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CONTAMINATION ASSESSMENT PLAN FOR SIGSBEE MARINA WITH TRANSMITTAL
LETTER NAS KEY WEST FL
11/30/2007
TETRA TECH NUS



AIK-07-0504

November 30, 2007

Project Number 00979

via U.S. Mail

Commander
Department of the Navy
NAVFAC SE
ATTN: Beverly Washington (Code OPAEVC)
P.O. Box 190010
North Charleston, South Carolina 29419-9010

Reference: CLEAN Contract No. N62467-04-D-0055
Contract Task Order No. 0095

Subject: Contamination Assessment Plan for Sigsbee Marina, Rev. 0, Naval Air Station,
Key West, Florida

Dear Ms. Washington:

I have enclosed a CD containing the PDF file for the Contamination Assessment Plan for Sigsbee Marina, Rev. 0, Naval Air Station, Key West, Florida. This file is being sent to you via U.S. Mail to meet TtNUS's contractual obligation under CTO 0095 for submittal of our "Work Plan" for sampling the site. I am not expecting to receive any comments on this document.

Please call me at (803) 641-4943, if you have any questions regarding the enclosed document.

Sincerely,

A handwritten signature in black ink, appearing to read 'C. M. Bryan'.

C. M. Bryan
Project Manager

CMB:spc

c: Ms. Debra M. Humbert (Cover Letter Only)
Ms. T. Bolaños, FDEP
Mr. R. Courtright, NAS Key West

Mr. M. Perry/File
Mr. M. Davenport, CNRSE
Files 00979-7.1.1

Comprehensive Long-term Environmental Action Navy

CONTRACT NUMBER N62467-04-D-0055



Rev. 0
11/30/07

CONTAMINATION ASSESSMENT PLAN FOR SIGSBEE MARINA

Naval Air Station Key West
Key West, Florida

Contract Task Order 0095

November 2007



Southeast

2155 Eagle Drive

North Charleston, South Carolina 29406

**CONTAMINATION ASSESSMENT PLAN
FOR
SIGSBEE MARINA**

**NAVAL AIR STATION
KEY WEST, FLORIDA**

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

**Submitted to:
Naval Facilities Engineering Command, Southeast
2155 Eagle Drive
North Charleston, South Carolina 29406**

**Submitted by:
Tetra Tech NUS
661 Andersen Drive
Foster Plaza 7
Pittsburgh, Pennsylvania 15220**

**CONTRACT NUMBER N62467-04-D-0055
CONTRACT TASK ORDER 0095**

NOVEMBER 2007

PREPARED UNDER THE SUPERVISION OF:

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ACRONYMS/ABBREVIATIONS

AS	Air sparging
AST	Above-ground storage tank
AVGAS	Aviation gasoline
bls	Below land surface
BTEX	Benzene, toluene, ethylbenzene, and total xylenes
CAP	Contamination Assessment Plan
CLEAN	Comprehensive Long-Term Environmental Action, Navy
CTO	Contract Task Order
DOT	Department of Transportation
DPT	Direct-push technology
EPA	United States Environmental Protection Agency
EM	Electromagnetic
F.A.C.	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FID	Flame ionization detector
FOL	Field Operations Leader
GCTL	Groundwater Cleanup Target Level
GPR	Ground Penetrating Radar
GPS	Global Positioning System
GS	Groundwater screening
IDW	Investigation-derived waste
KAG	Kerosene analytical group
KW	Key West
µg/L	Microgram per liter
MNA	Monitored natural attenuation
MS	Matrix spike
MSD	Matrix spike duplicate
MTBE	Methyl-tertiary butyl ether
MW	Monitoring well
NAS	Naval Air Station
NAVFAC SE	Naval Facilities Engineering Command, Southeast
OVA	Organic vapor analysis

ACRONYMS/ABBREVIATIONS (CONT.)

