different types of samples collected and analyzed for specific purposes. These types of samples and their constituents are discussed below and presented in tabular format at the end of this section.

4.1 CONFIRMATION SAMPLES

Soil confirmation samples will be collected and analyzed to confirm the removal of all contaminated soil from the excavated trenches. The four open trenches will have a collective length of approximately 230 linear feet.

Confirmation samples will be collected at the ends of each trench and at 25 foot intervals from the walls and floors of the trenches. This will yield approximately 48 soil confirmation samples. Quality assurance/quality control samples will be collected at a rate of 10% of the total amount of samples collected. Therefore, there will be an additional four to five samples collected for QA/QC purposes. To further assess the excavated areas, 10 percent of the confirmation samples will be analyzed by DQO Level IV for TCL/TAL. Figure 4.1 illustrates the approximate locations of the trenches and the sample locations. Table 4.1 identifies the number of samples, the number of QA/QC samples, and the constituents to be analyzed.

4.2 DRUM SAMPLES

It is assumed that each of the four trenches will yield 50 empty drums and 25 drums containing product. Each drum containing product will be sampled,

Table 4.1
Sampling and Frequency

Sample Group	Sample Matrix	Analysis	Number of Samples	QA/QC Samples
Confirmation	Soil	Full TCLP Ignitability pH Reactive CN-, Sulfide TPH by GC	48	5
Drum	Solid/ Liquid	Hazardous Category Drum Compatibility	100	10
	Composite Wastestreams	Total Suspended Solids Total Dissolved Solids Percent Water Acid Ions (Cl-, NO_3, SO_4, PO_4) Volatiles Semi-volatiles including TICs Pesticides/PCBs TAL Metals Full TCLP BTU Ignitability pH Reactive CN-, Sulfide Specific Gravity	11	1
Waste Characterization	Soil/Debris/ PPE	Full TCLP Ignitability pH Reactive CN-, Sulfide TPH by GC	3/3/1	1/1/1
	Decon. Water	TCLP Volatiles TCLP Semi-volatiles, Pesticides, Herbicides TCLP Metals Total PCBs Ignitability, pH, Reactive CN-, Reactive Sulfide TPH by GC	1	1
Disposal	Soil/Debris	Volatiles Semi-volatiles, Pesticides/PCBs Including TICs TAL Metals BTU Specific Gravity Acid Ions (Cl-, NO_3, SO_4, PO_4)	1/1	1/1
	Decon. Water	Volatiles Semi-volatiles, Pesticides/PCBs Including TICs TAL Metals BTU Specific Gravity Acid Ions (Cl-, NO_3, SO_4, PO_4)	1	1

Full TCLP includes TCLP volatiles, TCLP semi-volatiles, TCLP metals, TCLP pesticides, TCLP herbicides and total PCBs

yielding 100 drum samples. Approximately 10 additional samples will be collected for QA/QC analysis.

Each drum sampled will have a drum log completed. Figure 4.2 is an example of the drum log that will be used at MCB Camp Lejeune.

It is assumed that 11 wastestreams will be derived from the drums. The wastestreams will undergo further analysis for characterization. One QA/QC sample will be collected from the wastestreams.

Table 4.1 identifies the number of drum samples, the number of QA/QC samples, and the constituents to be analyzed.

4.3 WASTE CHARACTERIZATION SAMPLES

Approximately 310 cubic yards of material will be excavated from the trenches. One soil sample will be collected for every 100 cubic yards of soil, 1 QA/QC samples per every 10 samples or less.

Debris uncovered and removed from the trenches will be stockpiled and sampled. Sampling will be in accordance to NCDEHNR, Ground Waters Section, "Guidelines for the Investigation and Remediation of Soils and Groundwater, Section 9.4 Stockpiles." One sample will be collected for every 100 cubic yards of debris and 1 QA/QC sample per every 10 samples or less.

Decontamination water, rinse water, run-on water, and PPE will be sampled also. The decontamination water will be collected from triple-washing of the drums, tanks, and containers, and from the decontamination of equipment and machinery.

Table 4.1 identifies the number of decontamination water and PPE samples and number of QA/QC samples with the constituents to be analyzed.

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DRUM INVENTORY LOG

DRUM NO. _____
PROJECT NUMBER _____
PAGE _____ OF _____

PROJECT LOCATION _____ LOGGER _____ DATE _____
PROJECT CONTACT _____ SAMPLER _____ TIME _____
PHONE _____ WEATHER _____

DRUM TYPE: FIBER ☐ POLY-LINED ☐ STEEL ☐ POLY ☐ STAINLESS STEEL ☐ NICKEL ☐
LID TYPE: RINGTOP ☐ CLOSED TOP ☐
DRUM CONDITION: MEET DOT SPEC. ☐ GOOD ☐ FAIR ☐ POOR ☐
DRUM SIZE: 110 ☐ 85 ☐ 55 ☐ 42 ☐ 30 ☐ 16 ☐ 10 ☐ 5 ☐ OTHER ___
DRUM CONTENTS: VOLUME FULL ☐ 3/4 ☐ 1/2 ☐ 1/4 ☐ <1/4 ☐ MT ☐
OVERPACKED: NO ☐ YES ☐ Overpack Type: FIBER ☐ STEEL ☐ POLY ☐

	PHYS. STATE				COLOR	CLARITY			LAYER THICKNESS
LAYERS	LIQUID	SOLID	GEL	SLUDGE	USE STD COLORS	CLEAR	CLOUDY	OPAQUE	INCHES
T									
M									
B									

FIELD ANALYSIS

pH _____ SU PID _____ ppm
DOSIMETER _____
OTHER _____

DRUM LABELS/MARKINGS

DOT HAZ _____ UN/NA _____

MFG NAME _____
CHEMICAL NAME _____
ADDITIONAL INFORMATION _____

LABORATORY COMPATIBILITY DATA

☐ MARK IF PHYSICAL STATE AND COLOR MATCHES THE ABOVE INFORMATION. IF NOT, STOP ANALYSIS AND NOTIFY PROJECT CONTACT. FURTHER WORK WILL NOT BE PAID FOR.

