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

Contract N47408-92-D-3042
Camp Lejeune, North Carolina

Submitted to:

Commanding Officer
Atlantic Division
Naval Facilities Engineering Command
Norfolk, VA 23511-2699

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1.0 INTRODUCTION

The Naval Facilities Engineering Services Center (NFESC) has requested that OHM Remediation Services Corp. (OHM) provide site remediation services for Site 6, Operable Unit No. 2 (OU No. 2) located at Marine Corp Base (MCB) Camp Lejeune, North Carolina. This work will be completed under contract No. N47408-92-D-3042, Delivery Order No. 032. OHM personnel performed a site visit on July 26, 1993, to review existing site conditions and develop a cost estimate and proposal to remove the drums at Site 6.

Activities completed to date include a site visit, cost estimate and proposal preparation, negotiations, preparation of a revised cost estimate/proposal, issuance by NFESC of a Delivery Order, issuance by OHM Program Management Office of a Notice-to-Proceed, and development of a Submittal Status Log.

This Work Plan is based on the Final RAC Requirements Package, Removal of Drums at Site 6 (by Baker Environmental, Inc.) and OHM's Proposal Revised September 29, 1993.

2.0 BACKGROUND

Marine Corps Base (MCB) Camp Lejeune, North Carolina was placed on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) National Priorities List (NPL) that became effective on October 4, 1989 (54 Federal register 41015, October 4, 1989). The United States Environmental Protection Agency (USEPA) Region IV, the North Carolina Department of Environment, Health and Natural Resources (NC DEHNR) and the United States Department of the Navy (DoN) then entered into a Federal Facilities Agreement (FFA) for MCB, Camp Lejeune. The primary purpose of the FFA was to ensure that environmental impacts associated with past and present activities at the Base were thoroughly investigated and appropriate CERCLA Response/Resource Conservation and Recovery Act (RCRA) corrective action alternatives were developed and implemented as necessary to protect public health and the environment.

Site 6 is bounded by Site 82 on the north, by Piney Green Road on the East, by Site 9 on the south, and by Holcomb Boulevard on the West. Site 6 covers an area of approximately 177 acres that incorporates 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 5 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 Holcomb Boulevard to the west. Lots 203 and 201 are currently inactive.

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.

Woods and open fields surround both Lots 201 and 203 and make up the remaining area of Site 6. The topography of the wooded areas is relatively flat, but localized trenching and mounding is visible just north of Lot 203 and west of Piney Green Road. The wooded areas are randomly littered with debris including spent ammunition casings, and empty or rusted drums.

Site 6 has a long history of various uses including the disposal and storage of waste and supplies. Lot 203 has been used as a disposal area since the 1940s. Little documentation exists on the disposal area, but the ground surface is littered with debris. Lot 203 was also used for the storage and disposal of radio and communication parts, shredded tires, lubricants, petroleum products, corrosives, expended demolition kit training materials, ordnance, sheet metal debris, wire cables, and wood pallets. Lot 203 is currently fenced.

3.0 PROJECT STAFF

An organization chart, showing key project personnel and lines of reporting is provided in Figure 3.1. Should the personnel identified for this project not be available, OHM will notify NFESC prior to mobilization of any substitutions.

Furthermore, OHM will provide the ROICC at the Pre-Construction Meeting the proof of citizenship for all selected or anticipated personnel to be working at the project site during remediation activities.

OHM site personnel will be familiar with all the requirements of the Specifications, Plans, Drawings and site documentation prepared under this Delivery Order prior to commencing field activities.

OHM's day-to-day relationship with the NTR will be as defined in the Contract Documents. OHM's project manager and/or construction manager will be the primary point of contact with the NTR, and will be responsible for the preparation of all daily, weekly and monthly construction documentation as required. As issues arise regarding the work, the OHM Project/Construction Manager and the NTR will confer and agree upon the proper course of action. OHM understands that only the NAVFAC Contracting Officer in Port Hueneme, California, can issue modifications to the Delivery Order.

4.0 SUMMARY OF WORK

This section describes the activities required to perform the Scope of Work for Contract N47408-92-D-3042, Delivery Order 032, Site 6, Camp Lejeune, North Carolina.

4.1 PROJECT PLANNING

Activities completed to date include a site visit, cost estimate and proposal preparation, negotiations, preparation of a revised cost estimate/proposal, issuance by NFESC of Delivery Order 032, issuance by OHM Program Management Office of a Notice-to-Proceed, and development of a Submittal Status Log.

Following approval of all submittals, OHM will procure equipment and materials, and prepare for mobilization. All field activities will be conducted in accordance with the Site Health and Safety Plan (SHSP), and Construction Quality Control Plan (CQC) Addendum.

4.2 MOBILIZATION AND SITE PREPARATION

Mobilization and site preparation activities are described in the sections below.

All equipment used on-site will be certified as being free of contamination. A letter itemizing the equipment and stating that all equipment is free of contamination will be provided to the NTR immediately prior to initiating work.

4.2.1 Mobilization

Personnel and equipment will mobilize from OHM's Raleigh, North Carolina; Gallatin, Tennessee; and Covington, Georgia operations centers. Dispatching, loading and travel time are anticipated to require two 10-hour days. The pre-construction meeting will be scheduled prior to mobilization. Prior to mobilization, OHM will advise Camp Lejeune personnel in preparation of

obtaining base passes. OHM will conduct a site Scope of Work review and Safety and Health briefing for orientation of all site personnel.

