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FINAL ABBREVIATED CONTAMINATION ASSESSMENT PLAN FOR SITE A 824 AND  
GEIGER KEY HAWK MISSILE SITE G 01 MONITORED NATURAL ATTENUATION  
SAMPLING PLAN FOR BOCA CHICA HAWK MISSILE SITE B 01 WITH TRANSMITTAL  
LETTER NAS KEY WEST FL  
11/20/2003  
TETRA TECH



TETRA TECH NUS, INC.

AIK-03-0306

November 20, 2003

Project Number N4779

*via U.S. Mail*

Commander  
Department of the Navy  
SOUTHDIV NAVFACENGCOM  
ATTN: Byas Glover (Code ES24)  
P.O. Box 190010  
North Charleston, South Carolina 29419-9010

Reference: CLEAN Contract No. N62467-94-D-0888  
Contract Task Order No. 0318

Subject: Final Abbreviated Contamination Assessment Plan for Site A-824 and Geiger Key Hawk Missile Site G-01; Monitored Natural Attenuation Sampling Plan for Boca Chica Hawk Missile Site B-01, Rev. 1, Naval Air Station, Key West, Florida

Dear Mr. Glover:

TtNUS is pleased to submit the enclosed PDF file for the Final Abbreviated Contamination Assessment Plan for Site A-824 and Geiger Key Hawk Missile Site G-01; Monitored Natural Attenuation Sampling Plan for Boca Chica Hawk Missile Site B-01, Rev. 1, Naval Air Station, Key West, Florida. This revision documents our new approach to assessing Site A-824 due to the presence of the Lower Keys Marsh Rabbit at the site. As you requested, a copy of this plan is being sent to the Florida Department of Environmental Control (FDEP) for informational purposes only. I am not expecting to receive any comments on this plan.

Please call me at (803) 649-7963, extension 345, if you have any questions regarding the enclosed CD.

Sincerely,

C. M. Bryan  
Project Manager

CMB:spc

Enclosure

c: Ms. Debbie Wroblewski (Cover Letter Only)  
Mr. M. Perry/File  
File N4779-7.1.3

Mr. R. Courtright, NAS Key West  
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**Abbreviated Contamination  
Assessment Plan**  
for  
**Site A-824 and Geiger Key Hawk  
Missile Site G-01; Monitored Natural  
Attenuation Sampling Plan for Boca  
Chica Hawk Missile Site B-01**

**Naval Air Station  
Key West, Florida**



**Southern Division  
Naval Facilities Engineering Command**

**Contract Number N62467-94-D-0888  
Contract Task Order 0318**

November 2003



**ABBREVIATED CONTAMINATION ASSESSMENT PLAN  
FOR  
SITE A-824 AND GEIGER KEY HAWK MISSILE SITE G-01;  
MONITORED NATURAL ATTENUATION SAMPLING PLAN FOR BOCA CHICA  
HAWK MISSILE SITE B-01**

**NAVAL AIR STATION  
KEY WEST, FLORIDA**

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

**Submitted to:  
Southern Division  
Naval Facilities Engineering Command  
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North Charleston, South Carolina 29406**

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**CONTRACT NUMBER N62467-94-D-0888  
CONTRACT TASK ORDER 0318**

**NOVEMBER 2003**

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## ACRONYMS

AST	Aboveground Storage Tank
B&RE	Brown and Root Environmental
BBL	Blasland, Bouck, and Lee
bls	below land surface
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CAP	Contamination Assessment Plan
CLEAN	Comprehensive Long-term Environmental Action, Navy
COC	contaminant of concern
CTO	Contract Task Order
DOT	Department of Transportation
DPT	direct-push technology
EDB	ethylene dibromide
EPA	United States Environmental Protection Agency
F.A.C.	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
GCTL	Groundwater Cleanup Target Level
IDW	investigation-derived waste
IT	IT Corporation
KAG	kerosene analytical group
µg/L	microgram per liter
MNA	Monitored Natural Attenuation
MS	matrix spike
MSD	matrix spike duplicate
msl	mean sea level
MTBE	methyl-tertiary butyl ether
NAS	Naval Air Station
NOAA	National Oceanic and Atmospheric Administration
OVA	organic vapor analysis
PAH	polynuclear aromatic hydrocarbon
PPL	Priority Pollutant List
ppm	parts per million
QC	quality control
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation

RI	Remedial Investigation
SAR	Site Assessment Report
SCTL	Soil Cleanup Target Level
SOP	Standard Operating Procedure
SouthDiv	Southern Division, Naval Facilities Engineering Command
SWMU	Solid Waste Management Unit
TRPH	total recoverable petroleum hydrocarbons
TtNUS	Tetra Tech NUS, Inc.
UST	Underground Storage Tank
VOH	volatile organic halocarbon