COMPATIBILITY CAT: _____
ANALYSTS: _____
DATE PERFORMED: _____

RADIATION: POS ☐ NEG ☐ ____ MREM/HR

	PHYS. STATE				COLOR	CLARITY			WATER SOL	REACT	pH	HEX. SOL	PER	OXID	CN	SUL	BIEL-STEIN	FLASH POINT	PCBs (25ppm)	PCB TEST COMP
LAYERS	LIQUID	SOLID	GEL	SLUDGE	USE STD COLORS	CLEAR	CLOUDY	OPAQUE	SOLUBILITY SPSI DENSITY H OR L	A=AIR W=WATER	STD. UNIT	S OR I	+ OR −	+ OR −	+ OR −	+ OR −	+ OR −	<60°C + OR −	+ OR −	NUMBER
T																				
M																				
B																				

COMMENTS: _____

PCB CONC. _____ PPM FLASH POINT _____ °C COMPATIBILITY COMP. BULK # _____
DATA REVIEWER: _____ DATA REVIEW DATE: _____
FIELD REVIEWER: _____ FIELD REVIEW DATE: _____

TRANSFER NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1				
2				
3				

F-212a 11-22-91

Figure 4.2

4.4 DISPOSAL SAMPLES

Disposal samples will be collected for each wastestream to be disposed. Presently, there will be three wastestreams (excluding drum wastestreams) for disposal. One sample will be collected from the soil wastestream, the debris wastestream, and the decontamination water wastestream for disposal analysis. These samples are required by the disposal facility and are not part of the waste characterization profile. Additional wastestreams may be encountered onsite, and if so, these wastestreams will also be sampled.

Table 4.1 identifies the number of disposal samples and the constituents to be analyzed. The number of samples presented for collection are subject to change due to field conditions. When this is the case, the changes will be documented and forwarded to the proper authorities for approval.

4.5 QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

Table 4.2 identifies the frequency of field QC samples per sampling event.

Table 4.2
Field QC Samples Per Sampling Event

	Level C		Level D		Level E	
Type of Sample	Metal	Organic	Metal	Organic	Metal	Organic
Trip Blank (for volatiles only)	NA[1]	1/cooler	NA[1]	1/cooler	NA[1]	1/cooler
Equipment rinsate[2]	1/day	1/day	1/day	1/day	1/day	1/day
Field Blank	1/source/event for all levels and all analytes					
Field Duplicates[3]	10%	10%	10%	10%	5%	5%
Referee Duplicate[3]						

[1]NA - Not applicable
[2]Samples are collected daily; however, only samples from every other day are analyzed. Other samples are held and analyzed only if evidence of contamination exists.
[3]The duplicate must be taken from the same sample which will become the laboratory matrix/spike duplicate for organics or for the sample used as a duplicate in inorganic analysis.

4.5.1 Trip Blanks

Trip blanks are defined as samples which originate from analyte-free water taken from the laboratory to the sampling site and returned to the laboratory with the volatile organic (VOA) samples. One trip blank should accompany each cooler containing VOAs, should be stored at the laboratory with the samples, and analyzed by the laboratory. Trip blanks are only analyzed for VOAs.

4.5.2 Equipment Rinsates

Equipment rinsates are the final analyte-free water rinse from equipment cleaning collected daily during a sampling event. Initially, samples from every other day should be analyzed. If analytes pertinent to the project are found in the rinsate, the remaining samples must be analyzed. The results from the blanks will be used to flag or assess the levels of analytes in the samples. This comparison is made during data validation. The rinsates are analyzed for the same parameters as the related samples.

4.5.3 Field Blanks

Field blanks consist of the source water used in decontamination and steam cleaning. At a minimum, one field blank from each event and each source of water must be collected and analyzed for the same parameters as the related samples.

4.5.4 Field Duplicates/Splits

Duplicates or splits for soil samples are collected, homogenized, and split. All samples except VOAs are homogenized and split. Volatiles are not mixed, but select segments of soil are taken from the length of the core and placed in 40-ml glass vials. Cores may be sealed and shipped to the laboratory for subsampling if the project deems this appropriate. The duplicates for water samples should be collected simultaneously. Field duplicates should be collected at a frequency of 10 percent per sample matrix for Levels D and C. For Level E, the duplicates should be analyzed at a frequency of 5 percent. All the duplicates should be sent to the primary laboratory responsible for analysis. The same samples used for field duplicates shall be split by the laboratory and be used as the laboratory

duplicate or matrix spike. This means that for the duplicate sample, there will be analyses of the normal sample, the field duplicate, and the laboratory matrix spike/duplicate.

5.0 SAMPLE DESIGNATION

Each type of sample collected at MCB Camp Lejeune will have a unique sample number to aid in identifying the sample. There are four types of samples that will be collected at the site. For each type of sample a discussion is provided on the sample designation scheme used to identify the samples.

5.1 CONFIRMATION SAMPLES

The confirmation samples will consist of only one matrix, soil, collected from the excavated trenches. The samples will be numbered consecutively, starting with the first soil sample. An example of a confirmation sample number is presented below with an explanation.

- CLJ-CSS-01(D)
  CLJ – Camp Lejeune
  CSS – Confirmation soil sample
  01 – Sample number
  D – Duplicate, if applicable

5.2 DRUM SAMPLES

The drum samples will consist of waste samples collected from the unburied drums. The samples will be number consecutively, starting with the first drum sample. An example of a drum sample number is presented below with an explanation.

