QUALITY ASSURANCE PROJECT PLAN FOR GROUNDWATER DETECTION MONITORING HANGAR 1000 AND AREA T-56 NAVAL AIR STATION JACKSONVILLE JACKSONVILLE, FLORIDA

POST CLOSURE PERMIT NO. HF16288092

Submitted to:
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Naval Facilities Engineering Command
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DEP Project Manager

Date

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Section 3.0 PROJECT DESCRIPTION

3.1 Site Identification and History

Site Name: Naval Air Station Hangar 1000 and Area T-56
Site Address: Naval Air Station, Jacksonville, Florida

3.1.1 Site History

The Hangar 1000 regulated unit consisted of two underground storage tanks (UST) (Tank A and Tank B) which were operated from the late 1960s or early 1970s until they were closed in approximately 1993. Tank A was a 750-gallon concrete tank used as a solvent and water separator. Effluent from this unit was discharged through a pipe to the nearby storm sewer system. Tank B was a 2,000-gallon steel UST, which received solvent overflow from Tank A, and waste oils and solvents discharged from other operations at the facility.

In December 1993, a closure plan for this unit was submitted to and approved by the Florida Department of Environmental Protection (FDEP). Tanks A and B and the associated piping system were removed in March 1994. No evidence of soil contamination was detected in the tank excavations. Quarterly sampling performed in 1994 and 1995 after the tank closure activities indicated that 1,1-dichlorethene (1,1-DCE) was present in the groundwater above risk-based concentrations. Due to the presence of the 1,1-DCE, the application for closure permit required groundwater beneath the Hangar 1000 area to be sampled quarterly using eight existing monitoring wells.

The T-56 site was previously an engine wash area, which operated from approximately 1981 until 1996. Normal operations involved cleaning compressors from P-3 aircraft using water. The resulting wastewater was then discharged to the base storm water system via gravity flow. In May 1996, the wastewater from T-56 was analyzed and determined to contain elevated levels of cadmium. The cadmium concentrations exhibited by the wastewater were in excess of the Resource Conservation and Recovery Act (RCRA) hazardous levels. After receiving the results of that testing, the wastewater was containerized and properly disposed of as D006 hazardous waste. Due to this process, the application for closure permit required that the storm water pond at T-56 undergo a single soil and sediment sampling event, and groundwater in the area be sampled quarterly.

3.1.2 Summary of Historical Data

A summary of available historical data is presented in Table 3.1.

3.2 Project Scope and Purpose

3.2.1 Purpose of this Project

This project fulfills requirements of the Post Closure Permit (No. HF16288092) for compliance monitoring as specified in 40 Code of Federal Regulations (CFR) 264.99 at the following facilities:

Hangar 1000: Sampling of the groundwater underneath Hangar 1000 will be done on a quarterly basis to provide temporal contaminant information in compliance of the Post Closure Permit.

T-56 Engine Wash Area: A single round of soil/sediment sampling, and quarterly groundwater replicate monitoring will be done to provide temporal contaminant information, and to assess contaminant concentrations in this area.

TABLE 3.1
SUMMARY OF HISTORICAL DATA

Hangar 1000

Parameter	Max Concentration *	Parameter	Max Concentration *
Barium	0.432 mg/L	Trichloroethene	2.2 mg/L
Cadmium	0.00306 mg/L	trichlorofluoroethane	3.5 mg/L
Chromium	0.213 mg/L	vinyl chloride	0.0017 mg/L
Lead	0.143 mg/L	acenaphthalene	0.077 mg/L
Acetone	0.14 mg/L	bis (2-ethylhexyl) phthalate	0.0032 mg/L
Benzene	0.008 mg/L	benzo(a)anthracene	0.07 mg/L
Ethyl Benzene	0.007 mg/L	benzo(a)pyrene	0.07 mg/L
Toluene	0.031 mg/L	benzo(b)fluoranthene	0.069 mg/L
xylenes	0.1 mg/L	benzo(k)fluoranthene	0.066 mg/L
bromoethane	0.0065 mg/L	cresol	0.087 mg/L
1,1-DCA	0.63 mg/L	2-chlorophenol	0.058 mg/L
1,2-DCA	0.0017 mg/L	chrysene	0.086 mg/L
1,1-DCE	2.5 mg/L	benzo(a,h)anthracene	0.079
mg/L1,2-DCE (mixed)	5 mg/L	indeno(1,2,3-cd)pyrene	0.062 mg/L
tetrachloroethene	0.035 mg/L	p-cresol	0.1 mg/L
toluene	1.7 mg/L	naphthalene	0.13 mg/L
1,1,1-TCA	3.6 mg/L	4-nitrophenol	0.12 mg/L
1,1,2-TCA	0.0047 mg/L	N-nitroso-di-n-propylamine	0.053 mg/L
Methylethyl ketone	0.19 mg/L	pentachlorophenol	0.13 mg/L
methylene chloride	0.003 mg/L	2,4-dimethylphenol	0.018 mg/L
Phenol	0.085 mg/L		

* Maximum concentration is listed instead of concentration range because most constituents were not detected at multiple locations.

T-56 Engine Wash Area – No previous sampling information was included in the closure permit; therefore TtNUS has included the maximum concentration of the metals detected in the waste water that was discharged into this area.

Parameter	Maximum Concentration
Barium	0.088 mg/L
Cadmium	9.43 mg/L
Chromium	0.409 mg/L
Silver	0.004 mg/L

3.2.2 Intended End Use of Data:

_X_ Permit Compliance (Permit No. HF16288092)
___ Feasibility Study
___ Consent Order Compliance
___ Remedial Action
___ Contamination Assessment
___ Water Quality Database (Specify which Database: ________)
___ Facility Operating Report
___ Other: ________________

3.2.3 Project Schedule and Scope of Work

April 28, 1999
Project Beginning Date

Mar 31, 2005 (due to end of contract with consultant)
Project Ending Date

Major Project Tasks

The major tasks for Hangar 1000 of this project include:

Begin first quarter sampling field activities	Within 15 days of receipt of approved QAPP
First quarter groundwater sampling	5 days
Groundwater samples chemical analysis by Accutest	30 days
Data validation, chemical database entry and GIS	30 days
Draft quarterly sampling report submittal to FDEP	30 days from completion of EGIS
Regulator review of draft report	30 days
Issue final report	15 days

Each subsequent quarterly monitoring event will be performed on a similar schedule throughout the duration of the contract between SOUTHDIV and TtNUS, as directed by SOUTHDIV and required by FDEP and the Navy. The scope of work associated with the upcoming RI/FS planned for this site will be included in a revision to this document after that work has been authorized by the Navy.

The major tasks for T-56 Engine Wash Area of this project include:

Quarterly groundwater replicate sampling for Appendix IX metals of two (2) existing monitoring wells.

Collection of four soil and three sediment samples from the storm water pond near T-56 during the first sampling event.

The schedule for quarterly sampling at this site is similar to the schedule presented above for the Hangar 1000 site listed above. This sampling is anticipated to occur for the first year of this project only, and is intended to provide statistical evidence that the subsurface is not impacted from operations which previously occurred at the T-56 Engine Wash Area

3.3 Project Organization

3.3.1 Project Organization

Sample collection activities will be conducted by **Tetra Tech NUS, Inc**. personnel. The analytical work will be performed by Accutest Laboratories, inc. (Accutest), who is a Florida Department of Health – Division of Laboratory Services laboratory certified to perform the analyses requested for this project. Accutest, FL has a current FDEP-approved Comprehensive Quality Assurance Plan (CompQAP) (CompQAP number 940304, revision 12), last updated June 24, 1998. Accutest, MA has a current FDEP-approved CompQAP (CompQAP number 980076). Accutest, NJ has a current FDEP-approved CompQAP (CompQAP number 920124).