Following the approval of all submittals, the project will begin with mobilization of the necessary equipment and personnel. The following is a list of personnel and equipment intended to be utilized on the project site:

Personnel

- Truck drivers
- Equipment operators
- Project control technician
- Recovery technicians
- Project chemist
- Site supervisor
- Health and Safety Specialist
- Construction manager

Equipment

- OTR diesel tractor
- Water truck
- OHM van
- Lowboy trailer
- 12-000-gallon portable pool
- Sulfide detector
- Explosion meter
- Case 580 backhoe
- Cat 215 trackhoe
- Hot pressure washer
- Electric submersible pumps
- Hydraulic drum grappler
- Office trailer
- 2-ton stakebed
- OHM pick-up truck
- Decontamination trailer
- Utility trailer
- Cyanide detector
- Photoionization detector
- Organic vapor analyzer
- 963 track loader
- Generator 5KW
- Air compressor
- Diaphragm pumps
- Hydraulic shears
- Dump trucks

This list is not all inclusive; as changes, or field conditions dictate, OHM may elect to mobilize other equipment and personnel as necessary. Periodic site visits will be conducted by a Certified Industrial Hygienist, the Construction Manager and the Project Chemist.

4.2.2 Site Setup and Preparation

Site preparation activities will consist of the following activities:

- Establishing an office trailer and decontamination trailer
- Establishing work zones
- Constructing staging cells
- Constructing decontamination stations
- Implementing erosion control measures
- Installing a new gate in the existing fence.

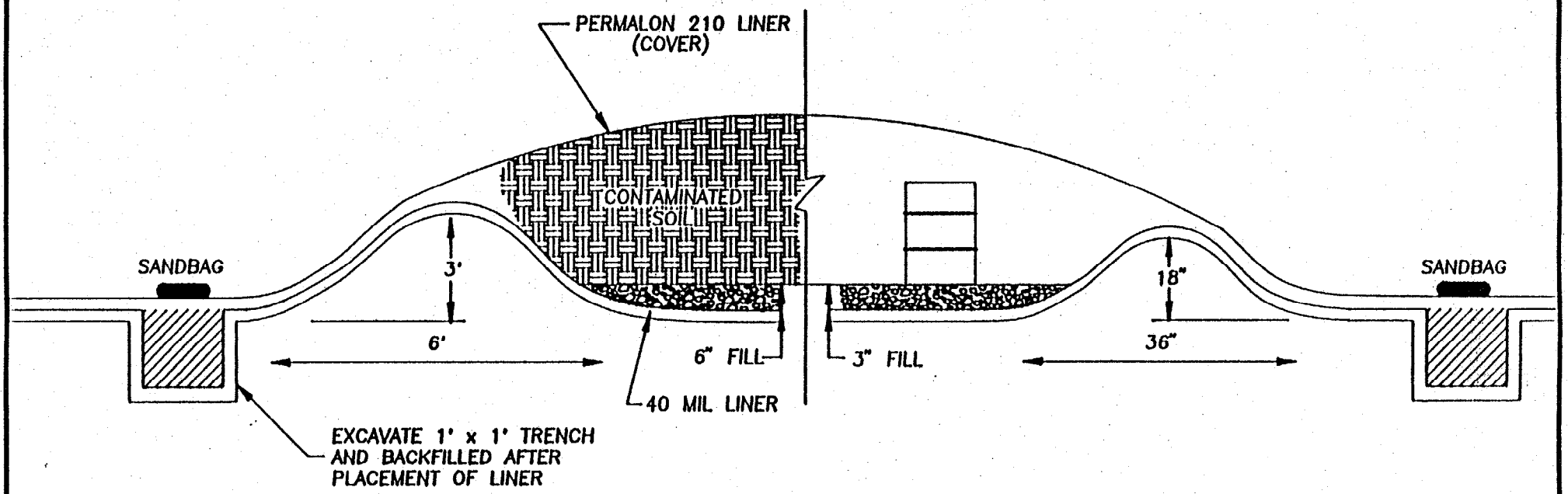
The entrance to Site 6, off Holcomb Boulevard, will serve as access to the project site. The gate will be secured with interlocking dual locks to allow authorized access during operational hours. Keys will be available to Camp Lejeune personnel and other appropriate officials involved in the remedial action. A field office trailer and decontamination trailer will be located at the entrance. All access to the project site will be through the field office trailer. All project personnel and visitors will sign the project sign-in log when entering and exiting.

During site setup and preparation, six lined staging cells will be constructed in accordance with design specifications and will consist of the following: drum staging cell, soil staging cell, debris staging cell, temporary rinse area, processing area, and a decontamination pad. In addition, two access roads and two staging areas will be constructed at the trench locations.

Berm construction will utilize soils from a borrow site located on the MCB. These soils are pre-approved clean and acceptable for compaction specifications. Figures 4.1 and 4.2 provide a drawing showing construction (location and size) of the staging cells, the liner and drainage.

The design of each staging area will conform to the RAC Requirements Package. Field conditions may necessitate minor changes in actual placement of each staging area. Any such changes will be discussed with the NTR prior to installation.

The drum staging cells will be constructed similar to the soil staging cells, however, the berm height will be 18 inches. The drums will be placed in groups of three and will have reasonable space between other groups to permit access



NOT TO SCALE

PROJECT: CAMP LEJEUNE
REMEDIAL ACTION
PROJECT No. 15226

LOCATION: CAMP LEJEUNE, N.C.

