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LETTER RESPONDING TO REQUEST FOR INFORMAITON FORMER LANDFILL 2 FORT STORY VA
8/5/1998
U.S. ARMY TRANSPORTATION CENTER FORT EUSTIS VA

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DEPARTMENT OF THE ARMY

U S ARMY TRANSPORTATION CENTER
FORT EUSTIS, VIRGINIA 23604-5000

August 5, 1998

REPLY TO
ATTENTION OF:
Directorate of Public Works

SUBJECT: Request for Information, Former Landfill-Fort Story Army Base, Virginia Beach

Ms. Kerita Kegler
Virginia Department of Environmental Quality
5636 Southern Boulevard
Virginia Beach, Virginia 23462

Dear Ms. Kegler:

Per your July 30, 1998 letter, the referenced landfill is an Installation Restoration Program (IRP) site. It has been under a site investigation and confirmation sampling since 1990. Over the past several years, documents and correspondence pertaining to this landfill have been sent to Mr. Durwood Willis of the Commonwealth of Virginia Department of Environmental Quality (DEQ), Federal Facilities Program in Richmond. Per your request, the below summary and enclosures should help in your review.

Landfill 2 was in operation from 1956 to 1962. In the 1960s, a group of wooden buildings were reported to have been demolished and buried at this site, but no documentation is available to confirm this action. Based on geographical and electromagnetic surveying conducted in 1990, the landfill was estimated to cover 3 acres.

In 1990, five groundwater-monitoring wells were installed. Two soil samples were collected from each monitoring well location, one at ground surface and the other at the soil-groundwater interface. Groundwater samples were also collected from each monitoring well. The only analyte detected above a soil trigger level was copper, at 19 mg/kg and 17 mg/kg, which was detected at one monitoring well location. Cadmium was the only analyte detected above a groundwater trigger level, at 87 µg/l. It was detected at only one groundwater monitoring location. The resulting 1992 Preliminary Assessment/Site Investigation report recommended an additional confirmatory investigation to determine the source of the cadmium. Enclosure 1 is the section from the 1992 report containing all the pertinent information about the landfill.

In January 1995, groundwater samples were collected from the five previously installed monitoring wells. Two surface water samples and five sediment samples were also collected. Total lead was the only constituent detected at two of the five

groundwater monitoring locations. Concentrations were above an MCL at 16 µg/l and 18 µg/l. Dissolved lead was not detected. Cadmium was not detected in any of the groundwater samples.

Zinc was detected in both of the surface water samples at 39 µg/l and 130 µg/l, which is above the Virginia Water Quality Standard of 33 µg/l. No other analyte was detected above a trigger level.

Arsenic, lead, mercury and zinc were detected in the sediment samples. They were slightly above the National Oceanic and Atmospheric Administration (NOAA) and the Environmental Protection Agency (EPA) Region III Biological Technical Assistant Group (BTAG) sediment screening trigger levels established at the site for the protection of fauna.

The 1995 Confirmatory Studies Report recommended an additional groundwater and surface water-sampling event. Enclosure 2 is the copy of the 1995 report excluding the appendices. This additional sampling event was conducted in September 1997. The five groundwater monitoring wells were re-sampled and two surface water samples were collected. Preliminary results have indicated total cadmium exceeded the MCL of 5 µg/l at two groundwater-monitoring locations. The concentrations were 6.6 µg/l and 15.2 µg/l. No other analyte exceeded an MCL. Several metals were also detected in the surface water above Virginia Water Quality Standards. The preliminary report is still being reviewed by the Army and is not ready for distribution. Once the draft report is prepared, we will send a copy to Ms. Sharon Wilcox of the DEQ Federal Facilities Program and to your office for review and comment. The draft report is expected to be completed by the end of September 1998.

As previously mentioned, all documentation and correspondence pertaining to this landfill have been sent to the DEQ Federal Facilities Program office in Richmond. If you have any questions or need additional information, please contact Mr. Dan Musel at (757) 878-4123 ext. 297.