Refer to Figure 3.1 for the specific organization of this project.

3.3.2 Personnel Modifications or Additions

The following personnel are not included in the CompQAPs of the referenced organizations (include brief descriptions of project responsibilities):

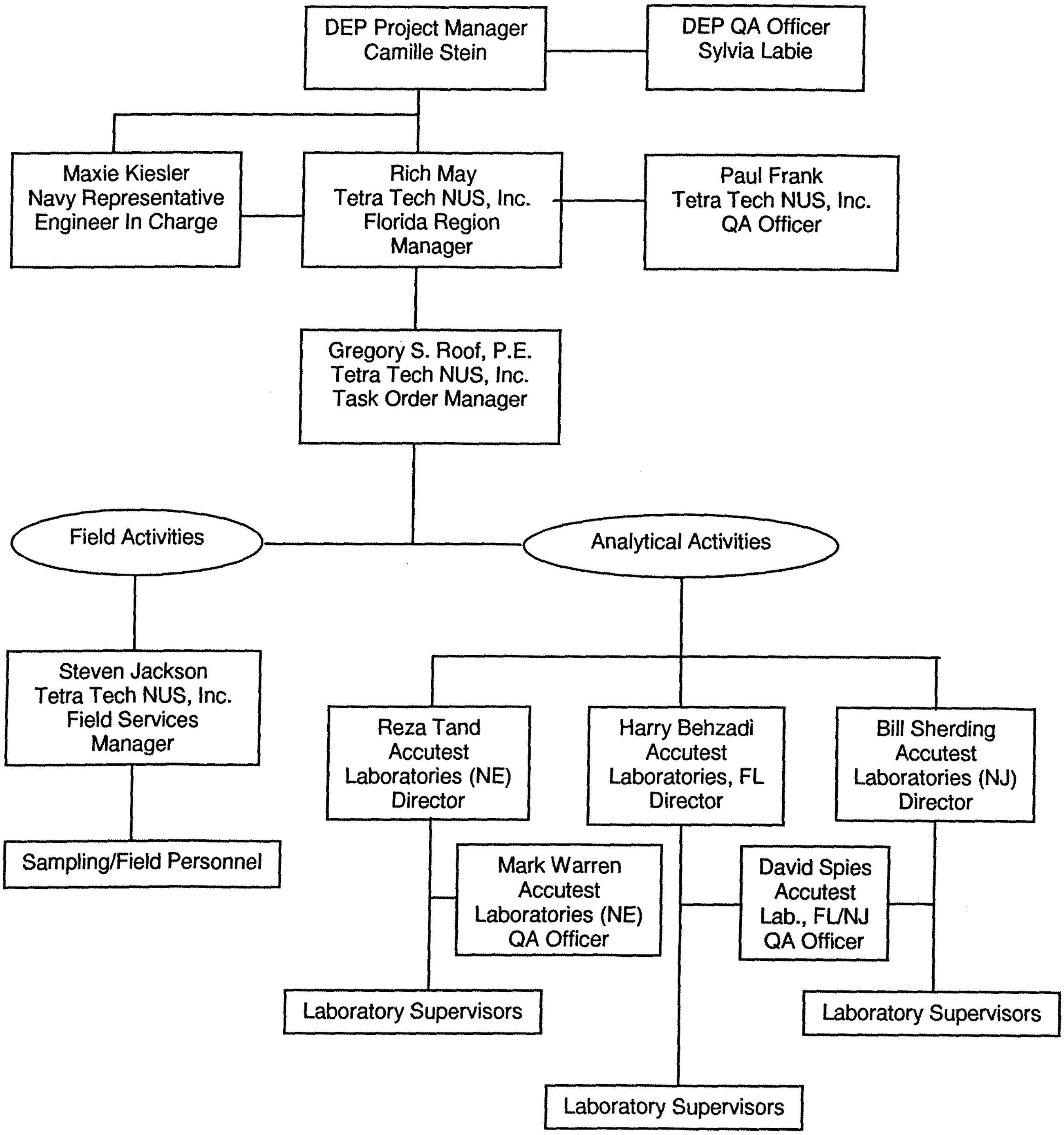
A. Field Personnel

1. No modifications

B. Laboratory Personnel

1. No modifications

FIGURE 3.1
PROJECT ORGANIZATION



3.4 Project Objectives

3.4.1 Data Quality Objectives

__**X**__ The data quality objectives for this project are the routine QA targets listed in the laboratory CompQAP.

_**N/A**_ The minimum detection limits specified in the laboratory CompQAP and are included as a part of Table 3.2.

_**N/A**_ The precision and accuracy requirements differ from the routine targets specified in the laboratory CompQAP and are included as a part of Table 3.2.

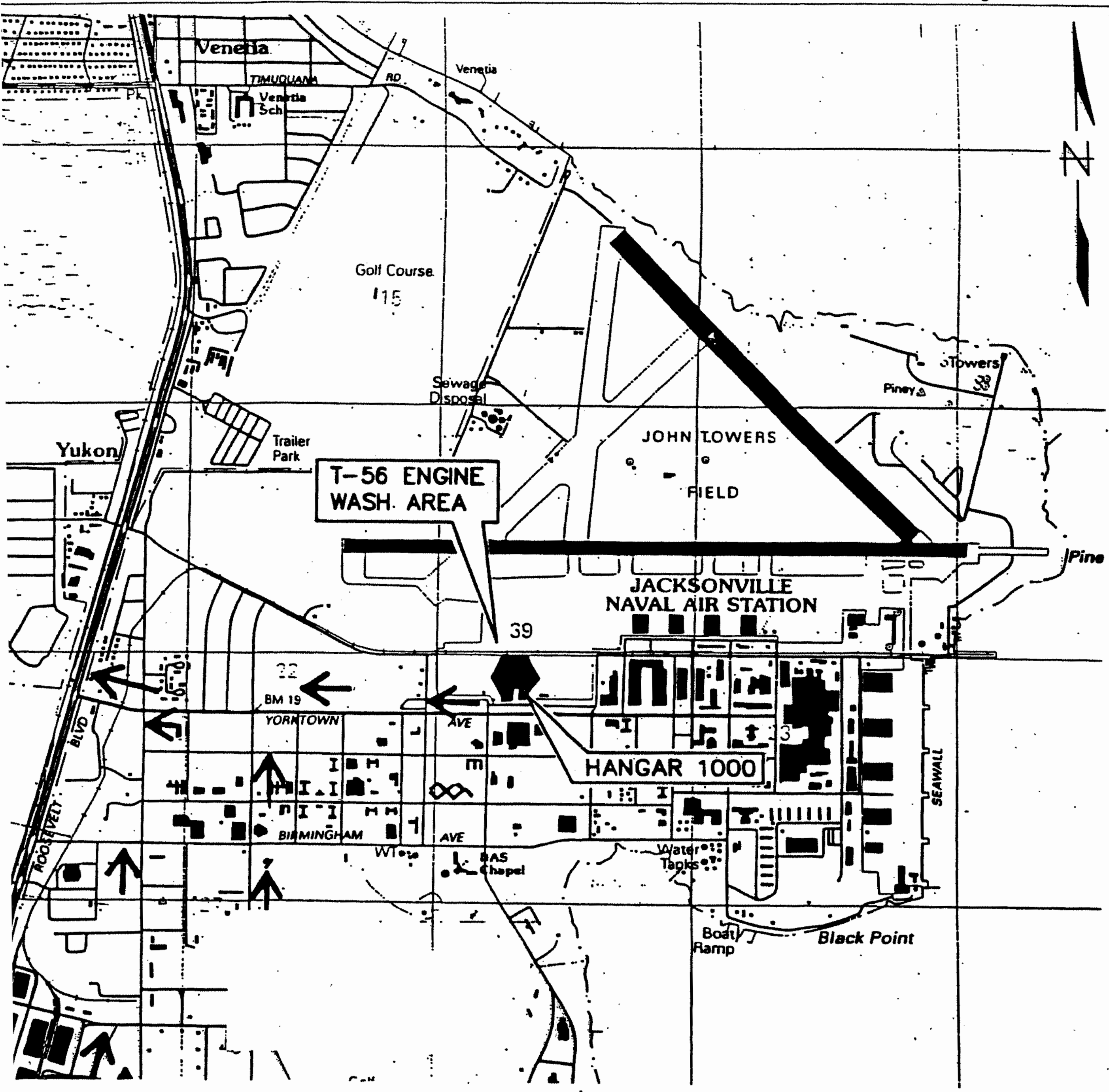
3.4.2 Proposed Samples for Project

a. See Figure 3.2 for a map of the project site.

b. See Table 3.2 of this Section for a summary of the sampling and analysis activities.