PAH	Polynuclear aromatic hydrocarbon
PPL	Priority Pollutant List
ppm	Parts per million
QC	Quality control
RAP	Remedial Action Plan
SAR	Site Assessment Report
SB	Soil boring
SM	Sigsbee Marina
SOP	Standard Operating Procedure
SVE	Soil vapor extraction
SWL	Static water level
TOM	Task Order Manager
TRPH	Total recoverable petroleum hydrocarbons
TtNUS	Tetra Tech NUS, Inc.
UST	Underground storage tank
VOC	Volatile organic compound

1.0 CONTAMINATION ASSESSMENT PLAN FOR SIGSBEE MARINA

Tetra Tech NUS, Inc. (TtNUS) has been contracted by the Department of the Navy, Naval Facilities Engineering Command, Southeast (NAVFAC SE) to perform a Site Assessment at Sigsbee Marina at Naval Air Station (NAS) Key West, Florida. This Contamination Assessment Plan (CAP) was prepared under the Comprehensive Long-term Environmental Action, Navy (CLEAN) Contract Number N62467-04-D-0055, Contract Task Order (CTO) Number 0095.

1.1 SITE DESCRIPTION

Sigsbee Marina is located within the Key West Naval Air Station, Dredgers Key (commonly referred to as "Sigsbee"), Key West, Monroe County, Florida. The site lies within Sections 28 and 29, Township 67 South, Range 25 East. Sigsbee Marina is currently an operating marina serving military personnel. The topography of the site is relatively flat and is composed mostly of fill material with some areas containing mangroves. The marina forms a small cove which is open to Florida Bay.

1.2 ENVIRONMENTAL SITE HISTORY

On January 25, 2007 petroleum hydrocarbons were found following a fuel leak at the south end of the pump island. Professional Service Industries (PSI) performed a brief assessment of the extent of petroleum-impacted soil and groundwater and then removed and disposed of approximately 1.4 cubic yards of petroleum-impacted soil. Soil vapor screening and soil sampling from the excavation walls confirmed the completeness of the source removal activities (PSI 2007). PSI also inserted a groundwater test pit while removing these impacted soils. Within approximately 2 hours of removing free product, the test pit had recharged with groundwater containing heavy aromatic (degraded and apparently well-aged) fuels on top. The test pit was filled as visual evidence indicated the remaining free product was due to historical releases and not associated with the current release.

1.3 SCOPE OF WORK

1.3.1 Site Assessment Plan

A site assessment will be conducted at the Sigsbee Marina to further delineate soil and groundwater contamination at the site initially investigated during the release and emergency response performed during January 2007. The investigation will include a direct-push technology (DPT) assessment to help delineate the free product and dissolved-phase plumes, monitoring well installation and sampling, and (if needed) future groundwater sampling events.

A DPT assessment will be conducted to assess the soil and groundwater at the site. Figure 1-2 shows the proposed initial DPT boring locations. Soil samples will be collected from the vadose and saturated zones, and screened using a flame ionization detector (FID). The samples will be collected from each 2-foot vertical interval in the vadose zone and 2 feet into the saturated zone in all soil borings. The purpose of the screening is to initially determine the extent of contamination both in the soil and groundwater. An FID reading in the vadose zone 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). A sample from all excessively contaminated soils will be submitted to the lab for analysis.

Soils within the saturated zone will be screened with an FID to aid in the determination of groundwater contamination at the site. If elevated FID levels are detected within this zone, or if contaminant odors are detected, a groundwater sample will be collected for analysis by the lab or field screening. A sample of the saturated soil will also be collected for lab analysis to quantify the nature and extent of contaminants in the soil.

Soil borings will be initially installed on a 10-foot spacing beginning near the south end of the pump island (Figure 1-2). This area is considered to be a likely source of contamination based on information from the PSI report. If soil or groundwater contamination is detected by visual evidence (of free product) or by the FID, a step-out boring approximately 10 feet from the source boring will be installed, and a sample collected for lab analysis. The purpose of this assessment will be to help define the extent and magnitude of contamination. Additional borings will be installed until the extent of contamination has been adequately delineated and data from the perimeter borings indicate concentrations below the cleanup target levels in the soil and groundwater. The need for additional borings and placement of these borings will be determined by the TtNUS Task Order Manager (TOM) and the Field Operations Leader (FOL) in the field based on the results of soil and groundwater results received from the lab ("quick turn-around" samples) and field screening.

