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NAS KEY WEST
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TECHNICAL MEMORANDUM SAMPLING AND ANALYSIS PLAN ADDENDUM FOR
SUPPLEMENTAL RESOURCE CONSERVATION AND RECOVERY ACT FACILITY
INVESTIGATION/REMEDIATION INVESTIGATION NAS KEY WEST FL
11/14/1996
BROWN AND ROOT ENVIRONMENTAL

**TECHNICAL MEMORANDUM FOR
SAMPLING AND ANALYSIS PLAN ADDENDUM**

SUPPLEMENTAL RCRA FACILITY INVESTIGATION/REMEDIAL INVESTIGATION

**FOR NAVAL AIR STATION KEY WEST
BOCA CHICA KEY, FLORIDA**

**COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT**

**Submitted for:
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29406**

**Submitted by:
Brown & Root Environmental
661 Andersen Drive
Foster Plaza 7
Pittsburgh, Pennsylvania 15220**

**CONTRACT NUMBER N62467-94-D-0888
CONTRACT TASK ORDER 0007**

November 14, 1996

INTRODUCTION

This Technical Memorandum for sampling and analysis plan addendum describes the groundwater sampling to be conducted at the solid waste management unit 1 (SWMU 1) at the Naval Air Station (NAS) Key West. This memorandum amends and follows all existing procedures and protocols of the Supplemental Resource Conservation and Recovery Act (RCRA) Facility Investigation/Remedial Investigation (RFI/RI) Work Plan and Sampling and Analysis Plan (SAP) prepared by ABB Environmental Services Inc., dated December 6, 1995.

The objective of the groundwater sampling is to measure the contaminant concentrations in the groundwater at or near SWMU 1 at 5 locations (one new well and four existing wells) using laboratory analyses to support the Corrective Measures Study (CMS) due to be submitted by February 24, 1997. This new data will supplement the sampling and analysis of 4 new wells installed by Brown & Root Environmental as a part of the Supplemental RFI/RI. Additionally samples for TAL metals will be analyzed on both filtered and unfiltered sample aliquots. Well analytical data from SWMU 1 taken in 1991 and 1993 was on unfiltered samples and the metals results may have been affected by particulate soils contained in the well water.

This document provides the details of the groundwater sampling event to be conducted at SWMU 1. Procedures and protocols for sampling and analyses of the groundwater will be conducted in accordance with the final work plan and SAP submitted by ABB Environmental Services Inc. (1995), and are not discussed in this addendum.