Sincerely,

Daniel E. Musel

for Stephen A. McCall
Chief, Environmental and
Natural Resources Division

Enclosures

Copy Furnished: DEQ, Federal Facilities Program, Ms. Sharon Wilcox

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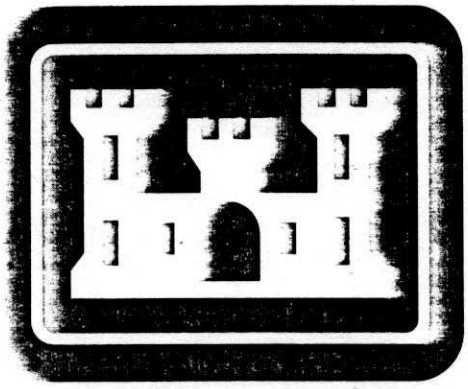
ENCLOSURE 1



U.S. Army Corps of Engineers
Missouri River Division
Omaha District

Final Site Investigation Report for the

Fort Story Preliminary Assessment/Site Investigation and Fort Story NIKE Preliminary Assessment/Site Investigation

Fort Story, Virginia
January 1992

JMM James M. Montgomery

2.2.2.2 Site 2, Landfill 2. Site 2, Landfill 2, is located within the wetland area along the southern margin of Fort Story, immediately adjacent to the southern flank of the central sand ridge area near the junction of Coast Artillery Road and U.S. Route 60. The purpose of the investigation of Site 2, Landfill 2, was to determine the boundary of the landfill and the presence of soil and groundwater contamination associated with the landfill.

The landfill was in operation from 1956 to 1962 (ESE, 1988). During the 1960s, a group of wooden buildings may have been demolished and buried at this site, but no documentation is available to confirm this action (Personal Communication, Fort Story Personnel, 1990). JMM's recent field observations did not indicate any surface debris or evidence of buried debris.

Groundwater and soil matrices were investigated at Site 2 through the installation of five monitoring wells. Figures 2-6 and 2-7 show sampling locations. Locations for the monitoring wells, which were installed in positions that collectively encircle the fill area, were selected on the

basis of geophysical surveying performed to locate the extent of the fill area. The geophysical survey at Landfill 2 did not clearly define its boundaries as clearly as for Landfill 1. This may be due to a lack of sufficient ferrous materials for the instruments (magnetic conductivity and magnetometer) to detect the transition between fill and native soil.

Well to poorly graded Holocene-age sand deposits underlie the site. The sand is generally characterized as medium to medium-fine grained and subangular to subrounded. At some locations, thin discontinuous peat lenses are interbedded with the sand. From ground surface to relatively shallow depths, the sand locally includes significant quantities of silt. Figure 2-8 presents cross sections based on soil boring data that illustrate the general stratigraphy of Site 2. The locations of the cross sections are shown on Figure 2-6.

