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NAB LITTLE CREEK
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TECHNICAL MEMORANDUM RECOMMENDED SAMPLING AT SITE 7 NAB LITTLE CREEK
VA
12/18/2000
CH2MHILL

NAB Little Creek - Recommended Sampling at Site 7

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This memorandum outlines a proposed approach for modifying the current sampling of surface water and sediment as part of the long-term monitoring (LTM) program at Naval Amphibious Base Little Creek Installation Restoration Site 7 (Amphibious Base Landfill), as well as addressing a one-time sampling of surface and subsurface soil. The proposed approach addresses sampling to support ecological and human health risk assessments of the site.

Surface Water and Sediment

Sampling Locations

Currently, seven surface water/sediment locations are sampled as part of the LTM program (SW/SD-201 through SW/SD-207; circled on attached figure). It is recommended that these seven locations continue to be used. In addition, it is recommended that the following locations be sampled as part of future LTM sampling efforts:

- Sampling locations recommended by the Eco Subgroup (circled x on attached figure): (1) two locations in a small "pond" just south of sampling locations 206 and 207, one in the southwest corner (abutting the landfill) and the second at the outlet of the pond, and (2) one sample near the end of the drainage swale located along the southern edge of the landfill.
- Additional recommended sampling (circled dots on attached figure): (1) three locations in the drainage canal present along the western site boundary, the first about midway between sampling locations 201 and 202, the second where the southern drainage swale enters the canal, and the third just north of Shore Drive. The purpose of these additional locations is to better characterize chemical concentrations in the drainage canal, since almost all of the exceedences of ecological sediment and surface water screening values occur at the three existing sampling locations in the canal (202, 203, and 204).

Media and Analytes

It is recommended that both surface water and sediment be sampled at the 13 sampling locations described above. Based upon the results of the screening ecological risk assessment (ERA) for Site 7, and the preliminary results of the baseline ERA, the recommended analytes are as follows:

- Surface water - TAL metals (total and dissolved), TCL VOCs (no SVOCs or pesticides)
- Sediment - TAL metals, TCL PCBs/pesticides, TCL semivolatile organics, total organic carbon (TOC), and pH. (no VOCs)

One-Time Soil Sampling

Sampling Locations

Currently 8 surface soil (0 to 6 inches) and 5 subsurface soil (just above the water table) samples have been collected at Site 7. Of the eight surface soil samples, 4 have since been covered over during the 1997 cover action. Of the remaining 4, two are in locations where landfill-related activities took place (weigh station, surface storage), and two are in other areas.