INVESTIGATION SITE AND ACTIVITIES

SWMU 1 -Boca Chica Open Disposal Area

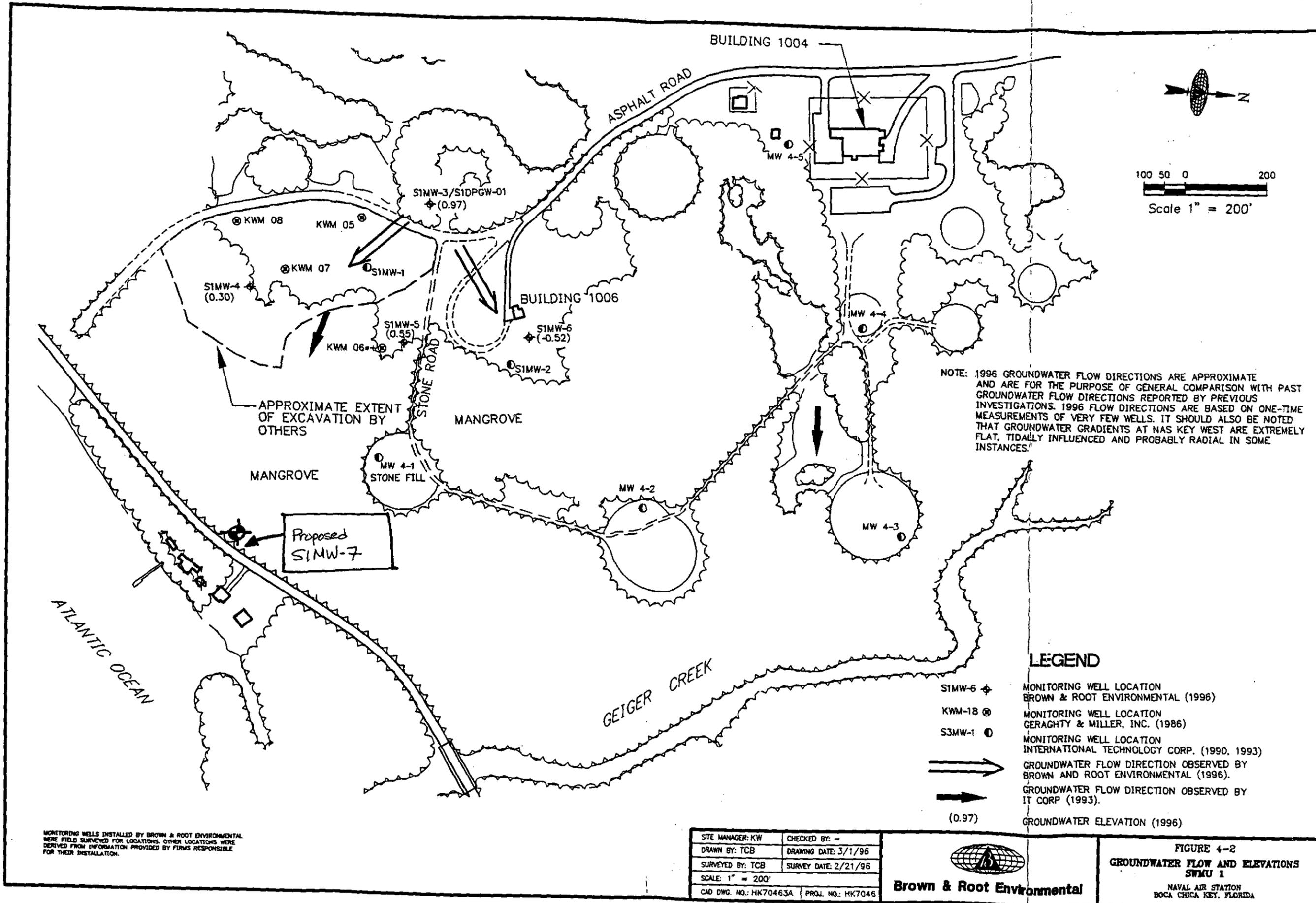
This site, designated as Site No. 4 in the initial assessment activities, consists of a former open disposal and burning area in the southeastern part of Boca Chica Key, between Stone Road and the mangrove swamp fringing Geiger Creek and the Atlantic Ocean as shown in Figure 4-2 attached. It was operated from 1942, when the Naval Air Station (NAS) activity was established on Boca Chica, until the mid-1960s. SWMU 1 reportedly received general refuse and waste associated with aircraft maintenance activities. The list of possible wastes it received includes waste oil, hydraulic fluid, paint thinner, and solvents. An estimated 2,600 tons of waste were disposed of or burned each year. Three abandoned aboveground fuel storage tanks were in the northwestern part of the site. The area of waste disposal and burning (approximately 4 acres) is indicated by debris present near the eastern edges of the site.

SWMU 1 is relatively flat with low vegetation and mangroves along its perimeter. Shell and gravel roads along the edge of the site enabled access to remote antenna sites that are no longer in use, although the site is adjacent to an operating communications center. The south and east sides of SWMU 1 are bordered closely by the Atlantic Ocean. It is not unusual for much of the unit to be under water during and after rainfall events. The site slopes gradually toward the mangrove swamp that lies between the site and the ocean shoreline. Sediments that originate from erosion of the site surface are deposited in the mangroves.

Field Activities

Field Mobilization/Demobilization

The field investigation will begin with mobilization activities such as coordination with utility clearance personnel and purchase of expendable materials. Mobilization also includes all other activities associated with preparation for the field activities such as coordination with all subcontractors (drilling, surveying, IDW disposal and laboratory) and NAS Key West personnel, preparation, packaging, and



NOTE: 1996 GROUNDWATER FLOW DIRECTIONS ARE APPROXIMATE AND ARE FOR THE PURPOSE OF GENERAL COMPARISON WITH PAST GROUNDWATER FLOW DIRECTIONS REPORTED BY PREVIOUS INVESTIGATIONS. 1996 FLOW DIRECTIONS ARE BASED ON ONE-TIME MEASUREMENTS OF VERY FEW WELLS. IT SHOULD ALSO BE NOTED THAT GROUNDWATER GRADIENTS AT NAS KEY WEST ARE EXTREMELY FLAT, TIDALLY INFLUENCED AND PROBABLY RADIAL IN SOME INSTANCES.

LEGEND

- MONITORING WELL LOCATION BROWN & ROOT ENVIRONMENTAL (1996)
- MONITORING WELL LOCATION GERAGHTY & MILLER, INC. (1986)
- MONITORING WELL LOCATION INTERNATIONAL TECHNOLOGY CORP. (1990, 1993)
- GROUNDWATER FLOW DIRECTION OBSERVED BY BROWN AND ROOT ENVIRONMENTAL (1996).
- GROUNDWATER FLOW DIRECTION OBSERVED BY IT CORP (1993).
- GROUNDWATER ELEVATION (1996)

MONITORING WELLS INSTALLED BY BROWN & ROOT ENVIRONMENTAL WERE FIELD SURVEYED FOR LOCATIONS. OTHER LOCATIONS WERE DERIVED FROM INFORMATION PROVIDED BY FIRMS RESPONSIBLE FOR THEIR INSTALLATION.

