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LETTER REGARDING REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN FOR  
OPERABLE UNIT 2 (OU 2) MCCOY ANNEX LANDFILL ADDENDUM 1 NTC ORLANDO FL  
4/21/1998  
BROWN & ROOT ENVIRONMENTAL

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April 21, 1998

Project Number 7457

Ms. Barbara Nwokike (Code 1873)  
SOUTHNAVFACENCOM  
Naval Training Center - Orlando  
1350 Grace Hopper Avenue  
Orlando, Florida 32813-8405

Reference: CLEAN Contract No. N62467-94-D-0888  
Contract Task Order No. 0024

Subject: Addendum to the RI/FS Work Plan for Operable Unit 2, McCoy Annex  
Landfill, Naval Training Center, Orlando, Florida

Dear Ms. Nwokike:

Enclosed is an addendum to the OU 2 Work Plan for review and comment by the OPT. The Addendum describes the additional work required to define the extent of the landfill, changes to reflect the increased number of monitoring wells, revisions in sampling and analysis requirements, and minor changes.

Any further changes or additions to the Addendum will be incorporated prior to the May OPT meeting. Please send comments to my attention, or call me at (423) 220-4730 or Mike Campbell at (423) 220-4714 if you have any questions.

Sincerely yours,

A handwritten signature in black ink that reads "Steven B. McCoy".

Steven B. McCoy, P.E.  
Task Order Manager

SBM/ckf

Enclosure

c: Ms. Nancy Rodriguez, USEPA Region IV  
Mr. John Mitchell, FDEP  
Mr. Wayne Hansel, SOUTHDIR (NTC-Orlando address - Lt. Gary Whipple)  
Lt. Gary Whipple, NTC-Orlando  
Mr. Bob Cohose, Bechtel  
Ms. Debra Evans-Ripley, SOUTHNAVFACENCOM (w/o enclosure)  
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Ms. Ruthann Baur, B&R Environmental (w/o enclosure)  
Mr. Mark Perry, B&R Environmental  
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Mr. Mike Campbell, B&R Environmental  
Mr. Gary Braganza, B&R Environmental

**REMEDIAL INVESTIGATION AND FEASIBILITY STUDY  
WORK PLAN FOR OPERABLE UNIT 2  
MCCOY ANNEX LANDFILL  
NAVAL TRAINING CENTER, ORLANDO, FLORIDA  
ADDENDUM I**

This addendum to the Remedial Investigation and Feasibility Study Work Plan for Operable Unit 2, McCoy Annex Landfill, Naval Training Center, Orlando, Florida (Work Plan) provides additions or revisions to the sections of the Work Plan indicated below.

### **3.1 GEOPHYSICAL SURVEY**

The results of the first phase of the geophysical survey program indicate that the full extent of the landfill has not been defined west of the golf course and the wooded area to the south. A Phase II magnetometer and terrain conductivity survey will be performed to fully define the extent of the landfill to the west. GPS will be used to determine the locations of the data points.

If the results of the Phase II geophysical survey indicate that landfill material is buried west of the initial study area, the cover thickness will be investigated. Hand auger borings will be used to determine the thickness of the cover material in this area because the trees and brush in the area will make data acquisition difficult using GPR. A Florida-Registered Professional Geologist will determine the cover thickness. One boring will be advanced for each acre of additional landfill material discovered. All Phase II hand auger boring locations will be surveyed by a Florida-registered land surveyor.

### **3.3 DIRECT-PUSH TECHNOLOGIES**

#### **3.3.1 Direct-Push Technology Sampling Program**

The results of the first phase of this program indicate that groundwater is contaminated in five areas. An additional (Phase II) DPT sampling survey will be performed to define the extent of the identified plumes. Samples will be collected at shallow (approximately 9 feet bgs) or intermediate (approximately 30 feet bgs) depths as appropriate depending on the results of the first phase.

If the Phase II geophysical surveys indicate that the landfill extends west of the initial study area, the Phase II DPT survey will also include sampling around the boundary of the newly identified areas. Samples will be collected at 75 to 100 foot intervals around the boundary depending on access and site conditions. Samples will be collected at both shallow and intermediate depths at each location.