FIGURE 4.1
STAGING CELL CONSTRUCTION

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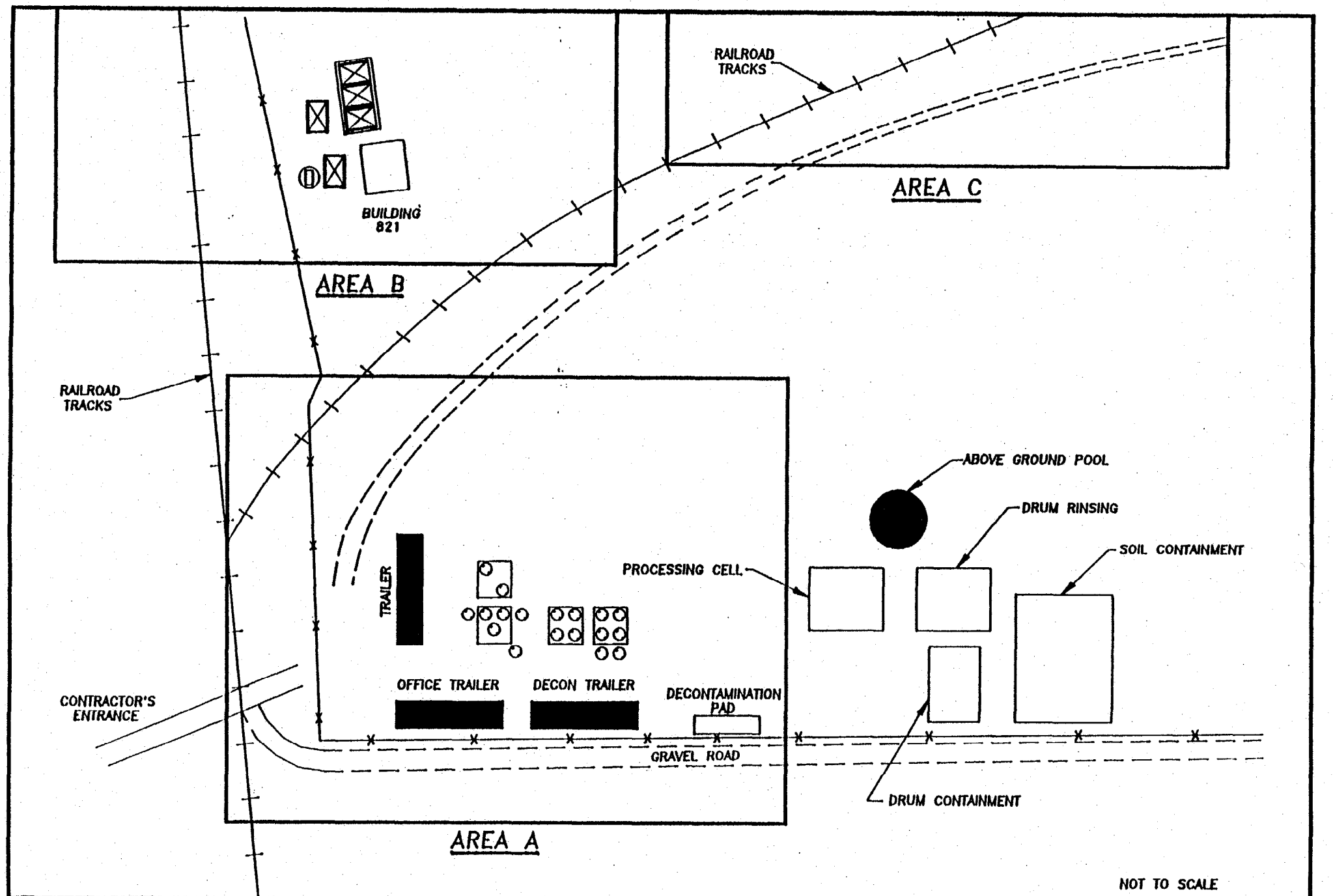


PROJECT: CAMP LEJEUNE
REMEDIAL ACTION
PROJECT No. 15226

FIGURE 4.2
STAGING CELL LOCATIONS
(SITE 6)

OHM Remediation Services Corp.

for sampling and inspection of the drums. If existing topography does not provide appropriate drainage, fill material will be used to create a gradual slope within the staging confines to control run-off. The rainwater will be collected in the staging areas and removed to a 12,000-gallon aboveground temporary pool.

OHM will construct a pad for heavy equipment decontamination operations and collection of rinse water. Installation of the decontamination pad (Figure 4.3) will be executed in accordance with the RAC Requirements Package. Any significant changes in the design of this pad will be discussed in advance with the NTR. All rinse water and decontamination water will be pumped to the above referenced pool.

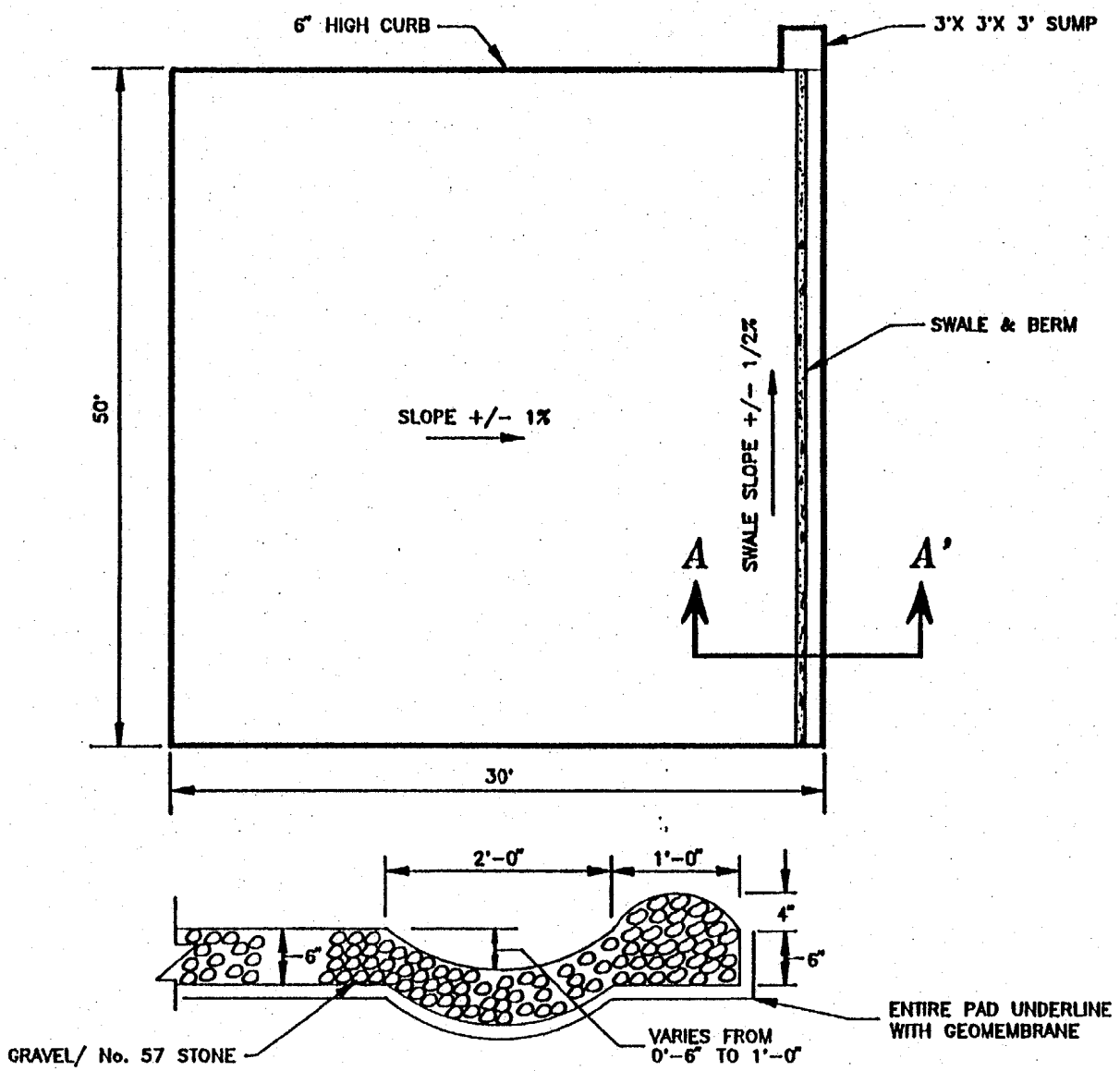
An access road will be constructed to each of the excavation areas. A safety fence will be installed around each of the excavation areas. The "Hot" Zone or Exclusion Zone, Contamination Reduction and personnel/equipment station will be established and clearly marked within the confines of the project site. A temporary staging zone will be established adjacent to each access road for loading and transporting drums. All harvestable trees and brush that could hinder excavation will be removed from the active areas, cut into manageable pieces and removed by the Forestry Division.

