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U S NAVY RESPONSE TO SOUTH CAROLINA DEPARTMENT OF HEALTH AND
ENVIRONMENTAL CONTROL COMMENTS ZONE H RCRA FACILITY INVESTIGATION
WORK PLAN ADDENDUM SOLID WASTE MANAGEMENT UNIT 196 (SWMU 196) CNC
CHARLESTON SC
2/15/2000
CH2M HILL



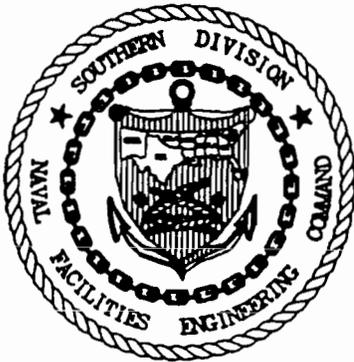
**COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY
CHARLESTON NAVAL COMPLEX
CHARLESTON, SOUTH CAROLINA
CTO-029**

**RESPONSE TO SOUTH CAROLINA DEPARTMENT OF
HEALTH AND ENVIRONMENTAL CONTROL COMMENTS
ZONE H RFI WORK PLAN ADDENDUM
SWMU 196 dated NOVEMBER 18, 1999**

Prepared for:

**DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON, SOUTH CAROLINA**

SOUTHDIV CONTRACT NUMBER: N62467-89-D-0318



Prepared by:

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**February 15, 2000
Revision No: 1**

**Release of this document requires the prior notification of the Commanding Officer of the
Naval Base Charleston, Charleston, South Carolina.**

**South Carolina Department of Health and Environmental Control
Response to Comments
Zone H RFI Work Plan Addendum for SWMU 196
dated November 18, 1999**

Comment 1:

Page 12 Spatial Distribution of Results, Groundwater

The text states that the assumption of groundwater flow is reflective of the topography, but does not explain the method used to confirm this result. Please explain the method by which groundwater flow was determined and also included groundwater contour maps from this information.

Response 1:

The first sentence in this section implies that the assumption was made that groundwater flow was reflective of topography when initial well locations for the investigation of this site were selected. The second sentence goes on to say that the assumption was correct based on groundwater elevation measurements obtained during the April/June 1999, sampling event. The explanation requested in the comment is provided in the third sentence which refers the reader to Figures 4, 5, and 6 which show contours of the local potentiometric surface.

Comment 2:

Page 15 Recommendations, Groundwater

This section states that three shallow wells are proposed north of the building. However, no deep wells are proposed and the contamination found at this site is heavier than water. The Navy needs to determine whether there is any evidence of contamination in the deep aquifer. Please install a deep well alongside a proposed shallow well #196001. This deep well should be completed to the top of the Ashley Formation and screen appropriately.

The deep well 00923D is stated to be 36.8 feet in depth. The text is not clear as to which geological formation this well terminates. Please provide the geological information and construction details for this well.

As shown from a map provided by EnSafe in the Zone G RFI Report, the Ashley Formation is depicted to be sloping to the northwest under building 1838. The Navy should complete a north-south and west-east trending cross sectional study of the Ashley to ensure that no contamination has migrated to the top of the Ashley Formation.

Response 2:

At the February 2000 project team meeting, the Navy and EnSafe presented information to support their belief that it is highly unlikely that contamination exists in the hydrologically up gradient portion of the deep flow zone when a downgradient well screened in that interval

is clean. Even though the available data suggests there is no contamination in the deep zone, the project team agreed that the affects of the top of the Ashley formation sloping away from the site does introduce some amount of uncertainty into the situation. To manage this uncertainty, the team agreed that it would be prudent to install a deep well to the northeast of Building 1838 near the shallow well 196-002. A revised Figure 7 is attached to these responses to document the proposed location in lieu of revising the work plan. Also, as requested in the comment, a sketch of the boring log and construction details for well 00923D are attached.

Comment 3:

Page 17 Recommendations, Soil

The text states that a full suite of analytical parameters will be performed on all soil samples. Please clarify which parameters will be used (i.e. formal headspace VOA, SVOC, Pest/PCB, cyanide, metals, etc.).