3.4.3 Summary of Matrix Types, Analytical Methods and QA Targets

Field and laboratory analytical measurements are presented in Table 3.2.



URCE: FIGURE B-1, SITE PLAN AND TRAFFIC PATTERNS, NAVAL AIR STATION - JACKSONVILLE, CKSONVILLE, FLORIDA, FROM THE 'APPLICATION FOR CLOSURE PERMIT, T-56 ENGINEWASH AREA, NGAR 1000, AND DISEASE VECTOR ECOLOGY AND CONTROL CENTER - BUILDING 937, DATED PTEMBER 1998, FRP ASSOCIATES, INC.

AWN BY / DATE R 3/12/99		FIGURE 3.2 SITE MAP	CONTRACT NO. N62467-94-D-0888
CKED BY / DATE	DEPARTMENT OF THE NAVY ★ SOUTHERN DIV FACILITIES ENGINEERING COMD	HANGAR 1000 AND T-56 ENGINE WASH AREA NAS JACKSONVILLE JACKSONVILLE, FLORIDA	APPROVED BY / DATE
OST/SCHED-AREA			APPROVED BY / DATE
SCALE IN = 2000 FT			DRAWING NO. CTO95.DWG / REV. 0

TABLE 3.2
PROPOSED SAMPLES, MATRICES AND ANALYTICAL METHODS FOR THE PROJECT

The standards outlined in DEWP Rule 62- 785 are the limit criteria for this project. The detection limits reported for this project shall at least meet, or be lower than the stated standards.

FIELD MEASUREMENTS WILL BE PERFORMED BY: **Tetra Tech NUS, Inc.,** whose CompQAP is **980038** with annual approval on **July 23, 1999.**

PARAMETER*	METHOD
Alkalinity and Dissolved Inorganic Carbon	HACH 8203(based on SM2320)
Carbon Dioxide	HACH 8205(based on SM4500-CO_2, modified)
Dissolved Oxygen	CHEMetrics K7501/K7512(based on ASTM D5543-94/D888-87)
Eh	SM 2580B
Ferrous Iron	HACH 8146(based on SM 315, modified)
Hydrogen Sulfide	HACH HS-C proprietary (based on SM 427 (3.c), modified)
pH	pH Probe (based on EPA 150.1)
Specific Conductance	Specific Conductance probe (based on EPA 120.1)
Sulfide	HACH 8131(based on EPA 376.2/SM4500-S^{2-}/SM427, modified)
Temperature	Electronic thermometer (based on EPA 170.1)
Turbidity	Turbidimeter (based on EPA 180.1)

*These are screening measurements used to evaluate the utility of natural attenuation remedial options. Unless otherwise indicated, only water will be tested for the parameter.

FIELD SAMPLE COLLECTION ACTIVITIES WILL BE PERFORMED BY THE ABOVE NAMED ORGANIZATION.

LABORATORY ANALYSES WILL BE PERFORMED BY: ACCUTEST, Inc., FL, whose COMPQAP is 940304 with annual approval on June 24.

									QA Targets[1]		
FREQUENCY	SAMPLE MATRIX	SAMPLE SOURCE	# SAMPLES	TB[2]	EB	FD	ANALYTICAL METHOD #	COMPONENT[3,4]	P	A	MDL
Single event (1st Qtr)	Soil	T-56 settling basin	4	0	1	1	SW-846 6010B SW-846 1312/6010B/	40CFR 264 Appendix IX Metals Cobalt, copper, lead, thallium, tin			
Single event (1st Qtr)	Sediment	T-56 settling basin	3	0	1	0	SW-846 6010B	40CFR 264 Appendix IX Metals			
Quarterly for four quarters (every 14th day for 4	WATER	MW-20 and MW-21	32	0	4	0	SW-846 6010B	40CFR 264 Appendix IX Metals			

FREQUENCY	SAMPLE MATRIX	SAMPLE SOURCE	# SAMPLES	TB[2]	EB	FD	ANALYTICAL METHOD #	COMPONENT[3,4]	QA Targets[1] P	A	MDL
sampling activities per quarter per well)											
Quarterly (one sampling event per quarter per well)	WATER	MW-2, MW-5, MW-8, H1-IS-MW-18, H1-IS-MW-17, H1-SS-MW-16, H1-SS-MW-19, H1-SS-MW-22 (MWs at Hangar 1000)	24	3	3	3	SW-846 8260	Attachment 1 VOCs			
							SW-8270C	Attachment 1 SVOCs			
							SW-846 8270 Selective ion Monitoring	pentachlorophenol and 2,4-dinitrotoluene			
							SW-846 6010B	cadmium and chromium			
							Nitrite/nitrate	EPA 353.2			
							Methane/ethane/ethene	RSK SOPs 147 and 175			
							Chloride	EPA 325.3			
							Sulfate	EPA 375.4			
							Sulfide	EPA 376.1			
Fourth Quarter (one sampling event per well)		MW-2, MW-5, MW-8, H1-IS-MW-18, H1-IS-MW-17, H1-SS-MW-16, H1-SS-MW-19, H1-SS-MW-22 (MWs at Hangar 1000), except most contaminated well as evident from first three quarters – see next line	7	1	1	1	SW-846 8260	Attachment 1 VOCs			
							SW-8270C	Attachment 1 SVOCs			
							SW-846 8270 Selective ion Monitoring	pentachlorophenol and 2,4-dinitrotoluene			
							SW-846 6010B	cadmium and chromium only			
							Nitrite/nitrate	EPA 353.2			
							Methane/ethane/ethene	RSK SOPs 147 and 175			
							Chloride	EPA 325.3			
							Sulfate	EPA 375.4			
							Sulfide	EPA 376.1			

FREQUENCY	SAMPLE MATRIX	SAMPLE SOURCE	# SAMPLES	TB[2]	EB	FD	ANALYTICAL METHOD #	COMPONENT[3,4]	QA Targets[1] P	A	MDL
Fourth Quarter (one sampling event per well)		Most contaminated well of the wells listed on the line above, as evident from first three sampling quarters	1	1	1	1	SW-846 8260	Attachment 1 VOCs			
							SW-8270C	Attachment 2 SVOCs			
							SW-846 8270 Selective ion Monitoring	pentachlorophenol and 2,4-dinitrotoluene			
							SW-846 6010B	40CFR 264 Appendix IX Metals			
							Nitrite/nitrate	EPA 353.2			
							Methane/ethane/ethene	RSK SOPs 147 and 175			
							Chloride	EPA 325.3			
							Sulfate	EPA 375.4			
							Sulfide	EPA 376.1			

TB – Trip Blank
SS – Soil Sample
EB – Equipment Blank
FD – Field Duplicate
MDL – Method Detection Limit
GW – Groundwater
SED – Sediment
P – Precision
A – Accuracy

[1]These values need to be completed if the Data Quality Objectives stated in the project description are different from the routine QA objectives cited in the CompQAP(s) or are not included in the CompQAP(s).
[2]One trip blank will be used in each sample cooler.
[3]These components are listed as target analytes in the laboratory CompQAP, except for methane/ethane/ethene, nitrate/nitrite, chloride, sulfide and sulfate, which are screening parameters for evaluating the utility of natural attenuation.
[4]Compliance target analytes are listed in Attachment 1 and are part of the routine target analytes for SW-846 methods cited in this QAPP.

TABLE 3.2a
PROPOSED SAMPLES, MATRICES AND ANALYTICAL METHODS FOR THE PROJECT

The standards outlined in DEWP Rule **62-**_785_ are the limit criteria for this project. The detection limits reported for this project shall at least meet, or be lower than the stated standards.

FIELD MEASUREMENTS WILL BE PERFORMED BY: **Tetra Tech NUS, Inc.,** whose CompQAP is **980038** with annual approval on **July 23, 1999.**

PARAMETER*	**METHOD**
Same as Table 3.2	Same as Table 3.2

FIELD SAMPLE COLLECTION ACTIVITIES WILL BE PERFORMED BY THE ABOVE NAMED ORGANIZATION.

LABORATORY ANALYSES WILL BE PERFORMED BY: ACCUTEST, Inc. (NE), in Marlborough, Massachussettes, whose COMPQAP is 980076.

									QA Targets[1]		
FREQUENCY	**SAMPLE MATRIX**	**SAMPLE SOURCE**	**# SAMPLES**	**TB**	**EB**	**FD**	**ANALYTICAL METHOD #**	**COMPONENT[2,3]**	**P**	**A**	**MDL**
Quarterly (one sampling event per quarter per well)	Water	MW-2, MW-5, MW-8, H1-IS-MW-18, H1-IS-MW-17, H1-SS-MW-16, H1-SS-MW-19, H1-SS-MW-22 (MWs at Hangar 1000)	24	0	3	3	SW-846 8310	PAHs			
Fourth Quarter (one sampling event per well)		MW-2, MW-5, MW-8, H1-IS-MW-18, H1-IS-MW-17, H1-SS-MW-16, H1-SS-MW-19, H1-SS-MW-22 (MWs at Hangar 1000), except most contaminated well as evident from first three quarters – see next line	7	0	1	1	SW-846 8310	PAHs			
Fourth Quarter (one sampling event per well)		Most contaminated well of the wells listed on the line above, as evident from first three sampling quarters	1	0	1	1	SW-846 8310	PAHs			

[1]These values need to be completed if the Data Quality Objectives stated in the project description are different from the routine QA objectives cited in the CompQAP(s) or are not included in the CompQAP(s).
[2]These components are listed as target analytes in the laboratory CompQAP.
[3]Compliance target analytes are listed in Attachment 1 and are part of the routine target analytes for SW-846 methods cited in this QAPP.

TABLE 3.2b
PROPOSED SAMPLES, MATRICES AND ANALYTICAL METHODS FOR THE PROJECT

The standards outlined in DEWP Rule 62- 785 are the limit criteria for this project. The detection limits reported for this project shall at least meet, or be lower than the stated standards.

FIELD MEASUREMENTS WILL BE PERFORMED BY: Tetra Tech NUS, Inc., whose CompQAP is 980038 with annual approval on July 23, 1999.

PARAMETER*	METHOD
Same as Table 3.2	Same as Table 3.2

FIELD SAMPLE COLLECTION ACTIVITIES WILL BE PERFORMED BY THE ABOVE NAMED ORGANIZATION.

LABORATORY ANALYSES WILL BE PERFORMED BY: ACCUTEST, Inc. (NJ) in Dayton, New Jersey, whose COMPQAP is 920124.

FREQUENCY	SAMPLE MATRIX	SAMPLE SOURCE	# SAMPLES	TB	EB	FD	ANALYTICAL METHOD #	COMPONENT[2,3]	QA Targets[1] P	A	MDL
Quarterly (one sampling event per quarter per well)	Water	MW-2, MW-5, MW-8, H1-IS-MW-18, H1-IS-MW-17, H1-SS-MW-16, H1-SS-MW-19, H1-SS-MW-22 (MWs at Hangar 1000)	24	3	3	3	SW-846 8015B Direct Aqueous Injection	methanol			
Fourth Quarter (one sampling event per well)		MW-2, MW-5, MW-8, H1-IS-MW-18, H1-IS-MW-17, H1-SS-MW-16, H1-SS-MW-19, H1-SS-MW-22 (MWs at Hangar 1000), except most contaminated well as evident from first three quarters – see next line	7	1	1	1	SW-846 8015B Direct Aqueous Injection	methanol			
Fourth Quarter (one sampling event per well)		Most contaminated well of the wells listed on the line above, as evident from first three sampling quarters	1	1	1	1	SW-846 8015B Direct Aqueous Injection	methanol			

[1]These values need to be completed if the Data Quality Objectives stated in the project description are different from the routine QA objectives cited in the CompQAP(s) or are not included in the CompQAP(s).
[2]These components are listed as target analytes in the laboratory CompQAP.
[3]Compliance target analytes are listed in Attachment 1 and are part of the routine target analytes for SW-846 methods cited in this QAPP.

Section 4.0 FIELD PROCEDURES AND QUALITY CONTROL

This section specifies the protocols and procedures to be used by **Tetra Tech NUS, Inc.** personnel when conducting sampling activities for this project.

4.1 Sampling Equipment

See Table 4.1 for a list of the equipment to be used for this project.

4.2 Field Activities

See Table 4.2

4.2.1 Sampling Protocols

Sampling protocols for this project that are not specified by the CompQAP specified in Table 4.2 include the following:

Only the protocols specified in the CompQAP will be used for this project.

4.2.2 Disposal Protocols

Disposal protocols for this project for handling wastes differ from those specified by the CompQAP. Investigation Derived Wastes (IDW) will be handled according to the following protocols:

Purge waters will be contained on-site until receipt of analytical data. Copies of drum logs will be provided to the NAS Jacksonville environmental office following the completion of field activities. Laboratory analytical results of the IDW samples will also be provided to the NAS Jacksonville environmental office upon receipt by TtNUS. The Navy will manage the waste in accordance with the installation's protocol for waste management and as required in the FDEP interoffice memorandum regarding "Management of Contaminate Media under RCRA" dated July 27, 1995.

4.3 Field Measurements

Field measurements are listed in Table 3.2 of this QAPP. The field screening measurements that will be made are:

1. Alkalinity and Dissolved Inorganic Carbon	HACH 8203(based on SM2320)
2. Carbon Dioxide	HACH 8205(based on SM4500-CO_2, modified)
3. Dissolved Oxygen	CHEMetrics K7501/K7512(based on ASTM D5543-94/D888-87)
4. Eh	SM 2580B
5. Ferrous Iron	HACH 8146(based on SM 315, modified)
6. Hydrogen Sulfide	HACH HS-C, proprietary (based on SM 427 (3.c), modified)
7. pH	pH Probe (based on EPA 150.1)
8. Specific Conductance	Specific Conductance probe (based on EPA 120.1)
9. Sulfide	HACH 8131(based on EPA 376.2/SM4500-S^{2-}/SM427, modified
10. Temperature	Electronic thermometer (based on EPA 170.1)
11. Turbidity	Turbidimeter (based on EPA 180.1)

TABLE 4.1
PROPOSED SAMPLING EQUIPMENT

The following equipment may be used by **Tetra Tech NUS, Inc.** for this project. With the exception of additional equipment, discussions on use and restrictions are included in CompQAP No. **980038** updated with annual amendments, which are approved **July 23, 1999.**

	EQUIPMENT DESCRIPTION	CONSTRUCTION MATERIALS	USE
Purging Equipment (include construction of tubing, tail pipes, etc.)			
1.	Grundfros Redi-Flo 2" submersible pump	Stainless Steel	Purging
2.	Hosing	Food Grade PVC	Purging
3.	Low-flow peristaltic pump	N/A	Purging
Sampling Equipment			
1.	Tubing	Teflon	GW Sampling
2.	Tubing	Other Plastic (Medical grade silicone)	GW Sampling
3.	Low-flow peristaltic pump	N/A	GW Sampling
4.	Trowel	Stainless Steel	Soil Sampling
5.	Petite Ponar Dredge	Stainless Steel	Sediment Sampling
6.	Scoop	Stainless Steel	Sediment Sampling

Additional equipment not address in the CompQAP includes [1]:

1. none

[1] If the sampling protocols for using this equipment are not included in the cited CompQAP, the sampling protocols must be discussed in Section 4.2.1 of this Quality Assurance Project Plan.

Field Measurement Equipment (construction does not need to be specified)

1. Keck ET94 Water level Indicator
2. Hach Test Kits for Nitrate, Nitrite (for screening)
3. YSI Water Quality Meter 6820/6920 (for screening)
4. Horriba Water Quality Meter U-10 (for screening)

TABLE 4.2
FIELD ACTIVITIES

The following field protocols will be used by **Tetra Tech NUS, Inc.** personnel. The Comprehensive QA Plan number for **Tetra Tech NUS, Inc.** is 980038. The date of the last update approval is **July 23, 1999**.

All protocols, procedures and policies in the above-mentioned document which are pertinent to this Quality Assurance Project Plan will be followed and are summarized below:

	VOCs	Extractable Organics	Metals	Inorganic Anions	Organics	Physical Properties	Micro	Other (Specify)
Groundwater	X	X	X	X		X		
Groundwater (in-place plumbing)								
Potable Water								
Surface Water								
Soil			X					
Sediment/Sludges			X					
Automatic Samplers								
Field Filtration								
Waste Water								
Stormwater								
Air								

SAMPLE CONTAINERS

Sample containers will be provided by the Florida Department of Health – Division of Laboratory Services approved laboratory, ACCUTEST, Inc. **The Accutest Florida facility will supply all sampling containers.** *

__X_ Sample containers will be pre-preserved by the above-referenced organization and be provided; **OR**

____ Field organizations will preserve samples onsite using protocols outlined in the CompQAP.

EQUIPMENT DECONTAMINATION

Equipment decontamination will follow protocols outlined in the above-referenced CompQAP. *

EQUIPMENT SHALL BE PRECLEANED PRIOR TO ON-SITE ARRIVAL

*** If more than one organization is involved with these activities, this QAPP must specifically identify the equipment and/or sample containers to be provided by each organization.**

WASTE DISPOSAL

___ The procedures for handling wastes from equipment cleaning and from sampling are discussed in the above-referenced CompQAP.

_X_ The disposal procedures for handling wastes for this project differ from those outlined in the above-referenced CompQAP and are outlined in Section 4.2.2.

Section 5.0 LABORATORY PROCEDURES AND QUALITY CONTROL

The laboratory analyses shall be conducted by the **ACCUTEST, Inc.** Florida, Massachussettes and New Jersey facilities.

Section 5.0a Accutest, Inc., Florida Facility

The Comprehensive QA Plans number for the Accutest Florida facility is **940304, revision 12.** The date of the last update approval is **June 24, 1998.**

All protocols, procedures and policies in the above-mentioned document that are pertinent to this Quality Assurance Project Plan shall be followed. The laboratory shall analyze the samples for this project by the methods specified in Table 3.2 of this QAPP.

Section 5.0b Accutest, Inc., Massachussettes Facility

The Comprehensive QA Plans number for the Accutest, Inc. Massachussettes facility is **980076.** The date of the last update approval is **January 8, 1999.**

All protocols, procedures and policies in the above-mentioned document that are pertinent to this Quality Assurance Project Plan shall be followed. The laboratory shall analyze the samples for this project by the methods specified in Table 3.2 of this QAPP.

Section 5.0c Accutest, Inc., New Jersey Facility

The Comprehensive QA Plans number for the Accutest, Inc. New Jersey facility is **920124.** The date of the last update approval is **November 17, 1998.**

All protocols, procedures and policies in the above-mentioned document that are pertinent to this Quality Assurance Project Plan shall be followed. The laboratory shall analyze the samples for this project by the methods specified in Table 3.2 of this QAPP.

5.1 Quality Control Checks, Accutest, Florida Facility

The types of laboratory control checks that will be used when analyzing samples for this project in the Accutest Florida facility are;

Chemical:

___ Reagent Blanks
_X_ Duplicate Samples
_X_ Duplicate Matrix Spikes
_X_ Continuing Calibration Standards
_X_ Other: LCS
_X_ Matrix Spikes
___ QC Check Samples
_X_ QC Check Standards

Microbiology:

___ Duplicates
___ Carry over blanks (MF)
___ Positive & Negative Controls
___ Other: ________________
___ Control Blanks (MF)
___ Dilution Blanks (MPN)

5.1a Quality Control Checks, Accutest, Massachussettes Facility

The types of laboratory control checks that will be used when analyzing samples for this project in the Accutest Massachussettes facility are;

Chemical:

___ Reagent Blanks
_X_ Duplicate Samples
_X_ Duplicate Matrix Spikes
_X_ Continuing Calibration Standards
_X_ Other: LCS
_X_ Matrix Spikes
___ QC Check Samples
_X_ QC Check Standards

Microbiology:

___ Duplicates
___ Carry over blanks (MF)
___ Positive & Negative Controls
___ Other: ____________
___ Control Blanks (MF)
___ Dilution Blanks (MPN)

5.1b Quality Control Checks, Accutest, New Jersey Facility

The types of laboratory control checks that will be used when analyzing samples for this project in the Accutest New Jersey facility are;

Chemical:

___ Reagent Blanks
_X_ Duplicate Samples
_X_ Duplicate Matrix Spikes
_X_ Continuing Calibration Standards
_X_ Other: LCS
_X_ Matrix Spikes
___ QC Check Samples
_X_ QC Check Standards

Microbiology:

___ Duplicates
___ Carry over blanks (MF)
___ Positive & Negative Controls
___ Other: ____________
___ Control Blanks (MF)
___ Dilution Blanks (MPN)

Section 6.0 QUALITY ASSURANCE MANAGEMENT

6.1 Corrective Actions

In addition to corrective actions cited in the approved Comprehensive QA Plans, all involved parties will initiate any corrective action deemed necessary by FDEP.

6.2 Performance and System Audits

6.2.1 Field Activities

Specific audits planned for this project are

Audit Type	Frequency/Date	Description
1. Routine	As indicated in CompQAP (DER SOP 12.0)	Routine

6.2.2 Laboratory Activities

Specific audits planned for this project are:

Audit Type	Frequency/Date	Description
1. Routine	As indicated in CompQAP (DER SOP 12.0)	Routine

ALL INVOLVED PARTIES WILL CONSENT TO AUDITS BY DEP IF DEEMED NECESSARY.

6.3 Quality Assurance Reports

Project specific QA Reports will be submitted to FDEP and the Navy at a frequency of once following the first year of post closure monitoring.

Note: Frequency must comply with Table V, Appendix D of the DEP Manual for Preparing Quality Assurance Plans or Table 6 of Chapter 62-160, F.A.C., Quality Assurance.

Appendix 1
Primary Contaminants of Interest

The following table presents primary VOC, SVOC and metal contaminants of interest for this project. Also presented are the Florida of Administrative Code (F.A.C.) 62-785 acceptance limits for those chemicals.

TABLE A.1
Compliance Monitoring and Standards[1] - Hangar 1000

Naval Air Station Jacksonville
Jacksonville, Florida

Volatile Organic Compounds		Semi-volatile Organic Compounds	
Parameter	**Standard (minimum DL) ug/L**	**Parameter**	**Standard (minimum DL) ug/L**
Acetone	700	Acenaphthene	20
Benzene	1	Benzo(a)anthracene	0.2
n-butanol	700	Benzo(a)pyrene	0.2
Carbon Disulfide	700	Benzo(b)fluoranthene	0.2
Carbon Tetrachloride	3	Benzo(k)fluoranthene	0.5
Carbazole	4	2-Chlorophenol	35
Chlorobenzene	100	Chrysene	4.8
Cyclohexanone	35,000	Dibenz(a,h)anthracene	0.2
1,1-Dichloroethane	70	2,4-Dinitrotoluene	0.2
1,2-Dichloroethane	3	Indeno(1,2,3-cd)pyrene	0.2
1,1-Dichloroethene	7	2-Methylphenol	35
1,2-Dichloroethene (total)	63	3-Methylphenol	35
Ethylbenzene	700	4-Methylphenol	4
Isobutanol	2,100	Naphthalene	20
Methanol	5,000	4-Nitrophenol	56
Methylene Chloride	5	N-nitroso-di-n-propylamine	4
2-Nitropropane	PQL[2]	Pentachlorophenol	1
Tetrachloroethane	3	Phenol	10
Toluene	1,000	Pyridine	7
1,1,1-Trichloroethane	200	1,1,1-Trichloro-1,2,2,-Trifluoroethane	PQL[2]
1,1,2-Trichloroethane	5	**Metals Parameter**	**Standard (minimum DL) ug/L**
Trichloroethene	3	Chromium, Total	100
Xylenes	10,000	Cadmium	5
Vinyl Chloride	1		

Notes:
1 As listed in Table 1 of Chapter 62-785, Florida Administrative Code (F.A.C.)
2 Neither 2-Nitropropane nor 1,1,1-Trichloro-1,2,2-Trifluoroethane has a groundwater standard listed in chapter 62-785, F.A.C. The Practical Quantitation Limit (PQL) for each parameter will therefore serve as the standard

Accutest Laboratories Southeast

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Phone 407-425-6700 Fax 407-425-0707

Fax

To:	Greg Roof	**From:**	Dave Greer
Fax:	904-281-0070	**Pages:**	~~2~~ 3
Phone:	904-281-0400	**Date:**	11/22/1999
Re:	MDL results for SVOA by SIM	**CC:**	

☐ **Urgent** ☑ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

• **Comments:** If you did not receive all the pages, please call 407-425-6700

Greg,

Attached is a copy of our MDLs for selected SVOA by SIM. Please note that the Pentachlorophenol MDL is just under 1.0 ug/L and the spike level was 5 ug/L. The percent recovery for PCP is generally lower than other compounds (approx. 50%). I am also enclosing our New Jersey laboratory's MDL for the alcohols. Let me know if you need anything else.

Dave

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Orlando, Florida 32811

METHOD DETECTION LIMIT STUDY

Method: 8270C SIM **Date: 12/01/98** **Instrument: GC/MS2** **Analyst: NF**
Prep: 3510

Column: DB-5 **MDL Concentration: 1.0ug/l** **Matrix: water** **Units: ug/l**
MDL Concentration: 5.0ug/l (PCP)

Analyte	Data File L000808 mdl-1	Data File L000809 mdl-2	Data File L000810 mdl-3	Data File L000811 mdl-4	Data File L000812 mdl-5	Data File L000813 mdl-6	Data File L000814 mdl-7	S	MDL
1,4-Dichlorobenzene-d4 IS	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.000	**0.000**
bis(2-chloroisopropyl)ether	0.84	0.84	0.87	0.86	0.85	0.85	0.75	0.040	**0.125**
Acenaphthene-d10 IS	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.000	**0.000**
2,6-Dinitrotoluene	0.71	0.72	0.73	0.69	0.71	0.70	0.59	0.047	**0.148**
2,4-Dinitrotoluene	0.63	0.62	0.64	0.61	0.67	0.61	0.51	0.050	**0.157**
Phenanthrene-d10 IS	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.000	**0.000**
Hexachlorobenzene	0.89	0.89	0.90	0.89	0.87	0.89	0.82	0.027	**0.086**
Pentachlorophenol	2.26	1.97	2.21	2.04	2.31	2.01	1.39	0.310	**0.975**

Method Detection Limit Calculation (MDL) = S x (T Value)

T Value = 3.143 for N - 1 = 6

Accutest Laboratories Annual Method Detection Limit Determination
Method: Alcohols by Direct Injection Matrix: Aqueous
Determination Date: 3/4/99

Compound	Spike ug/l ppb	R1 ug/l	R2 ug/l	R3 ug/l	R4 ug/l	R5 ug/l	R6 ug/l	R7 ug/l	X-Bar ug/l	Std Dev ug/l	MDL ug/l
Methanol	500	536	511	497	537	526	508	486	514	19.47	61
Ethanol	500	561	486	488	485	495	487	495	500	27.40	86
Tert-Butyl Alcoh	500	570	502	446	479	513	476	488	496	38.84	122
1-Propanol	500	569	479	463	489	489	512	490	499	34.27	108
2-Propanol	500	545	474	455	500	493	501	509	497	28.23	89
Isobutanol	500	545	538	442	489	492	531	498	505	36.07	113
1-Butanol	500	568	551	453	515	488	565	538	525	42.71	134
2-Butanol	500	567	457	423	512	489	482	514	492	45.83	144

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METHOD DETECTION LIMIT STUDY

Method: 625 | **Date: 02/01/99** | **Instrument: GC/MS1** | **Analyst: NF**
Method: 3510C/8270C

MDL Concentration: 10.0ug/l
Column: DB-5 | **MDL Concentration: 20.0ug/l*** | **Matrix: water** | **Units: ug/l**

Analyte	*Data File* H003924 mdl-1	*Data File* H003925 mdl-2	*Data File* H003926 mdl-3	*Data File* H003927 mdl-4	*Data File* H003928 mdl-5	*Data File* H003929 mdl-6	*Data File* H003930 mdl-7	S	MDL
1,4-Dichlorobenzene-d4 IS	40.0	40.0	40.0	40.0	40.0	40.0	40.0	0.00	**0.00**
1,4-Dioxane	3.5	4.2	4.1	4.1	4.3	4.4	5.2	0.51	**1.60**
N-nitrosodimethylamine	2.9	3.4	3.5	4.0	4.5	4.2	4.2	0.57	**1.80**
Pyridine	1.2	1.6	2.1	1.6	2.3	2.0	1.6	0.36	**1.13**
Aniline	4.3	4.4	5.3	5.1	5.7	5.8	5.4	0.58	**1.83**
2-Fluorophenol SS (100)	46.2	49.4	56.6	58.7	61.1	61.9	60.8	6.20	**19.48**
bis(2-Chloroethyl)ether	8.0	7.2	8.8	9.4	9.7	9.7	9.2	0.96	**3.03**
Phenol-d5 SS (100)	29.9	31.3	36.5	37.2	39.5	39.0	39.3	3.94	**12.37**
Phenol	3.0	3.2	3.9	3.6	4.3	4.1	4.0	0.49	**1.54**
2-Chlorophenol	7.2	7.1	8.2	9.2	9.2	9.5	9.0	0.99	**3.13**
1,3-Dichlorobenzene	5.3	5.4	6.6	7.1	7.2	7.3	6.9	0.85	**2.66**
1,4-Dichlorobenzene	5.7	5.8	7.0	7.4	7.4	7.8	7.2	0.83	**2.61**
1,2-Dichlorobenzene	5.6	5.9	7.1	7.6	7.6	7.6	7.4	0.85	**2.66**
Benzyl alcohol	5.4	5.3	6.2	6.5	7.1	7.3	6.3	0.75	**2.36**
bis(2-chloroisopropyl)ether	8.4	8.3	9.8	10.5	10.6	11.0	10.3	1.09	**3.43**
2-Methylphenol	6.5	6.4	7.5	8.2	8.5	8.2	8.1	0.85	**2.68**
Hexachloroethane	4.9	5.3	6.6	6.8	7.3	7.3	7.0	0.95	**2.98**
N-Nitroso-di-n-propylamine	7.4	7.1	8.9	9.4	9.3	9.7	9.3	1.05	**3.29**
3&4-Methylphenol	5.9	5.8	6.9	7.3	7.6	7.9	7.0	0.81	**2.55**
Naphthalene-d8 IS	40.0	40.0	40.0	40.0	40.0	40.0	40.0	0.00	**0.00**
Nitrobenzene-d5 SS (50)	40.0	39.9	46.5	51.7	50.7	51.1	49.8	5.16	**16.22**
Nitrobenzene	7.5	7.6	9.1	10.3	10.3	9.9	9.3	1.18	**3.71**
Isophorone	8.4	8.1	9.6	10.7	10.7	10.3	10.2	1.08	**3.38**
2-Nitrophenol	7.8	7.7	9.1	9.7	10.2	9.8	9.2	0.97	**3.05**
2,4-Dimethylphenol	6.4	6.3	7.5	8.0	8.2	8.1	7.5	0.78	**2.47**
bis(2-Chloroethoxy)methane	8.1	8.1	9.6	10.4	10.6	10.5	9.8	1.07	**3.38**
Benzoic Acid*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	**0.00**
2,4-Dichlorophenol	7.8	8.0	9.3	10.1	10.2	10.0	9.3	0.99	**3.13**
1,2,4-Trichlorobenzene	5.5	5.8	7.1	7.4	7.9	7.4	7.3	0.89	**2.78**
Naphthalene	7.0	7.2	8.5	9.3	9.5	9.1	8.9	1.01	**3.18**
4-Chloroaniline	7.0	6.7	7.8	8.4	8.8	8.8	8.5	0.85	**2.68**
2,6-Dichlorophenol (NS)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	**0.00**
Hexachlorobutadiene	4.5	5.0	6.1	6.3	7.0	6.6	6.5	0.90	**2.83**
4-Chloro-3-methylphenol	7.5	7.3	8.5	9.7	9.8	9.8	9.1	1.09	**3.41**
-Methylnaphthalene	6.8	6.9	7.9	8.8	9.2	9.2	8.7	1.00	**3.16**
-Methylnaphthalene	7.9	8.1	9.2	9.8	9.9	10.0	9.7	0.89	**2.80**
Acenaphthene-d10 IS	40.0	40.0	40.0	40.0	40.0	40.0	40.0	0.00	**0.00**
Hexachlorocyclopentadiene	3.0	3.1	4.1	4.1	5.1	4.5	4.1	0.76	**2.39**
2,4,6-Trichlorophenol	7.5	7.4	8.9	9.8	10.1	9.5	8.9	1.06	**3.33**
2,4,5-Trichlorophenol	7.8	7.5	9.6	9.5	10.5	10.0	9.3	1.11	**3.48**
-Fluorobiphenyl SS (50)	39.2	39.3	46.7	49.0	50.6	47.7	48.2	4.62	**14.51**
-Chloronaphthalene	7.2	7.2	8.8	9.0	9.3	9.2	9.1	0.95	**2.97**
-Nitroaniline	7.2	7.3	8.4	9.6	9.9	8.8	8.8	1.04	**3.28**
Acenaphthylene	9.3	9.1	10.8	11.6	12.0	11.7	11.1	1.16	**3.66**
Dimethylphthalate	4.8	3.4	4.5	4.1	4.3	5.1	5.7	0.72	**2.26**
6-Dinitrotoluene	7.7	7.1	8.9	9.7	9.7	9.5	9.2	1.04	**3.27**

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Acenaphthene	7.7	8.0	9.5	9.9	10.1	9.8	9.6	0.95	**3.00**
3-Nitroaniline	7.1	6.9	8.1	8.8	9.3	9.0	8.6	0.97	**3.03**
2,4-Dinitrophenol*	8.4	8.0	10.0	11.1	11.9	12.1	9.9	1.60	**5.04**
Dibenzofuran	8.0	7.9	9.4	10.0	10.0	9.8	9.8	0.93	**2.93**
2,4-Dinitrotoluene	7.7	7.4	9.1	9.8	9.4	9.8	9.4	0.97	**3.06**
4-Nitrophenol*	5.4	5.5	6.9	7.2	7.4	7.5	7.0	0.88	**2.78**
2,3,4,6-Tetrachlorophenol (NS)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	**0.00**
Fluorene	8.1	8.3	9.7	10.3	10.8	10.4	10.1	1.06	**3.34**
4-Chlorophenyl-phenylether	8.0	7.9	9.6	10.2	10.4	10.2	10.4	1.12	**3.51**
Diethylphthalate	6.9	6.1	7.7	7.8	7.9	8.2	8.2	0.78	**2.45**
4-Nitroaniline	7.2	7.6	8.6	9.5	9.1	9.3	8.6	0.86	**2.69**
Phenanthrene-d10 IS	40.0	40.0	40.0	40.0	40.0	40.0	40.0	0.00	**0.00**
4,6-Dinitro-2-methylphenol	12.7	13.0	15.4	16.7	18.3	17.2	15.2	2.11	**6.62**
n-Nitrosodiphenylamine	8.0	8.3	10.4	10.7	11.0	10.4	9.9	1.21	**3.81**
1,2-Diphenylhydrazine	6.8	6.8	8.4	8.6	8.9	8.6	8.5	0.90	**2.83**
2,4,6-Tribromophenol SS (100)	84.6	85.7	104.8	107.8	108.8	104.9	103.7	10.33	**32.48**
4-Bromophenyl-phenylether	6.7	6.8	8.7	8.9	9.2	8.8	8.4	1.02	**3.20**
Hexachlorobenzene	8.2	8.6	10.6	11.2	11.3	10.8	10.7	1.26	**3.97**
Pentachlorophenol*	14.0	13.6	15.0	17.5	18.4	17.9	16.1	1.93	**6.06**
Phenanthrene	8.4	8.6	10.2	10.6	10.9	10.4	10.2	0.98	**3.09**
Anthracene	8.4	8.9	10.6	11.1	11.0	10.7	10.8	1.09	**3.44**
Carbazole	8.5	8.4	10.0	10.8	10.4	10.6	10.6	1.00	**3.15**
Di-n-butylphthalate	7.9	7.8	9.3	10.0	9.9	10.2	9.7	1.01	**3.17**
Fluoranthene	8.4	8.4	10.0	10.7	10.6	10.8	10.3	1.04	**3.28**
Chrysene-d12 IS	40.0	40.0	40.0	40.0	40.0	40.0	40.0	0.00	**0.00**
Benzidine*	12.2	12.5	14.6	12.0	16.1	12.1	11.5	1.69	**5.31**
Pyrene	8.0	8.0	10.3	10.4	10.7	10.2	9.8	1.16	**3.66**
Terphenyl-d14 SS (50)	39.6	40.3	51.9	52.5	51.7	51.1	48.3	5.61	**17.62**
Butylbenzylphthalate	7.7	7.5	9.4	9.8	10.2	10.3	9.4	1.15	**3.61**
3,3'-Dichlorobenzidine*	16.1	15.9	19.9	20.1	19.9	20.1	19.0	1.91	**5.99**
Benzo[a]anthracene	8.1	8.2	10.3	10.7	10.6	10.5	10.2	1.11	**3.50**
Chrysene	8.0	8.2	10.1	10.6	10.4	10.3	9.7	1.07	**3.37**
bis(2-Ethylhexyl)phthalate	8.0	8.1	9.9	10.5	10.6	10.5	10.1	1.16	**3.64**
Perylene-d12 IS	40.0	40.0	40.0	40.0	40.0	40.0	40.0	0.00	**0.00**
Di-n-octylphthalate	7.3	7.1	8.9	9.6	9.6	9.7	9.4	1.13	**3.55**
Benzo[b]fluoranthene	6.7	6.7	9.3	9.2	8.7	8.3	8.4	1.08	**3.41**
Benzo[k]fluoranthene	8.3	8.1	10.4	10.6	11.4	11.2	10.9	1.36	**4.29**
enzo[a]pyrene	7.5	7.4	9.5	10.0	9.6	9.4	9.4	1.06	**3.34**
ndeno[1,2,3-cd]pyrene	7.1	6.6	6.7	8.3	7.5	8.5	7.6	0.74	**2.32**
ibenz[a,h]anthracene	5.4	5.2	5.3	7.4	6.4	7.0	7.1	0.95	**3.00**
enzo[g,h,i]perylene	8.2	7.9	8.0	10.6	9.5	11.2	11.1	1.49	**4.68**

