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GROUNDWATER MONITORING WELL REPORT FOR JANUARY 2001 FOR BUILDING 189
WITH TRANSMITTAL LETTER NAS KEY WEST FL
4/9/2001
TETRA TECH NUS



TETRA TECH NUS, INC.

AIK-01-0085

April 9, 2001

Project Number HK 7846

via Electronic Mail

Byas Glover (Code 18410)
Department of the Navy
SOUTHDIV NAVFACENGCOM
P.O. Box 190010
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Reference: CLEAN Contract No. N62467-94-D-0888
Contract Task Order No. 059

Subject: Groundwater Monitoring Well Report, January 2001 for Building 189, Rev. 0
Naval Air Station Key West, Florida

Dear Mr. Glover:

TtNUS is pleased to submit the enclosed PDF file for the Groundwater Monitoring Well Report, January 2001 for Building 189, Rev. 0, Naval Air Station Key West, Florida. At your request, a copy of this final report is being distributed to the Florida Department of Environmental Protection FDEP for their review and comment or concurrence. I am planning on receiving comments or concurrence on this document from FDEP within the next 30 days.

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

Sincerely,

C. M. Bryan
Project Manager

CMB:spc

Enclosure

c: Ms. Debbie Wroblewski (Cover Letter Only)
Mr. Jorge Caspary, FDEP
File: 7846-7.4.1

Mr. R. Courtright, NAS Key West
Mr. M. Perry/File

**GROUNDWATER MONITORING WELL REPORT
JANUARY 2001**

for

BUILDING 189

**Naval Air Station
Key West, Florida**



**Southern Division
Naval Facilities Engineering Command**

Contract Number N62467-94-D-0888

Contract Task Order 059

April 2001

Rev. 0

**GROUNDWATER MONITORING WELL REPORT
JANUARY 2001**

FOR

BUILDING 189

**NAVAL AIR STATION
KEY WEST, FLORIDA**

**COMPREHENSIVE PERFORMANCE
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT**

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

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

**CONTRACT NUMBER N62467-94-D-0888
CONTRACT TASK ORDER 059**

April 2001

PREPARED UNDER THE SUPERVISION OF:

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ACRONYMS

AS	Air Sparging
AS/SVE	Air Sparging/Soil Vapor Extraction
CLEAN	Comprehensive Long-Term Environmental Action, Navy
CTO	Contract Task Order
FDEP	Florida Department of Environmental Protection
GCTL	Groundwater Contaminant Target Levels
KAG	Kerosene Analytical Group
MW	monitoring well
MOP	monitoring only plan
PAH	Polynuclear Aromatic Hydrocarbons
TtNUS	Tetra Tech NUS, Inc.
VEW	vapor extraction well

1.0 QUARTERLY REPORT

Tetra Tech NUS, Inc. (TtNUS) is pleased to submit the January 2001 Groundwater Monitoring Report for the referenced Contract Task Order (CTO). This report has been prepared for the U.S. Navy Southern Division Naval Facilities Engineering Command under CTO-059, for the Comprehensive Long-Term Environmental Action, Navy (CLEAN) Contract Number N62467-94-D-0888.

1.1 SITE HISTORY OVERVIEW

Building 189 is located adjacent to the eastern seawall of the turning basin, which was formerly used to dock naval vessels. During reconstruction of the wharf in 1989, a north-to-south-oriented Bunker C fuel oil pipeline was discovered approximately 25 feet west of Building 189. The fuel line was broken prior to or during wharf reconstruction activities.

In 1998, TtNUS implemented a monitoring only plan (MOP) at the site. Six wells were sampled for parameters of the Kerosene Analytical Group (KAG). By the end of the sixth quarter of sampling, petroleum hydrocarbon levels in the wells sampled were below Groundwater Contaminant Target Levels (GCTLs) for the site; however, free product was still present in monitoring well (MW-02). The product, Bunker C fuel oil, could not be recovered any further because its viscous nature prevented it from entering the bailer. In May 2000, an Air Sparging/Soil Vapor Extraction (AS/SVE) Treatability Study was initiated at the site to remediate residual hydrocarbon contaminants in soil and groundwater and free product in the groundwater in the vicinity of former MW-02 to undetectable levels (TtNUS, 2000).