Soils found to be "excessively contaminated" will be analyzed for Priority Pollutant List (PPL) VOCs by the lab in accordance with 62 F.A.C. 770. Groundwater screening samples will be analyzed for PPL VOCs including benzene, toluene, ethylbenzene, and total xylenes (BTEX) and methyl-tertiary butyl ether (MTBE), total recoverable petroleum hydrocarbons (TRPH), and polynuclear aromatic hydrocarbons (PAHs) by the laboratory. If the contaminant concentrations in groundwater are found to exceed any of the groundwater cleanup target levels (GCTLs) for these parameters, the area represented by the boring will be considered for additional assessment using a permanent monitoring well.

After completion of the DPT investigation, monitoring wells will be installed to delineate any detected groundwater contamination. The location, depth, and total number of wells will be determined based on the soil and groundwater laboratory analytical results. A minimum of two wells (one shallow well up to 15 feet in depth and one deep well up to 30 feet in depth) are expected to be installed in the source area.

In addition, at least three perimeter monitoring wells are expected to be installed as necessary outside of the source area. Monitoring wells will be installed following the appropriate Florida standard operating procedures (SOPs) and surveyed by a Florida-licensed surveyor following installation (FDEP 2002). Groundwater samples will be collected from the newly installed monitoring wells at the Sigsbee Marina. The samples obtained from these wells will be analyzed for the KAG by a fixed-base laboratory. Table 1-1 summarizes soil and groundwater samples and analyses for the Sigsbee Marina contamination assessment. Groundwater sampling activities, including quality assurance/quality control and field documentation, will be performed following FDEP SOPs and TtNUS's Florida Regional Quality Assurance Program Manual (TtNUS, 2002). Low-flow sampling techniques and gravity flow will be used for groundwater sample collection.

1.4 SAMPLE IDENTIFICATION

The base designation for NAS Key West is KW. The site designation for the Sigsbee Marina is SM. The sample tracking number will consist of a five- to six-segment, alphanumeric code that identifies the Site designation, 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:

AA	-	Base Designation
AA	-	Site Designation
AANN-		Location
NN	-	Depth range in feet (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 SB-100 at the Sigsbee Marina, at a depth of 0-2 feet, during a January 2008 sampling event would be called KWSMSB100-02-0108. The groundwater

screening sample collected from soil boring SB-120 at the Sigsbee Marina during the same sampling event would be called KWSMSB-120-0108.

Example 2: The fixed base analytical groundwater sample, matrix spike (MS), and matrix spike duplicate (MSD) collected from monitoring well MW-05 at the Sigsbee Marina during a March 2008 sampling event would be called KWSMMW-05-0308, KWSMMW-05-0308MS, KWSMMW-05-0308MSD.

Trip, rinsate, and field blanks will be identified by base designation, type of blank, and the date of collection. For example, a trip blank collected on January 14, 2008 would be called KWTB011408.

1.4.1 IDW Handling

Development water, purge water, decontamination water, and soil cuttings from the installation of DPT locations and monitoring wells 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 sampling results from the new monitoring wells, 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 non-hazardous waste. In this case, groundwater will be returned to ground in the immediate area of the monitoring well that produced it.

1.4.2 QC Samples

QC samples will be collected as specified in the FDEP SOP FQ1000 – Field Quality Control Requirements (FDEP, 2002). 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.