A total of 150 DPT samples are proposed to investigate the previously identified plumes and any possible extension of the landfill to the west.

Groundwater samples will be analyzed at a fixed-base laboratory using USEPA Method 8260B with a 24-hour turnaround time. One field duplicate sample will be collected for every 10 environmental samples. QC analyses will consist of a minimum five-point calibration for each analyte, a 12-hour continuing calibration verification, a laboratory control sample (blank spike - one per 12-hour batch), matrix spike/matrix spike duplicate (one per 20 samples), and a method blank, as stipulated by the method.

All Phase II DPT sampling locations will be surveyed by a Florida-registered land surveyor.

### **3.4 SURFACE SOIL, SURFACE WATER, AND SEDIMENT SAMPLING PROGRAM**

#### **3.4.1 Surface Soil Sampling**

If the Phase II geophysical surveys indicate that the landfill extends west of the initial study area, surface soil samples will be collected to determine if the cover material is contaminated. Both organic and inorganic chemicals were found in the cover material at the golf course and the wooded area south of the golf course. One sample will be collected from each acre of additional landfill material discovered. Geotechnical samples will not be collected because sufficient geotechnical data have already been obtained.

The analytical parameters specified for the initial phase will be used for Phase II, with the exception that the Florida Petroleum Range Organic (FL-PRO) analysis will be substituted for TPH analysis. Samples for SVOCs, metals, pesticides, herbicides, FL-PRO, PCBs, and radiological parameters will be composited from five sample locations within each acre as indicated in Figure 3-2 of the Work Plan. Samples for VOC analysis will not be composited but will be collected from the central node of the composite pattern. All Phase II surface soil sampling locations will be surveyed by a Florida-registered land surveyor.

#### **3.4.2 Surface Water and Sediment Sampling**

The results of the first phase of this program indicate that contaminants were found in surface water and sediment samples in the initial study area. Off-site surface water and sediment sampling will be performed in Phase II to determine if water bodies adjacent to and downstream of the landfill have been impacted. Fifteen off-site surface water and sediment samples will be collected.

The analytical parameters specified for the initial phase will be used for Phase II, with the exception that the FL-PRO analysis will be substituted for TPH analysis. All Phase II surface water and sediment sampling locations will be surveyed by a Florida-registered land surveyor.

### 3.5 MONITORING WELL INSTALLATION

A series of 20 well clusters (shallow, intermediate, and deep wells) will be installed in the surficial aquifer to characterize the groundwater and any contaminant plumes emanating from the McCoy Annex Landfill.

Shallow wells will be screened from approximately 5 to 15 feet bgs (across the water table), intermediate wells from 40 to 50 feet bgs, and deep wells from 80 to 90 feet bgs (based on the results of the initial phase of the investigation).

Shallow and intermediate depth monitoring wells in the surficial aquifer will be installed using 6.25-inch inner diameter (ID) hollow-stem augers (HSA). Deep wells (90 feet) in the surficial aquifer will be installed using 6-inch mud rotary techniques. For 25 percent of the deep wells split spoon samples will be collected every 5 feet from surface to total depth (TD). These wells will be drilled first during the installation of the surficial aquifer monitoring wells to provide additional data regarding the lithology of the surficial aquifer. Three Shelby tube samples will be collected in each of five 90-foot wells (expected intervals are 5 to 15 feet bgs, 40 to 50 feet bgs, and 70 to 90 feet bgs).

Mud rotary drilling will be used to install monitoring wells (including outer protective casing) in the Hawthorn Group if they are needed. Split spoon samples will be collected every 5 feet from 65 feet bgs to the top of the Hawthorn Group in all wells. In the first well drilled, split spoon samples will be collected every 5 feet from the top of the Hawthorn Group to TD. In the remaining wells, split spoon samples will be collected every 5 feet from the 25-foot interval which will include the screen.

