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NAS PENSACOLA
5090.3a

LETTER REPORT SITE ASSESSMENT ADDENDUM 3 UNDERGROUND STORAGE TANKS
681 AND 682 NAS PENSACOLA FL
4/23/2002
TETRA TECH



TETRA TECH NUS, INC.

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TTNUS/TAL-02-032/0231-4.3

April 23, 2002

Project Number 0231

Tracie Vaught, P.G.
Remedial Project Manager
Technical Review/Federal Facilities
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Reference: CLEAN Contract No. N62467-94-D-0888
Contract Task Order No. 0098

Subject: Site Assessment Report Addendum No. 3, Underground Storage Tanks 681 and 682,
U.S. Naval Air Station Pensacola, Pensacola, Florida
FDEP #179202973

Ms. Vaught:

Tetra Tech NUS, Inc. (TTNUS) is pleased to submit this Site Assessment Report (SAR) Addendum No.3 for Underground Storage Tanks (USTs) 681 and 682 located at Naval Air Station Pensacola (NASP), Pensacola, Florida. This SAR Addendum No. 3 has been prepared for the U.S. Navy Southern Division Naval Facilities Engineering Command under Contract Task Order 0098, for the Comprehensive Long-term Environmental Action Navy (CLEAN) Contract Number N62467-94-D-0888.

The purpose of the investigation was to address comments from Florida Department of Environmental Protection (FDEP) dated November 9, 2001 on the SAR Addendum No.2.

PREVIOUS INVESTIGATIONS

Investigations conducted at USTs 681 and 682 included a Tank Closure Assessment (NASP Public Works, July 19, 1995), a SAR (TTNUS, January 2000), a SAR Addendum (TTNUS, January 23, 2001), a SAR Addendum No. 2 (TTNUS, October 26, 2001), and this SAR Addendum No. 3.

The initial SAR field activities were conducted during October 1999, and included Direct-Push Technology (DPT) soil sampling of subsurface soil, installation of five (5) monitoring wells using a drill rig and hollow stem auger, and groundwater sampling. The subsurface soil was analyzed for gasoline and kerosene analytical group (KAG) parameters (Table B, Chapter 62-770, Florida Administrative Code), total halides, and fractional organic carbon (FOC). Groundwater samples were analyzed for KAG parameters and natural attenuation parameters (sulfate, nitrate, and dissolved gases [methane, ethane, and ethene]). In January 2000, TTNUS submitted the SAR summarizing the findings of the investigation.

Upon review of the SAR, FDEP issued a letter (Attachment A; March 1, 2000) providing comments on the SAR and requiring the preparation of a SAR Addendum for the site. SAR Addendum activities conducted during October 2000 included DPT sampling of subsurface soil for KAG parameters. A Synthetic Precipitation Leaching Procedure (SPLP) leachate was also analyzed for the stated analyses. An additional monitoring well was installed near former temporary well TW-4. Groundwater samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX), PAHs, TRPH, 1,2-dibromoethane (EDB), and total lead. In January 2001, TTNUS submitted the SAR Addendum in response to the FDEP request. The SAR Addendum addressed the FDEP comments and detailed the fieldwork conducted in October 2000. Upon review of the SAR Addendum, FDEP issued a second letter (Attachment A; April 16, 2001) providing comments on the SAR Addendum.

On August 24 and 25, 2001, TTNUS personnel conducted additional fieldwork to address the SAR Addendum comments. Two soil borings were advanced to 20 feet below land surface (bls) in the vicinity of MW-1S and MW-2S (Figure 1; Attachment B). Soil samples were collected at 5-ft. intervals for soil gas screening. The soil gas screening did not indicate elevated soil gas concentrations. Two subsurface soil samples were collected from the vadose zone, analyzed for BTEX, PAHs, TRPH, and evaluated by SPLP. None of the analytes analyzed for were detected above the instrument detection limits.

TTNUS personnel also collected and analyzed groundwater samples from three monitoring wells (MW-1S, MW-2S, and TW-4) (Figure 1; Attachment B). The groundwater samples were analyzed for Volatile Organic Compounds (VOCs), PAHs, TRPH, EDB, and total lead. 1-methylnaphthalene (47 µg/L), 2-methylnaphthalene (57 µg/L), and TRPH (10,500 µg/L) were detected above the FDEP groundwater cleanup target levels (GCTLs) in monitoring well TW-4. Although the concentrations for the two PAHs and TRPH were above the FDEP GCTLs, they were below the Natural Attenuation Default Concentrations for

a source well prescribed by Chapter 62-770, F.A.C. On October 26, 2001, TTNUS submitted the SAR Addendum No.2 in response to the FDEP request. The SAR Addendum No.2 addressed the FDEP comments and detailed the fieldwork conducted in August 2001. Upon review of the SAR Addendum No.2, FDEP issued a third letter (Attachment A; November 9, 2001) providing comments on the SAR Addendum No.2. To address these comments TTNUS completed additional fieldwork. This letter report summarizes the fieldwork and each comment in turn. Conclusions and recommendations for the site are provided in dedicated sections.

FIELD WORK METHODOLOGY AND RESULTS

Groundwater Investigation Results

On March 12, 2002, TTNUS collected groundwater samples from onsite monitoring wells MW-1S (sample NASP-681/682-MW1S) and TW-4 (sample NASP-681/682-TW-4) (Figure 1; Attachment B). In addition, quality assurance samples including, one equipment blank and one trip blank were collected. The groundwater sample from monitoring well MW-1S was analyzed for EDB (EPA 504.1), and the sample from monitoring well TW-4 was analyzed for TRPH (FDEP FL-PRO).

The groundwater sample analytical results are summarized in Table 1 (Attachment C), and the full data package is included in Attachment E. EDB was not detected above the instrument detection limit of 0.02 ug/L in the groundwater sample from monitoring well MW-1S. FDEP's GCTL for EDB is 0.02 ug/L (Chapter 62-777, FAC). TRPH was detected at 18,000 ug/L in the groundwater sample from monitoring well TW-4. The detected concentration of TRPH exceeded the FDEP GCTL of 5,000 ug/L, but was less than the Natural Attenuation Default Concentration for a source well prescribed in Chapter 62-770, FAC.

Two rounds of groundwater level measurements were conducted on November 27, 2001 and March 12, 2002. Each monitoring well top of casing elevation was previously surveyed by a Florida licensed professional surveyor (TTNUS, SAR, January 2000). The north rim for each top of well casing was surveyed to the nearest 0.01 foot relative to the North American Vertical Datum 1988. The water table elevation was calculated by subtracting the depth to water from the top of casing elevation. The results are included in Attachment D. Groundwater flow maps (Figures 2 and 3) are included in Attachment B.

RESPONSE TO COMMENTS

1. *The EDB detection limit (1 ug/L) for the most recent groundwater sampling/analysis event was above the previous detection of 0.54 ug/L at MW1S and well above the primary standard of 0.02 ug/L. Therefore, the monitoring wells should be resampled for EDB analysis.*

Monitoring well MW-1S was re-sampled on March 12, 2002 for EDB. The groundwater sample from monitoring well MW-1S was analyzed for EDB by Environmental Protection Agency method 504.1 resulting in an analytical detection limit of 0.02 ug/L. EDB was not detected in the groundwater sample above the instrument detection limit.