## **1.0 ABBREVIATED CONTAMINATION ASSESSMENT PLAN FOR SITE A-824 AND GEIGER KEY HAWK MISSILE SITE G-01; MONITORED NATURAL ATTENUATION SAMPLING PLAN FOR BOCA CHICA HAWK MISSILE SITE B-01**

Tetra Tech NUS, Inc. (TtNUS) has been contracted by the Department of the Navy, Southern Division, Naval Facilities Engineering Command (SouthDiv) to perform environmental studies at three sites at Naval Air Station (NAS) Key West, Florida. A Site Assessment at Site A-824 and a Supplemental Site Assessment at the Geiger Key Hawk Missile Site G-01 will be performed. Also included in this Plan is a Monitored Natural Attenuation (MNA) Sampling Plan for activities at the Boca Chica Hawk Missile Site B-01. This abbreviated Contamination Assessment Plan (CAP) and MNA Sampling Plan was prepared under the Comprehensive Long-term Environmental Action Navy (CLEAN) Contract Number N62467-94-D-0888, Contract Task Order (CTO) Number 0318.

### **1.1 SITE HISTORY**

#### **1.1.1 Site A-824**

Building A-824 stands on the north side of NAS Key West, on Boca Chica Key, Florida (Figure 1-1). The site is located in Section 29, Township 67 South, Range 29 East. Figure 1-2 shows the site layout.

Building A-824 is located within the boundaries of Solid Waste Management Unit (SWMU) 7. This building was previously used to store supplies and small electrical transformers. It was also used for temporary staging of 55-gallon drums of hazardous waste. Although no reported release of petroleum hydrocarbon contaminants was recorded, fuel contamination identified to the east of the building during the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) suggested a possible roadside diesel spill (IT, 1994). Fuel constituents were also discovered in the area between the access roads to the east of Building A-824 during the Supplemental RFI/RI performed by Brown and Root Environmental, Inc. (B&RE, 1998). Additional investigation under the NAS Key West Underground Storage Tank (UST) program was recommended in the Supplemental RFI/RI because the contamination was determined not to be associated with activities conducted at SWMU 7.

#### **1.1.2 Geiger Key Hawk Missile Site G-01**

Geiger Key Hawk Missile Site G-01 is located in Section 27, Township 67 South, Range 26 East. The site is located south of State Road S-941 (Old Boca Chica Road) on the southwest end of Geiger Key

(Figure 1-1). The site topography is level and the elevation of the site is less than 5 feet above mean sea level (msl). The site is approximately one-quarter-mile from the Atlantic Ocean.

Two aboveground storage tanks (ASTs) used to store diesel fuel for emergency generators were located at the Geiger Key Hawk Missile Site. The tanks also reportedly stored jet propellant (JP-5) fuel on occasion. The 2,000-gallon and 500-gallon tanks were closed in place on April 27, 1996. The Closure Report indicated that the groundwater in the vicinity of the 2,000-gallon tank AST showed signs of petroleum hydrocarbon contamination and recommended that a Contamination Assessment be performed. The Navy submitted a Closure Assessment Form to the Florida Department of Environmental Protection (FDEP) on June 17, 1996 (Blasland, Bouck, and Lee, Inc. [BBL], 2002).

A site assessment was conducted by BBL and a Site Assessment Report (SAR) was submitted to FDEP in February 2002. Petroleum contamination was identified during the site assessment in soil and groundwater extending from the 2,000-gallon AST to the north end of the study area (Figure 1-3). The SAR concluded that the horizontal extent of contamination at the Geiger Key Hawk Missile Site G-01 was not fully defined. MNA was recommended for the site, following the installation of additional monitoring wells (BBL, 2002). For this reason, TtNUS will perform additional screening of soil and groundwater to determine the optimum locations for three additional monitoring wells. FDEP approved the SAR on May 2, 2002, concurring with the recommendation to continue further field investigation to delineate the extent of the petroleum hydrocarbons (BBL, 2002). A copy of this approval letter is included in Appendix A.

### **1.1.3 Boca Chica Hawk Missile Site B-01**

Boca Chica Hawk Missile Site B-01 is located on the northern end of Boca Chica Key, in Section 19, Township 67 South, Range 26 East (Figure 1-1). The site has been abandoned and no activities are conducted with the exception of a tower operated by the National Oceanic and Atmospheric Administration (NOAA) and an associated emergency generator with 1,000-gallon AST containing jet propellant fuel (JP-5), located approximately 250 feet from the study area. The site layout is shown in Figure 1-4.

A 2,000-gallon AST and a 500-gallon AST were removed from the site on April 14, 1996. These tanks were used to store diesel fuel for the site's emergency generators. They may have also been used to store JP-5 fuel on occasion. The Closure Report indicated that the soil and groundwater in the vicinity of the 2,000-gallon AST exhibited signs of petroleum contamination, and recommended that a

Contamination Assessment be performed. The Navy submitted a Closure Assessment Form to FDEP on June 17, 1996 (BBL, 2002).