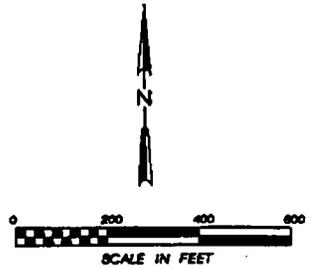
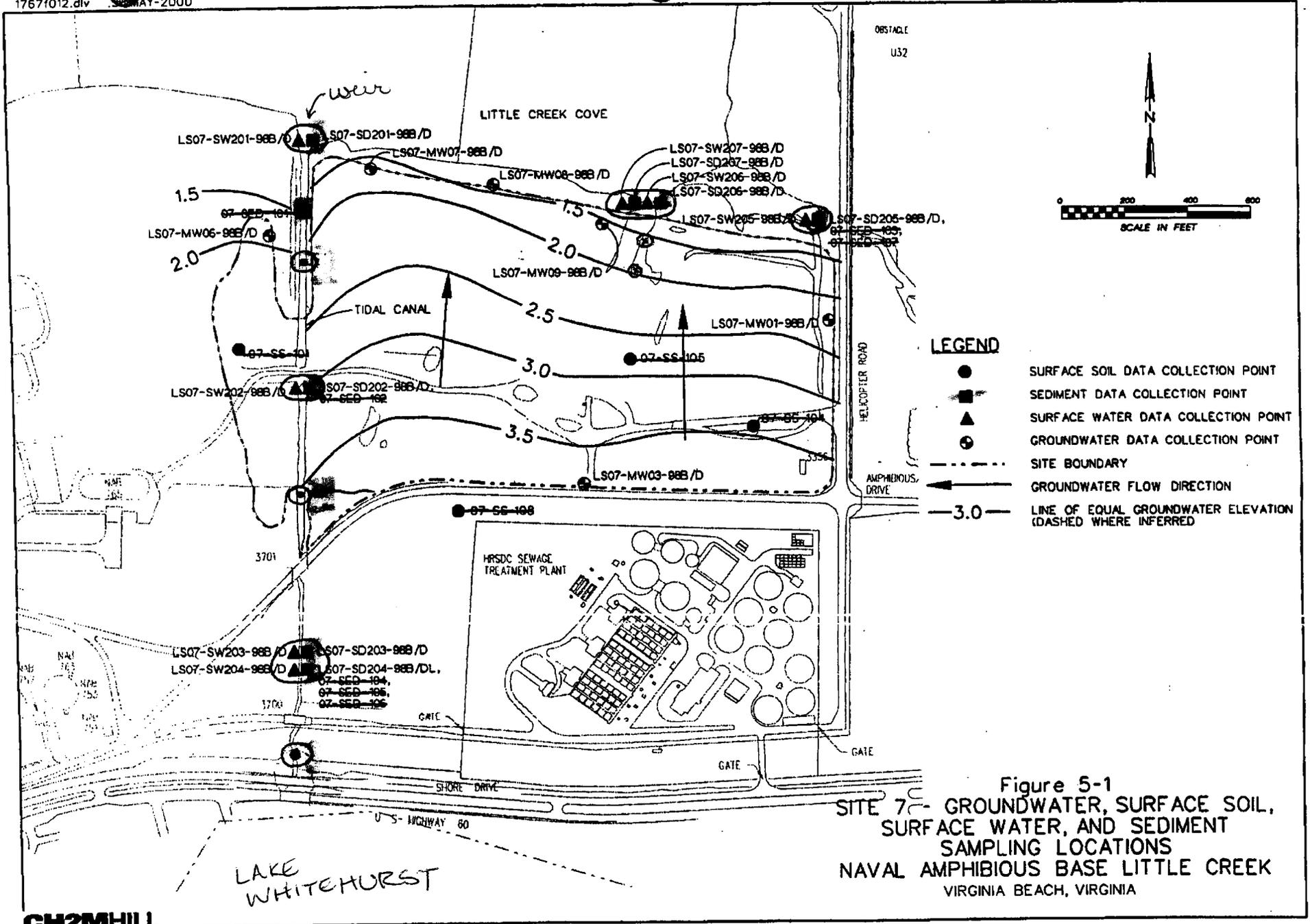
EPA has required that a revised HHRA be conducted for Site 7. Because of the low number of surface soil samples (4), and because the data from two of these samples indicate exceedences of residential RBCs for PAHs and PCBs, it is suggested that three additional soil samples be collected: two in the "ear" on the west side of the landfill and one near the former entrance road and weigh station on the east side of the landfill.

It is suggested that subsurface soil samples (from 1-3 feet) be collected at the same three locations.

Media and Analytes

It is recommended that both surface soil and subsurface soil be sampled for TAL metals and TCL SVOCs and PCBs/pesticides.