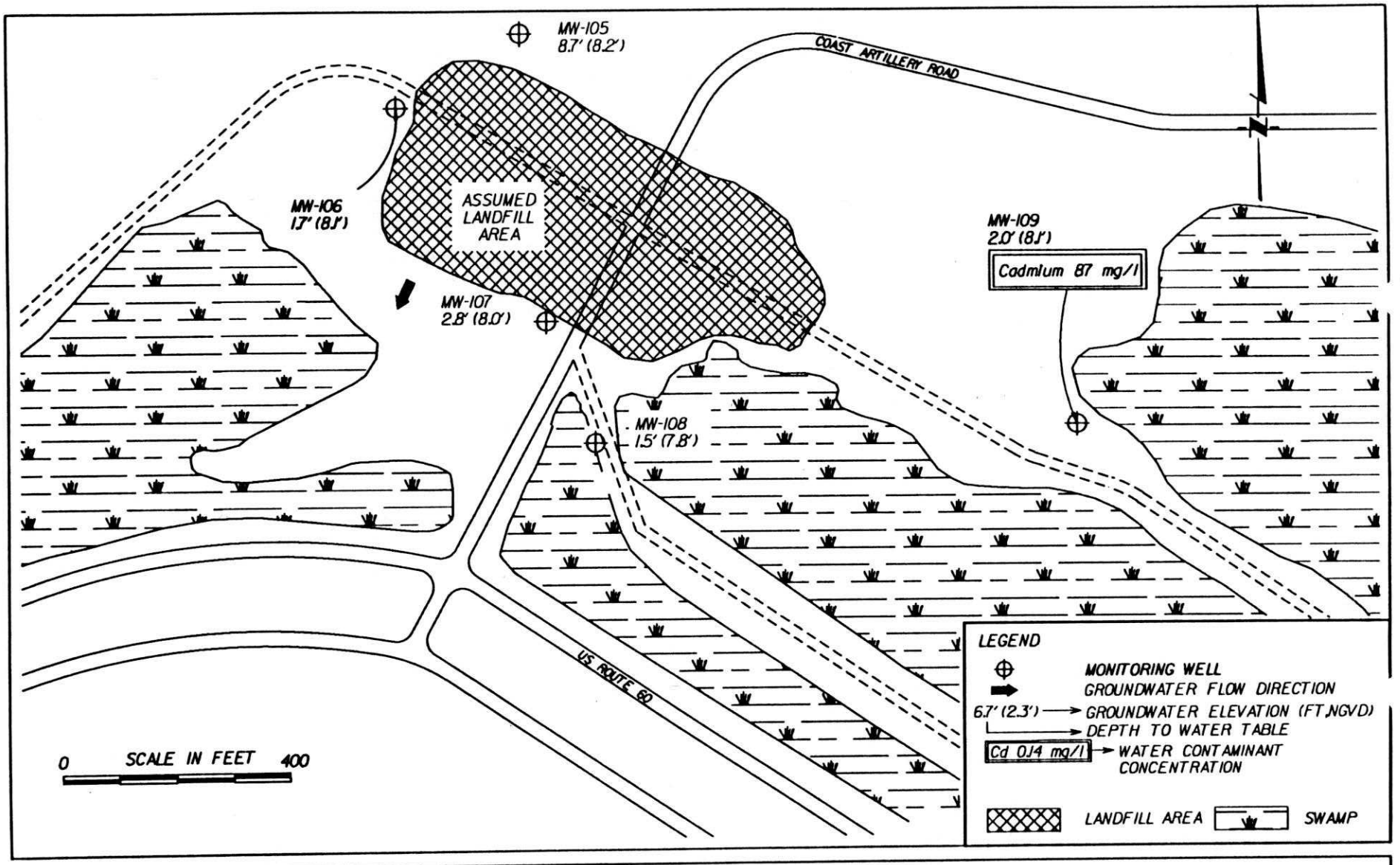
Groundwater is encountered at relatively shallow depths in the Site 2 area. Monitoring wells MW-106 through MW-109 were installed in the immediate vicinity of the fill area. Based on water level data from the wells installed in the low lying area adjacent to the landfill, the water table was measured at an average depth of 2 feet bls. Water level data and well construction data for each of the Site 2 monitoring wells are presented in Table 2-13. Well MW-105 is located in an upgradient position, on the southern flank of the central sand ridge area. The water table occurs at a depth of 8.73 feet bls in this well. Measured groundwater elevations ranged from 8.16 feet NGVD in MW-105 to 7.78 feet NGVD in MW-108. Based on these data, the hydraulic gradient across the site is directed toward the southwest. Hydraulic conductivity values calculated for Site 2, Landfill 2, range from 1.74×10^{-4} to 1.79×10^{-2} cm/sec (4 to 379 gal/da/ft^2),.with an average value of 6.36×10^{-3} cm/sec (135 gal/da/ft^2).