4.3 TRENCH EXCAVATION AND DRUM REMOVAL

This phase of operation includes the removal of drums and containers from burial trenches as defined in the RAC Requirements Package. After completion of the staging areas and delineation of work zones, the excavation of soils associated with the drums will begin. Diversion ditches, dikes or other suitable means will be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. During the excavation of soils, operating personnel will perform the work in the appropriate level of protection as described in the SHSP. An ordnance survey will be conducted prior to any excavation, and an OHM ordnance personnel will remain on-site during all excavation activities. Should ordnance be discovered during excavation, all activities in the immediate area will be stopped. The area

will be cleared and Camp Lejeune's EOD Department will be notified. At which time no further work will be conducted unless directed by the EOD group.

A track excavator equipped with a 1/2-yard bucket will carefully excavate soil adjacent to the drums. During excavation the soils and debris will be removed



SECTION A-A'

SWALE & BERM
NOT TO SCALE

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PROJECT: CAMP LEJEUNE
REMEDIAL ACTION

PROJECT No.: 15226

LOCATION: CAMP LEJEUNE, N.C.

FIGURE 4.3
TYPICAL DECONTAMINATION PAD DESIGN

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and inspected for evidence of contamination. For staging purposes, the soils will be visually inspected and/or field screened as necessary with an organic vapor analyzer (OVA)/photoionization detector (PID) to distinguish suspected contaminated soils from non-contaminated soil. The classification of soils will be stockpiled accordingly in the staging areas and covered with permalon X210 liner on completion of the excavation or imminent weather conditions to prevent rainwater impingement and erosion.

Excavation of each trench will be completed when all soils failing TCLP have been removed. After removal of all visually contaminated soil and drums/containers, confirmation grab samples will be collected at both ends and every 25 linear feet on both sides and bottom of the excavation, and analyzed for full TCLP analysis. The excavation will remain open until receipt of the analysis indicating all hazardous material has been removed. Limits of excavation can only be estimated at this time. At this time, the excavation will be backfilled. The backfill will be compacted using three passes with the excavation equipment, after every 12-inch lift. Should additional excavation be required upon receipt of analysis, approval will be obtained from the contracting officer at that time and the soils will be excavated and staged accordingly.

To assist in the separation of soil and debris, OHM may utilize an air bucket, which is a custom designed tool fabricated by OHM to assist in the segregation of soil and debris. The bucket is constructed of plate steel in a mesh design that allows soil/sediments to pass through and retain debris in the bucket. Varying mesh sizes (typically 4-inch by 4-inch or 6-inch by 6-inch) are used depending upon the material being excavated. The size of the weave is based on the nature of the debris and matrix of the soils encountered in the excavation. As the debris is segregated from the soil, it will be loaded into a designated dump truck for transportation to the staging cell for temporary storage.

As drums are sufficiently unearthed, a track excavator equipped with a drum grappler will be used to remove them individually. Each drum will be given a quick inspection. If a drum is found to be leaking, heavily corroded, distended or otherwise unsound, it will be immediately placed in an overpack. The overpacked and excavated sound drums will then be placed in the front bucket

of a rubber tire loader for transportation to the designated staging area. During excavation of the drums, a supply of overpacks will be maintained adjacent to the excavation. All drums/containers that are RCRA empty will be transported via the bucket of a front-end loader to the processing area to be triple rinsed prior to disposal. All efforts possible will be made to keep personnel out of the excavation.