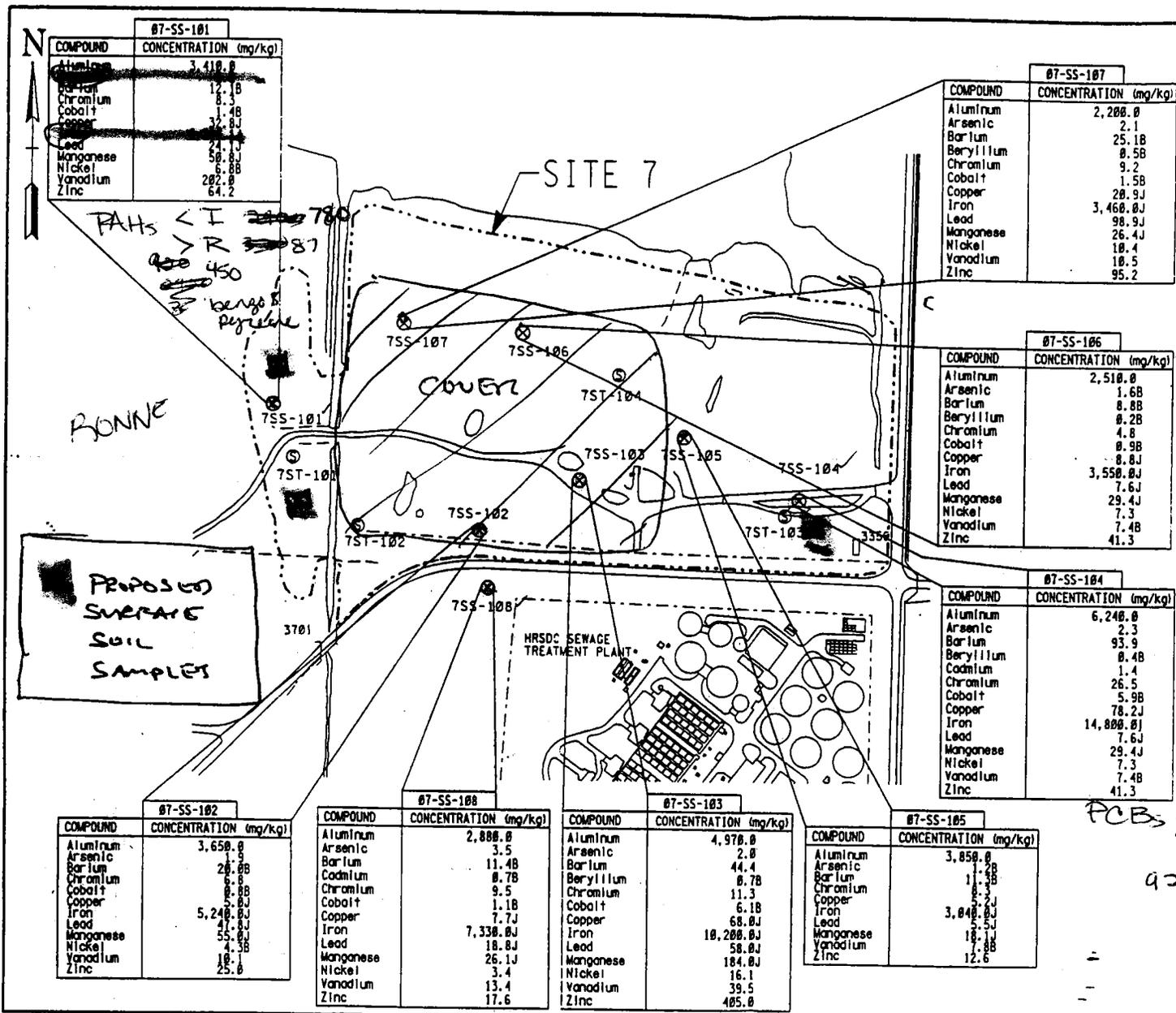
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LEGEND

- SURFACE SOIL DATA COLLECTION POINT
- SEDIMENT DATA COLLECTION POINT
- ▲ SURFACE WATER DATA COLLECTION POINT
- GROUNDWATER DATA COLLECTION POINT
- - - SITE BOUNDARY
- ← GROUNDWATER FLOW DIRECTION
- 3.0 - LINE OF EQUAL GROUNDWATER ELEVATION (DASHED WHERE INFERRED)

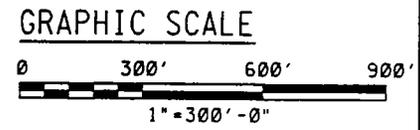
Figure 5-1
 SITE 7 - GROUNDWATER, SURFACE SOIL,
 SURFACE WATER, AND SEDIMENT
 SAMPLING LOCATIONS
 NAVAL AMPHIBIOUS BASE LITTLE CREEK
 VIRGINIA BEACH, VIRGINIA



- NOTES:**
1. ug/kg indicates micrograms per kilogram.
 2. J Indicates an estimated value.
 3. B Indicates compound detected in lab blank.