2. *The TRPH concentration of 10.5 mg/L (duplicate had 14.9 mg/L) at TW4 increased from the previous detection of 8.8 mg/L. Therefore, TW4 should be resampled for the site parameters to determine if a decreasing trend in concentrations can be established prior to determine the appropriateness of the monitoring only proposal.*

Monitoring well TW-4 was resampled on March 12, 2002 for TRPH. The groundwater sample from NASP-681/682-TW-4 was analyzed for TRPH by FDEP method FL-PRO. TRPH was detected at 18,000 ug/L. The historic concentrations are presented below.

Monitoring Well	Date	TRPH Concentration (ug/L)
TW-4	October 20, 2000	8,800
	August 25, 2001	10, 500, duplicate sample 14,400
	March 12, 2002	18,000

The detected TRPH concentrations from each sampling event (October 2000, August 2001, and March 2002) increased in comparison to the previous concentration; however, the difference in concentrations is relatively insignificant. The difference in the detected concentrations is most likely due to the limitations of the laboratory sample preparation procedure and the analytical method. This is most apparent in the analysis of the duplicate sample collected on August 25, 2001. There was an approximate 40% difference between the sample (NASP-681/682-TW-4) and the duplicate sample (NASP-681/682-DUP2).

In addition, review of the dissolved oxygen concentration reported for the two wells (Appendix C) indicates reduced dissolved oxygen concentration in source well TW-4, and higher dissolved oxygen concentration in downgradient perimeter monitoring well MW-1. This trend is generally indicative of ongoing natural attenuation processes.

3. *Two complete rounds of water level elevation surveys at least one month apart should be completed to establish site flow conditions, and to aid in determining which monitoring wells should be included in future monitoring events.*

Two complete rounds of groundwater level elevation surveys were conducted on November 27, 2001 and March 12, 2002. The results are included in Attachment D and presented graphically on Figure 2 and 3; Attachment B. Based on the results the groundwater flow is toward the southeast.

RECOMMENDATIONS

Results of the groundwater sampling performed in March 2002 indicate that natural attenuation is a viable option for the UST 681/682 Tank Site. EDB was not detected in the groundwater sample from monitoring well MW-1. TRPH was detected in the groundwater sample from monitoring well TW-4, but at concentrations below the required Natural Attenuation Default Concentrations for a source well prescribed by Chapter 62-770, F.A.C. It is expected that the site will receive a No Further Action (NFA) within five (5) years. Therefore, quarterly monitoring for natural attenuation of the previously detected PAHs, and the previously and currently detected TRPH contamination should be conducted for one year. After this one-year period, the site should be re-evaluated.

The quarterly monitoring event should include groundwater elevation measurements in all on-site monitoring wells and groundwater sampling of monitoring wells TW-4 (source well) and MW-1S and MW-2S (perimeter wells). All three monitoring wells should be sampled for the following parameters:

- BTEX by SW-846 8260B
- PAHs by SW-846 8310
- TRPH by FDEP FL-PRO

The monitoring well samples should be analyzed for the following field and natural attenuation parameters:

- turbidity
- specific Conductance
- temperature
- pH
- dissolved Oxygen
- carbon Dioxide
- oxidation-Reduction (REDOX) Potential
- sulfide
- ferrous Iron

The laboratory, field, and natural attenuation parameters will be used to determine if natural attenuation is possible, and if so, whether natural attenuation is occurring.

Additionally, the Site should be included in the Installation Restoration Program Operable Unit (OU) 2 so the migration of the chlorinated solvent plume associated with OU 2 can be evaluated and tracked.

Sincerely,



Gerald A. Walker, P.G.
Florida Professional Geologist No. 0001180
Tetra Tech NUS, Inc.

c: Timothy Bahr, FDEP
Byas Glover, SOUTHNAVFACENCOM
Greg Campbell, NAS Pensacola
Debbie Wroblewski, TTNUS
Mark Perry, file
Tallahassee, file

ATTACHMENT A
FDEP Comment Letter



Department of Environmental Protection

Jeb Bush
 Governor

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

David B. Strubbs
 Secretary

March 1, 2000

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 for Tanks 681 and 682, NAS
 Pensacola, DEP Facility #179202973

Dear Mr. Glover:

I have completed the technical review of the above referenced document dated January 2000 (received January 5, 2000). Based on my own review of the data, it is not evident that the plume from OU 2 is commingled with a petroleum contaminant plume at the site. It is highly probable that petroleum contamination is present in the soil and groundwater in the area south of former UST 681. I recommend completing the investigation of this site under the petroleum program.

I have the following comments that must be addressed in an Addendum Report for this site in order to meet the requirements of Chapter 62-770, Florida Administrative Code (FAC).

1. No soil borings or monitoring wells are located in the vicinity of former TW-4, where groundwater contamination was detected during the CA. I recommend that a soil boring and monitoring well be placed in this location to determine the nature and extent of petroleum contamination in the soil and groundwater. A monitoring well in this location would also demonstrate if the plume from OU 2 extends across the site.
2. Soil borings SB02 and SB03 exhibited high organic vapor readings; however, only one soil sample (SB031214) was collected from an elevated interval and analyzed by mobile lab. It is not clear if high OVA readings may be attributed to volatile organic halocarbons. I recommend that at least one soil sample be collected

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Mr. Byas Glover
Page Two
March 1, 2000

from an interval exhibiting high OVA readings for laboratory analysis.

- 3. Leachability testing should also be conducted within the interval exhibiting high OVA readings. I recommend that at least one leachability sample be collected from the appropriate interval in the soil boring proposed in Comment 1.
- 4. Only page 5-1 was included in Section 5.0, Conclusions and Recommendation. Any missing pages should be submitted with the final document.
- 5. A Professional Engineer or Geologist should certify the final document in accordance with Chapter 62-770.490
FAC:
- 6. Appendix B, SAR Summary Sheet: The site location should be corrected to Pensacola, Florida.

If I can be of any further assistance with this matter, please contact me at (850) 921-9989.

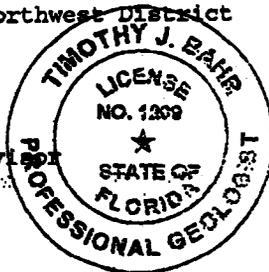
Sincerely,

Joseph F. Fugitt
Joseph F. Fugitt, P.G.
Remedial Project Manager

cc: Greg Campbell, NAS Pensacola
Charlie Goddard, FDEP Northwest District

Reviewed by:

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



Date

3/2/00

JJC

JJC

ESN

ESN



0130 512

Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

April 16, 2001

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 Addendum for Tanks 681 and 682,
NAS Pensacola, DEP Facility #179202973

Dear Mr. Glover:

I have completed the technical review of the above referenced document dated January 23, 2001 (received January 24, 2001). I have the following comments that must be addressed in an Addendum Report for this site in order to meet the requirements of Chapter 62-770, Florida Administrative Code (FAC).

1. Soil sample results exceed leachability criteria for benzene and ethylbenzene. The report should be revised to state this.
2. SPLP sample results indicate 1-methylnaphthalene, 2-methylnaphthalene, toluene, and xylene exceed leachability criteria. Benzene detection limits were elevated (50 ug/L); therefore, it is not clear if benzene exceeds leachability criteria in this sample.
3. The geologist log of the soil boring at TW-4 indicate that the SPLP sample may have been collected from within the saturated zone therefore, it is unclear if the data indicates subsurface soil or groundwater conditions.
4. The geologist log of the soil boring at TW-4 indicates the presence of a petroleum sheen or potential free product at the location of TW-4; therefore, the presence or absence of free product should be confirmed at this location.