The drums will be placed in the staging area in groups of three with adequate space between the groups to permit access to the drums. Again, drums will be visually inspected for integrity, contents and labeling. Each drum will be given a consecutive number identifying the drum. After a select number of drums have been placed in the staging area, each drum will be opened using a non-sparking punch attached to the bucket of a backhoe to provide access to the drum contents for sampling. The staging area will be clear of all personnel during punching operation. Personnel in the staging area will again inspect each drum for leaks after opening and promptly containerize the contents if necessary. Procedures for opening containers segregated during initial container survey as having a potential for containing special handling requirements (shock sensitive, lab pack, etc.) will be written at the time they are encountered and submitted to the NTR for approval. These plans will be based on past experience with other containers of similar type.

4.4 COLLECTION AND STAGING OF SURFACE DRUMS/TANKS

All identified drums located in Areas A-K of Site 6 will be collected and transported to the appropriate staging cell. Approximately 48 drums containing product will be placed in compatible overpacks, loaded individually in the bucket of a front-end loader and transported to the drum staging cell. The drums will be staged in groups of three to provide access. All remaining drums that are RCRA empty will be transported via front-end loader to the drum rinsing cell. All drum handling will be performed with drum grapplers to avoid personnel contact.

The five aboveground storage tanks (ASTs) will be handled as follows:

- Remove pumpable product
- Test tank interior for flammables
- If flammable, inert and purge
- Retest atmosphere and repeat until safe
- Relocate tank
- Retest atmosphere for flammables
- Cut/open tank
- Clean tank

The five ASTs (none exceeding 500-gallon capacity) will be pumped void of product and sent to a oil recycler for fuel blending. This petroleum-based product will be bulked in a vacuum truck for transportation to the designated facility. After evacuation of product, the tank atmosphere will be measured for flammables and oxygen. Before the tank can be moved, the tank's atmosphere must be less than 10 percent lower explosion limit (LEL) or less than 8 percent oxygen. If the tank atmosphere shows flammable vapors in excess of 10 percent LEL then the tank will be rendered inert. Action will be taken to reduce the flammable vapor concentration or reduce the oxygen concentration to less than 8 percent oxygen. This may be done by introducing either nitrogen or carbon dioxide (dry ice). Field conditions will determine which method will be utilized.

If possible, all lines will be removed by disconnecting joints rather than cutting or burning; no hot work will be performed. Appropriate rigging will be used to relocate the tanks, to the bucket of a front-end loader to be transported to the processing cell for dismantlement.

4.5 SAMPLING AND DECONTAMINATION OF TANKS AND DRUMS

Decontamination procedures for tanks and drums are detailed below.

4.5.1 Tanks

The tanks, having been purged of flammable vapors, will be ready for final demolition/cutting. A track excavator fitted with hydraulic shears will be utilized to cold-cut the tanks. Cold-cutting eliminates the hazards associated with hot work methods. The tanks will be cut into manageable pieces and

stockpiled temporarily on-site for transportation to a reclamation facility. The tank surfaces will be decontaminated to remove residue so they can be disposed of as clean material. A certificate of disposal for each tank will be obtained for project records.

4.5.2 Drums

Each drum will undergo an inspection prior to rinse operations. Any drum with greater than 2 inches of product or heel will be properly relocated into the drum staging cell. After an acceptable quantity of RCRA empty drums are staged in the drum rinsing area, each drum will be completely rinsed three times to remove foreign matter adhering to the surface. After each drum has completed a triple rinse it will be crushed and temporarily staged until transportation and disposal can be arranged. Rinsewater will be collected in the staging cell and pumped to an aboveground storage pool for profiling and disposal.

4.5.3 Drum Sampling

For each consecutively numbered drum removed from the excavation, an OHM drum log sheet will be completed in the field (Figure 4.4). The drum log sheet will be reviewed and audited by the field chemist and submitted along with the samples for compatibility/hazardous categorization (Haz Cat) analysis. Compatibility results will be entered directly on the drum log sheet for comparison purposes. All sampling equipment used in obtaining samples from containers will be either dedicated (disposable) or decontaminated by the following steps.

- Thoroughly scrub with a brush using a soap (Liquinox) and water solution to remove large particles.
- Thoroughly rinse the soap solution off the equipment with potable water.
- Solvent clean the equipment with pesticide grade isopropanol.
- Rinse the equipment with deionized water.
- Air dry the equipment before use.

4.4

Actual sampling collection methods will be determined based on the matrix of the material contained within the drum. At a minimum, it will follow:

- **Solids and Semi-Solids**
  Solids in a container will be sampled with a PVC or stainless steel thief or trier. The thief or trier will be slowly forced through the material to the bottom. The sample will then be transferred to an 8-ounce glass jar. If the material must be broken up prior to sampling, a brass hammer and chisel will be used, or, if the material is too elastic, a piece will be cut off with a razor knife. Sampling tools must be decontaminated between drums following the previously mentioned procedures.

- **Sampling Liquids**
  Liquids in a container will be sampled using 4-foot sections of glass thief or pipette (8 to 12 mm ID). The pipette is slowly lowered into the drum. When the bottom of the drum is reached, the sampler places his thumb over the end of the pipette and pulls it up. Any liquid or sludge layering in the container should now be apparent as the tube is brought up. The contents of the tube are then released into an 8-ounce bottle, the process is repeated until sufficient sample has been collected.

- **Sludge or Solids Underneath a Liquid**
  Sludge or solids underneath a liquid may be sampled by carefully forcing the pipette into the sludge or solid. If the sludge or solid does not run out into the jar, shaking the pipette or tapping the pipette against the side of the bottle may loosen the sample. If this fails, one may break the pipette and put the pieces which contain the sample in them in the bottle.

  After the sample has been taken, the outside of the bottle will be wiped off and labeled with drum number. The drum number will also be written on the jar lid. All sampling data and observations will be recorded on the drum inventory log sheet.

All samples for compatibility/Haz Cat will be sent off-site to an approved laboratory. Once all compatibility testing is completed on the samples, preliminary groups will be generated and the laboratory will develop composite samples for these preliminary groups. These waste stream samples will be submitted to a NFESC-approved laboratory to identify and characterize the proposed waste streams for final disposal options. Other waste streams (soils, rinse water and debris) will also be submitted for identification characterization for final disposal options. After review of wastestreams, those wastestreams requiring hazardous waste labeling will be appropriately labeled and dated.