The AS/SVE Treatability Study incorporated soil vapor extraction with air sparging (AS) to remove hydrocarbon contaminants from the soil and groundwater. Two 2-inch-diameter AS wells (AS-1 and AS-2), installed to the north and south of former MW-02, were used as injection points. Vapor extraction for the soil remediation was achieved by using one vapor extraction well (VEW) which was placed in the former location of MW-02 and between the two AS wells. The remedial system operated effectively for the duration of the study, during which TtNUS performed routine operation and maintenance during the monthly site visits. The system operated continuously during the six-month period with no down time. During the monthly visits, wells VEW-1, AS-1, AS-2, and the observation well (OW-1) were gauged for the presence of free product. No free product was detected in any of the wells gauged.

Based on the continued low-level detections in the influent and effluent vapor samples of the AS/SVE system, and the absence of free product in any of the wells, it was recommended by the Florida

Department of Environmental Protection (FDEP) that the long-term AS/SVE study be terminated at the end of the second quarter. Results indicated that only minor concentrations of residual hydrocarbons remained in the soil and would be eliminated over time by natural attenuation processes. TtNUS recommended sampling of the source well (VEW-1) and one perimeter well (MW-01) for an additional two quarters. In addition, wells AS-1, AS-2, and OW-1 will be monitored for free product. Figure 1-1 provides a map of the site showing locations of the monitoring wells.

1.2 MONITORING OBJECTIVES

The objectives of the quarterly monitoring program are to evaluate groundwater quality after the termination of the long-term AS/SVE Study and to monitor any rebound effects that might occur after the system was shut down. Groundwater samples will be analyzed for the Kerosene Analytical Group, (KAG) as listed in the Chapter 62-770 of the Florida Administrative Code.

Groundwater at the site is classified as a G-III aquifer (McKenzie, 1990). As a result of this classification, the FDEP GCTLs for groundwater of low yield/poor quality, as prescribed by Chapter 62-770, are the appropriate GCTLs for the site.

1.3 FIRST QUARTERLY MONITORING

On January 21, 2001, TtNUS personnel collected groundwater samples from two monitoring wells (MW-01 and MW-02). A duplicate groundwater sample was also collected for laboratory analysis. All sampling was conducted in accordance with TtNUS, FDEP-approved CompQAP #980038. Immediately prior to collection of the groundwater samples, water level and free product measurements were recorded from the designated monitoring wells. Based on the water level elevations, groundwater was flowing primarily to the west at the time of sampling. Figure 1-2 depicts the groundwater elevations recorded on January 21, 2001. Top of casing elevations, water table elevations, and depth to water measurements are provided in Table 1-1.

Following collection of groundwater samples, the sample bottles were packed on ice and shipped via overnight transport to Katahdin Analytical Services in Westbrook, Maine. Samples were analyzed by U.S. Environmental Protection Agency Method 610 for Polynuclear Aromatic Hydrocarbons (PAHs). A copy of the laboratory report is provided in Appendix A.

1.3.1 Free Product Monitoring

During monthly visits, wells MW-02, AS-1, AS-2, and OW-1 were gauged for the presence of free product. No free product was detected in any of the wells during the quarter.