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Mr. Byas Glover
Page Two
April 16, 2001

It is not clear if monitoring for natural attenuation (MNA) is the appropriate remedial alternative at this time. I recommend resampling monitoring wells TW-4, MW-1S, and MW-2S for VOCs, PAHs, EDB, and TPHs. Based on an evaluation of the analytical results from these monitoring wells, a free product assessment may be required in the vicinity of TW-4. Additional assessment may also be required downgradient of MW-1S to determine the extent of EDB exceedence in the groundwater.

If I can be of any further assistance with this matter, please contact me at (850) 921-9989.

Sincerely,

Joseph F. Fugitt

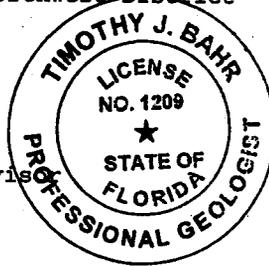
Joseph F. Fugitt, P.G.
Remedial Project Manager

cc: Greg Campbell, NAS Pensacola

~~_____~~
Charlie Goddard, FDEP Northwest District

Reviewed by:

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



4/16/01
Date

JJC *gje*

ESN *ESN*



Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

November 9, 2001

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 Addendum No. 2 for Tanks 681 and 682, NAS Pensacola, DEP Facility #179202973

Dear Mr. Glover:

I have completed the technical review of the above referenced document dated October 26, 2001 (received October 29, 2001). I have the following comments that must be addressed in an Addendum Report for this site in order to meet the requirements of Chapter 62-770, Florida Administrative Code (FAC).

1. The EDB detection limit (1 ug/l) for the most recent groundwater sampling/analysis event was above the previous detection of 0.54 ug/l at MW1S and well above the primary standard of 0.02 ug/l. Therefore, the monitoring wells should be resampled for EDB analysis.
2. The TRPH concentration of 10.5 mg/l (duplicate had 14.9 mg/l) at TW4 increased from the previous detection of 8.8 mg/l. Therefore, TW4 should be resampled for the site parameters to determine if a decreasing trend in concentrations can be established prior to determining the appropriateness of the monitoring only proposal.
3. Two complete rounds of water level elevation surveys at least one month apart should be completed to establish site flow conditions, and to aid in determining which monitoring wells should be included in future monitoring events.

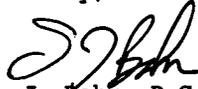
If I can be of any further assistance with this matter, please contact me at (850) 921-9984.

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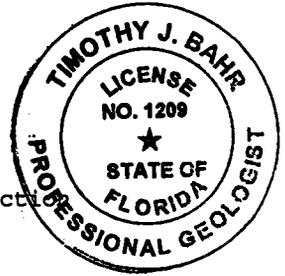
Printed on recycled paper.

Mr. Byas Glover
Page Two
November 9, 2001

Sincerely,



Tim J. Bahr, P.G.
Technical Review Section



cc: Greg Campbell, NAS Pensacola
Terry Hansen, Tetra Tech NUS, Inc., Tallahassee
Charlie Goddard, FDEP Northwest District

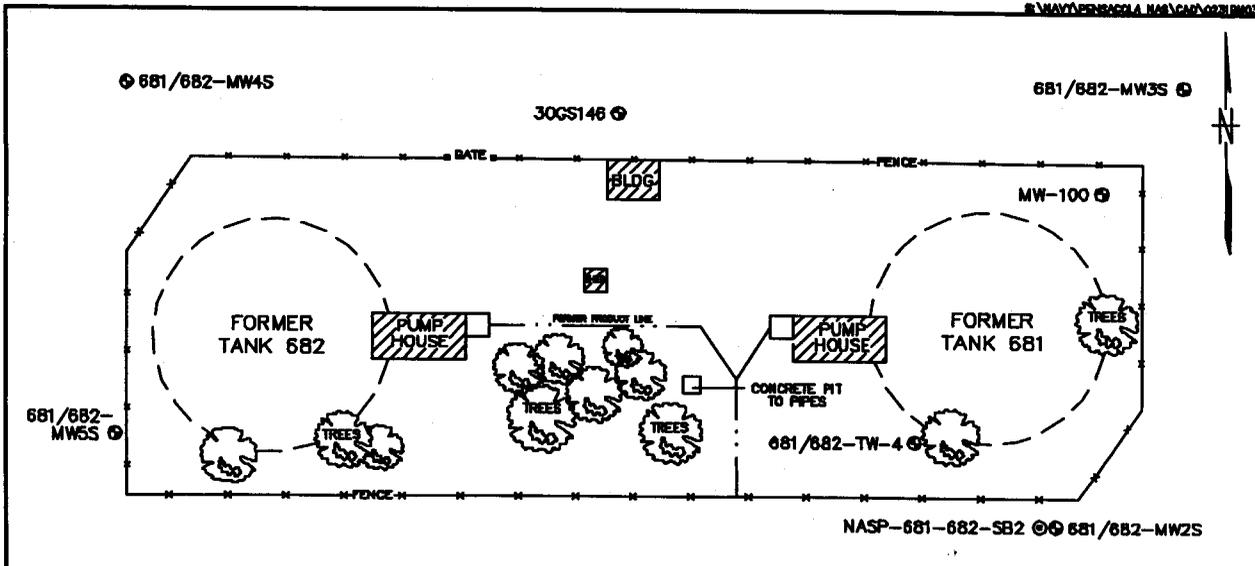
JJC



ESN

ESN

ATTACHMENT B
Figures



LEGEND

⊕ 681/682-MW4S MONITORING WELL LOCATION AND DESIGNATION

⊙ NASP-681-682-SB2 SOIL BORING LOCATION AND DESIGNATION



681/682-MW1S

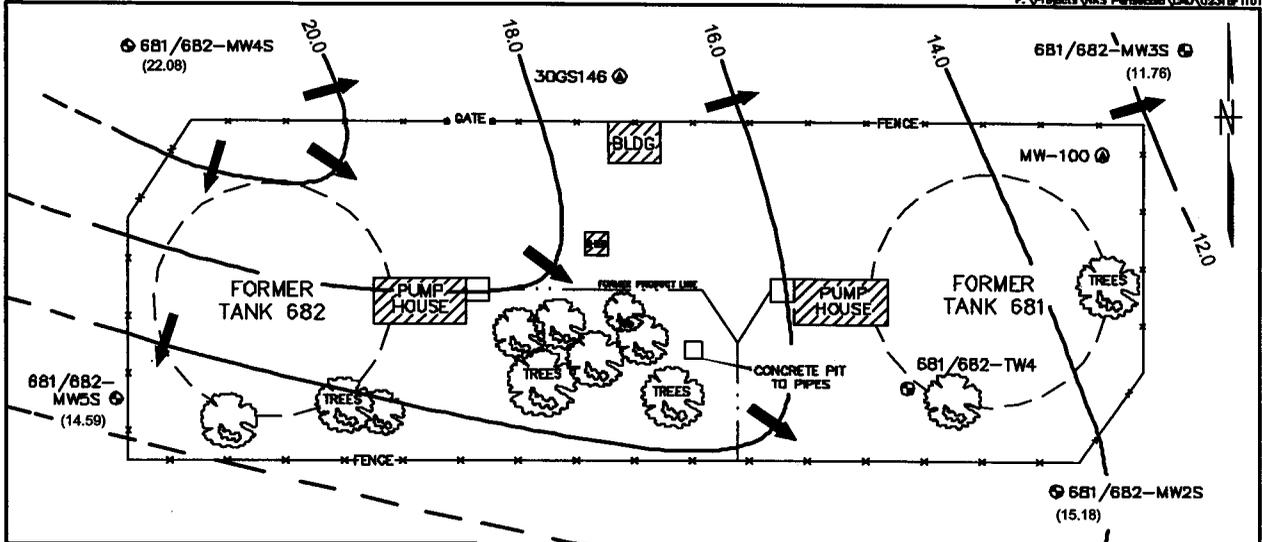
NASP-681-682-SB1

DRAWN BY	DATE
LLK	12/7/89
CHECKED BY	DATE
COST/BCHED-AREA	
SCALE	
AS NOTED	



MONITORING WELL AND SOIL BORING LOCATIONS
TANKS 681 AND 682
U.S. NAVAL AIR STATION PENSACOLA
PENSACOLA, FLORIDA

CONTRACT NO.	0231
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO.	FIGURE 1
REV.	0