4.6 WASTE PROFILING AND INTERIM DEMOBILIZATION

OHM will prepare and submit profiles for the review of NFESC and Camp Lejeune personnel. All waste streams will be profiled for disposal at a CERCLA-approved disposal sites. Waste streams generated at the Camp Lejeune site during this project will be subject to the provisions set forth in 40 CFR 262 "Standards Applicable to Generators of Hazardous Waste." Camp Lejeune will be considered the generator of all wastes at this site.

Waste characterization will be an ongoing task for each waste stream throughout the waste handling activities. Compatibility analysis, waste stream composition, and disposal analysis that applies to each stream will be reviewed.

The following summary describes related on-site classification and analytical interpretation for each waste stream.

- **Surface Drums**
  - Review of Baker Haz Cat analysis and drum logs
  - RCRA interpretation of Baker waste stream composite analysis (TCLP)

- **Excavated Drums**
  - Sample drums for OHM Haz. Cat. analysis, filling out drum logs, recording physical descriptions of waste on-site
  - Review of Haz. Cat. analysis and drum logs
  - RCRA interpretation of waste stream composite analysis (TCLP)

- **Soils**
  - Sample soils for full RCRA characteristics analysis
  - RCRA interpretation of soil analysis

- **Debris**
  - Sample debris if soils are determined RCRA hazardous
  - RCRA interpretation of debris

- **Washwater**
  - Washwater will be sampled for full RCRA characteristics
  - RCRA interpretation of washwater

- **Empty Drums**
  - Drums containing less than 2 inches of waste are considered RCRA empty
  - All RCRA empty drums will be triple rinsed

During the submittal and approval process of the waste profiles, an interim demobilization will occur while scheduling arrangements for transportation of the waste can be completed.

4.7 TRANSPORTATION AND DISPOSAL OF MATERIALS

Completion of transportation and disposal will be based on actual quantities of wastes characterized, sampled, analyzed, profiled, and accepted for disposal. When permissible, Base disposal facilities will be utilized. Personnel and equipment requirements will be determined prior to remobilization. The necessary personnel and equipment will remobilize to the project site to load all waste for transportation to the appropriate disposal facility. Several treatment and disposal facilities have been identified that may receive samples of the waste streams for the disposal query. Facilities will be chosen after review of approvals and price quotes. A potential list with pertinent information is provided below.

CWM - Emelle
Highway 17
Emelle, AL 35459
ID#ALD000622464

ENSCO - El Dorado
American Oil Road
EL Dorado, AR 71730
ID#ARD069748192

Laidlaw - Pinewood
Route 1, Box 255
Pinewood, SC 29125
ID#SCD070375985

NOBLE - Sanford
5617 Clyde Rhyne Dr.
Sanford, NC 27330
ID#NCD986172476

CyanoKem - Detroit
12381 Schaffer Highway
Detroit, MI 48227
ID#MID098011992

Marine Corps Camp Lejeune
Sneads Ferry Road
Camp Lejeune, NC 28542
Permit # 67-03

4.8 DEMOBILIZATION AND FINAL REPORT

All disturbed areas will be final graded, seeded and fertilized in accordance with the RAC Requirements Package with the exception of the access roads. All equipment required to perform the operation will be decontaminated by using a steamer or hot water wash, and a certificate of vehicle decontamination at the project site will be provided. All equipment, support trailers and personnel will then be demobilized from the project site.

A Contractor Close-out Report will be completed and submitted for review and approval. This report will include: Introduction, Summary of Action, Final Health and Safety Report, Summary of Record Documents, Field Changes and Contract Modification, Final Documents, Summary of Chemical and Geotechnical Testing, Off-site Disposition of Materials, and QC Summary Report.

5.0 ENVIRONMENTAL PROTECTION PLAN

This Environmental Protection Plan (EPP) has been prepared in accordance with the OHM Remediation Services Corp. (OHM) Contract Quality Control Plan, dated September, 1992. The plan provides specific information relating to the drum removal action at Site #6. The plan will provide site-specific information for:

- Surveying
- Land resources management
- Water resources management
- Air and noise pollution control
- Non-compliance/corrective action
- Post-excavation cleanup
- Site security

The control of environmental pollution at Site #6 will consider air, water and land impacts, as well as noise and solid waste management.

The land resources within the property of MCB Camp Lejeune, but outside the limits of permanent work, will be preserved in their present condition or restored to a condition after completion of construction that does not detract from the appearance of the area. As much as is practical, construction activities will be limited to areas defined by plans and specifications.

5.1 HISTORICAL AND ARCHAEOLOGICAL FINDS

Although the presence of historical artifacts is not anticipated, if a historical artifact is encountered during field operations, OHM will stop work and notify the NTR. The NTR will be responsible for contacting the federal, state and local authorities to determine if the site may contain other important historical artifacts, and whether this site qualifies for possible placement on the National Registrar of Historical Places. Field operations will not resume until the NTR issues a written authorization to proceed.

5.2 TEMPORARY CONSTRUCTION ROADS

The construction of all temporary construction roads in and around the job site will be performed in a manner as to minimize the impact to the natural environment. Water will be used for dust control, as necessary. It is not expected that a significant number of construction roads will be necessary during removal action. All access to the site will most likely be from Holcomb Boulevard.