A site assessment was conducted by BBL and a SAR was submitted to FDEP in February 2002. Concentrations of contaminants of concern (COCs) in soil were below soil cleanup target levels (SCTLs), and organic vapor analyzer (OVA) readings did not exceed 10 parts per million (ppm). Polynuclear aromatic hydrocarbons (PAHs) were detected above Groundwater Cleanup Target Levels (GCTLs) in groundwater from the Boca Chica Hawk Missile Site B-01. However, no other Kerosene Analytical Group (KAG) constituents were detected above GCTLs. BBL recommended that MNA take place at the site at two monitoring wells for one to two years and that groundwater from the site be analyzed for PAHs only (BBL, 2002). FDEP approved the SAR and issued a Natural Attenuation Monitoring Plan Approval Order on May 3, 2002. A copy of FDEP's approval order is included in Appendix A

## **1.2 SCOPE OF WORK**

### **1.2.1 Site Assessment at Site A-824**

Soil and groundwater sampling will be conducted at Site A-824 to determine if soil and groundwater at the site have been contaminated by a fuel spill to the east of road that runs adjacent to Building A-824. All site assessment activities will be performed in a manner that minimizes any potential impact to the sensitive ecological habitat that is present at this site. The Lower Keys Marsh Rabbit has been observed at Site A-824 and no human activities will be allowed within this sensitive habitat. TtNUS will clear all field activities with the NAS Key West Natural Resource Manager prior to initiating any work. The locations for soil borings and monitoring wells proposed in this plan are believed to be outside of the sensitive habitat. If during the execution of field activities, a proposed sampling location is found to be within (or too close to) the habitat, TtNUS personnel will consult with the NAS Key West Natural Resource Manager and select an alternate location that is as close as possible to the planned location.

The planned soil assessment consists of three soil sample locations as shown on Figure 1-2. The soil borings will be advanced to the water table, which is an assumed depth of five feet below land surface (bls). Soil samples collected from the vadose zone will be screened using an OVA. An OVA reading greater than 50 ppm will be considered "excessively contaminated soil," as defined in Chapter 62-770.200 of the Florida Administrative Code (F.A.C.). Fixed-base laboratory analyses, to include benzene, toluene, ethylbenzene, and total xylenes (collectively known as BTEX), methyl-tertiary butyl ether (MTBE), PAHs, and total recoverable petroleum hydrocarbons (TRPH), will be performed for each 2-foot vertical interval at all three soil sampling locations. The laboratory analyses listed in Table 1-1 show the maximum

number of soil samples (18) that will be collected and analyzed by the fixed-based laboratory. Fewer soil samples will be obtained if the water table is 4 feet or less bls.

Upgradient, downgradient, side-gradient, and source area wells will be installed to delineate any groundwater contamination plume that may be present (see Figure 1-2). All soil cuttings and development water produced during the monitoring well installation will be containerized and managed as investigation-derived waste (IDW). Monitoring wells will be surveyed by a Florida-licensed surveyor following installation. Groundwater samples will be collected from the four new wells at Site A-824 for laboratory analysis for the KAG, to include BTEX, MTBE, priority pollutant list (PPL) volatile organic halocarbons (VOHs), lead, ethylene dibromide (EDB), and TRPH. Groundwater samples will also be collected from all the wells for field screening for dissolved oxygen, carbon dioxide, and ferrous iron, as well as laboratory analysis for nitrate, sulfate, and methane. Two groundwater-sampling events will occur approximately 90 days apart prior to submittal of the SAR. Table 1-1 summarizes groundwater samples and analyses for Site A-824. Groundwater sampling activities, including quality assurance/quality control, and field documentation will be performed at each site following FDEP Standard Operating Procedures (SOPs) (FS2200 and FQ1000), and TtNUS's Florida Regional Quality Assurance Program Manual (TtNUS, 2002). Low-flow sampling techniques and gravity flow will be used at each of the sites for groundwater sample collection.

The scope of the contamination assessment will also include a tidal influence study. A minimum of three wells will be used to assess the degree to which tides influence water levels in the monitoring wells. Static water levels in the well will be measured at 15-minute intervals over a 48-hour period using an electronic data logger. The study will be conducted as close as possible to a full moon to assess the maximum possible tidal effect.