1.4 CONCLUSIONS AND RECOMMENDATIONS

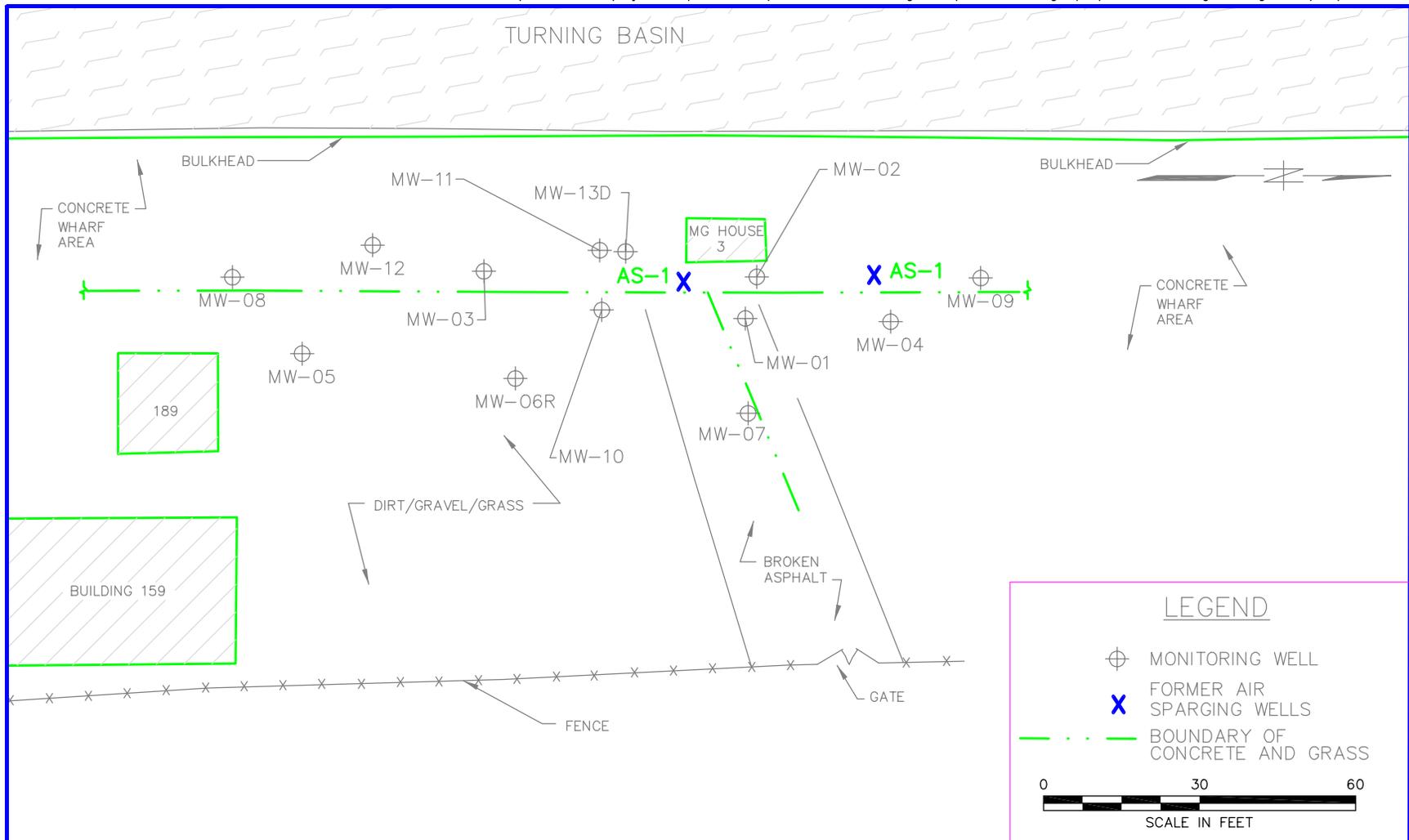
PAH constituents were not detected above method detection limits in any samples collected during first quarterly sampling. Based on results of this event, TtNUS recommends continuation of groundwater monitoring for at least one additional quarter. If PAH constituents are not detected during the following quarter, a No Further Action status will be requested for the site.