LEGEND

681/682-MW3S ⊕
MW-100 ⊕ MONITORING WELL LOCATION

(14.59) WATER TABLE ELEVATION
(FEET MEAN SEA LEVEL)

14.0 EQUIPOTENTIAL LINE (FT)
(DASHED WHERE INFERRED)

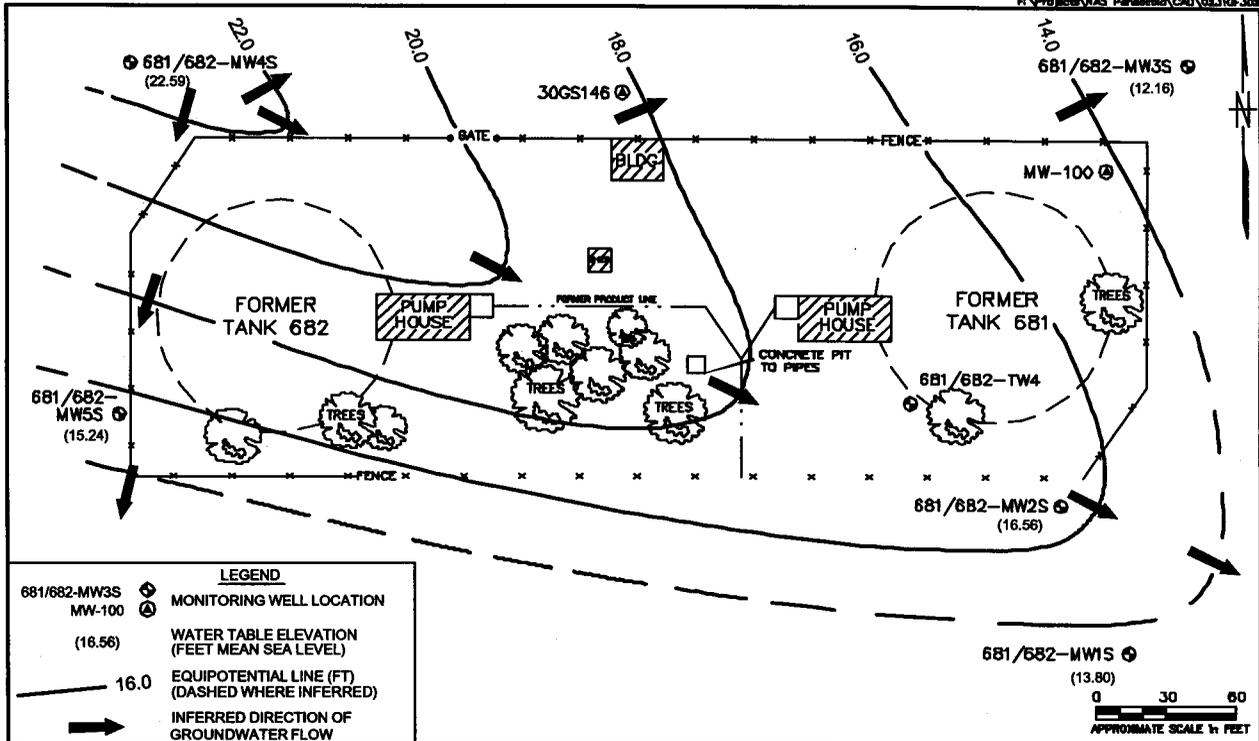
→ INFERRED DIRECTION OF
GROUNDWATER FLOW



DRAWN BY LLK	DATE 12/7/99
CHECKED BY	DATE
COST/SCHED- AREA	
SCALE AS NOTED	

GROUNDWATER FLOW
(NOVEMBER 27, 2001)
TANKS 681 AND 682
U.S. NAVAL AIR STATION PENSACOLA
PENSACOLA, FLORIDA

CONTRACT NO.	0231
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO.	FIGURE 2
REV.	0



LEGEND	
681/682-MW3S	MONITORING WELL LOCATION
MW-100	MONITORING WELL LOCATION
(16.56)	WATER TABLE ELEVATION (FEET MEAN SEA LEVEL)
16.0	EQUIPOTENTIAL LINE (FT) (DASHED WHERE INFERRED)
→	INFERRED DIRECTION OF GROUNDWATER FLOW



DRAWN BY	DATE
LLK	4/15/02
CHECKED BY	DATE
COST/SCHED-AREA	
SCALE	
AS NOTED	

GROUNDWATER FLOW
(MARCH 12, 2002)
TANKS 681 AND 682
U.S. NAVAL AIR STATION PENSACOLA
PENSACOLA, FLORIDA

CONTRACT NO.	0231
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO.	FIGURE 3
REV.	0

ATTACHMENT C
Tables

Table 1
Summary of Chemicals and Analytes Detected in Groundwater Samples
Naval Air Station Pensacola, Pensacola, Florida
Tanks 681 and 682

Sample No.	NASP-681/682-MW1S	NASP-681/682-TW4
Sample Location	MW1S	TW4
Collect Date	3/12/2002	3/12/2002
Groundwater Criteria ¹ (ug/L)		
EDB² (ug/L)	0.02	–
Total Petroleum Hydrocarbons³ (ug/L)	5,000	16,000

¹ Groundwater Criteria from Chapter 62-777, F.A.C.

² EPA 504.1, ³ FL-PRO

Bold indicates the exceedance of the regulatory limit.

⁴ indicates the presence of a chemical at an estimated concentration

A trip blank and equipment blank were collected with these samples. EDB and TRPH were not detected in either blank.

ATTACHMENT D
Groundwater Level Measurement Sheet
Groundwater Sample Log
Huriba U-10 Water Quality Checker



GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NASP - 681/682
 Project No.: NA123

Sample ID No.: NASP-681/682-MW15
 Sample Location: MW15
 Sampled By: H. Lee
 C.O.C. No.: _____

- Domestic Well Data
- Monitoring Well Data
- Other Well Type: _____
- QA Sample Type: _____

- Type of Sample:
 - Low Concentration
 - High Concentration

SAMPLING DATA

Date:	Color Visual	pH Standard	S.C. mg/cm	Temp. °C	Turbidity NTU	DO mg/l	TBD	TBD
3/12/02		6.53	0.340	22.4	1	3.96	17.96	
Time: 0922								
Method: <u>low flow/pneumatic</u>								

PURGE DATA

Date:	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	TBD	TBD
3/12/02								
Method: <u>low flow/pneumatic</u>								
Monitor Reading (ppm):	See Low Flow Purge Data Sheet							
Well Casing Diameter & Material	2.1 L	6.56	0.268	22.1	28	4.49	17.97	0852
Type: <u>1" PVC</u>	4.5 L	6.54	0.339	22.3	6	3.98	17.96	0905
Total Well Depth (TD): <u>22.9'</u>	7.0 L	6.54	0.339	22.4	4	3.94	17.96	0910
Static Water Level (WL): <u>17.95'</u>	8.5 L	6.54	0.339	22.4	2	3.94	17.96	0915
One Casing Volume (gal/L): <u>0.84</u>	10.6 L	6.53	0.340	22.4	1	3.96	17.96	0922
Start Purge (hrs): <u>0845</u>								
End Purge (hrs): <u>0922</u>								
Total Purge Time (min): <u>37</u>								
Total Vol. Purged (gal/L): <u>3.0 gal</u>								

SAMPLE COLLECTION INFORMATION

Analyte	Preservative	Container Requirements	Collected
<u>EDB ED4.1</u>	<u>HCl</u>	<u>2 40ml vials</u>	<u>Yes</u>

OBSERVATIONS / NOTES

See Field Analytical Log Sheets for Geochemical Parameters (i.e. natural attenuation).