1.5 REPORTING

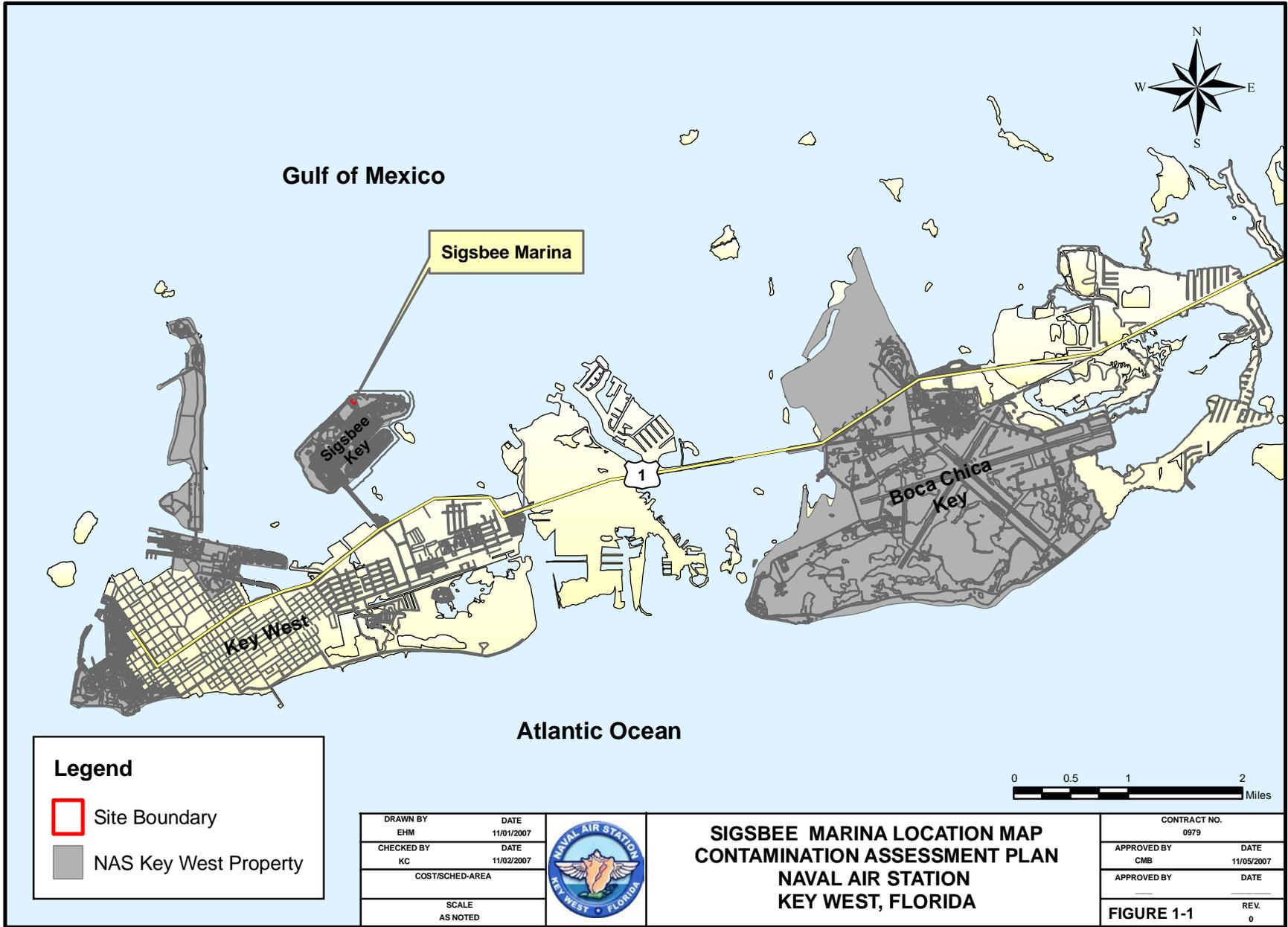
A Site Assessment Report (SAR) will be prepared evaluating all soil and groundwater data collected during the investigation. The report will identify the horizontal and vertical extent of contamination and any free-phase product discovered. The report will also include confirmation of the contaminant source if found, 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 and location of confining beds, if any, beneath the contamination zone. Groundwater data collected from all on site monitoring