Table 2-14 indicates the depths at which soil samples were collected from the Site 2 monitoring well borings. Analytical soil samples were collected at ground surface and at the depth corresponding to the soil-groundwater interface. The analyses performed on the samples collected included pesticides/PCBs, VOCs, BNAs, total metals, EP Tox metals, cyanide and total solids. Holding times were exceeded for these VOC soil samples: S2MW105(10), S2MW107(0), S2MW107(2), S2MW108(0), S2MW108(0)D and S2MW108(2). These three soil samples were recollected and sent to the laboratory for analysis: S2MW107(0), S2MW108(0), and S2MW108(0)D. The analytical results from the Site 2 soil samples and the resampling effort are presented in Table 2-SS of the *FTSFARD*. The groundwater samples collected from the Site 2 monitoring wells were analyzed for pesticides/PCBs, VOCs, BNAs, dissolved metals, total metals, cyanide and inorganics. The analytical results for these analyses are presented in Table 2-GW in the *FTSFARD*.

Soil Analytical Results. The results of soil analyses at Site 2 are presented in Table 2-SS of the *FTSFARD*. Figure 2-6 shows the sampling locations and the soil analytes detected above trigger levels. The only analyte detected above trigger level that could warrant further investigation in the soil was copper, at 19 mg/kg and 17 mg/kg, which was detected in the surface soil and two-foot samples collected from MW-107, located downgradient of the landfill. This slightly exceeds the trigger level of 14 mg/kg for copper. Although 2 mg/kg of cyanide was found in the sample collected from the surface at MW-107, it is considered to be within acceptable range for background, as discussed in Section 2.1.2.1.

Groundwater Analytical Results. The analytical results of groundwater analyses of samples from Site 2 are presented in Table 2-GW of the *FTSFARD*. Figure 2-7 shows the sampling locations, with the groundwater analytes detected above trigger levels. Cadmium was found in concentrations greater than its trigger level in the sample from one well, MW-109, at a concentration of 87 µg/l, which is over 10 times the trigger level of 5 µg/l.

Numerous analytes were detected in concentrations below trigger levels. Carbon disulfide was detected in all monitoring well groundwater samples collected at this site. The highest



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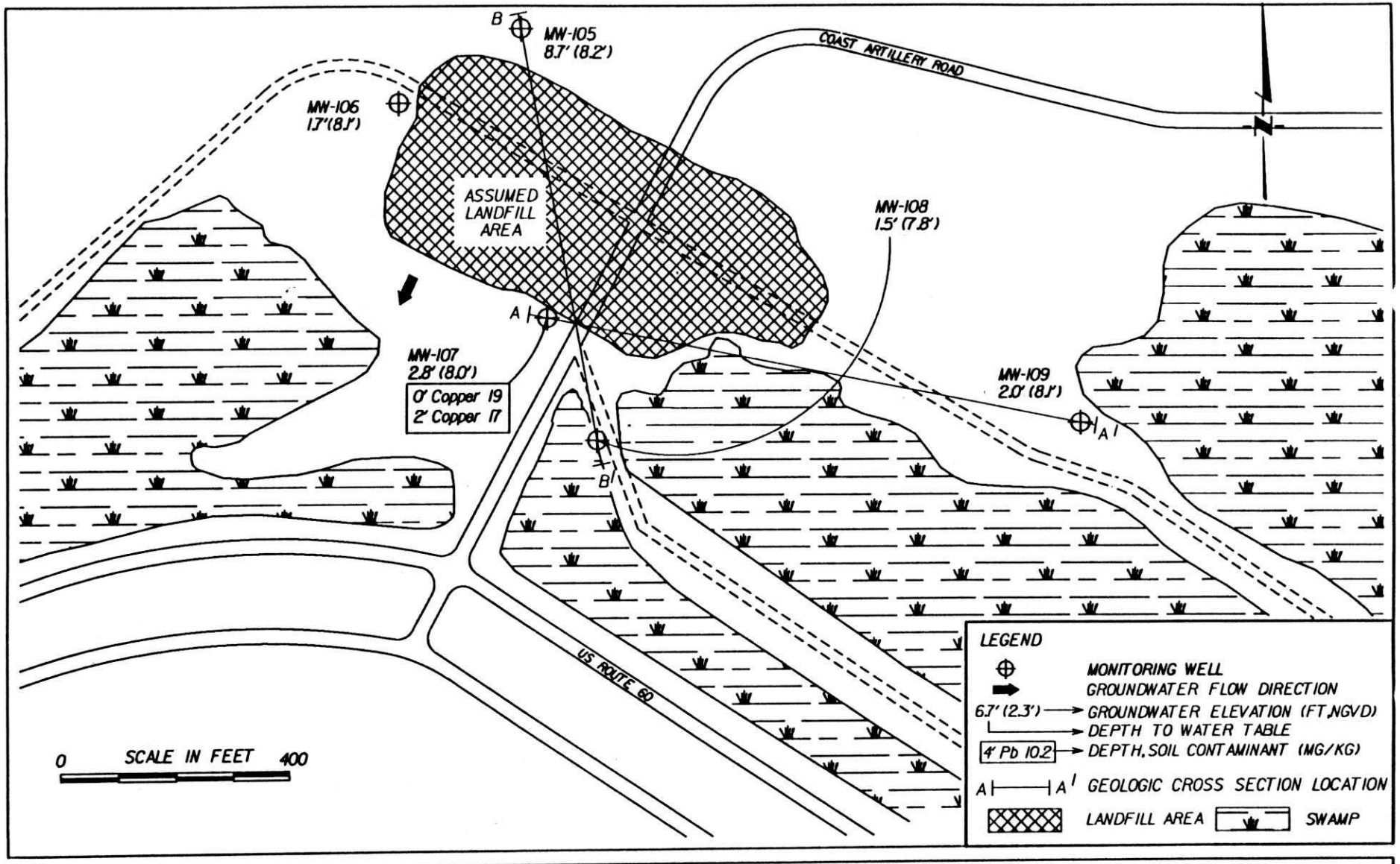
Groundwater Chemistry Concentrations,
Site 2, Landfill 2
Ft. Story, VA