### **1.2.2 Supplemental Site Assessment at the Geiger Key Hawk Missile Site G-01**

A supplemental site assessment will be performed at Geiger Key Hawk Missile Site to further assess the horizontal extent of petroleum contamination at the site. A preliminary DPT assessment will include approximately 45 soil borings at Geiger Key Hawk Missile Site G-01 (Figure 1-3). The borings will be advanced into the water table to an estimated depth of four to five feet bls. Soil samples collected from the vadose zone will be screened using an OVA. An OVA reading greater than 50 ppm will be considered "excessively contaminated soil," as defined in Chapter 62-770.200 of the F.A.C. Laboratory analyses, to include BTEX, MTBE, PAHs, and TRPH, will be performed on three grab samples with high, medium and low OVA screening results for the site. Table 1-2 summarizes planned fixed-based laboratory analytical analyses for the DPT investigation. However, only one sample will be collected if the

field screening results indicate that contaminated soil is not present. Groundwater screening samples will also be collected from each boring and analyzed using either an on-site mobile laboratory or fixed-based laboratory. Analyses for the groundwater screening samples will include BTEX, MTBE, and PAHs. The groundwater screening data will be used to determine the optimum location and number of permanent monitoring wells.

TtNUS plans to install three shallow monitoring wells (12 feet deep) at the Geiger Key Hawk Missile Site G-01, as recommended in the SAR (BBL, 2002). Proposed monitoring well locations, based on recommendations in the SAR, are shown in Figure 1-3. However, if soil and groundwater screening results indicate more suitable areas, monitoring wells may be installed in alternate locations. Additional shallow or deep monitoring wells will be installed as needed. All soil cuttings and development water produced during the DPT investigation and monitoring well installation will be containerized and managed as IDW. Monitoring wells will be surveyed by a Florida-licensed surveyor following installation.

Samples will be collected from the three new monitoring wells and three existing monitoring wells (G01-MW-04, -05, and -06) at Geiger Key Hawk Missile Site G-01 and analyzed at a fixed-base laboratory for the KAG. Groundwater samples will also be collected from the wells for field screening for dissolved oxygen, carbon dioxide, and ferrous iron, as well as laboratory analysis for nitrate, sulfate, and methane. Three monitoring wells closest to the existing building will also be analyzed for Used Oil Group constituents, which include arsenic, cadmium, chromium, lead, and any non-priority pollutant organics with gas chromatograph (GC)/mass spectrometer (MS) peaks greater than 10 micrograms per liter ( $\mu\text{g/L}$ ). Fixed-based laboratory analyses planned for the Geiger Key Hawk Missile Site G-01 are summarized in Table 1-2. Two groundwater-sampling events will occur approximately 90 days apart prior to submittal of the SAR. Groundwater sampling activities, including quality assurance/quality control, and field documentation will be performed at each site following FDEP SOPs (FS2200 and FQ1000), and TtNUS's Florida Regional Quality Assurance Program Manual (TtNUS, 2002). Low-flow sampling techniques and gravity flow will be used at each of the sites for groundwater sample collection.

The scope of the supplemental site assessment will also include a tidal influence study. Three shallow wells at Geiger Key Hawk Missile Site G-01 will be used to determine if tides affect water levels in monitoring wells. Static water levels in the well will be measured at 15-minute intervals over a 48-hour period using an electronic data logger. The study will be conducted as close as possible to a full moon to assess the maximum possible tidal effect.

### 1.2.3 Monitored Natural Attenuation for Hawk Missile Site B-01

Field activities at the Hawk Missile Site B-01 will include quarterly water level measurements followed by collection of groundwater samples from two monitoring wells, B01-MW-01 and B01-MW-03, for PAH analysis. The fixed-based laboratory analyses planned for the site are summarized in Table 1-3. Groundwater sampling activities, including quality assurance/quality control, and field documentation will be performed at each site following FDEP SOPs (FS2200 and FQ1000), and TtNUS's Florida Regional Quality Assurance Program Manual (TtNUS, 2002). Low-flow sampling techniques and pump and vacuum trap method will be used at each of the site for groundwater sample collection.

### 1.3 **SAMPLE IDENTIFICATION**

#### Base and Site Designations

The base designation for Naval Air Station Key West is KW. The site designation for Site A-824 is A824. The site designation for Hawk Missile Site G-01 is G01. The site designation for Hawk Missile Site B-01 is B01.

#### Groundwater Sample Identification

A sample tracking number will consist of a five- to six-segment, alphanumeric code that identifies the Site number, location, depth, month and year of sample event, and the Quality Control (QC) designation. The depth and QC designations will only be used if applicable. Any other pertinent information regarding sample identification will be recorded in the field logbook.

The alphanumeric coding to be used in the sample system and examples of possible sample identification numbers follow:

ANNN	-	Site Number
AANN	-	Location
NN	-	Depth (if applicable)
NNNN	-	Month and Year
AAA	-	QC Designation (if applicable)

Character Type:

A = Alpha  
N = Numeric

Location:

GS = Groundwater Screening  
MW = Monitoring Well  
SB = Soil Boring

*Example 1:* A soil sample collected from soil boring SB1 at Site A-824 a depth of 0-2 feet, during the November 2003 sampling event would be called A824SB-01-02-1103. The groundwater sample collected from monitoring well MW1 at Site A-824 during the February 2004 sampling event would be called A824MW-01-0204.