Response 3:

The term “full suite” was defined the first time it appeared in the text on Page 15, Paragraph 2 as VOAs, SVOAs, Pest/PCBs, cyanide, and metals. The proposed samples for the various media being investigated are listed in Tables 5, 6, and 7. A footnote at the bottom of each of these tables also list the individual parameters for which all samples will be analyzed. The SW-846 Method numbers for each of these parameters has been provided in the *Comprehensive Sampling and Analysis Plan*. The Navy believes the comment is adequately addressed by the text as written.

Comment 4:

Page 17 Recommendations, Sediment

See Comment #3.

Response 4:

Please refer to the response to comment number 3 above.

Comment 5:

Recommendations, Surface Water

The text does not state which analytical parameters will be performed in the diffusion samples. Please see Comment #3.

Response 5:

The surface water sample will be analyzed for VOCs. The diffusion sampler only has sufficient volume for this analysis.

Comment 6:

Page 18 Recommendations, Surface Water

The previous diffusion samplers were incorrectly placed on top of the marsh thereby rendering them useless for analytical purposes. The text states that a proposed diffusion sampler will be utilized, but does not state the protocol for the execution of the diffusion sample process. Please provide the guidance document or describe the diffusion sampling protocol in detail that will be used to perform this sampling.

Response 6:

The diffusion sampler will be placed at the bottom of Shipyard Creek in the channel. A weight will be attached to the sampler so that it stays at the bottom. There is water present in the channel of Shipyard Creek at the proposed location of the diffusion sampler, even at low tide, so that the sampler is not exposed to the atmosphere, but is always underwater.

Comment 7:

Page 26 Table 7

The table references sample locations with existing well numbers. The well numbers 196GDF01, 196GDF02, and 196GDF03 were not located on the proposed sample location map, Figure 7. Please provide a revised location map or an explanation of the well numbers for verification of the sample locations.

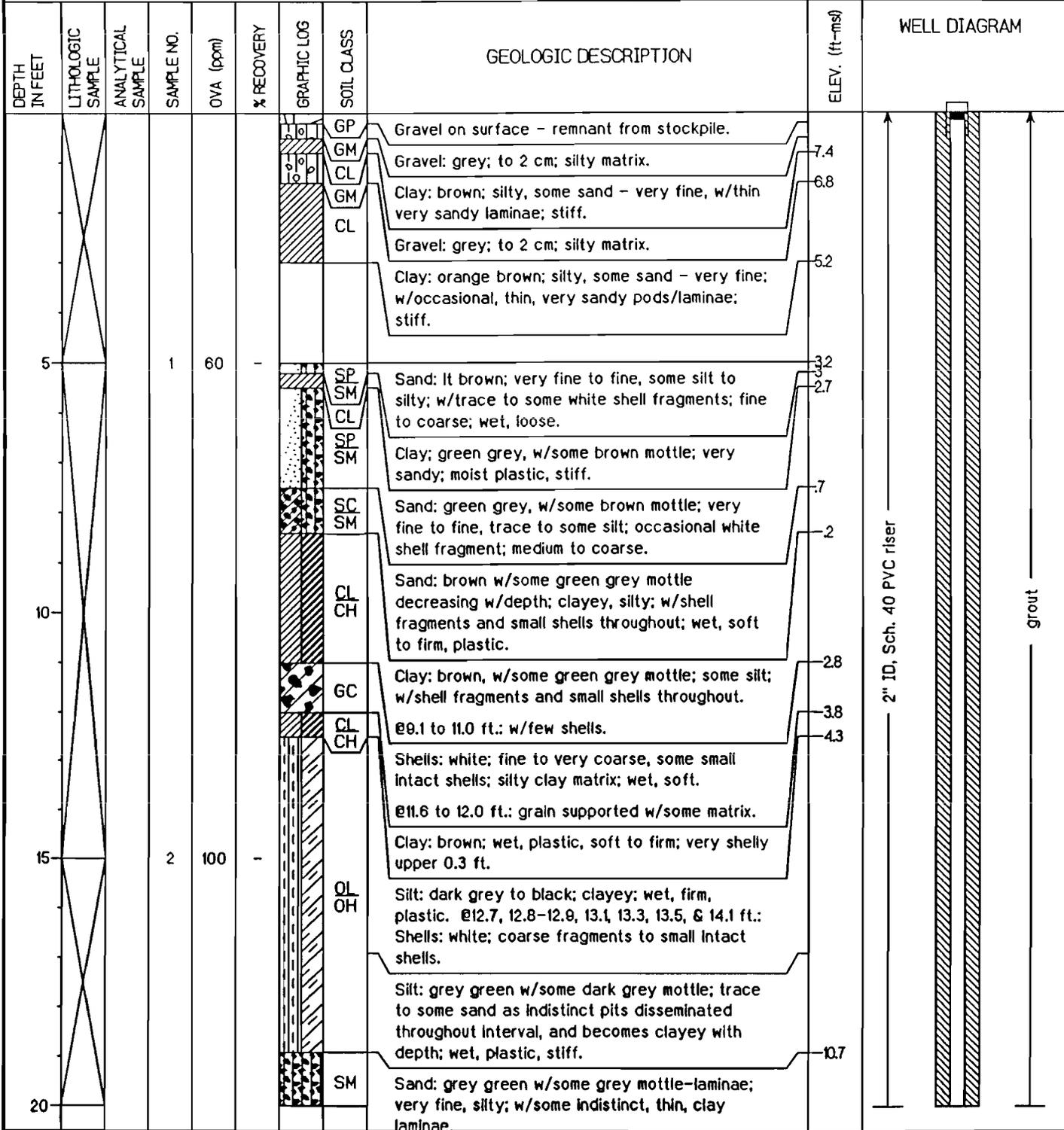
Response 7:

Figure 7 has been revised so that the referenced wells are present.

ATTACHMENT

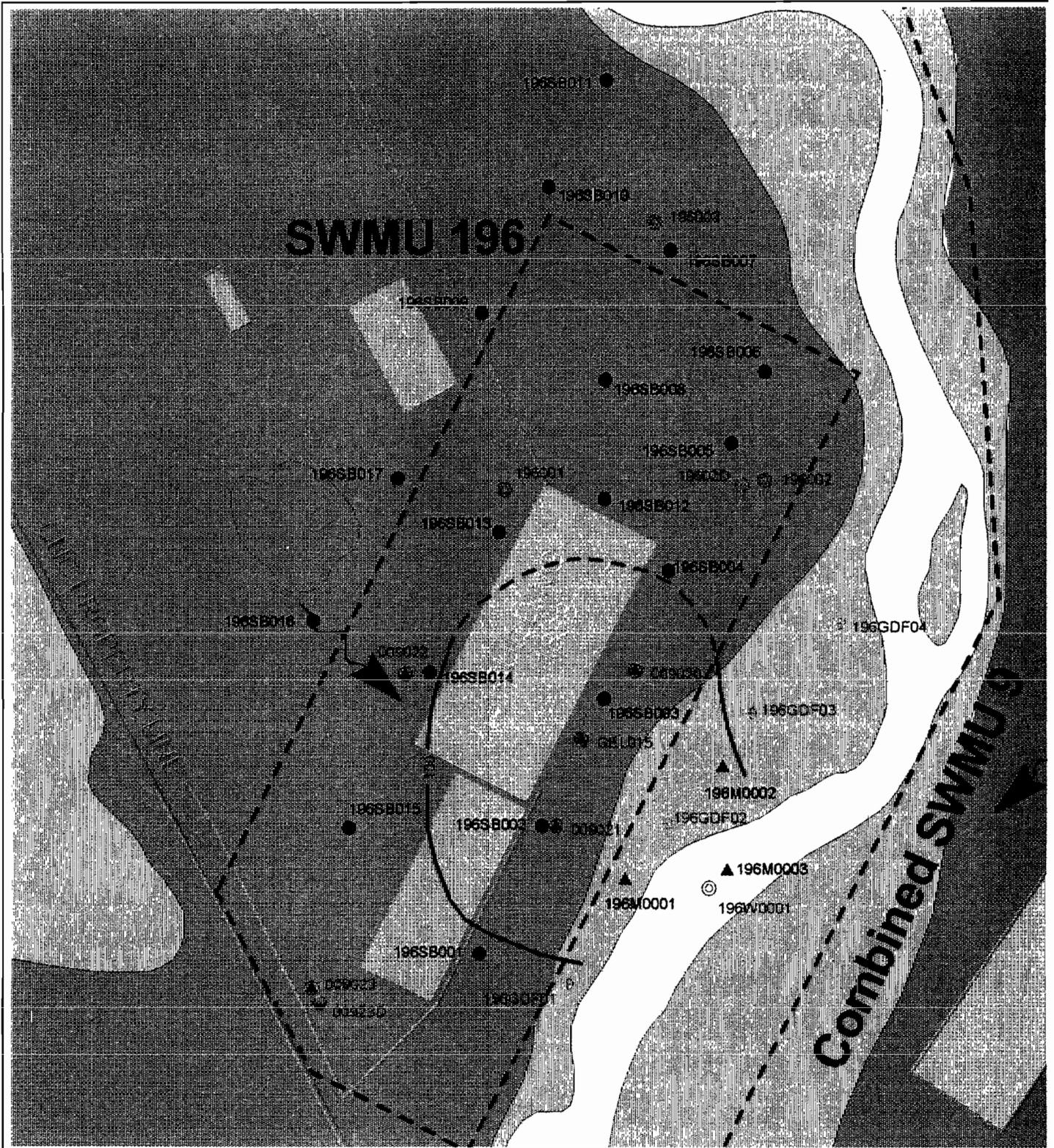
**WELL CONSTRUCTION
BORING LOG**

| | |
|---|---|
| Project: Zone H-Naval Base Charleston | Coordinates: 2321365.71 E, 370017.86 N |
| Location: Charleston, SC | Surface Elevation: 8.2 feet msl |
| Started at 0830 on 6-08-98 | TOC Elevation: 8.28 feet msl |
| Completed at 1130 on 6-08-98 | Depth to Groundwater: 4.09 feet TOC Measured: 7/21/98 |
| Drilling Method: Rotasonic (7.5" OD casing, 3.8" ID coring bit) | Groundwater Elevation: 4.19 feet msl |
| Drilling Company: Alliance Environmental | Total Depth: 36.8 feet |
| Geologist: P. Bayley | Well Screen: 27.0 to 36.3 feet |



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| DEPTH IN FEET | LITHOLOGIC SAMPLE | ANALYTICAL SAMPLE | SAMPLE NO. | OVA (ppm) | % RECOVERY | GRAPHIC LOG | SOIL CLASS | GEOLOGIC DESCRIPTION | ELEV. (ft-msl) | WELL DIAGRAM |
|---------------|-------------------|-------------------|------------|-----------|------------|-------------|------------|---|----------------|--|
| 11.9 | | | | | | | SM | Sand: olive brown; very fine, silty, trace to some clay; wet, soft, plastic/sticky; w/trace to some very fine Phosphatic sand. | 11.9 | <p>2" ID, Sch. 40 PVC riser</p> <p>0.01 slot, PVC screen</p> <p>10-20 sand filter</p> <p>grout</p> <p>bentonite seal</p> <p>hole plug</p> <p>end cap</p> |