Mud rotary drilling will be used to install monitoring wells (including both outer protective casings) in the Floridan aquifer system if they are needed. In the first well drilled, split spoon samples will be collected every 5 feet from the TD of the deepest Hawthorn Group well to the top of the Floridan aquifer system. In the remaining wells, split spoon samples will be collected every 5 feet from the 35-foot interval above the top of the Floridan aquifer system.

Bedrock coring will be performed in all three monitoring wells completed in the Floridan aquifer system. Cores will be collected from the top of the Floridan aquifer system to the termination of the borings (estimated to be approximately 3 feet). Coring runs will be limited to 5-foot intervals to obtain the best possible recovery.

Monitoring wells installed in the surficial aquifer and the Hawthorn Group will be constructed of Schedule 40, 2-inch ID PVC riser pipe and screen. Schedule 80, 2-inch ID PVC riser pipe and screen will

be used for monitoring wells installed in the Floridan aquifer system. Schedule 80 PVC outer protective casing will be used for the monitoring wells installed in the Hawthorn Group and the Floridan aquifer system. Contrary to the statement on page 3-16, paragraph 1 of the Work Plan, all monitoring well installation and construction will be performed in accordance with *Monitoring Well Design, Installation, Construction, and Development Guidelines* (U. S. Navy 1997).

Monitoring wells will be purged and sampled using low-flow techniques in accordance with *Low Stress (low flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells* (USEPA 1996d). Wells will be purged and sampled using a bladder pump. Purging will be considered complete when water quality parameters have stabilized. Indicator parameters will be pH, oxidation/reduction potential (Eh), dissolved oxygen (DO), temperature, specific conductance, and turbidity. A flow-through-cell will be used to measure all listed parameters except turbidity.

Stabilization will be considered to have been achieved when three consecutive readings, taken at 3 to 5 minute intervals, are within the limits listed below (USEPA 1996d).

- Turbidity ( $\pm 10\%$ )
- DO ( $\pm 10\%$ )
- Specific conductance ( $\pm 3\%$ )
- Temperature ( $\pm 3\%$ )
- pH ( $\pm 0.1$  unit)
- Eh ( $\pm 10$  millivolts)

Once all indicator parameters have stabilized, purging will be considered complete and sampling will proceed. The sample for VOC analysis will be collected first. If turbidity is greater than 10 Nephelometric Turbidity Units (NTUs) both filtered and unfiltered samples will be collected for metals analysis. A 0.45 micron in-line filter will be used for any filtered samples that may be required.

The analytical parameters will be as specified in the Work Plan, with the exception that the FL-PRO analysis will be substituted for TPH analysis. All monitoring well locations will be surveyed by a Florida-registered land surveyor.

### **3.6 AQUIFER TESTING**

Contrary to the statement on page 3-18, paragraph 4 of the Work Plan, aquifer testing for OU 2 will consist of completing specific capacity tests at 30 percent of the newly installed monitoring wells. Specific

capacity tests are considered more accurate than slug tests and are required by the Navy in lieu of slug tests. Specific capacity tests will be performed in six shallow, six intermediate, and six deep wells completed in the surficial aquifer.

If monitoring wells are required in the Hawthorn Group, specific capacity tests will be performed in two of the wells and if wells are required in the Floridan Aquifer system, one will be tested.

All specific capacity tests will be performed in accordance with Navy guidance (U. S. Navy 1997).

A 72-hour pumping test will be performed to more completely characterize the surficial aquifer. One 4-inch PVC pumping well and eight 2-inch PVC observation wells will be installed for the test. Pressure transducer data loggers will be used to measure drawdown during the pumping and recovery phases of the test. In addition, water levels will be recorded manually in any nearby monitoring wells. The objectives of the pumping test will be to obtain more accurate measurements of aquifer properties than can be obtained using specific capacity tests.

## REFERENCES

U.S. EPA (United States Environmental Protection Agency) 1996d. *Low Stress (low flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells*, Revision 2, SOP #: GW 0001, July 30.

U.S. Navy (United States Navy) 1997. *Monitoring Well Design, Installation, Construction, and Development Guidelines*, Interim Final, Rev. 0, March 27.