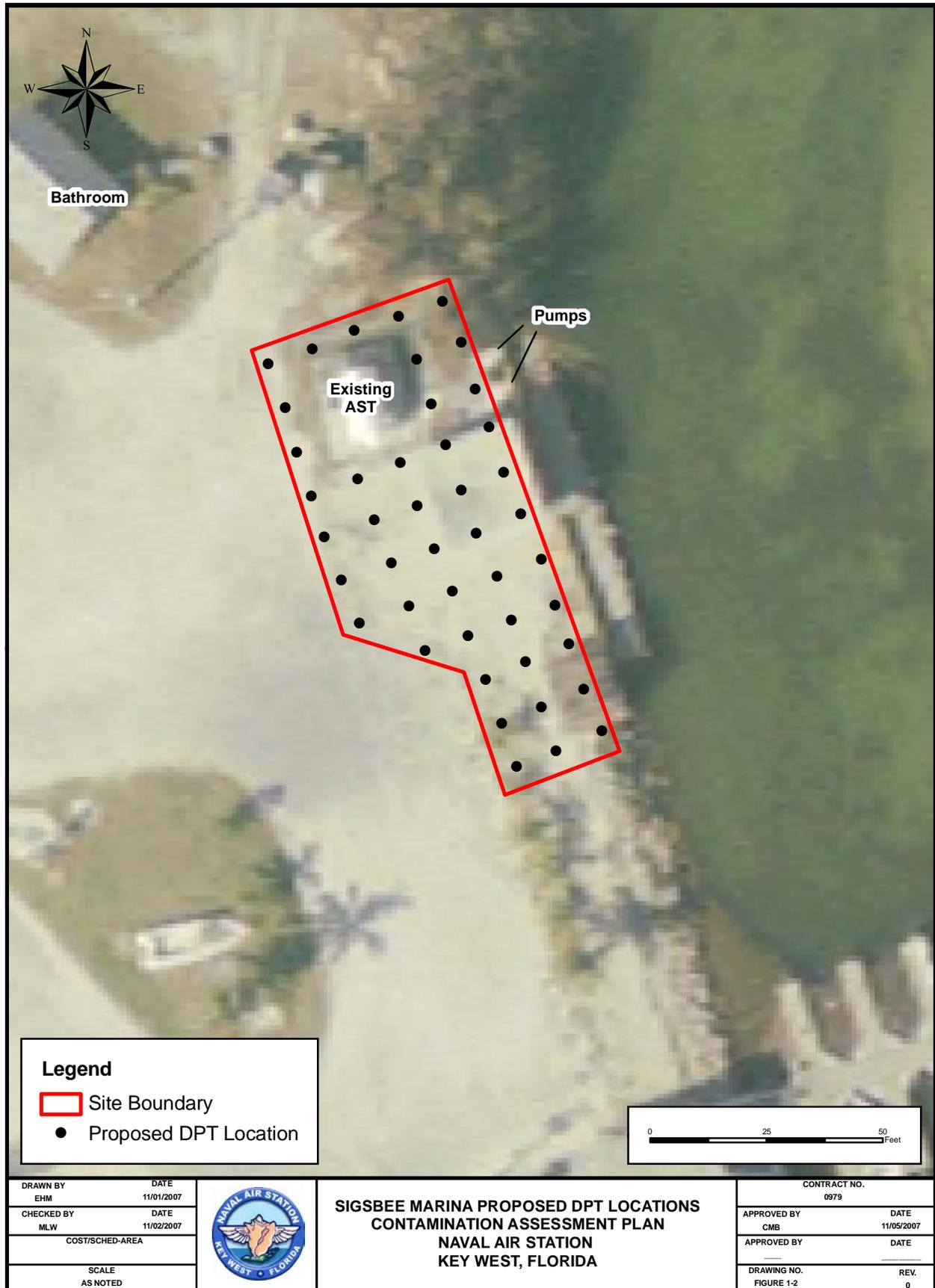
wells will also be included in the report. The SAR will recommend an appropriate remedy for the site based on the investigation results. If monitored natural attenuation (MNA) is the selected remedy for the site, the SAR will include detailed recommendations such as the number of wells to be sampled, analyses scoped for the samples, and frequency of sampling events. The SAR will be prepared in draft and final forms. After the state's review of the final SAR, TtNUS will prepare an addendum (if necessary) to incorporate any comments received.

TABLE 1-1
PARAMETER GROUPS AND MEDIA OF INTEREST
FOR LABORATORY ANALYSIS
SIGSBEE MARINA
NAVAL AIR STATION
KEY WEST, FLORIDA

Media Samples	PPL VOCs (including BTEX and MTBE)	PAHs	TRPH
Soil	X		
Groundwater Screening	X	X	X*
Groundwater	X	X	X

* These are contingent on results of PPL VOC.
 BTEX, MTBE, and PPL VOC – Method SW-846 8260B
 PAH – Method SW-846 8270C, 8310, or 8270C SIM
 TRPH – Method FL-PRO





REFERENCES

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.

PSI (Professional Service Industries, Inc.). 2007. Source Removal Report for Sigsbee Marina, Key West Naval Air Station. Miami, Florida, March.

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