*Example 2:* The fixed base analytical groundwater sample, matrix spike (MS), and matrix spike duplicate (MSD) collected from monitoring well MW01 at Site A-824 during the November 2003 sampling event would be called A824MW-01-1103, A824MW-01-1103MS, A824MW-01-1103MSD.

Trip, rinsate, and field blanks will be identified by base designation, type of blank, and the date of collection. For example, the fixed base analytical trip blank collected on November 4, 2003 would be called KWTB110403.

### **1.3.1 IDW Handling**

Development water, purge water, and decontamination water will be managed as investigation-derived waste (IDW) and containerized in Department of Transportation (DOT) approved 55-gallon drums. All drums will be labeled, at a minimum, with the following: contents, date, source and NAS Key West generator number (FL 6170022952). All IDW will be handled in accordance with the United States Environmental Protection Agency (EPA) guidance document "Management of Investigation-Derived Wastes During Site Inspections" (EPA, 1991).

Following receipt of initial groundwater sample results for each site, TtNUS personnel will dispose of IDW. Additional groundwater sampling events may not require containerization of IDW if initial sample results indicate that the groundwater is nonhazardous waste. In this case, groundwater will be returned to ground in the immediate area of the monitoring well that produced it.

### **1.3.2            QC Samples**

QC samples will be collected as specified in the FDEP SOP FQ1000 – Field Quality Control Requirements (FDEP, 2001). A trip blank will be included in all shipments containing samples for volatile analysis. MS/MSD samples will be collected at the rate of one per 20 samples per matrix. Equipment blanks and field blanks will also be collected at a minimum of 5% of each reported test result/matrix combination. Duplicate samples will be collected at a rate of one per 10 samples per matrix.

## **1.4                REPORTING**

### **1.4.1            Site Assessment Report for Site A-824**

Results from this investigation will be reported in the SAR. The report will identify the horizontal and vertical extent of contamination and any free product based on sample results. The report will also include confirmation of the contaminant source and geologic and hydrologic conditions at the site that may affect contaminant transport, the rate and direction of groundwater flow, classification of aquifers beneath the site, location of confining beds, if any, beneath the contamination zone, and location of closest potable water wells, if any, and potential to contaminate these wells. Results from the tidal influence study performed at the site will also be presented in the SAR. The SAR will recommend an appropriate remedy for the site based on the investigation results. For example, if MNA is the selected remedy for the site, the SAR will include detailed recommendations such as the number of wells to be sampled, analyses scoped for the samples, and frequency of sampling events. The SAR will be submitted in draft and final form to the Navy. After the state's review of the final SAR, TtNUS will prepare an addendum (if necessary) to incorporate any comments received.

### **1.4.2            Supplemental Site Assessment Report for Hawk Missile Site G-01**

Results from this investigation will be reported in the Supplemental SAR. The SAR prepared for the site (BBL, 2002) will be referenced, as needed, and results of this supplemental investigation will be provided to complete the delineation of the petroleum hydrocarbon plume. Results from the tidal influence study performed at the site will also be presented in the supplemental SAR. The Supplemental SAR will recommend an appropriate remedy for the site based on the investigation results. For example, if MNA is the selected remedy for the site, the Supplemental SAR will include detailed recommendations such as the number of wells to be sampled, analyses scoped for the samples, and frequency of sampling events. The SAR will recommend an appropriate remedy for the site based on results of the investigation and will be submitted in draft and final form to the Navy.

**1.4.3            Monitored Natural Attenuation for Hawk Missile Site B-01**

Results from the MNA events will be presented in separate MNA reports submitted to the Navy and the FDEP on a quarterly basis. The reports will include a summary of work performed, sampling results, and recommendations. The first three quarterly reports will be prepared in final form only. An annual report will be produced at the completion of four quarterly events presenting contaminant trends and recommendations for future monitoring, if required. The annual report will be prepared in draft and final forms.

**TABLE 1-1**  
**PARAMETER GROUPS AND MEDIA OF INTEREST**  
**FOR FIXED-BASED LABORATORY ANALYSIS**  
**SITE A-824 CONTAMINATION ASSESSMENT PLAN**  
**NAVAL AIR STATION**  
**KEY WEST, FLORIDA**

Parameter	Soil	Groundwater
<b>DPT INVESTIGATION</b>		
BTEX, MTBE	18	0
PAH	18	0
TRPH	18	0
<b>GROUNDWATER SAMPLING EVENT 1</b>		
PPL VOHs	0	9
BTEX, MTBE	0	9
PAH	0	9
EDB	0	9
TRPH	0	9
Lead	0	9
Nitrate	0	9
Sulfate	0	9
Methane	0	9
<b>GROUNDWATER SAMPLING EVENT 2</b>		
PPL VOHs	0	9
BTEX, MTBE	0	9
PAH	0	9
EDB	0	9
TRPH	0	9
Lead	0	9
Nitrate	0	9
Sulfate	0	9
Methane	0	9