SITE MANAGER: KW	CHECKED BY: --
DRAWN BY: TCB	DRAWING DATE: 3/1/96
SURVEYED BY: TCB	SURVEY DATE: 2/21/96
SCALE: 1" = 200'	
CAD DWG. NO.: HK70463A	PROJ. NO.: HK7046

Brown & Root Environmental

FIGURE 4-2
GROUNDWATER FLOW AND ELEVATIONS
SWMU 1
NAVAL AIR STATION
BOCA CHICA KEY, FLORIDA

shipping of all required field equipment and materials, and performance of site-specific health and safety training for all on-site personnel. Point of contact at NAS Key West is Mr. Phillip Williams, Installation Restoration Coordinator.

Groundwater Monitoring Well Installation and Environmental Sampling

The field investigation includes installing one shallow groundwater monitoring well and sampling five monitoring wells (including the new monitoring well) at SWMU 1 for all analytical parameters that were included in the Supplemental RFI/RI sampling. The monitoring well installation, sampling and surveying will be performed as described in the existing Work Plan (ABB 1995). A brief summary of the field activities is described below.

The single 2 inch monitoring well will be installed so that the well screen intersects the top of the water table. The monitoring well will have a stainless steel stickup with a 3 ft. by 3 ft. by 6 inch pad and yellow 4 inch bumper posts in the pad. The lithology of the well will be determined by drill cuttings. Drill cuttings and purge water will be containerized and left the Boca Chica Contractor's Laydown Yard until the sampling results are received and validated.

Each of the five monitoring wells will be purged and sampled with low flow pump (peristaltic) except for volatile and semivolatile organic compounds. The wells will be purged at a rate of 300 milliliters per minute by dedicated Teflon tubing. Purge water readings will be taken for every gallon for pH, conductivity, temperature, dissolved oxygen, turbidity and salinity. A minimum of 3 well volumes will be removed from the well even if the purge water parameters stabilize. B&R Environmental experience with sampling at this site indicates a turbidity problem is experienced with samples taken with a bailer. Therefore, all samples for metals, PCBs, pesticides, herbicides, and cyanides will be performed with the pump and tubing. In addition, volatile and semivolatile organic compounds will be carefully obtained with a dedicated (laboratory clean) bailer to reduce the turbidity in the samples to the maximum extent practicable. The locations of the new monitoring well (S1MW-7) and four monitoring wells to be sampled (KMW 06, KWM 07, S1MW-5, MW 4-1) are shown in Figure 4-2. The number and type of samples proposed for collection and subsequent laboratory analyses are listed in Table 1.

Health and Safety

B&R Environmental staff will adhere to the Health and Safety Plan Mod. 02 dated 10 July 1996 since the field activities are identical to those utilized in the recent fieldwork at NAS Key West. In addition, the plan addresses SWMU 1 contaminants and drilling hazards as B&R Environmental performed fieldwork at this unit during January 1996.

Field Staff

Scott Flickinger	B&RE Aiken Field Operations Leader
Paul Calligan	B&RE Tallahassee Geologist

Table 1 - SWMU 1 Sample Number and Analytical Fractions

The following is a summary of the groundwater and QC samples that will be obtained during this field investigation:

Analytical Fraction	Analytical Method	Bottles	Number of Samples	Duplicate Samples	Rinsate Blanks (Aqueous)	Field Blank (Aqueous)	Trip Blanks (Aqueous)	Total Samples
Appendix IX Volatile Organic Compounds	SW-846/8260	40 ml preserv. HCL	5	1	1	1	3	11
Appendix IX Semivolatile Organic Compounds	SW-846/8270B	(2) 1 liter amber	5	1	1	1	0	8
Appendix IX Pesticides and PCBs	SW-846/8081	(2) 1 liter amber	5	1	1	1	0	8
TAL Metals and Cyanide (Filtered)	CLP SOW ILMO 3.0	500 ml preserv. poly each HNO3/NaOH	5	1	1	1	0	8
TAL Metals and Cyanide (Unfiltered)	CLP SOW ILMO 3.0	500 ml preserv. poly each HNO3/NaOH	5	1	1	1	0	8
Appendix IX Herbicides	SW-846/8151	(2) 1 liter amber	5	1	1	1	0	8
TOTAL			30	6	6	6	3	51