Circle if Applicable:

MS/M&D Duplicate ID No.: _____

Signature(s):

TBD: To Be Determined



Project Site Name: 681/682
Project No.: -N14177-N0123

Sample ID No.: NAS-PEN-TW-4
Sample Location: TW-4
Sampled By: JTA
C.O.C. No.: _____

- Domestic Well Data
- Monitoring Well Data
- Other Well Type: _____
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
 - High Concentration

SAMPLING DATA:

Date:	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	IBD H ₂ O Level	TBD Time
3/12/02		6.71	0.411	22.7	0	0.30	Level	10:02

PURGE DATA:

Date:	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	TBD	TBD
3/12/02								
Method: <u>Low Flow/Peristaltic</u>								
Monitor Reading (ppm): <u>See Low Flow Purge Data Sheet</u>								
Well Casing Diameter & Material	0.5 gal	6.75	0.579	22.0	0	0.66	24.5	9:45
Type: <u>2" PVC</u>	1.0 gal	6.75	0.483	22.0	0	0.49	24.5	9:50
Total Well Depth (TD): <u>20.7</u>	1.5 gal	6.73	0.436	22.4	0	0.35	24.6	9:55
Static Water Level (WL): <u>24.5</u>	2.0 gal	6.72	0.419	22.4	0	0.30	24.6	10:00
One Casing Volume (gal): <u>0.714 gal</u>	2.2 gal	6.71	0.411	22.7	0	0.30		10:02
Start Purge (hrs): <u>9:20</u>								10:07
End Purge (hrs): <u>10:05</u>								
Total Purge Time (min): <u>45</u>								
Total Vol. Purged (gal/L): <u>2.3 gal</u>								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TRPH	HCL	2L Amber	(2) JTA

OBSERVATIONS/NOTES:

See Field Analytical Log Sheets for Geochemical Parameters (i.e. natural attenuation).

Removed old lock/Replaced w/ H₂O lock

Circle if Applicable: _____ Signature: [Signature]

MS/MSD Duplicate ID No.: _____

TBD: To Be Determined

ATTACHMENT E
Data Validation Report



Tetra Tech NUS, Inc.

Internal Correspondence

TO: Mr. Terry Hansen **DATE:** April 10, 2002

FROM: Suzanne I. Smith **CC:** File

SUBJECT: Organic and Inorganic Data Validation – VOC, PAH, EDB, TPH, and Lead
CTO098 – NAS Pensacola
SDG 203058

SAMPLES: 4/Aqueous

EQ. BLANK **NASP-681/682-MW1** **NASP-681/682-TW4**
TRIP BLANK-031202

OVERVIEW

The sample set for CTO098, SDG 203058; Naval Air Station Pensacola, Pensacola, Florida consists of two (2) aqueous environmental samples, one (1) equipment blank, and one (1) trip blank. NASP-681/682-TW4 was analyzed for Total Petroleum Hydrocarbons (TPH) only. NASP-681/682-MW1 was analyzed for Ethylene Dibromide (EDB) only. The equipment blank was analyzed for select Volatile Organic Carbons (VOCs), Polycyclic Aromatic Hydrocarbons (PAHs), EDB, TPH, and Lead. The equipment blank also applies to SDG 203052. The trip blank was only analyzed for select VOCs.

The samples were collected by Tetra Tech NUS on March 12, 2002 and analyzed by GPL Laboratories. All analyses were performed in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria and analyzed according to SW-846 Method 8260B (VOCs), EPA Method 504.1 (EDB), SW-846 Method 8270C (PAHs), FDEP FL-PRO (TPH), and SW-846 6010B (Lead) analytical and reporting protocols. The data in this SDG was validated with regard to the following parameters:

- * • Data Completeness
- * • Holding Times
- Laboratory method/field quality control blank results
- * • Detection Limits

The symbol (*) indicates that all quality control criteria were met for this parameter.

Volatile and EDB Fractions

Equipment Blank Analysis

Samples Affected: none

<u>Analyte</u>	<u>Maximum Concentration (ug/L)</u>	<u>Action Level (ug/L)</u>
Chloroethane	0.87J	4.35
Methylene Chloride	1.9	7.5
Toluene	1.2	6.0

An action level of 5x the maximum concentration has been used to evaluate the sample for contamination in the equipment blank. Dilution factors and sample aliquots were taken into account when evaluating for blank contamination. Positive results less than the action level were reported as nondetects due to field blank contamination.

Detections for methylene chloride in the equipment blank and trip blank were qualified as estimated "J" due to its detection in the method blank at 1.4 ug/L. Samples were qualified based on the contamination of the equipment blank, however, as it was the blank with the highest detection of methylene chloride.

Continuing calibration requirements were not met for EDB analysis therefore all EDB results are qualified as estimated "J".

All other quality control criteria were met for this fraction.

Polycyclic Aromatic Hydrocarbon Fraction

All quality control criteria were met for this fraction.

Total Petroleum Hydrocarbon Fraction

Equipment Blank Analysis

Samples Affected: none

<u>Analyte</u>	<u>Maximum Concentration (mg/L)</u>	<u>Action Level (mg/L)</u>
TPH	0.44	2.2

An action level of 5x the maximum concentration has been used to evaluate the sample for contamination in the equipment blank. Dilution factors and sample aliquots were taken into account when evaluating for blank contamination. No positive results less than the action level were reported.

All other quality control criteria were met for this fraction.

Lead Fraction

Equipment Blank Analysis

Samples Affected: none

<u>Analyte</u>	<u>Maximum Concentration (ug/L)</u>	<u>Action Level (ug/L)</u>
Lead	1.8	9.0

An action level of 5x the maximum concentration has been used to evaluate the sample for contamination in the equipment blank. Dilution factors and sample aliquots were taken into account when evaluating for blank contamination. No positive results less than the action level were reported.

All other quality control criteria were met for this fraction.

Executive Summary

Laboratory performance: Detections for methylene chloride in the equipment blank and trip blank were qualified as estimated "J". Continuing calibration requirements were not met for EDB analysis therefore all EDB results are qualified as estimated "J".

Other factors affecting data quality: No other factors affected data quality.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (February, 1996), and the NFESC guidelines "Navy Installation Restoration Chemical Data Quality Manual" (September, 1999). The text of the report has been formulated to address only those problems affecting data quality.

"I attest that the data referenced herein was validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



Suzanne I. Smith

Project Chemist
Tetra Tech NUS, Inc.