BTEX, MTBE, and PPL VOH – Method SW-846 5030B/8260B  
 PAH – Method SW-846 8270C, 8310, or 8270C SIM  
 EDB – Method EPA 504.1  
 TRPH – Method FL-PRO  
 Lead – Method SW-846 6010B  
 Nitrate and sulfate – Method EPA 300 or SW-846 9506  
 Methane - RSK SOPs 147 and 175

**TABLE 1-2**  
**PARAMETER GROUPS AND MEDIA OF INTEREST**  
**FOR FIXED-BASED LABORATORY ANALYSIS**  
**GEIGER KEY HAWK MISSILE SITE G-01 CONTAMINATION ASSESSMENT PLAN**  
**NAVAL AIR STATION**  
**KEY WEST, FLORIDA**

Parameter	Soil	Groundwater
<b>DPT INVESTIGATION</b>		
BTEX, MTBE	3	0
PAH	3	0
TRPH	3	0
<b>GROUNDWATER SAMPLING EVENT 1</b>		
PPL VOHs	0	6
BTEX, MTBE	0	6
PAH	0	6
EDB	0	6
TRPH	0	6
Lead	0	6
Arsenic, Cadmium, Chromium	0	3
Non-PPL Organics (with peaks >10 µg/L)	0	3
Nitrate	0	6
Sulfate	0	6
Methane	0	6
<b>GROUNDWATER SAMPLING EVENT 2</b>		
PPL VOHs	0	6
BTEX, MTBE	0	6
PAH	0	6
EDB	0	6
TRPH	0	6
Lead	0	6
Arsenic, Cadmium, Chromium	0	3
Non-PPL Organics (with peaks >10 µg/L)	0	3
Nitrate	0	6
Sulfate	0	6
Methane	0	6

BTEX, MTBE, and PPL VOH – Method SW-846 8260B  
 PAH – Method SW-846 8270C, 8310, or 8270C SIM  
 EDB – Method EPA 504.1  
 TRPH – Method FL-PRO  
 Lead, Arsenic, Cadmium, Chromium – Method SW-846 6010B  
 Non-PPL Organics – Methods SW-846 8260B and 8270C  
 Nitrate and sulfate – Method EPA 300 or SW-846 9506  
 Methane - RSK SOPs 147 and 175

**TABLE 1-3**  
**PARAMETER GROUPS AND MEDIA OF INTEREST**  
**FOR FIXED-BASED LABORATORY ANALYSIS**  
**BOCA CHICA HAWK MISSILE SITE B-01 MNA SAMPLING PLAN**  
**NAVAL AIR STATION**  
**KEY WEST, FLORIDA**

<b>Parameter</b>	<b>Groundwater</b>
<b>QUARTERLY EVENT 1</b>	
PAH	2
<b>QUARTERLY EVENT 2</b>	
PAH	2
<b>QUARTERLY EVENT 3</b>	
PAH	2
<b>QUARTERLY EVENT 4</b>	
PAH	2

PAH – Method SW-846 8270C, 8310, or 8270C SIM









## REFERENCES

BBL (Blasland, Bouck & Lee, Inc.), 2002. Site Assessment Reports, Former Hawk Missile Sites, Site G-01 – Geiger Key, Site B-01 – Boca Chica Key. Prepared for Naval Air Station Public Works Department, Key West, Florida. February.

B&RE (Brown and Root Environmental), 1998. Supplemental RCRA Facility Investigation and Remedial Investigation Report for Eight Sites; Naval Air Facility Key West, Florida. Prepared for Department of the Navy, Southern Division Naval Facilities Engineering Command, Aiken, South Carolina, January.

EPA (United States Environmental Protection Agency), 1991. Management of Investigation – Derived Waste During Site Inspections. DER Directive 9345.3.02.

FDEP (Florida Department of Environmental Protection), 2002. SOPs for Field Activities, DEP-SOP-001/01, Tallahassee, Florida, January.

IT (IT Corporation), 1994. RCRA Facility Investigation/Remedial Investigation, Final Report, NAS Key West. Prepared for Southern Division Naval Facilities Engineering Command. Tampa, Florida, June.

TtNUS (Tetra Tech NUS), 1999. Corrective Measures Study Report for Solid Waste Management Unit 7 (SWMU 7). Prepared for Department of the Navy, Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina. March.

TtNUS, 2002. Florida Regional Quality Assurance Program Manual, October.