Figure 2-7



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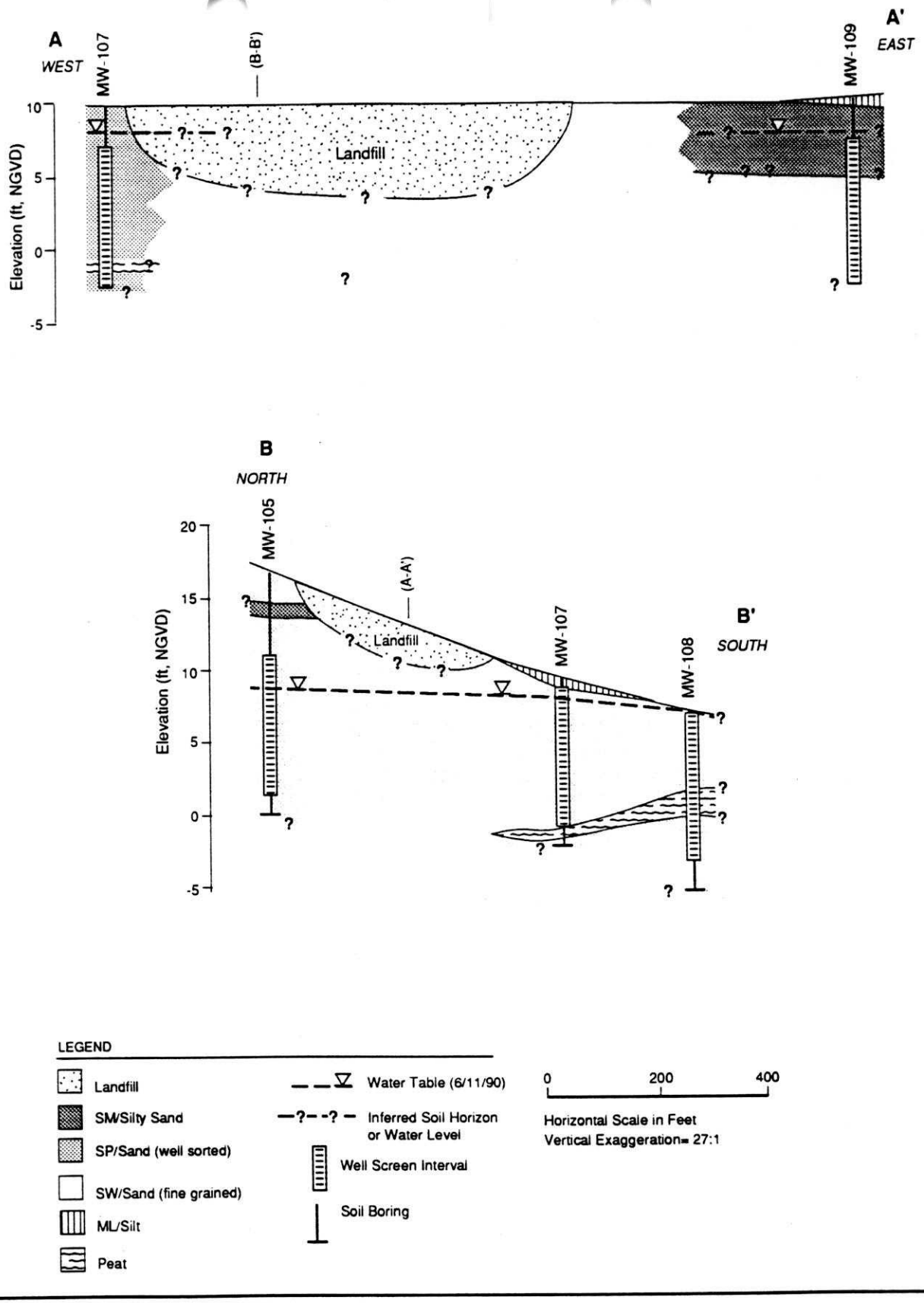
Soil Chemistry Concentrations and Geologic Cross Section Locations,
Site 2, Landfill 2
Ft. Story, VA

Figure 2-6



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Cross Sections A-A' and B-B' at Site 2, Landfill 2
Ft. Story, VA

Figure 2-8

TABLE 2-13

SITE 2, LANDFILL 2
WELL CONSTRUCTION SUMMARY

Well No.	TOC[a] Elevation (ft., NGVD[d])	Total Depth[b] (ft.)	Elevation Top Screen (ft., NGVD)	Elevation Bottom Screen (ft., NGVD)	Ground Elevation (ft., NGVD)	Depth to Water[c] (ft.)	Water Level (ft., NGVD)	Date Water Level Measured
MW-105	16.56	15.00	11.56	1.56	16.89	8.73	8.16	06/11/90
MW-106	9.52	11.75	7.77	-2.23	9.75	1.73	8.02	06/11/90
MW-107	10.60	11.50	9.10	-0.90	10.84	2.84	8.00	06/11/90
MW-108	8.98	12.00	6.98	-3.02	9.29	1.51	7.78	06/11/90
MW-109	9.68	10.07	7.93	-2.07	10.07	1.99	8.08	06/11/90

(a) TOC - top of casing.
(b) Total depth relative to ground surface.
(c) Relative to ground surface.
(d) NGVD - National Geodetic Vertical Datum of 1929.

TABLE 2-14

SITE 2, LANDFILL 2
SUMMARY OF SOIL SAMPLING DEPTHS

Boring Number	Total Depth[a] (ft.)	Samples Logged	Samples Analyzed	Depth of Soil Samples[b] (ft.)
MW-105	17.5	6	2	0,2,4,6,8,14
MW-106	12	4	2	0,2,4,10
MW-107	13	4	2	0,2,5,10
MW-108	14	4	2	0,2,5,10
MW-109	12	4	2	0,2,4,10

(a) Total depth relative to ground surface.
(b) An underlined number (e.g., 0) indicates depth at which an analytical sample was collected. Lithologic samples were collected at all depths shown.