- CLJ-DWS-01(D)
  CLJ – Camp Lejeune
  DWS – Drum waste sample
  01 – Sample number
  D – Duplicate, if applicable

5.3 WASTE CHARACTERIZATION SAMPLES

Waste characterization samples will consist of different matrices. The matrices are soil, debris, decontamination water and PPE. Sample identification numbers will be assigned to help distinguish between the matrices within the group. For waste characterization soil samples, the following designation will be used:

- CLJ - WCS-01(D)

For waste characterization debris samples, the following designation will be used:

- CLJ-WCD-01(D)

For waste characterization decontamination water samples, the following designation will be used:

- CLJ-WCW-01(D)

For waste characterization PPE samples, the following designation will be used:

- CLJ-WCP-01(D)

An explanation of the sample identification numbers are presented below.

- CLJ – Camp Lejeune
  WCS – Waste Characterization Soil
  WCD – Waste Characterization Debris
  WCW – Waste Characterization Water
  WCP – Waste Characterization PPE
  01 – Sample Number
  D – Duplicate, if applicable

5.4 DISPOSAL SAMPLES

Disposal samples will consist of different matrices also. The matrices are soil, debris and decontamination water. The sample identification numbers will be assigned to help distinguish between the matrices within the group.

For disposal soil samples, the following designation will be used:

- CLJ-DS-01(D)

For disposal debris samples, the following designation will be used:

- CLJ-DD-01(D)

For disposal decontamination water samples, the following designation will be used:

- CLJ-DW-01(D)

An explanation of the sample identification number is presented below:

- CLJ – Camp Lejeune
  DS – Disposal Soil Sample
  DD – Disposal Debris Sample
  DW – Disposal Decontamination Water Sample
  01 – Sample Number
  D – Duplicate, if applicable

5.5 QA/QC SAMPLES

QA/QC samples will consist of water samples. Sample identification numbers will be assigned to help distinguish between the different types of QA/QC samples. Duplicate samples have been described earlier.

For trip blank samples, the following designation will be used:

- CLJ-TB-01

For rinsate blank samples, the following description will be used:

- CLJ-RB-01

For field blank samples, the following designation will be used:

- CLJ-FB-01

An explanation of the sample identification numbers are presented below:

- CLJ – Camp Lejeune
  TB – Trip Blank
  RB – Rinsate Blank
  FB – Field Blank
  01 – Sample Number

6.0 SAMPLING EQUIPMENT AND PROCEDURES

6.1 SAMPLING PROCEDURES

Sampling methodologies for this project will follow at a minimum the USEPA Region IV Engineering Support Branch Standard Operating Procedures and Quality Assurance Manual, February 1991. For each type sample proposed for collection at MCB Camp Lejeune, the procedures used are described to enable a sampling team unfamiliar with the site to gather the samples and necessary information.

6.1.1 Confirmation Samples

The confirmation soil samples collected at the site will consist solely of grab samples collected from the walls and floors of the trenches. The following procedures will be used to collect the confirmation soil samples:

1. Locate and flag (from the surface) the sampling locations in trenches.

2. Using a backhoe with a decontaminated bucket, retrieve the soil from the designated sample location.

3. Using a clean pair of sampling gloves and using a clean stainless steel spoon or a clean stainless steel auger, scrape the top layer of soil away.

4. With the spoon or auger, collect enough sample in a stainless steel or glass bowl to fill the sample jars.

5. Once enough soil has been collected, the sample jars should be filled. The volatile sample is transferred to the appropriate container first. After the volatile sample is collected, the remaining sample is thoroughly mixed in the sample bowl. After thorough mixing, the remaining sample jars are filled and labeled.

6.1.2 Drum Samples

Drum samples will consist of grab samples taken from the drums unearthed at MCB Camp Lejeune. Opening and sampling of the drums will be done in level B PPE. The following procedures will be used to open the drums:

1. Using an oxygen meter and a photoionization detector, scan the drum staging area for readings. Once the readings are determined to be satisfactory, proceed with the opening and sampling of the drums. If the readings are not satisfactory, evacuate the area and notify the site safety officer.

2. Using a brass tipped punch and/or brass tools, (spark-proof) remove the bung from the drum.

3. If the drums are in bad condition, other methods will be used to open the drums, such as remote punch or using a pry bar. These methods will only be used after it is approved by the site safety officer. When transferring liquids from the drums, appropriate grounding techniques will be employed.

6.1.2.1 Solid Drum Contents

1. Using a clean pair of gloves and clean stainless steel spoon, collect enough sample in a stainless steel or glass bowl to fill the sample jars.

2. For volatiles, the sample is transferred directly to the appropriate containers. After enough sample has been collected in the bowl, the contents of the bowl is thoroughly mixed.

3. Once thoroughly mixed, the sample is transferred to the remaining sample jars.

6.1.2.2 Liquid Drum Samples

1. Using a clean pair of gloves and a clean glass drum thief, lower the drum thief into the drum until it reaches the bottom of the drum, allowing the contents to flow into the drum thief.

2. Transfer the contents of the drum thief to the volatile sample jar.

3. After the volatile sample jar has been filled, the remainder of the sample jars are filled.

6.1.3 Waste Characterization Samples

Waste characterization samples will consist of grab samples taken from different matrices. These matrices are soil, debris, decontamination water, and PPE. The soil samples will be collected as described in Section 6.1.1. The debris, decontamination water, and PPE samples will be collected as described in the following procedures.

6.1.3.1 Debris Samples

1. Using a clean pair of gloves and a clean stainless steel or glass bowl, collect enough sample to fill the sample containers.