TABLE 1-1

**TOP OF CASING ELEVATIONS, WATER TABLE ELEVATIONS, AND TOTAL DEPTHS
BUILDING 189
NAVAL AIR STATION
KEY WEST, FLORIDA**

Well ID	Total Depth	Top of Casing Elevation ⁽¹⁾	January 21, 2001	
			Groundwater Level	Groundwater Elevation
B189-MW01	12.88	10.00	5.92	4.08
B189-MW02	13.00	10.74	7.25	3.49
B189-MW03	12.45	10.52	6.77	3.75
B189-MW04	12.97	10.91	7.63	3.28

1. TtNUS assigned an arbitrary 10-foot top of casing elevation for well B189-MW01 to provide a benchmark against which to establish top of casing elevations for the other wells listed in this table.

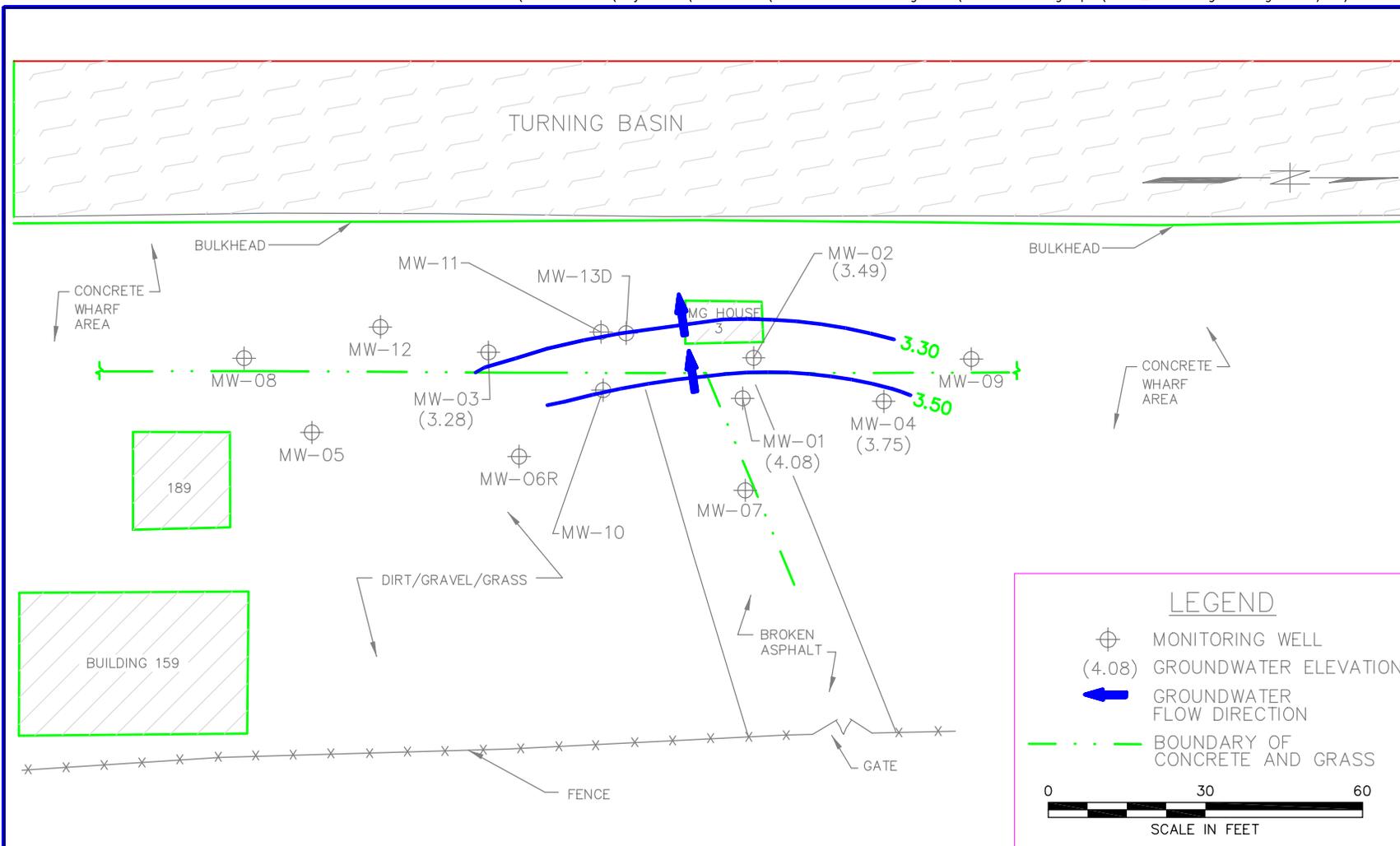


DRAWN BY	DATE
MDB	03/19/01
CHECKED BY	DATE
GLG	04/03/01
COST/SCHED-AREA	
SCALE	
AS NOTED	



GROUNDWATER QUARTERLY MONITORING REPORT
JANUARY 2001
FIGURE 1-1
SITE MAP
BUILDING 189
NAVAL AIR STATION
KEY WEST, FLORIDA

CONTRACT NO.	
7846	
APPROVED BY	DATE
CMB	04/03/01
APPROVED BY	DATE
DRAWING NO.	REV.
	0



DRAWN BY	DATE
MDB	03/19/01
CHECKED BY	DATE
GLG	04/03/01
COST/SCHED-AREA	
SCALE	
AS NOTED	



GROUNDWATER QUARTERLY MONITORING REPORT
JANUARY 2001
FIGURE 1-2
GROUNDWATER ELEVATION CONTOUR MAP
BUILDING 189
NAVAL AIR STATION
KEY WEST, FLORIDA

CONTRACT NO.	
7846	
APPROVED BY	DATE
CMB	04/03/01
APPROVED BY	DATE
DRAWING NO.	REV.
	0

REFERENCES

McKenzie, D. J., 1990. Water Resources Potential of the Freshwater Lens at Key West, Florida: U.S. Geological Survey Water-Resources Investigation Report 90-4115.