5.3 PROTECTION OF TREES AND SHRUBS

Prudent steps will be taken to protect trees and shrubs outside of the excavation zone as necessary. Those trees and shrubs within the excavation zone will be removed by the Forestry Division in order to allow for the removal action. All trees and shrubs removed as a result of the construction activities will be cut into manageable pieces and moved from the project site so as not to interfere with operations. Precautions to be taken to minimize the construction activities' impact on the existing vegetation will include but not be limited to:

- Utilization of existing or temporary construction roads only
- Closely supervised equipment operators with an emphasis placed on preservation of vegetation in non-work areas
- Proper guidance of heavy equipment and truck operators by site personnel to minimize damage to adjacent vegetation not directly affected by construction activities
- Utilization of equipment appropriately designed and sized for precise excavation

5.4 RESTORATION OF LANDSCAPE DAMAGE

Upon completion of the field construction activities, disturbed areas will be seeded. Prior to seeding and fertilization, lime will be applied as a soil amendment for pH adjustment at a rate of approximately 40 pounds per acre.

Any trees or other landscape features damaged by equipment will be restored if practical by trimming of damaged limbs and application of tree dressing. Damaged trees which cannot be restored will be felled, limbed and left on-site. Soil will be placed and compacted around any root systems exposed during excavation activities.

5.5 WATER RESOURCES PROTECTION

New River and Wallace Creek are located near Site #6, and could possibly be impacted by construction activities if proper sediment and erosion protection measures are not taken. To protect against damage, storm water surface run-off leaving the site will be controlled by temporary erosion/sediment control techniques such as berms, hay bales, silt fencing and grading. The area of bare soil exposed at any one time by construction activities will be held to a minimum.

5.5.1 Erosion/Sediment Control

Prior to disturbance of native vegetation and soils, temporary erosion/sediment control will be established at the northern excavation only. Control techniques to be utilized will involve silt fencing.

Silt fencing will be installed with the fabric a minimum 6 inches below grade and extending 36 inches above grade and fastened to posts no more than 6 feet apart. The posts will be installed with a minimum of 24 inches below grade and extend a minimum of 36 inches above grade. Fabric will be attached to the up-slope side of the posts using 1-inch staples or tie wires. Silt fences will be inspected after every rain fall and daily during extended rain fall. Accumulated sediment will be removed before the depth reaches 12 inches.

5.5.2 Spill Control

Measures will be taken to prevent chemicals, fuels, oils, greases, bituminous materials and contaminated materials from entering streams, rivers or lakes. Adsorbents will be available to solidify any leaks outside containment and any soil contaminated with fuel spills will be immediately removed and placed into appropriate containers and sampled to determine proper disposition.

5.6 DUST AND AIR POLLUTION CONTROL

5.6.1 Air and Noise Monitoring

Personnel and ambient air monitoring will be conducted as necessary in order to determine airborne dust and contaminant levels. Ambient air monitoring will be conducted at working locations and on occasion at the perimeter of the project site. This ensures that respiratory protection is adequate to protect personnel against the contaminants that are encountered as well as assuring that harmful levels of airborne contaminants are not leaving the site.

OHM will only perform operations of heavy equipment during daylight hours to minimize the impact of noise pollution on off-site personnel. Noise exposure to off-site residents or personnel is expected to be minimal. Hearing protection will still be implemented if necessary as specified in the SHSP.

5.6.2 Particulate Emission Controls

Specific measures to be taken to minimize particle emissions for major activities during site construction include the following:

- Soil Excavation, Handling, Site Grading and Transportation
  - Apply water to work and traffic areas as necessary to minimize dust emissions.
  - Cover stockpiles with sheeting to minimize wind and/or storm water erosion.
  - Move and load soil for transport within the site that limits freefall of material and is least likely to generate dust emissions.

- Halt dust-generating work when on-site wind conditions exceed 35 miles per hour.

- Movement of Equipment
  - Water traffic areas as required to minimize dust emissions.
  - Designate equipment traffic patterns to minimize travel distance and vehicular dust emissions.
  - Limit vehicle speed to minimize dust emissions.

5.6.3 Burning

No burning will be performed on-site. In the event of an unexpected fire on-site, work will stop immediately and the MCB Camp Lejeune fire department will be notified.