2. Depending upon the nature of the debris, it may need to be cut, crushed, or torn to accommodate the sample containers.

3. After enough sample has been collected, the volatile sample is transferred to the appropriate sample container.

4. After the volatile sample is transferred, the remainder of the sample is thoroughly mixed and transferred to the remainder of the sample containers.

6.1.3.2 Decontamination Water

1. Using a clean pair of gloves and a clean Teflon or stainless steel bailer, lower the bailer into the holding pond, or using the sample jar itself, lower the sample jar into the holding pond and fill the sample jars. When using the sample jars to collect the sample, the volatile sample is collected first, followed by the remaining jars.

2. Once the bailer is full, remove from the holding pond, and slowly pour the contents into the sample jars, beginning with the volatile jar first.

3. Once the jars are filled, the samples are preserved with the appropriate preservative. The volatile jar is preserved before the sample is collected.

6.1.3.3 PPE

1. Using a clean pair of gloves, collect enough sample to fill the sample jars.

2. Due to the nature of material, the material may need to be cut, torn or shredded to accommodate the sample containers. If this is the situation, any instrument used to will be of appropriate composition and decontaminated appropriately.

3. The volatile sample will be collected first, followed by the remaining sample jars.

6.1.4 Disposal Samples

Disposal samples will consist of grab samples of excavated soil from the trenches, grab samples of the debris removed from the trenches and grab samples from the decontamination water holding pool. Sampling procedures for the soil, debris and decontamination water will follow the procedures outlined in Sections 6.1.1, 6.1.3.1, and 6.1.3.2, respectively.

6.2 SAMPLING EQUIPMENT

Table 6.1 lists the equipment to be used to collect the samples at MCB Camp Lejeune along with the material composition of each piece of equipment.

6..2.1 Equipment Decontamination

The following steps will be used to decontaminate the sampling equipment utilized at MCB Camp Lejeune.

1. Clean with tap water and phosphate-free laboratory detergent (Liquinox), using brush, if necessary, to remove particulate matter and surface films.

2. Rinse thoroughly with tap water.

3. Rinse thoroughly with deionized water.

Table 6.1
Sample Equipment

Sample Group	Sample Type	Sample Equipment	Material Composition
Confirmation	Grab	Auger	Stainless Steel
		Spoon	Stainless Steel
		Bowl	Stainless Steel
			Glass
Drum	Grab/Solid	Spoon	Stainless Steel
		Bowl	Stainless Steel
			Glass
	Grab/Liquid	Drum Thief/Dip	Glass
		Tube	Stainless Steel
		Bowl	Glass
Waste Characterization	Grab/Soil	Spoon	Stainless Steel
		Bowl	Stainless Steel
			Glass
		Knife	Stainless Steel
	Grab/Debris	Spoon	Stainless Steel
		Bowl	Stainless Steel
			Glass
		Knife	Stainless Steel
	Grab/Liquid	Bailer	Teflon
			Stainless Steel
		Sample Jar	Glass
			Plastic
	Grab/PPE	Spoon	Stainless Steel
		Knife	Stainless Steel
Disposal	Grab/Soil	Auger	Stainless Steel
		Spoon	Stainless Steel
		Bowl	Stainless Steel
			Glass
	Grab/Debris	Spoon	Stainless Steel
		Bowl	Stainless Steel
			Glass
		Knife	Stainless Steel
	Grab/Liquid	Bailer	Teflon
			Stainless Steel
		Sample Jar	Glass
			Plastic

4. Rinse twice with pesticide-grade isopropanol.

5. Rinse thoroughly with organic-free water and allow to air dry as long as possible.

6. If organic-free water is not available, allow equipment to air dry as long as possible. Do not rinse with deionized or distilled water.

7. Wrap with aluminum foil, if appropriate, to prevent contamination if equipment is going to be stored or transported.

Decontamination fluids and PPE will be collected, containerized and disposed properly.

Any heavy machinery brought onsite will require steam cleaning upon departure. The equipment will be decontaminated on the decontamination pad and decontamination fluids transferred to the appropriate pool.

7.0 SAMPLE HANDLING AND ANALYSIS

7.1 SAMPLE ANALYSIS

Table 7.1 provides the analysis, sample containers, preservatives, and holding times for the samples collected at MCB Camp Lejeune. The disposal decontamination water samples will be preserved with HCl for the volatiles fraction and with HNO_3 for the metals fraction. Chemical preservatives are not required for soil samples. All samples will be stored and shipped at 4°C.

Samples will have analyses performed at QC Level C. EPA DQO Level I will be used when determining the hazardous category for the drums.

A standard 14-day turnaround time (TAT) will be needed at MCB Camp Lejeune.

Table 7.1
Sample Analysis, Containers, Preservation, Holding Times

Sample Group	Sample Matrix	Analysis	Sample Container	Preservation Method	Holding Time
Confirmation	Soil	TCLP Volatiles	4-ounce jar	Cool, 4°C	28 days
		TCLP Semi-volatiles, Pesticides, Herbicides	8-ounce jar	Cool, 4°C	54 days
		TCLP Metals Total PCBs	8-ounce jar	Cool, 4°C	6 months*
		Ignitability	8-ounce jar	Cool, 4°C	NA
		pH	8-ounce jar	Cool, 4°C	54 days
		Reactive CN-	8-ounce jar	Cool, 4°C	NA
		Reactive Sulfide	8-ounce jar	Cool, 4°C	NA
		TPH by GC	8-ounce jar	Cool, 4°C	54 days
Drum	Solid/ Liquid	Hazardous Category	16-ounce jar	None	NA
		Drum Compatibility	16-ounce jar	None	NA

Table 7.1 - Continued
Sample Analysis, Containers, Preservation, Holding Times

Sample Group	Sample Matrix	Analysis	Sample Container	Preservation Method	Holding Time
Drum	Com. Waste-streams	Total Suspended Solids Total Dissolved Solids Percent Water Acid Ions (Cl^-, NO_3, SO_4, PO_4) Volatiles Semi-volatiles Pesticides/PCBs TAL Metals BTU Flashpoint Total CN- Amenable CN- Reactive CN- Total Sulfide Reactive Sulfide	16-ounce jar	Cool, 4°C	NA
Waste Characterization	Soil/ Debris/ PPE	TCLP Volatiles	4-ounce jar	None	28 days
		TCLP Semi-volatiles, Pesticides, Herbicides	8-ounce jar	None	54 days
		TCLP Metals Total PCBs	8-ounce jar	Cool, 4°C	6 months*
		Ignitability	8-ounce jar	None	NA
		pH	8-ounce jar	None	NA
		Reactive CN-	8-ounce jar	None	NA
		Reactive Sulfide	8-ounce jar	None	NA
		TPH by GC	8-ounce jar	None	54 days
	Decon. Water	TCLP Volatiles	3 40-ml vials with septums	None	28 days
		TCLP Semi-volatiles, Pesticides, Herbicides	1-gal amber glass jar	None	54 days
		TCLP Metals Total PCBs	1-gal. amber glass jar	None	6 months*
		Ignitability	8-ounce jar	None	NA
		pH	8-ounce jar	None	NA
		Reactive CN-	8-ounce jar	None	NA
		Reactive Sulfide	8-ounce jar	None	NA
		TPH by GC	8-ounce jar	None	
Disposal	Soil/ Debris	Volatiles	4-ounce jar	Cool, 4°C	14 days
		Semi-volatiles, Pesticides/PCBs	8-ounce jar	Cool, 4°C	47 days
		TAL Metals	8-ounce jar	Cool, 4°C	6 months
		BTU	8-ounce jar	Cool, 4°C	28 days
		Specific Gravity	8-ounce jar	Cool, 4°C	NA
		Acid Ions, (Cl, SO_4, NO_3, PO_4)	8-ounce jar	Cool, 4°C	14 days

Table 7.1 - Continued
Sample Analysis, Containers, Preservation, Holding Times

Sample Group	Sample Matrix	Analysis	Sample Container	Preservation Method	Holding Time
Disposal	Decon. Water	Volatiles	3 40-ml vials with septums	HCl, pH, <2	14 days
		Semi-volatiles, Pesticides, PCBs	1-gal amber glass jar	Cool, 4°C	9 days
		TAL Metals	1-liter plastic	HNO3, pH <2	6 months*
		BTU	8-ounce jar	None	28 days
		Specific Gravity	8-ounce jar	None	NA
		Acid Ions (Cl, SO4, NO3, PO4)	8-ounce jar	Cool, 4°C	14 days
QA/QC	Trip Blank/ water	Volatiles	3 40-ml vials with septums	HCl, pH, <2	14 days
	Rinsate Banks/ Water	Volatiles	3 40-ml vials with septums	HCl, pH <2	14 days
		Semi-volatiles; Pesticides/PCBs	1-gal. amber glass	Cool, 4°C	40 days
		TAL Metals	1 liter plastic	HNO3, pH <2	6 months*
	Field Blanks/ Water	Volatiles	3 40-ml vials w/septums	HCl, pH <2	14 days
		Semi-volatiles	1-gal amber glass	Cool, 4°C	47 days
		Pesticides/PCBs	1 liter plastic	HNO3, pH <2	6 months
		TAL Metals			

*Holding time for mercury is 28 days.

7.2 SAMPLE HANDLING

7.2.1 Field Logbook

Field logbooks will be kept to record pertinent information regarding the events of the field work and the collection of samples during the field work. The logbook will contain the following information:

- Contract number
- Project location
- Sampling methodology
- Sample identification number
- Depths at which the sample was collected (if applicable)
- Date and time of collection

- Chain-of-custody number
- Preservative (type and pH)
- Names of sampler and witness
- Lot number of sample containers used (if applicable)
- Analysis to be performed
- Method of shipment and shipper information (manifest numbers, waste profile numbers, date of shipment, etc.)
- All pertinent information/observations

Any errors in the field logbook will be noted with a single line through the error and initialized. Information regarding visitors to the site, ambient field conditions, sample sequence, preservation, field cleaning documentation, ph of preserved samples, and location of samples will be included in the field logbook. All entries into the logbook will be with indelible ink.

7.2.2 Sample Labels

A sample label is attached to all sample containers at the time of collection. The sample label is written in indelible ink and will contain the following information:

- Project number
- Sample identification number
- Time and date of collection
- Preservatives and pH (if applicable)
- Description of sample location
- Name of sampler
- Name of witness
- Analysis requested

A sample label is illustrated in Figure 7.1.

7.2.3 Chain-of-Custody Procedures

Sample custody is initiated by the detailed record-keeping of the field sampling personnel. The chain-of-custody (COC) establishes the documentation and control necessary to identify and trace a sample from collection through analysis.

Job # _____ Sample # _____

Date _____ Time _____

Sample _____

_____

Taken by _____

Witness. _____

PROJECT: CAMP LEJEUNE REMEDIAL ACTION

PROJECT No.: 15226

LOCATION: CAMP LEJEUNE, N.C.

FIGURE 7.1
SAMPLE LABEL

OHM Remediation Services Corp.

It includes field-sample labeling to prevent sample mix-up, custody seals to prevent sample tampering and to secure custody, and to provide the support information for potential litigation.

The COCs are used to document integrity of all samples, to maintain a record of sample collection, transfers between personnel, and shipment and receipt by the laboratory. A COC will be completed for each set of samples at each sampling location and will contain the following information:

- Project number, site name and address
- Sample number
- Date and time of sample collection
- Signatures of all persons involved in the chain-of-possession
- Inclusive dates of possession
- Analyses to be performed
- Preservation
- Comments about sample or sample conditions
- Number of samples

An example of a COC is provided in Figure 7.2.

The sampler will use indelible ink to complete then project number; the project name; the sampler's signature; the sample station number; the date and time of collection; indicate a grab or composite sample; give a description of sample location and matrix; the total number of sample containers for each sample; the sample analysis; and any pertinent remarks.

When transferring sample custody, the sampler will sign and record the date and time of transfer on the COC. The person receiving custody will also sign, date and record the time on the COC.

7.2.4 Custody Seals

Custody seals will be attached to all sample containers after collection. The custody seals are placed on the containers' lids to prevent tampering. The samplers will use indelible ink to sign the custody seals. Figure 7.3 provides illustration of a custody seal.

OHM

CHAIN-OF-CUSTODY RECORD

Form 0000
Field Technical Services
Rev 00/00

No. 62119

O.H. MATERIALS CORP. • P.O. BOX 551 • FINDLAY, OH 45839-0551 • 419-423-3526

PROJECT NAME | PROJECT LOCATION

PROJ NO | PROJECT CONTACT | PROJECT TELEPHONE NO

CHAIN OF POSSESSION | PROJECT MANAGER/SUPERVISOR

ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS)

ITEM NO	SAMPLE NUMBER	DATE	TIME	GRAB	COMP	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)	NUMBER OF CONTAINERS								REMARKS
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															

ITEM NO	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1					
2					
3					
4					

REMARKS

SHIPPING INFORMATION

PLEASE PRESS HARD. ALL 4 PARTS MUST BE READABLE

PROJECT: CAMP LEJEUNE REMEDIAL ACTION

PROJECT No.: 15226

LOCATION: CAMP LEJEUNE, N.C.

FIGURE 7.2
CHAIN-OF-CUSTODY RECORD

OHM Remediation Services Corp.

CUSTODY SEAL

Person Collecting Sample _____ Sample No. _____

Date Collected _____ Time Collected _____

PROJECT: CAMP LEJEUNE REMEDIAL ACTION

PROJECT No.: 15226

LOCATION: CAMP LEJEUNE, N.C.

FIGURE 7.3
CUSTODY SEAL

OHM Remediation Services Corp.

7.3 SAMPLE SHIPMENT

Samples will be collected in the appropriate containers allowing approximately 10 percent air space so that the containers are not full at 130°F. If headspace is not desired for a particular analysis (i.e., volatile organic analysis), the container will be placed inside another container to provide the desired headspace. The sealed and labeled container will then be placed inside an ice chest and packed with vermiculite to prevent breakage. Custody seals will be placed on the cooler to prevent tampering. Appendix A contains additional shipping instructions to meet DOT and/or IATA regulations.

Sample packaging, shipping and chain-of-custody procedures will be performed in accordance with applicable USEPA guidelines. No samples will be held on-site for more than 24 hours.

7.4 SITE-GENERATED WASTE

Waste generated at the site will be stored separate to prevent any contamination of the clean areas. Contaminated soils will be kept in stockpiles away from the clean areas and will be covered with plastic sheeting to prevent mobilization of particles. Debris will also be kept in stockpiles and covered with plastic sheeting or kept in covered roll-offs. Decontamination fluids will be stored in a 12,000-gallon aboveground pool. PPE will be kept in drums or in roll-offs to prevent contamination of the clean areas.

Samples delivered to the laboratory will be disposed by the laboratory. The laboratory is required to ship the samples to an EPA-approved TSDF. Approved TSDFs that may be used are listed in the following table.

Facilities Approved by OHM
to Receive Waste from Government Sites

Facility Name	Comment and Conditions
All waste	All facilities
Aptus	Coffeeville, Kansas
Chambers Development Company	All facilities
Chemical Waste Management	All facilities, except Chicago and Sauget, Illinois
ChemNuclear	Barnwell, South Carolina
Concord Resources Group	All facilities
CyanoKEM	Detroit, Michigan
Disposal Systems, Inc.	Deer Park, Texas
ENSCO	All facilities
EnviroSafe	All facilities
EnviroTech – 1st Piedmont	Danville, Virginia
Georgia Recovery Systems	Fairburn, Georgia
Heritage Environmental Services	All facilities
Inmetco	Ellenwood City, Pennsylvania
Kedesh, Inc.	Jesup, Georgia
Laidlaw	All facilities, except Pinewood, South Carolina
Mercury Refining Company, Inc.	Albany, New York
MKC Enterprises, Inc.	Doraville, Georgia
OHM Resource Recovery	Morrow, Georgia
OSCO/Bryson	Nashville, Tennessee
Peoria Disposal Company	All facilities
Recycling Alternatives	All facilities
Rollins	All facilities
Soil Remediation Company, Inc.	All facilities
Systech, Inc.	All facilities
ThermalKEM	All facilities
USEPCI	All facilities
USEPCI – PPM	All facilities
UWT (Universal Waste Management)	Tampa, FL
Wadco	Camden, New Jersey or Baltimore, Maryland
Waste Management	All facilities

Note: Use of other facilities is not prohibited provided the facility is in good regulatory standing. Work performed for the EPA and on CERCLA sites requires CERCLA approved facilities. If you wish to propose other TSDFs, please include their name, address, phone number and EPA ID number.

APPENDIX A

SHIPPING INSTRUCTIONS

M E M O

To: Division Managers

From: Tom Mears

Date: 4/12/93

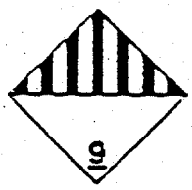
Re: Sample Shipment

Upon conversations with Federal Express and review of the new DOT and IATA regulations (Fed-Ex follows IATA) the following instructions will apply for any shipment of samples when Federal Express is the carrier. Please disregard any earlier instructions about packing & shipping samples via Federal Express.

These instructions are for materials which meet the DOT and/or IATA definition of hazardous materials. These instructions are more restrictive than is necessary for non-regulated samples. However, it will be easier for field personnel to follow a single uniform procedure than to decide when less restrictive shipping methods based on a set of complex rules and exceptions can be used. Several packages of labels & materials are attached for your use until you have time to order your own supplies. If you have any questions please contact me.

1) Samples must be shipped in "Strong outer packaging". Fed-Ex stated that a rigid plastic cooler like we are currently using would be acceptable.
2) Both the shipper's & receiver's address must be on the box. This can be either an address label or addresses actually written on the cooler using a permanent marker.
3) The following shipping name must be printed in large letters using a permanent marker on the top and side of the cooler:

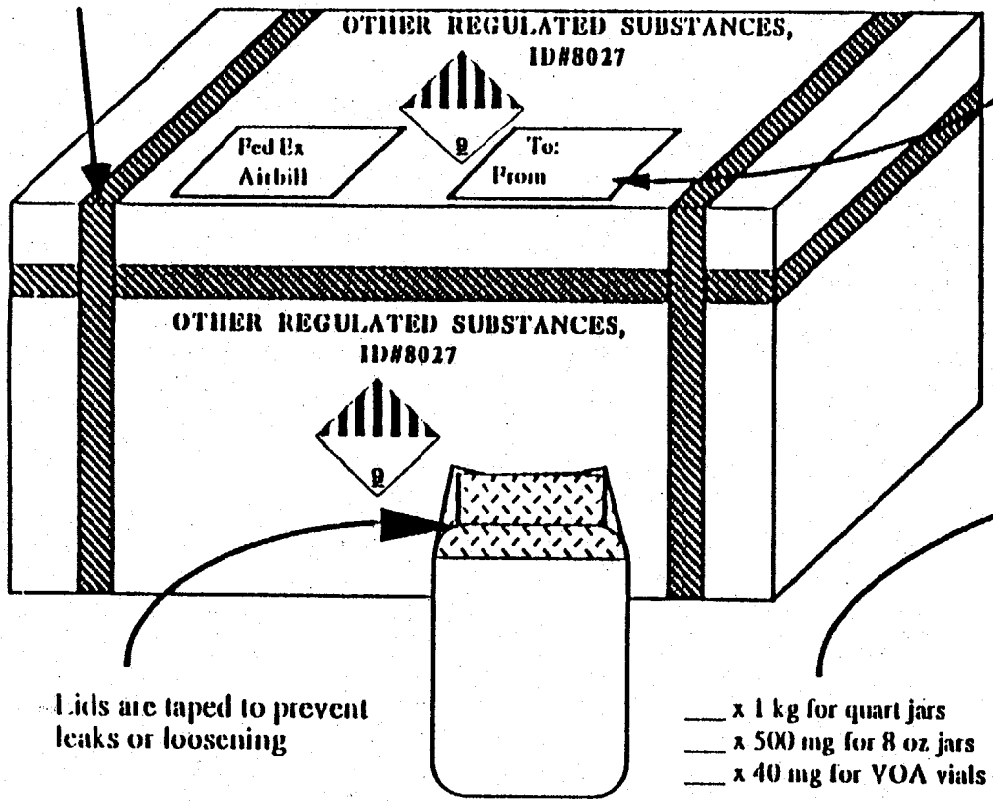
   OTHER REGULATED SUBSTANCES, ID#8027
4) A Class 9 hazardous material shipping label must appear on the top and side of the box next to the shipping name. These can be ordered from Lab Safety @ (800) 356-0783--catalog # QA-20702(P)



5) Inner packages cannot exceed 1 gallon each, and the entire shipment (cooler, samples & absorbent) cannot exceed 66 lb.
6) Coolers must be packed with absorbent material which will absorb any spills or leaks, not react with the sample contents, and which will minimize the chance that inner containers will break. The coolers should also be fastened shut securely using tape or strapping.
7) Inner containers should have their lids secured with tape or wire to prevent the lids coming off while being transported.
8) The materials must be shipped using a Federal Express Hazardous Materials Airbill (see the attached shipping instructions). You can also call the Hazardous Materials group at Federal Express at (800) 238-5355 for instructions on filling out this form.

Cooler lid is taped closed and additional tape should be used around the outside to act as strapping.

OHM Address Label
w/ Lab's mailing address



Lids are taped to prevent leaks or loosening

___ x 1 kg for quart jars
___ x 500 mg for 8 oz jars
___ x 40 mg for VOA vials

Lower Portion of Fed-Ex DANGEROUS GOODS airbill

CHECK ONE -> [ ] 49 CFR [X] IATA/ICAO

Dangerous Goods Identification		UN or ID No.	**	Quantity and Type of Packing	Pack. Inst.	Auth
Proper Shipping Name	Class or Division					
Other Regulated Substances	Class 9	ID 8027	NA	Plastic Box Containing ___ x 1 kg Inner containers	906	
		Passenger Aircraft		Cargo Aircraft		
		Non-Radioactive		Radioactive		

1) Samples must be shipped in "Strong outer packaging". Fed-Ex stated that a rigid plastic cooler like we are currently using would be acceptable.

2) Both the shipper's & receiver's address must be on the box. This can be either an address label or addresses actually written on the cooler using a permanent marker.

3) The following shipping name must be printed in large letters using a permanent marker on the top and side of the cooler:

OTHER REGULATED SUBSTANCES, ID#8027

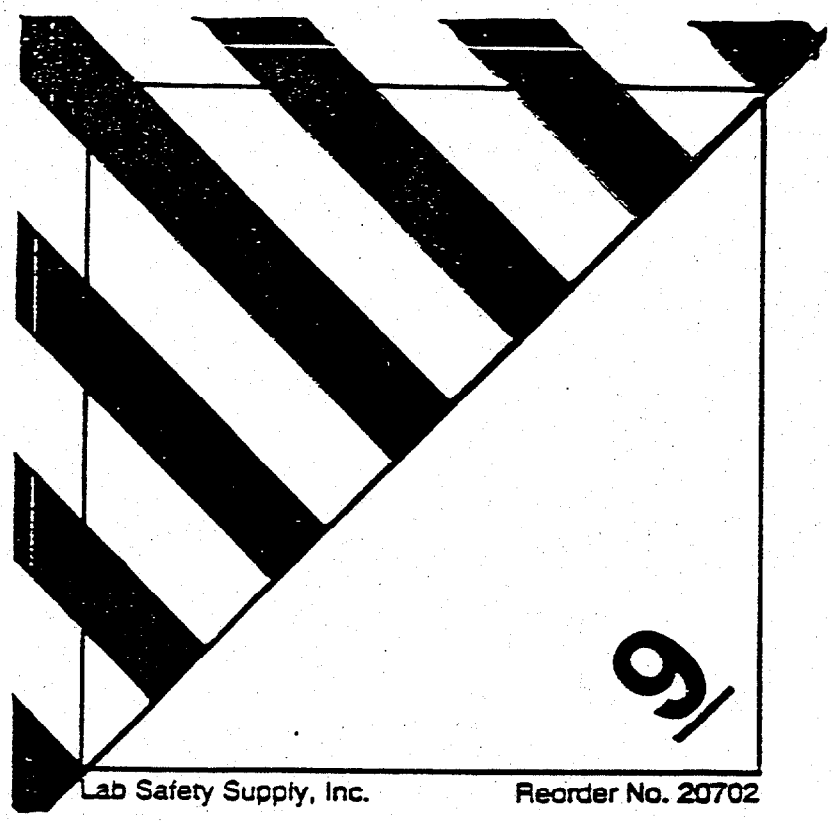
4) A Class 9 hazardous material shipping label must appear on the top and side of the cooler next to the shipping name.

5) Inner packages cannot exceed 1 gallon each, and the entire shipment (cooler & samples) cannot exceed 66 lb.

6) Coolers must be packed with absorbent material (vermiculite or kitty litter) which will absorb any spills or leaks, not react with the sample contents, and which will minimize the chance that inner containers will break. The coolers should also be fastened shut securely using tape or strapping.

7) Inner containers should have their lids secured with tape or wire to prevent the lids coming off while being transported.

8) The materials must be shipped using a Federal Express Hazardous Materials Airbill. Use the example above or call the Hazardous Materials group at Federal Express at (800) 238-5355 for more instructions on filling out this form.



Class 9 Shipping Label

OHM Corporation

AIRBILL PACKAGE TRACKING NUMBER 6729209572

QUESTIONS? CALL 800 463-3339 TOLL FREE.

6729209572

404-729-3900

C H M CORP

5335 TRIANGLE PKWY STE 450

NORCROSS GA 30092

SERVICES

DELIVERY AND SPECIAL HANDLING

SERVICE CONDITIONS, DECLARED VALUE AND LIMIT OF LIABILITY

INSTRUCTIONS

SIGNATURE RELEASE UNAVAILABLE

6729209572 AIRBILL NUMBER

SHIPPER'S CERTIFICATION FOR RESTRICTED ARTICLES/DANGEROUS GOODS

CHECK ONE ☐ 49 CFR ☐ IATA/ICAO (TYPE OR PRINT)

DANGEROUS GOODS IDENTIFICATION						
PROPER SHIPPING NAME	CLASS OR DIVISION	UN OR ID NO	SUBSIDIARY RISK	QUANTITY AND TYPE OF PACKING	PACKING INST	AUTHORIZATION

ADDITIONAL HANDLING INFORMATION

TRANSPORT DETAILS	THIS SHIPMENT IS WITHIN THE LIMITATIONS PRESCRIBED FOR ▶	PASSENGER AIRCRAFT	CARGO AIRCRAFT ONLY	(DELETE NONAPPLICABLE)
AIRPORT OF DEPARTURE	AIRPORT OF DESTINATION	SHIPMENT TYPE ▶	NON-RADIOACTIVE	RADIOACTIVE (DELETE NONAPPLICABLE)

IF ACCEPTABLE FOR PASSENGER AIRCRAFT, THIS SHIPMENT CONTAINS RADIOACTIVE MATERIAL INTENDED FOR USE IN, OR INCIDENT TO, RESEARCH MEDICAL DIAGNOSIS OR TREATMENT

I HEREBY DECLARE THAT THE CONTENTS OF THIS CONSIGNMENT ARE FULLY AND ACCURATELY DESCRIBED ABOVE BY PROPER SHIPPING NAME AND ARE CLASSIFIED, PACKED, MARKED, AND LABELED, AND ARE IN ALL RESPECTS IN PROPER CONDITION FOR TRANSPORT BY AIR ACCORDING TO THE APPLICABLE INTERNATIONAL AND NATIONAL GOVERNMENT REGULATIONS.

NAME AND TITLE OF SHIPPER | PLACE AND DATE

EMERGENCY TELEPHONE NUMBER | SIGNATURE OF SHIPPER | SEE WARNING ON BACK

Federal Express Airbill

OHM Corporation