TtNUS, (Tetra Tech NUS, Inc.), 2000. Air Sparging/Vapor Extraction Treatability Study Work Plan for Building 189, Truman Annex, Naval Air Station Key West, Key West, Florida, prepared for Southern Division Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), Charleston, South Carolina, May.

APPENDIX A
LABORATORY REPORT

**NAS KEY WEST
WATER DATA
KAS
SDG: NASKW15**

SAMPLE NUMBER:	B189-MW-01-012101	B189-MW-02-012101	FC-DUP-01	FCMW-20-2Q2
SAMPLE DATE:	01/21/01	01/21/01	01/19/01	01/19/01
LABORATORY ID:	WR0215-1	WR0215-2	WR0204-6	WR0204-5
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	0.0 %	0.0 %	0.0 %	0.0 %
UNITS:	UG/L	UG/L	UG/L	UG/L
FIELD DUPLICATE OF:			FCMW-6-2Q2	

	RESULT	QUAL	CODE									
POLYNUCLEAR AROMATIC HYDROCARBONS												
2-METHYLNAPHTHALENE	0.2	U		0.2	U		27			140		
ACENAPHTHENE	0.2	U		0.2	U		0.2			0.7		
ACENAPHTHYLENE	0.2	U										
ANTHRACENE	0.2	U										
BENZO(A)ANTHRACENE	0.2	U										
BENZO(A)PYRENE	0.2	U										
BENZO(B)FLUORANTHENE	0.2	U										
BENZO(G,H,I)PERYLENE	0.2	U										
BENZO(K)FLUORANTHENE	0.2	U										
CHRYSENE	0.2	U										
DIBENZO(A,H)ANTHRACENE	0.2	U										
FLUORANTHENE	0.2	U		0.1	J	P	0.2	U		0.2	U	
FLUORENE	0.2	U		0.2	U		0.2	U		0.6		
INDENO(1,2,3-CD)PYRENE	0.2	U										
NAPHTHALENE	0.1	J	P	0.2	U		160			140		
PHENANTHRENE	0.2	U		0.2	U		0.2	U		0.2		
PYRENE	0.2	U		0.6			0.2	U		0.2	U	