| 13.6 | | | | | | | | 13.6 | | |
| 25 | | | 3 | 68 | - | | SC SM | Shelby Tube: 25.0 to 27.5 ft. Top and bottom of tube: Sand as above. | 16.8 | |
| 30 | | | 4 | 100 | | | SM | Sand: as above w/slight decrease in fines. @30.0 to 35 ft.: slight increase in Phosphate sand content. | 19.3 | |
| 35 | | | 5 | 100 | - | | SM | Sand: olive brown; very fine, silty, trace clay; wet, soft, sticky; w/some small shells. At 35.8 ft.: a 4x2 cm bone fragment; brown. | 27.8 | |
| 40 | | | | | | | ML CL | Silt: olive brown; clayey; stiff, moist, plastic. (Ashley Formation) @35.8-38.3 ft.: w/occasional sandy pods-peppery (very fine black Phosphatic sand), and w/occasional shells and shell fragments. | | |



LEGEND

- ⊕ PROPOSED SHALLOW MONITORING WELL
- ⊙ PROPOSED DEEP MONITORING WELL
- PROPOSED SOIL BORING
- ▲ PROPOSED CORE SEDIMENT SAMPLE
- ⊙ PROPOSED SURFACE WATER SAMPLE
- ▲ EXISTING SHALLOW MONITORING WELL
- ⊙ EXISTING DEEP MONITORING WELL
- ⊙ EXISTING TEMPORARY WELL (IN MARSH)
- - - APPROXIMATE PLUME BOUNDARY



ZONE H
RFI WORKPLAN ADDENDUM
CHARLESTON NAVAL COMPLEX
CHARLESTON, SC

FIGURE 7
SWMU 196
MONITORING WELL, SOIL BORING,
SEDIMENT SAMPLE, AND SURFACE WATER
SAMPLE LOCATIONS