Qualifier Codes:

- A** = Lab Blank Contamination
- B** = Field Blank Contamination
- C** = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
- D** = MS/MSD Noncompliance
- E** = LCS/LCSD Noncompliance
- F** = Lab Duplicate Imprecision
- G** = Field Duplicate Imprecision
- H** = Holding Time Exceedance
- I** = ICP Serial Dilution Noncompliance
- J** = GFAA PDS - GFAA MSA's $r < 0.995$
- K** = ICP Interference - include ICSAB % R's
- L** = Instrument Calibration Range Exceedance
- M** = Sample Preservation
- N** = Internal Standard Noncompliance
- O** = Poor Instrument Performance (i.e., base-time drifting)
- P** = Uncertainty near detection limit ($< 2 \times$ IDL for inorganics and $<$ CRQL for organics)
- Q** = Other problems (can encompass a number of issues)
- R** = Surrogates Recovery Noncompliance
- S** = Pesticide/PCB Resolution
- T** = % Breakdown Noncompliance for DDT and Endrin
- U** = Pest/PCB D% between columns for positive results
- V** = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
- W** = EMPC result
- X** = Signal to noise response drop
- Y** = % Solid content is less than 30%

DATA QUALIFIER DEFINITIONS:

- U - Value is a nondetected result as reported by the laboratory and should not be considered present.
- J - Positive result is estimated as a result of a value below the CRQL or a technical noncompliance.
- UJ - Nondetected result is considered to be estimated as a result of technical noncompliances.

APPENDIX A
Qualified Analytical Results

48
CT0146-NAS PENSACOLA

**WATER DATA
 GPL LABORATORIES
 SDG: 203058**

203058

SAMPLE NUMBER:
 SAMPLE DATE:
 LABORATORY ID:
 QC TYPE:
 % SOLIDS:
 UNITS:
 FIELD DUPLICATE OF:

EQ. BLANK
 03/12/02
 203058-003-01-1
 NORMAL
 0.0 %
 UG/L

EQ. BLANK
 03/12/02
 203058-003-03-3
 NORMAL
 0.0 %
 UG/L

NASP-681/682-MW-1
 03/12/02
 203058-002-01-1
 NORMAL
 0.0 %
 UG/L

TRIP BLANK-031202
 03/12/02
 203058-004-01-1
 NORMAL
 0.0 %
 UG/L

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
1,1,1-TRICHLOROETHANE	1	U		1	U					1	U	
1,1,2,2-TETRACHLOROETHANE	1	U		1	U					1	U	
1,1,2-TRICHLOROETHANE	1	U		1	U					1	U	
1,1-DICHLOROETHANE	1	U		1	U					1	U	
1,1-DICHLOROETHENE	1	U		1	U					1	U	
1,2-DIBROMOETHANE	0.02	U		0.02	U	C	0.02	U	C			
1,2-DICHLOROBENZENE	1	U		1	U					1	U	
1,2-DICHLOROETHANE	1	U		1	U					1	U	
1,2-DICHLOROPROPANE	1	U		1	U					1	U	
1,3-DICHLOROBENZENE	1	U		1	U					1	U	
1,4-DICHLOROBENZENE	1	U		1	U					1	U	
2-CHLOROETHYL VINYL ETHER	1	U		1	U					1	U	
4-BROMOFLUOROBENZENE	89			89			102			82		
BENZENE	1	U		1	U					1	U	
BROMODICHLOROMETHANE	1	U		1	U					1	U	
BROMOFORM	1	U		1	U					1	U	
BROMOMETHANE	1	U		1	U					1	U	
CARBON TETRACHLORIDE	1	U		1	U					1	U	
CHLOROBENZENE	1	U		1	U					1	U	
CHLORODIBROMOMETHANE	1	U		1	U					1	U	
CHLORODIBROMOMETHANE	1	U		1	U					1	U	
CHLOROETHANE	0.87	J	P	0.87	J	P				1	U	
CHLOROFORM	1	U		1	U					1	U	
CHLOROMETHANE	1	U		1	U					1	U	
CIS-1,2-DICHLOROETHENE	1	U		1	U					1	U	
CIS-1,3-DICHLOROPROPENE	1	U		1	U					1	U	
ETHYLBENZENE	1	U		1	U					1	U	
M+P-XYLENES	1	U		1	U					1	U	
METHYL TERT-BUTYL ETHER		U		1	U					1	U	
METHYLENE CHLORIDE	1.9	B		1.8	B	A				1.7	B	A
O-XYLENE	1	U		1	U					1	U	
TETRACHLOROETHENE	1	U		1	U					1	U	

WATER DATA
 GPL LABORATORIES
 SDG: 203058

SAMPLE NUMBER:
 SAMPLE DATE:
 LABORATORY ID:
 QC_TYPE:
 % SOLIDS:
 UNITS:
 FIELD DUPLICATE OF:

EQ. BLANK
 03/12/02
 203058-003-01-1
 NORMAL
 0.0 %
 UG/L

EQ. BLANK
 03/12/02
 203058-003-03-3
 NORMAL
 0.0 %
 UG/L

NASP-681/682-MW-1
 03/12/02
 203058-002-01-1
 NORMAL
 0.0 %
 UG/L

TRIP BLANK-031202
 03/12/02
 203058-004-01-1
 NORMAL
 0.0 %
 UG/L

	RESULT	QUAL	CODE									
VOLATILES												
TOLUENE	1.2			1.2						1	U	
TRANS-1,2-DICHLOROETHENE	1	U		1	U					1	U	
TRANS-1,3-DICHLOROPROPENE	1	U		1	U					1	U	
TRICHLOROETHENE	1	U		1	U					1	U	
VINYL CHLORIDE	1	U		1	U					1	U	

SAMPLE NUMBER:
SAMPLE DATE:
LABORATORY ID:
QC_TYPE:
% SOLIDS:
UNITS:
FIELD DUPLICATE OF:

EQ. BLANK
03/12/02
203058-003-08-1
NORMAL
0.0 %
UG/L

//

100.0 %

//

100.0 %

//

100.0 %

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	0.11	U										
2-FLUOROBIPHENYL	88											
2-METHYLNAPHTHALENE	0.11	U										
ACENAPHTHENE	0.11	U										
ACENAPHTHYLENE	0.11	U										
ANTHRACENE	0.11	U										
BENZO(A)ANTHRACENE	0.11	U										
BENZO(A)PYRENE	0.11	U										
BENZO(B)FLUORANTHENE	0.11	U										
BENZO(G,H,I)PERYLENE	0.11	U										
BENZO(K)FLUORANTHENE	0.11	U										
CHRYSENE	0.11	U										
DIBENZO(A,H)ANTHRACENE	0.11	U										
FLUORANTHENE	0.11	U										
FLUORENE	0.11	U										
INDENO(1,2,3-CD)PYRENE	0.11	U										
NAPHTHALENE	0.11	U										
P-TERPHENYL	103											
PHENANTHRENE	0.11	U										
PYRENE	0.11	U										

these are surrogates

WATER DATA
 GPL LABORATORIES
 SDG: 203058

SAMPLE NUMBER:	EQ. BLANK	NASP-681/682-TW-4		
SAMPLE DATE:	03/12/02	03/12/02	//	//
LABORATORY ID:	203058-003-06-1	203058-001-01-1		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	MG/L	MG/L		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE									
TOTAL PETROLEUM HYDROCARBONS	0.44 *			18 *								

SAMPLE NUMBER:

SAMPLE DATE:

LABORATORY ID:

QC_TYPE:

% SOLIDS:

UNITS:

FIELD DUPLICATE OF:

EQ. BLANK

03/12/02

203058-003-10-1

NORMAL

0.0 %

UG/L

//

//

//

100.0 %

100.0 %

100.0 %

RESULT

QUAL

CODE

RESULT

QUAL

CODE

RESULT

QUAL

CODE

RESULT

QUAL

CODE

INORGANICS

LEAD

1.8

FJ

P

203858

HOLDING TIME
04/04/02

Units	Nsample	Lab Id	Cc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
UGL	EQ. BLANK	203058-003-03-3	NORMAL	203058	EDB	03/12/02	03/18/02	03/22/02	6	4 ✓	10 ✓
UGL	NASP-881/882-MW-1	203058-002-01-1	NORMAL	203058	EDB	03/12/02	03/18/02	03/22/02	6	4	10
UGL	EQ. BLANK	203058-003-10-1	NORMAL	203058	M	03/12/02	03/18/02	03/21/02	6	3 ✓	9 ✓
UGL	EQ. BLANK	203058-003-01-1	NORMAL	203058	OV	03/12/02	03/19/02	03/19/02	7 ✓	0	7
UGL	TRIP BLANK-031202	203058-004-01-1	NORMAL	203058	OV	03/12/02	03/19/02	03/19/02	7 ✓	0	7
UGL	EQ. BLANK	203058-003-08-1	NORMAL	203058	PAH	03/12/02	03/14/02	03/19/02	2 ✓	5 ✓	7
MGL	EQ. BLANK	203058-003-06-1	NORMAL	203058	TPH	03/12/02	03/14/02	03/20/02	2 ✓	6 ✓	8
MGL	NASP-881/882-TW-4	203058-001-01-1	NORMAL	203058	TPH	03/12/02	03/14/02	03/20/02	2	6	8

APPENDIX B

Results as Reported by the Laboratory

Summary of Analytical Results

Client ID EQ. BLANK
GPL ID: 203058-003-03-3/3
Matrix: WATER
Date Collected: 03/12/2002
Date Received: 03/13/2002

Prep Method: E504
Prep Date: 03/18/2002
Prep Time: 17:16
Prep Batch 53668

Analytical Method: E504
Date Analyzed: 03/22/2002
Time Analyzed 05:03
Analysis Batch 52942

<u>Parameter</u>	<u>Result</u>	<u>Rep Limit</u>	<u>Units</u>	<u>Qualifier</u>	<u>D.F.</u>
Ethylene DiBromide	BQL	0.020	ug/L	U	1

Summary of Analytical Results

Client ID EQ. BLANK
GPL ID: 203058-003-06-1/2
Matrix: WATER
Date Collected: 03/12/2002
Date Received: 03/13/2002

Prep Method: FL_PRO
Prep Date: 03/14/2002
Prep Time: 00:00
Prep Batch 53642

Analytical Method: FL_PRO
Date Analyzed: 03/20/2002
Time Analyzed 16:45
Analysis Batch 52913

Parameter	Result	Rep Limit	Units Qualifier	D.F.
TPH	0.44	0.18	mg/L	1

Summary of Analytical Results

Client ID NASP-681/682-MW-1
GPL ID: 203058-002-01-1/2
Matrix: WATER
Date Collected: 03/12/2002
Date Received: 03/13/2002

Prep Method: E504
Prep Date: 03/18/2002
Prep Time: 17:16
Prep Batch 53668

Analytical Method: E504
Date Analyzed: 03/22/2002
Time Analyzed 04:34
Analysis Batch 52942

<u>Parameter</u>	<u>Result</u>	<u>Rep Limit</u>	<u>Units</u>	<u>Qualifier</u>	<u>D.F.</u>
Ethylene DiBromide	BQL	0.020	ug/L	U	1

Summary of Analytical Results

Client ID NASP-681/682-TW-4
GPL ID: 203058-001-01-1/2
Matrix: WATER
Date Collected: 03/12/2002
Date Received: 03/13/2002

Prep Method: FL_PRO
Prep Date: 03/14/2002
Prep Time: 00:00
Prep Batch 53642

Analytical Method: FL_PRO
Date Analyzed: 03/20/2002
Time Analyzed 20:21
Analysis Batch 52913

<u>Parameter</u>	<u>Result</u>	<u>Rep Limit</u>	<u>Units Qualifier</u>	<u>D.F.</u>
TPH	18	0.18	mg/L	1

APPENDIX C
Support Documentation

CASE NARRATIVE

CLIENT: TETRA TECH NUS INC.
PROJECT/SITE: PENSACOLA
WORK ORDER(S): 203058
REVIEW DATE: 03/29/02

The Case Narrative, Chain of Custody, Sample Receipt Checklist, and the cover page of the Analytical Report are integral parts of GPL Laboratories' report package. If you did not receive all of these documents please contact GPL immediately.

Sample Receipt

Four water samples were received on 03/13/02. The samples were delivered by Fed Ex. The samples were received intact. Sample receipt conditions and temperatures are documented on the Sample Receipt Checklist.

Sample Analysis

Samples were prepared and analyzed by GPL using the analytical methodologies indicated on the Analytical Report of Analysis.

Volatile Analysis

1. Two water samples were analyzed for volatile organic compounds using EPA method 8260B 25ml purge.
2. Laboratory control sample (LCS) was analyzed with the batch and result submitted.
3. BLK53681 had 1.4 ug/L of methylene chloride.

Semivolatile Analysis

1. One water sample was extracted by method 3520C. This sample was analyzed for semivolatile organic PAH compounds, plus 1-Methylnaphthalene by using a modified low level method 8270C.
2. Due to insufficient sample volume, matrix spike and duplicate analysis was performed on a blank spike and blank spike duplicate. There were four matrix spike recoveries outside of QC limits.
3. Due to a software limitation, the Form VI and Form VII's submitted in this data package are from the run software. They could not be produced in the Enviroforms software.

Pesticides

1. Two water samples were extracted and analyzed for Ethylene dibromide using EPA method 504.
2. Matrix spike analysis was shared with work order #203052. A LCS was extracted and analyzed with this batch of samples.
3. Percent D for EDB was out of QC limits on both columns for continuing calibration K115141. Since the observed response was greater than that of the initial calibration and no EDB was detected in the client samples, no further analysis was conducted.

CASE NARRATIVE

4. Surrogate BFB recovery was above QC limits on the RTX-CLP column for sample EQ. BLANK.
5. Concentrations reported on Form 1 are the higher values of results generated by two columns. However, the analyst determines the most reliable results based on the evaluation of quality control parameters. Flagged concentrations (*) on Form 1 indicate that reported results are the lower values.
6. Due to software limitations, some forms were corrected manually.
7. Peaks for BFB (surrogate) were manually integrated on both columns for both samples.

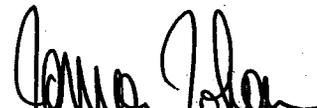
Total Petroleum Hydrocarbons

1. Two water samples were extracted and analyzed for TPH-DRO using FLORIDA PRO methodologies.
2. The matrix spike and matrix spike duplicate analyses was not performed due to insufficient volume.
3. Total Petroleum Hydrocarbon (TPH) concentration for these analyses are calculated by linear regression. Surrogate recoveries are calculated using the average response factor of the initial calibration.
4. Percent surrogate recovery of nonatriacontane was outside QC limits. It was determined that this surrogate compound could not be fully dissolved in the sample, thus, lower recoveries.
5. One laboratory control sample (LCS) was submitted with this package.
6. Surrogate peaks for both samples were manually integrated

Metals

1. One water sample was analyzed only for lead by EPA SW846 methods.
2. A matrix spike, duplicate, and serial dilution were performed on the batch sample 203065-001. They were within the control limits.
3. Calibration standards are verified against independent check standards purchased from a commercial vendor of environmental standards.
4. All GPL QA/QC criteria were met.