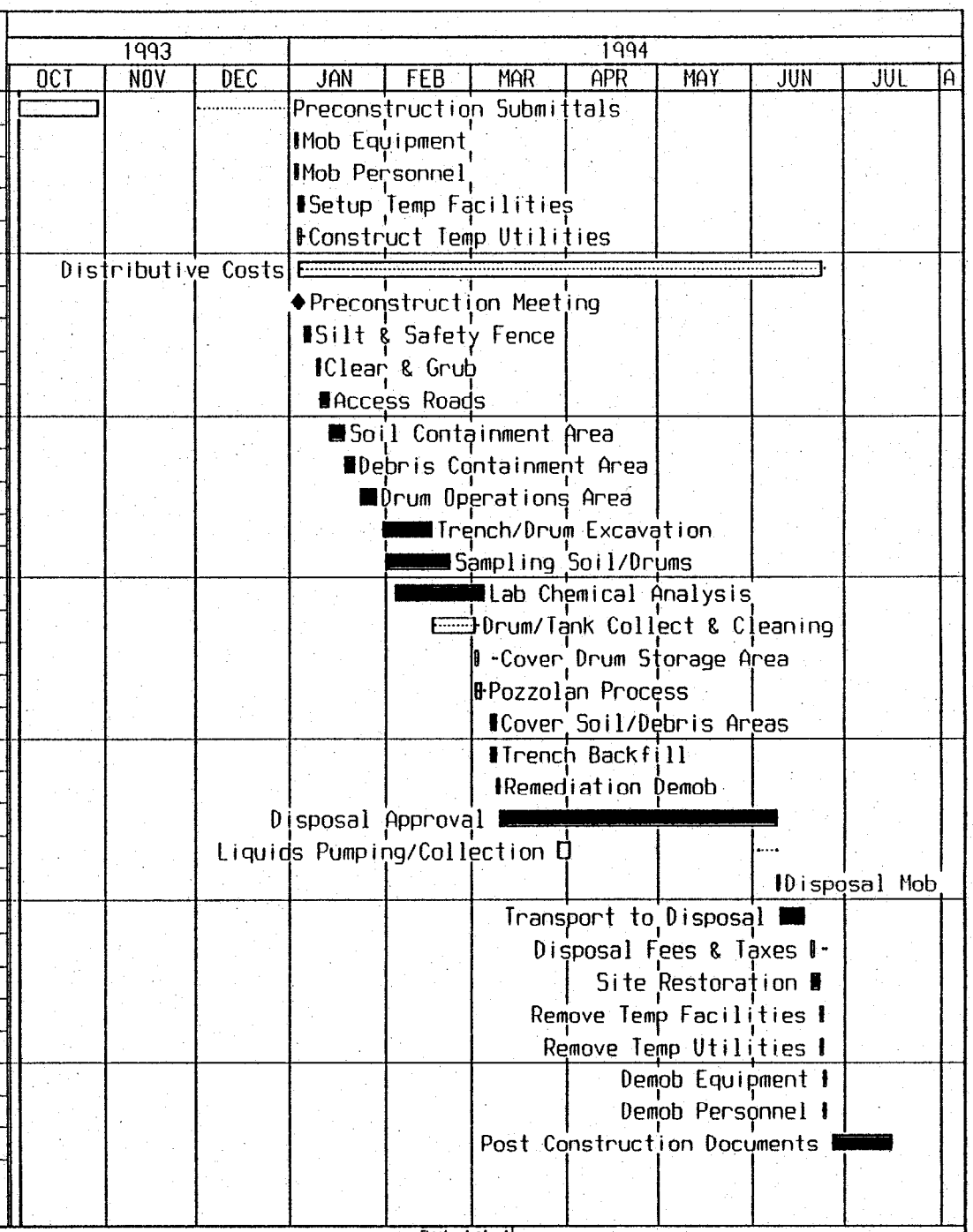
5.7 POST- EXCAVATION CLEANUP

All excavation equipment will be decontaminated in a lined pad prior to demobilizing from the site. Decontamination will consist of scrapping and pressure washing to remove visible soil and debris from tires and undercarriage of vehicles and heavy equipment. Decontamination water will be transferred to the holding pool for analysis and disposal. The site will then be turned over to the Navy following their acceptance of site conditions.

APPENDIX A

BAR CHART

ACTIVITY ID	EARLY START	EARLY FINISH	REM DUR	PCT
D201.03	4OCT93	29OCT93	20	0
D201.01	3JAN94	3JAN94	1	0
D201.02	3JAN94	3JAN94	1	0
D201.04	4JAN94	5JAN94	2	0
D201.05	4JAN94	4JAN94	1	0
D299.00	4JAN94	23JUN94	123	0
D2PC	4JAN94	3JAN94	0	0
D203.05	6JAN94	7JAN94	2	0
D203.02	10JAN94	10JAN94	1	0
D203.04	11JAN94	13JAN94	3	0
D203.90	14JAN94	18JAN94	3	0
D203.91	19JAN94	21JAN94	3	0
D210.01	24JAN94	28JAN94	5	0
D208.01	31JAN94	15FEB94	12	0
D202.06	1FEB94	21FEB94	15	0
D202.09	4FEB94	4MAR94	21	0
D210.02	16FEB94	1MAR94	10	0
D210.90	2MAR94	2MAR94	1	0
D215.03	2MAR94	3MAR94	2	0
D208.05	7MAR94	8MAR94	2	0
D220.01	7MAR94	8MAR94	2	0
D221.00	9MAR94	9MAR94	1	0
D299.04	10MAR94	8JUN94	65	0
D209.06	29MAR94	1APR94	4	0
D201.00	9JUN94	9JUN94	1	0
D219.02	10JUN94	17JUN94	6	0
D219.03	20JUN94	20JUN94	1	0
D220.06	20JUN94	22JUN94	3	0
D221.01	23JUN94	23JUN94	1	0
D221.02	23JUN94	23JUN94	1	0
D221.04	24JUN94	24JUN94	1	0
D221.05	24JUN94	24JUN94	1	0
D221.06	27JUN94	15JUL94	15	0



Plot Date 20OCT93
Data Date 4OCT93
Project Start 4OCT93
Project Finish 15JUL94

(c) Primavera Systems, Inc.

Activity Bar/Early Dates
Critical Activity
Progress Bar
Activity Late Dates
Milestone/Flag Activity

ZEST NC02

Sheet 1 of 1

NEESA POLM
Bar Chart
Camp Lejeune Drum Removal

OHM Remediation Services Corp

Date	Revision	Checked	Approved

APPENDIX B

ACRONYM AND ABBREVIATION LIST

ACRONYM AND ABBREVIATION LIST

AOC	Area of Concern
ARAR	Applicable of Relevant and Appropriate Requirement
AST	Aboveground Storage Tank
AWQC	Ambient Water Quality Criteria
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	Contaminant of Concern
cy	cubic yard
DoN	Department of the Navy
FDA	U. S. Food and Drug Administration
FFA	Federal Facilities Agreement
FS	Feasibility Study
gpm	gallons per minute
HI	Hazard Index
IAS	Initial Assessment Study
ICR	Incremental Cancer Risk
IRP	Installation Restoration Program
LEL	Lower Explosion Limit
MBI	Macroninvertebrates Biotic Index
MCB	Marine Corps Base
NCDEHNR	North Carolina Department of Environment, Health, and Natural Resources
NCP	National Contingency Plan
NPL	National Priorities List
NPW	Net Present Worth
NTR	Navy Technical Representative
OHM	OHM Remediation Services Corp.
O&M	Operation and Maintenance
OVA	Organic Vapor Analyzer
PAH	Polynuclear Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
PCE	Tetrachloroethene
PID	Photoionization Detector
PRAP	Proposed Remedial Action Plan
RAA	Remedial Action Alternative
RI	Remedial Investigation

ROD	Record of Decision
ROICC	Resident Officer Charge of Construction
SVOC	Semivolatile Organic Compound
TCE	Trichloroethene
TCLP	Toxicity Characteristics Leaching Procedure
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound