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OHM Corporation

WORK PLAN
FOR
ADDITIONAL SITE INVESTIGATION
TO DEFINE VOC CONTAMINATION
IN PORTIONS OF AOC 1, AREA 82
MCB CAMP LEJEUNE, NORTH CAROLINA

Prepared for:

DEPARTMENT OF THE NAVY
Contract No. N64270-93-D-3032
Atlantic Division
Naval Facilities Engineering Command
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1.0 INTRODUCTION

1.1 SITE BACKGROUND

Baker Environmental, Inc. performed a Remedial Investigation of several areas of MCB Camp LeJeune near Jacksonville, North Carolina. Their results, based on only four contaminated soil samples, revealed two small areas (approximately 100 feet by 120 feet and 200 feet by 200 feet) in Area 82 with soil showing elevated concentrations of volatile organic compounds (VOCs). Therefore, additional investigation is necessary before remedial design can be confidently addressed.

The area of concern is located within the southeastern portion of Site 82 (north of Lot 203) in a moderately wooded section containing moderate to dense underbrush. Two previous excavations along with several permanent monitoring wells are also located in the area of investigation.

1.2 PURPOSE

The primary objective of this investigation is to determine the horizontal and vertical extent of soil VOC contamination within two areas of Site 82 of OU No. 2 which exceed the established soil clean-up objectives. Soil VOC contaminant concentrations within the two areas of AOC 1 must be further defined to complete the remedial design and construct an effective soil vapor extraction system which will achieve the remedial goals. The remedial goals for soils in AOC 1 were provided in Baker's Basis of Design Report dated May 10, 1994 as part of the pre-design package to OHM. The soil remedial goals to date for VOCs are as follows:

- Benzene – 5.4 µg/kg
- Trichloroethene – 32.2 µg/kg
- Tetrachloroethene – 10.5 µg/kg

2.0 SCOPE OF WORK

The scope of work for this investigation addresses only VOC contaminants which may exist in the two areas of AOC 1 described in Baker's report. In order to accomplish this objective, the following tasks will be performed. All tasks will be performed directly by or under the oversight of OHM. They include:

- Developing Site Health and Safety Plan
- Coordination of site activities
- Sample grid (surveying) layouts
- Soil sampling
- OVA headspace screening

The following sections generally describe tasks and procedures to be used in conducting the additional investigation of the designated VOC areas of site 82. More detailed descriptions of certain procedures are included in the attached SAP. Work will be conducted in general accordance with those descriptions. Limited work plan or procedural modifications may be made by the Site Supervisor/Site Safety Officer in the field as necessary based on field findings, client requests, weather conditions, etc.

2.1 HEALTH AND SAFETY PLAN

A site specific health and safety plan will be developed for this investigation. The plan will be consistent with the site specific Health and Safety Plan prepared by OHM for the Remedial Action Work Plan. Based on OHM's understanding of the site conditions, potential hazards, and sampling techniques, personnel are expected to use level C personal protection. Adequate air monitoring using a PID or portable FID will be performed during the field activities to detect conditions requiring upgrade of personal protective equipment. An OHM representative will perform air monitoring to determine the actual level of protective equipment required.

2.2 COORDINATING ACTIVITIES

The designated OHM site representative will contact the appropriate Base personnel during mobilization as specified by LANTDIV. The purpose will be to coordinate field activities, request utility clearances, and provide LANTDIV/Base Representatives with a copy of OHM's Health and Safety Plan. Base personnel are expected to identify all electrical and underground utilities in addition to past burial trenches or other site features which are relevant to the field investigation or pose potential hazards. OHM has received written confirmation from LANTDIV that the area of interest of AOC 1 has been checked and cleared of unexploded ordinances.

2.3 SITE SURVEY AND SAMPLING GRID

Due to the access restrictions and dense underbrush present on the site, a professional licensed surveyor will be required to locate reference points in the field so that an accurate sampling grid may be established for each of the two sampling areas. Figure 1 shows these areas and the proposed 40 foot sample grid baseline. Boundaries of the study areas will be the approximate 200 feet by 200 feet and expanded 160 feet by 120 feet areas shown in Figure 1. Approximate boundaries are based on previous design drawings provided by Baker. Boundaries may be slightly adjusted to coincide with the established grid system currently in use. The sampling grid (40- to 50-foot spacing) will be established by the OHM representative in the field and expanded or reduced as required. Sampling will begin near previous sample points of each area and extend outward along the established grid. Each of the locations selected for direct push sampling will be clearly marked with a flag or other appropriate identifier. Once the grid is established, the OHM representative will use direct observations and OVA headspace analysis to determine actual sample point locations and/or horizontal extent of the investigated area. The surveyor may be required to return to the site after sampling and well point installation to record actual locations and elevations.

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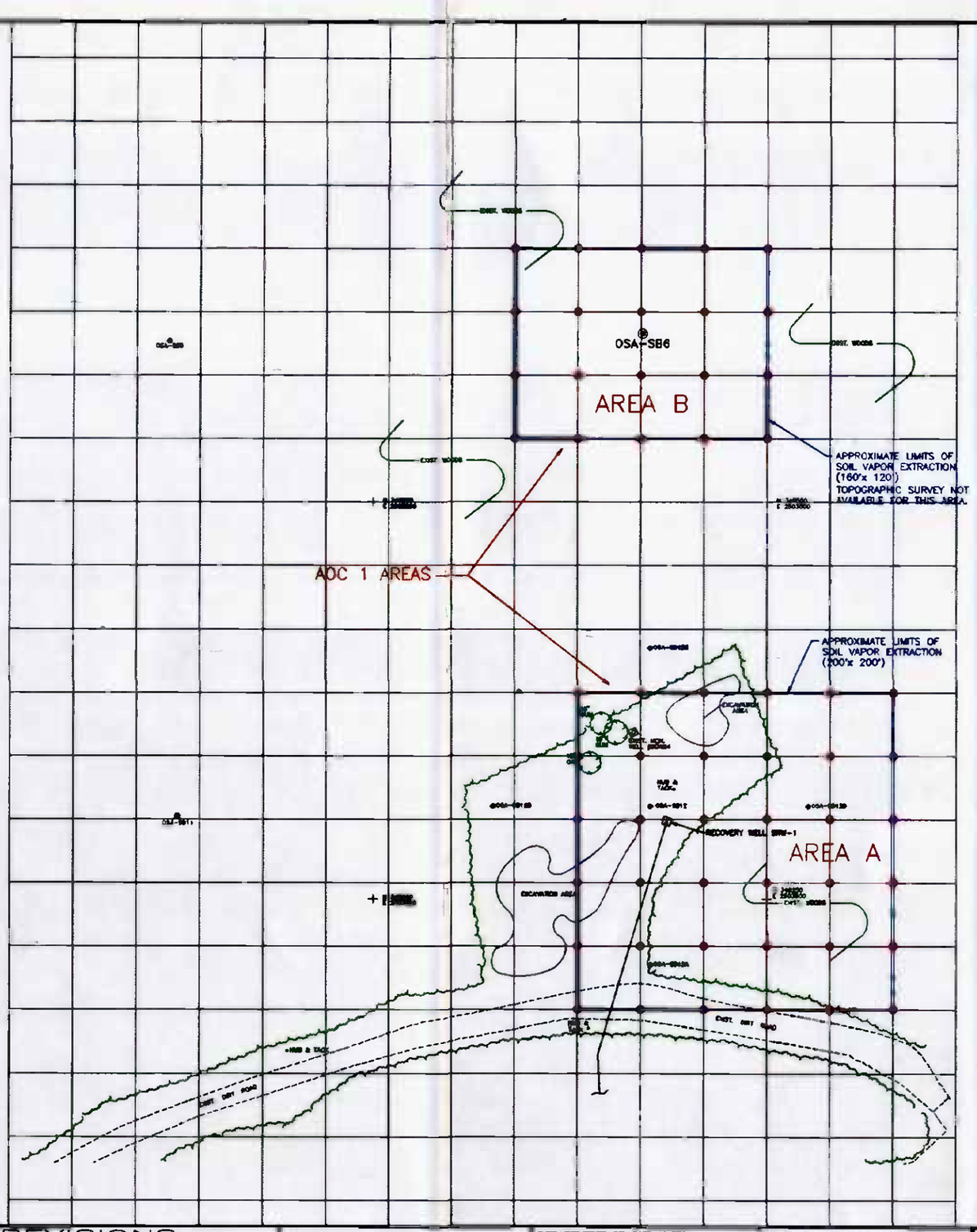

OHM Remediation Services Corp.
Norcross, Georgia
A Subsidiary of OHM Corporation

SUBMITTED: _____ PROJECT MANAGER DATE: _____
APPROVED: _____ SR PROJECT ENGINEER DATE: _____
APPROVED: _____ DEPT. MANAGER DATE: _____

AT FULL SCALE (IF NOT 2"-SCALE ACCORDINGLY)
CADD FILE: SAMPLING.DWG
DRAWN: B. MATTHEWS
DESIGNED: G. GILLES
CHECKED: G. GILLES
CHECKED: _____

REVISIONS

ZONE	REV.	DESCRIPTION	BY	DATE	APP.

DEPARTMENT OF THE NAVY — NAVAL FACILITIES ENGINEERING COMMAND
ATLANTIC DIVISION
NAVAL STATION — NORFOLK, VIRGINIA
LANTDIV RAC CONTRACT N62470-93-D-3032 — DELIVERY ORDER NO. 0015
OPERABLE UNIT NO. 2 — MARINE CORPS BASE, CAMP LEJEUNE, N.C.

FIGURE 1.0

PROPOSED AOC 1 SAMPLING LOCATIONS

DRAWING NUMBER: C-1
SHEET NUMBER: 1 of 1
DATE: 6\30\94

2.4 SOIL SAMPLING

The collection of soil samples for headspace and laboratory analysis will be performed using direct push sampling methods. On-site equipment used for direct push sampling includes a truck mounted or ATV mounted "cone-penetrometer" rig with attachments specifically designed for environmental sampling. This rig utilizes an hydraulic hammer unit that advances a small diameter hollow steel probe to the desired depth. Specialized attachments allow soil, soil gas, and/or groundwater samples to be taken at discrete depths. Direct push sampling methods were chosen for this investigation for the following reasons:

- A high density of direct samples can be obtained in a short time period,
- The method yields minimal waste streams such as drill cuttings or decontamination wastes, and
- Wooded areas of AOC 1 are more accessible with direct push sampling equipment compared to a conventional drilling rig.

For this investigation, only soil samples will be analyzed (except for QC blanks). OVA headspace screening as discussed in Section 2.5, will be performed on an undetermined amount of soil samples at a minimum of two depths per location above groundwater surface. Where it can be determined that groundwater is greater than 12 feet below ground surface, three soil samples will be collected. All samples will be collected in glass jars with teflon lined lids and placed on ice in a cooler for shipment to the laboratory for analysis. The OVA headspace results will be used for contaminant concentrations screening in an effort to identify the extent of contamination and reduce the total number of samples for off-site laboratory confirmation analysis. Approximately 60 soil samples or less will be taken for confirmation analysis from both sampling areas combined. Additionally, field duplicates and field blanks will be collected and submitted for analysis as described in sections 3.2 and 3.5 of the SAP.

All samples collected on-site will be provided with a unique sample designation. The number will serve to identify the site, location, grid and specific sample number. The sample designation format will appear as follows:

A(x,y)D

Where:

A or B = Particulate test area within wooded part of area 82, north of lot 203, west of Piney Green Road, and south of Wallace Creek (Figure 1)

(x,y) = Grid Coordinates of sample

D = Depth of sample

Dup = Field Duplicate designation, when applicable

Examples:

B(2,5)6

Denotes the sample removed from sample area B at grid coordinates x = 2, Y = 5, at 6 feet.

In conjunction with the soil sampling, approximate groundwater levels will also be recorded at several locations relative to the site topography. Four to eight 2-inch diameter piezometers will be installed in the two study areas for a more precise identification of the depth to groundwater. These piezometers will be installed by using direct-push methods to establish a pilot hole, then an enlarged hole (to approximately 1-7/8 inches). The 1-inch slotted PVC screen and riser can then be set and sand-packed as a temporary or permanent well point.

2.5 OVA HEADSPACE SCREENING

During soil sampling operations, an aliquot of soil will be placed in a ziploc bag and set aside for headspace analysis using an Organic Vapor Analyzer (OVA). This method provides a quantitative field screening of volatile organics being released from within the soil sample. Samples selected for laboratory confirmation analysis will be placed in glass jars with teflon lines lids and stored on ice. By measuring relative levels of headspace VOCs, field personnel can

identify "hot spots", and selectively reduce the quantity of more costly off-site analyses. Thus, the investigation goals can be achieved more cost effectively. Headspace data can be plotted on a field map of the area and evaluated to help in directing the investigation. It should be noted that the OVA screening results are intended as a field decision making tool and may or may not directly correlate with the actual soil sample concentrations reported by the laboratory. A more detailed explanation of OVA headspace screening procedures is provided in section 3.2.1 of the SAP.

3.0 FIELD DATA COLLECTION

3.1 QUALITY ASSURANCE/QUALITY CONTROL

The OHM representative on-site will be responsible for implementing OHM's Quality Control procedures. Proper chain-of-custody documentation will accompany samples at all times. Also, trip blanks will be sent by the laboratory to be included with the sample shipments. These are prepared by the laboratory by filling a 40-ml VOA sample container with purified water. Also, appropriate equipment blanks and field duplicates will be collected. These items are described in more detail in section 3.5 of the SAP.

Savannah Laboratories, Inc. (SLI) in Savannah, Georgia, will provide QA/QC procedures in accordance with all relevant EPA testing methods and in accordance with North Carolina State requirements.

3.2 PERSONAL PROTECTION

It has been anticipated that activities in AOC-1 (area 82) will be conducted in Level C. Level C will include tyvek overgarments, steel toe boots with tingley overboots, nitrile gloves, respiratory protection and hard hats. Refer to the Health and Safety Plan for this project for more details.

3.3 FIELD NOTEBOOKS

During site operations field notebooks will be used to log all operational activities on site. Entries will include but not be limited to the following data:

- Personnel on site
- Time/date of events
- Sample descriptions (e.g., location, ID number, matrix, headspace results)
- Chain-of-custody numbers
- General site observations

3.4 DECONTAMINATION PROCEDURES

All sampling equipment will undergo the following sequence of decontamination procedures after each sample is taken. These steps are consistent with OHM Standard Operating Procedures and EPA Region IV SOPs.

1) Detergent (liquinox) wash and brushing to remove large particles
2) Tap water rinse
3) Solvent (isopropanol) rinse
4) Deionized or distilled water rinse

All liquids generated during decontamination procedures will be collected in DOT approved 17H/E drums and labelled for waste profiling, temporary storage, and off-site disposal as directed by LANTDIV.

3.5 SAMPLE MANAGEMENT

Soil samples will be logged, and placed on ice for shipment to Savannah Laboratories, Inc. in Savannah, Georgia (SLI). The samples will be packaged in accordance with International Airline Transportation Association (IATA) regulations and shipped via Federal Express. Proper chain-of-custody documentation will be maintained for all samples collected and sent for laboratory analysis.

3.6 ANALYTICAL PROGRAM

Samples collected will be sent to SLI, to be analyzed for Volatile Organics (VOC's) using EPA method 8240. Trip blank samples will be run for QA/QC per Section 3.1. In order to comply with system design deadlines, a 5-day turnaround of sample results will be requested.

4.0 RESIDUALS MANAGEMENT

As stated previously, this investigation utilizes procedures which greatly reduce the generation of waste materials. However, residuals that are generated will be handled in an appropriate manner (i.e. containerized in drums, labeled and staged on site) consistent with RCRA regulations concerning hazardous waste. LANTDIV will be responsible for assigning the proper waste codes as applicable to the residuals. Residual disposal is not included within this scope of work.

5.0 SCHEDULE

OHM is prepared to mobilize to the site the week of July 11 with LANTDIV authorization and notice to proceed. Coordination with the appropriate Base personnel is ongoing. The proposed project schedule, once work has commenced, is as follows:

- Mobilization - Day 1
- Initial site survey - Days 1 and 2
- Piezometer installation - Days 2 through Day 4
- Brush clearing (backhoe on-site) - Day 1 through Day 5
- Direct push sampling - Day 2 through Day 5
- Final site survey - Days 5 and 6
- Demobilization - Day 6

Once Savannah Laboratories receives the confirmation soil samples, the analytical results will be reported to OHM within one week. Results of the investigation will be compiled and presented in a summary report to LANTDIV along with recommendations within two weeks of OHM's receipt of final laboratory data. This information will also be incorporated into the Remedial Action Work Plan for OU No. 2. OHM recommends that a telephone conference call be held at that time with LANTDIV and Baker to discuss further actions for AOC 1.