Project Manager

Lab Director

GPL LABORATORIES, LLP
ANALYTICAL RESULTS

Project Name : Pensacola

Date Printe March 29, 2002

GPL ID	Client ID
203058-003-01-1/3	EQ. BLANK
203058-003-03-3/3	EQ. BLANK
203058-003-06-1/2	EQ. BLANK
203058-003-08-1/2	EQ. BLANK
203058-003-10-1/1	EQ. BLANK
203058-002-01-1/2	NASP-681/682-MW-1
203058-001-01-1/2	NASP-681/682-TW-4
203058-004-01-1/2	TRIP BLANK

000012

GPL LABORATORIES, LLLP

Qualifier Definitions

U = Indicates that the compound was analyzed for but not detected at or above the reporting limit

Organics:

B = Indicates that the analyte was found in the associated blank as well as in the sample

D = Indicates that the analyte was reported from a diluted analysis

E = Indicates that the concentration detected exceeded the calibration range of the instrument

J = Value is less than the reporting limits but greater than the MDL

P = Indicates that there is greater than 25% difference for detected pesticide/Aroclor results between the two GC columns

Metals:

B = Indicates that the reported value was less than the reporting limit but greater than or equal to the IDLMDL

E = Indicates that reported value is estimated because of the possible presence of interference (i.e., the serial dilution not within control limits)

H = Indicates that the element was found in the associated blank as well as in the sample and the value is greater than or equal to the reporting limit

N = Spiked sample recovery not within control limits

***** = Duplicate analysis not within control limits

GPL LABORATORIES, LLLP

202 Perry Parkway
 Gaithersburg, MD 20877
 (301) 926-6802
 Fax (301) 840-1209

Contract #/Billing Reference
 WJ2-98-2
 MSA N3526-MSA0501-033

1 of 1 Pgs.

Project: NASP 681/682					Turnaround Time					25	25	25	25	25											
Client: TENUS					# of Containers					3	2	2	2	1											
Send Results To: Gerald Walker					Container Type					40ml	40ml/1L	1L	1L	Plastic											
Address: 140 Owen Park Dr. Suite 102					Preservative Used					HCl	HCl	HCl	-	HNA											
City: Tall. FL 32308					Type of Analysis					VOC	EDS	TRPH	PAH	Total Lead	!!										
Phone: 850-385-9899					Lab Cooler No.					CLIENT COMMENTS															
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials																					
NASP-681/682-74	3/12/02	1005	Aa	MA																					
NASP-681/682-74	3/12/02	0922		HR																					
EQ. BLANK	3/12/02	830		ME																					
Trip Blank not analyzed																									
Relinquished By: <i>[Signature]</i>					Date/Time	Received By:					Relinquished By:					Received for Laboratory By:									
Relinquished By: <i>[Signature]</i>					3/12/02 1700	Received By:					Date/Time					Date/Time									
Relinquished By:					Date/Time	Received By:					Date/Time	Shipper:					Airbill No.:								
Relinquished By:					Date/Time	Received By:					Lab Comments:										Temp:				
																					30				

G.P. W.O. 203052

10014

Figure 1
SAMPLE RECEIPT CHECKLIST

W.O. No: 023259
 Client Name: TETRA TECH - NUS
 Date Received: 03/13/02
 Time Received: 10:30 AM
 Received By: huds

Carrier Name: Fed Ex
 Prepared (Logged In) By: Y Initials Date 03/13/02
 Project: NASP 67462
 Site: _____
 VOA Holding Blank I.D. No: _____

Airbill/Manifest Present?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	Trip Blanks: No. of Sets <u>2 Vials</u>	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
No. <u>933 933 77 8 2 11</u>		Field Blanks: No. of Sets _____	<input type="checkbox"/> <input checked="" type="checkbox"/>
Shipping Container in Good Condition?	<input checked="" type="checkbox"/> <input type="checkbox"/>	Equip. Blank: No. of Sets <u>1</u>	<input checked="" type="checkbox"/> <input type="checkbox"/>
Custody Seals Present on Shipping Container?	<input checked="" type="checkbox"/> <input type="checkbox"/>	Field Duplicate: No. of Sets _____	<input type="checkbox"/> <input checked="" type="checkbox"/>
Condition: Broken _____		MSMSD: No of Sets _____	<input type="checkbox"/> <input checked="" type="checkbox"/>
Intact-not dated or signed _____		VOA Vials Have Zero Headspace?	<input type="checkbox"/> <input checked="" type="checkbox"/>
Intact-dated and signed <input checked="" type="checkbox"/>		Preservatives Added to Sample?	<input checked="" type="checkbox"/> <input type="checkbox"/>
Usage of Tamper Evident Type	<input checked="" type="checkbox"/> <input type="checkbox"/>	pH Check Required?	<input checked="" type="checkbox"/> <input type="checkbox"/>
Chain-of-Custody Present?	<input checked="" type="checkbox"/> <input type="checkbox"/>	Performed By? <u>huds</u>	<input checked="" type="checkbox"/> <input type="checkbox"/>
Chain-of-Custody Agrees with Sample Labels?	<input checked="" type="checkbox"/> <input type="checkbox"/>	Ice Present in Shipping Container?	<input checked="" type="checkbox"/> <u>yes</u>
Chain-of-Custody Signed?	<input checked="" type="checkbox"/> <input type="checkbox"/>	Container # Temp. Container # Temp.	
Packing Present in Shipping Container?	<input checked="" type="checkbox"/> <input type="checkbox"/>	<u>11</u> <u>3.0</u> _____ _____	
Type of Packing <u>BASE/BUCKLE WRAP</u>		_____ _____	
Custody seals on Sample Bottles?	<input type="checkbox"/> <input checked="" type="checkbox"/>	_____ _____	
Condition: Good _____ Broken _____		_____ _____	
Total Number of Sample Bottles <u>16</u>		_____ _____	
Total Number of Samples <u>4</u>		_____ _____	
Samples Intact?	<input checked="" type="checkbox"/> <input type="checkbox"/>	_____ _____	
Sufficient Sample Volume for Indicated Test?	<input checked="" type="checkbox"/> <input type="checkbox"/>	_____ _____	
		Project Manager Contacted?	
		Name: <u>EPD NUS</u>	
		Date Contacted: <u>03/13/02</u>	

Any NO response must be detailed in the comments section below. If items are not applicable to particular samples or contracts, they should be marked N/A

COMMENTS: Temp blank used for temp. 2 vials for TRIC blank run but
we not on C.O.C. 2 of 2 vials for TRIC blank contains duplicate

Checklist Completed By: Y

Date: 03/13/02 AA0017

Sample Preservation Check Documentation Form

Work Order: 23257

TETRAETHYL-NU2

Parameter:	Metals	Phenol	TPH O&G	Classical Parameters	Cyanide	Sulfide	Radiology	Other
Preservative: pH Value	HNO3 2	H2SO4 2	H2SO4 2 ML	H2SO4 2	NaOH >12	NaOH >9	H2SO4 2	Preservations
Client ID								
NAS-61192-70-Y			1.2					
↓			1.2					
EQ. BLACK			1.2					
↓			1.2					
↓	1.0							
<p>Close 1/3/22</p>								

Sample Preservation Check Performed By: Y

Date: 03/13/22