**APPENDIX A**  
**FDEP APPROVAL LETTERS**





# Department of Environmental Protection

Jeb Bush  
Governor

Twin Towers Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

David B. Struhs  
Secretary

RECEIVED  
5.12.02

May 2, 2002

Mr. Byas Glover  
Code 18410  
Southern Division  
Naval Facilities Engineering Command  
Post Office Box 190010  
North Charleston, South Carolina 29419-9010

RE: Site Assessment Report, Former Hawk Missile Sites, Site G-01-Geiger Key, (NAS) Key West, Key West, Florida

Dear Mr. Glover:

I have completed the technical review of the above referenced document dated February 2002 (received February 27, 2002). The following comments will need to be addressed prior to approval of the SAR:

1. Page 4-2, Section 4.2: FDEP concurs with the recommendation to install new monitoring wells as described in the SAR.
2. Table 2-2: FDEP would also like additional soil samples collected to be analyzed with OVA and laboratory analysis to further delineate the elevated OVA readings at SB-11 and SB-12 and the TRPH contamination found in SB-5 of 9,200,000 mg/kg.

Please note, the Site Assessment Report (SAR) for Site B-01 Boca Chica Key included in this report, will be addressed separately. If I can be of any further assistance with this matter, please contact me at (850) 921-9988.

Sincerely,

*Tracie Vaught*  
Tracie L. Vaught  
Remedial Project Manager

cc: ~~Robert Courtright~~, NAS Key West  
Chuck Bryan, Tetra Tech NUS, Aiken, South Carolina

TJB *B*

JJC *JJC*

for  
ESN *JJC*

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Jeb Bush  
Governor

Department of  
Environmental Protection

Twin Towers Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

David B. Struhs  
Secretary

- NAS Key West  
- Pet. Site  
- Rev. Comm

May 3, 2002

Mr. Byas Glover  
Code 18410  
Southern Division  
Naval Facilities Engineering Command  
2155 Eagle Drive  
P.O. Box 190010  
North Charleston, South Carolina 29419-9010

RE: Site Assessment Report, Former Hawk Missile Site, Site  
G-01-Geiger Key, NAS Key West, Key West, Florida

Dear Mr. Glover:

I have completed the technical review of the above referenced document dated February 2002 (received February 27, 2002). The Site Assessment Report for site B-01 Boca Chica Key, is adequate to meet the contamination assessment requirements of Chapter 62-770, Florida Administrative Code (F.A.C.). Attached is the Natural Attenuation Monitoring Plan Approval Order signed by Doug Jones, Chief, Bureau of Waste Cleanup.

If I can be of any further assistance with this matter, please contact me at (850) 921-9988.

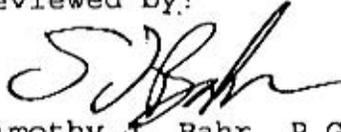
Sincerely,

~~Greg Campbell~~  
Remedial Project Manager

cc: Greg Campbell, NAS Pensacola  
Gerry Walker, Tetra Tech NUS, Tallahassee  
Charlie Goddard, FDEP Northwest District  
Bill Kellenberger, FDEP, Northwest District Office

"Protect, Conserve and Manage Florida's Environment and Natural Resources"

Reviewed by:



Timothy J. Bahr, P.G.  
Professional Geologist Supervisor  
Bureau of Waste Cleanup



5/3/02

Date

JJC 

for  
ESN 



# Department of Environmental Protection

Jeb Bush  
Governor

Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

David B. Struhs  
Secretary

May 3, 2002

**CERTIFIED MAIL**  
**RETURN RECEIPT REQUESTED**

Mr. Byas Glover  
Code 18410  
Southern Division  
Naval Facilities Engineering Command  
2155 Eagle Drive  
North Charleston, South Carolina 29419-9010

Subject: Natural Attenuation Monitoring Plan Approval Order  
Former Hawk Missile Sites  
Site B-01 Boca Chica Key  
Key West, Florida  
FDEP Facility ID# None

Dear Mr. Glover:

The Bureau of Waste Cleanup has completed the review of Natural Attenuation Monitoring Plan dated February 2002 (received February 27, 2002), submitted for the petroleum product discharge discovered at this site. Pursuant to Rule 62-770.690, Florida Administrative Code (F.A.C.), the Department of Environmental Protection (Department) approves the Natural Attenuation Monitoring Plan Pursuant to Rule 62-770.690(7), F.A.C., you are required to complete the monitoring program outlined below. The first sampling event should be performed within 60 days of receipt of this Natural Attenuation Monitoring Plan Approval Order (Order). Water-level measurements should be made immediately prior to each sampling event. The analytical results (laboratory report), chain of custody, cumulative summary table of the analytical results, site map(s) illustrating the most recent analytical results, and the water-level elevation information (cumulative summary table and most recent flow interpretation map), must be submitted to the Department within 60 days of sample collection.

The monitoring wells to be sampled, the sampling parameters, and the sampling frequency for the first year are as follows:

<u>Monitoring Wells</u>	<u>Contaminants of Concern</u>	<u>Frequency</u>	<u>Duration</u>
MW-1, 3 and 5	PAHs	Semiannually	2 years

The approved Remedial Action by Natural Attenuation monitoring period is two years. The sampling frequency will be evaluated following the submittal of the first annual report to determine whether semiannual or annual sampling may be appropriate.