LEGEND

⊗ SURFACE SOIL SAMPLE
TSS-105



A 10-29-93 DRAFT TO LMTDIV			
REV.	DATE	DESCRIPTION	APPR.
REVISIONS			
FIGURE 5-2			
TAL METALS IN SURFACE SOIL SITE 7 VIRGINIA BEACH - LITTLE CREEK VIRGINIA BEACH, VIRGINIA			
 This drawing is the property of the FOSTER WHEELER ENVIRONMENTAL SERVICES LIVINGSTON, NEW JERSEY AND IS LOANED WITHOUT CONSIDERATION OTHER THAN THE BORROWER'S AGREEMENT THAT IT SHALL NOT BE RE- PRODUCED, COPIED, LOANED, OR OTHERWISE DIRECTLY OR INDIRECTLY FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS SPECIFICALLY FURNISHED.			
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07-SS-101

COMPOUND	CONCENTRATION (mg/kg)
Aluminum	3,410.0
Arsenic	12.18
Barium	8.3
Chromium	1.48
Cobalt	32.8J
Copper	24.1J
Lead	50.8J
Manganese	6.88
Nickel	202.0
Vanadium	64.2
Zinc	

07-SS-107

COMPOUND	CONCENTRATION (mg/kg)
Aluminum	2,288.0
Arsenic	2.1
Barium	25.18
Beryllium	0.58
Chromium	9.2
Cobalt	1.58
Copper	20.9J
Iron	3,460.0J
Lead	98.9J
Manganese	26.4J
Nickel	10.4
Vanadium	10.5
Zinc	95.2

07-SS-106

COMPOUND	CONCENTRATION (mg/kg)
Aluminum	2,510.0
Arsenic	1.68
Barium	8.88
Beryllium	0.28
Chromium	4.8
Cobalt	0.98
Copper	8.8J
Iron	3,550.0J
Lead	7.6J
Manganese	29.4J
Nickel	7.3
Vanadium	7.48
Zinc	41.3

07-SS-104

COMPOUND	CONCENTRATION (mg/kg)
Aluminum	6,240.0
Arsenic	2.3
Barium	93.9
Beryllium	0.48
Cadmium	1.4
Chromium	26.5
Cobalt	5.98
Copper	78.2J
Iron	14,800.0J
Lead	7.6J
Manganese	29.4J
Nickel	7.3
Vanadium	7.48
Zinc	41.3

07-SS-102

COMPOUND	CONCENTRATION (mg/kg)
Aluminum	3,650.0
Arsenic	1.9
Barium	20.08
Chromium	0.88
Cobalt	0.88
Copper	5.0J
Iron	5,240.0J
Lead	41.0J
Manganese	55.0J
Nickel	4.38
Vanadium	10.1
Zinc	25.0

07-SS-108

COMPOUND	CONCENTRATION (mg/kg)
Aluminum	2,888.0
Arsenic	3.5
Barium	11.48
Cadmium	0.78
Chromium	9.5
Cobalt	1.18
Copper	7.7J
Iron	7,330.0J
Lead	18.8J
Manganese	26.1J
Nickel	3.4
Vanadium	13.4
Zinc	17.6

07-SS-103

COMPOUND	CONCENTRATION (mg/kg)
Aluminum	4,970.0
Arsenic	2.0
Barium	44.4
Beryllium	0.78
Chromium	11.3
Cobalt	6.18
Copper	68.0J
Iron	10,200.0J
Lead	58.0J
Manganese	104.0J
Nickel	16.1
Vanadium	39.5
Zinc	405.0

07-SS-105

COMPOUND	CONCENTRATION (mg/kg)
Aluminum	3,850.0
Arsenic	1.28
Barium	11.58
Chromium	8.3
Copper	5.2J
Iron	3,040.0J
Lead	5.5J
Manganese	18.1J
Vanadium	10.8
Zinc	12.6

07-10N-91-20