If concentrations of contaminants of concern in any of the designated wells increase above the action levels listed below, the well or wells must be resampled no later than 30 days after the initial

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Mr. Byas Glover  
Page Two  
May 3, 2002

positive results are known. If the results of the resampling confirm the initial sampling results, then a proposal as described in Rule 62-770.690(7)(f), F.A.C., must be submitted to the Department.

Contaminated wells:

MW-1 and MW-3: 20 µg/L Benzo(b)fluoranthene, 20 ug/L Benzo(a) pyrene, 20 ug/L Dibenz(a,h) anthracene and 20 ug/L Indeno(1,2,3-cd)pyrene.

Perimeter well (temporary point of compliance):

MW-5: 0.2 µg/L Benzo(b)fluoranthene, 0.2 ug/L Benzo(a) pyrene, 0.2 ug/L Dibenz(a,h) anthracene and 0.2 ug/L Indeno(1,2,3-cd)pyrene.

If the applicable No Further Action criteria in Rule 62-770.680, F.A.C., are met at the end of the monitoring period, a Site Rehabilitation Completion Report, summarizing the monitoring program and containing documentation supporting the opinion that the cleanup objectives have been achieved, must be submitted as required in Rule 62-770.690, F.A.C. If the applicable No Further Action criteria in Rule 62-770.680, F.A.C., are not met following two years of monitoring, then a report summarizing the monitoring program must be submitted, including a proposal as described in Rule 62-770.690(7), F.A.C.

Legal Issues

The Department's Order shall become final unless a timely petition for an administrative proceeding (hearing) is filed under Sections 120.569 and 120.57, Florida Statutes (F.S.), within 21 days of receipt of this Order. The procedures for petitioning for a hearing are set forth below.

Persons affected by this Order have the following options:

If you choose to accept the above decision by the Department about the Monitoring Plan Approval Order you do not have to do anything. This Order is final and effective as of the date on the top of the first page of this Order.

If you disagree with the decision, you may do one of the following:

- (1) File a petition for administrative hearing with the Department's Office of General Counsel within 21 days of receipt of this Order; or
- (2) File a request for an extension of time to file a petition for hearing with the Department's Office of General Counsel within 21 days of receipt of this Order. Such a request should be made if you wish to meet with the Department in an attempt to informally resolve any disputes without first filing a petition for hearing.

Please be advised that mediation of this decision pursuant to Section 120.573, F.S., is not available.

How to Request an Extension of Time to File a Petition for Hearing

For good cause shown, pursuant to Rule 62-110.106(4), F.A.C., the Department may grant a request for an extension of time to file a petition for hearing. Such a request must be filed (received) in

Mr. Byas Glover  
Page Three  
May 3, 2002

the Department's Office of General Counsel at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, within 21 days of receipt of this Order. Petitioner, if different from Mr. Byas Glover, shall mail a copy of the request to Mr. Byas Glover at the time of filing. Timely filing a request for an extension of time tolls the time period within which a petition for administrative hearing must be made.

#### How to File a Petition for Administrative Hearing

A person whose substantial interests are affected by this Order may petition for an administrative hearing under Sections 120.569 and 120.57, F.S. The petition must contain the information set forth below and must be filed (received) in the Department's Office of General Counsel at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, within 21 days of receipt of this Order. Petitioner, if different from Mr. Byas Glover, shall mail a copy of the petition to Mr. Byas Glover at the time of filing. Failure to file a petition within this time period shall waive the right of anyone who may request an administrative hearing under Sections 120.569 and 120.57, F.S.

Pursuant to Section 120.54(5)(b)4.a., F.S., and Rule 28-106.201, F.A.C., a petition for administrative hearing shall contain the following information:

- (a) The name, address, and telephone number of each petitioner, the name, address, and telephone number of the petitioner's representative, if any, the site owner's name and address, if different from the petitioner, the FDEP facility number, and the name and address of the facility;
- (b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
- (c) An explanation of how each petitioner's substantial interests are or will be affected by the Department's action or proposed action;
- (d) A statement of the material facts disputed by the petitioner, or a statement that there are no disputed facts;
- (e) A statement of the ultimate facts alleged, including a statement of the specific facts the petitioner contends warrant reversal or modification of the Department's action or proposed action;
- (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the Department's action or proposed action; and
- (g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the Department to take with respect to the Department's action or proposed action.

This Order is final and effective as of the date on the top of the first page of this Order. Timely filing a petition for administrative hearing postpones the date this Order takes effect until the Department issues either a final order pursuant to an administrative hearing or an order responding to supplemental information provided pursuant to meetings with the Department.

#### Judicial Review

Any party to this Order has the right to seek judicial review of it under Section 120.68, F.S., by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, Mail Station 35,