Data File	***Data File***	***Data File***	***Data File***	***Data File***	***Data File***	***Data File***
H003924	H003925	H003926	H003927	H003928	H003929	H003930
mdl-1	mdl-2	mdl-3	mdl-4	mdl-5	mdl-6	mdl-7

ethod Detection Limit Calculation (MDL) = S x (T Value)

Value = 3.143 for N - 1 = 6

Accutest Laboratories Annual Method Detection Limit Determination
Method: SW846 8260B Matrix: Water
Determination Date: 1/14/99

Compound Name	Spike ug/l	R1 ug/l	R2 ug/l	R3 ug/l	R4 ug/l	R5 ug/l	R6 ug/l	R7 ug/l	X-Bar ug/l	Std Dev ug/l	MDL ug/kg	Spike/MDL Ratio	R8 ug/l
Chlorodifluoromethane	2.00	2.17	1.94	1.91	1.83	2.13	2.09	2.05	2.02	0.13	0.40	5.1	2.03
dichlorodifluoromethane	2.00	1.90	1.89	1.99	1.83	1.84	2.19	2.06	1.96	0.13	0.41	4.8	2.08
chloromethane	2.00	2.44	2.12	2.05	1.99	2.31	2.18	2.25	2.19	0.16	0.49	4.1	2.12
vinyl chloride	2.00	2.56	2.24	2.14	2.11	2.41	2.39	2.31	2.31	0.16	0.50	4.0	2.35
bromomethane	2.00	2.41	2.10	1.97	2.14	2.15	2.18	2.18	2.16	0.13	0.41	4.8	2.05
chloroethane	2.00	2.43	2.14	2.18	2.10	2.14	2.28	2.11	2.20	0.12	0.37	5.3	2.20
trichlorofluoromethane	2.00	2.01	1.91	1.83	1.72	1.98	2.09	2.07	1.94	0.13	0.42	4.8	2.10
ethyl ether	2.00	11.01	9.79	9.52	9.47	10.09	9.48	9.70	9.87	0.55	1.73	1.2	9.68
acrolein	20.00	25.35	21.70	22.63	22.80	22.61	21.74	22.45	22.75	1.23	3.85	5.2	19.40
1,1-dichloroethene	2.00	2.29	2.05	1.94	1.90	2.11	2.05	2.21	2.08	0.14	0.44	4.6	1.99
tertiary butyl alcohol	10.00	9.86	5.05	6.34	7.54	7.12	7.67	8.91	7.50	1.59	4.98	2.0	9.36
acetone	2.00	15.02	9.88	11.37	10.65	8.89	12.68	11.12	11.37	2.00	6.28	0.3	15.25
methyl acetate	2.00	1.72	1.73	1.83	1.68	1.78	1.84	1.91	1.78	0.08	0.25	7.9	1.46
allyl chloride	2.00	2.49	2.04	2.06	2.01	2.21	2.01	1.98	2.11	0.18	0.57	3.5	2.07
acetonitrile	10.00	21.88	18.51	18.38	19.38	20.41	19.74	20.29	19.80	1.21	3.81	2.6	20.22
iodomethane	2.00	2.47	2.21	2.17	2.09	2.33	2.24	2.19	2.24	0.12	0.39	5.1	2.29
iso-butyl alcohol	20.00	9.37	3.75	4.05	19.86	3.87	4.55	6.07	7.36	5.86	18.42	1.1	3.37
carbon disulfide	2.00	9.68	8.44	8.23	7.85	8.19	8.93	8.56	8.55	0.60	1.88	1.1	8.49
methylene chloride	2.00	2.59	2.19	2.15	2.22	2.34	2.30	2.26	2.29	0.15	0.46	4.4	2.29
methyl tert butyl ether	2.00	2.49	2.25	2.21	2.24	2.27	2.21	2.35	2.29	0.10	0.32	6.3	2.25
trans-1,2-dichloroethene	2.00	2.23	2.08	2.04	1.81	2.07	2.09	2.03	2.05	0.12	0.39	5.1	1.95
di-isopropyl ether	2.00	2.45	2.21	2.11	2.17	2.22	2.19	2.24	2.23	0.11	0.34	6.0	2.19
2-butanone	2.00	9.69	8.41	9.04	9.20	8.94	8.15	9.45	8.98	0.55	1.72	1.2	8.58
1,1-dichloroethane	2.00	2.51	2.18	2.17	2.11	2.29	2.16	2.28	2.24	0.13	0.42	4.7	2.24
hexane	2.00	1.84	1.74	1.77	1.58	1.76	1.94	1.85	1.78	0.11	0.35	5.6	1.86
chloroprene	2.00	2.09	1.86	1.80	1.73	1.94	1.78	1.93	1.88	0.12	0.38	5.2	1.90

Accutest Laboratories Annual Method Detection Limit Determination
Method: SW846 8260B Matrix: Water
Determination Date: 1/14/99

Compound Name	Spike ug/l	R1 ug/l	R2 ug/l	R3 ug/l	R4 ug/l	R5 ug/l	R6 ug/l	R7 ug/l	X-Bar ug/l	Std Dev ug/l	MDL ug/kg	Spike/MDL Ratio	R8 ug/l
acrylonitrile	10.00	8.53	7.53	7.36	8.07	7.82	7.75	8.30	7.91	0.42	1.31	7.6	8.25
vinyl acetate	2.00	0.43	0.31	1.44	0.43	0.35	0.37	0.48	0.54	0.40	1.25	1.6	0.37
ethyl acetate	2.00	0.55	1.50	2.40	2.33	1.92	2.21	2.29	1.89	0.67	2.09	1.0	2.33
2,2-dichloropropane	2.00	2.36	2.03	1.94	1.95	2.05	1.95	1.98	2.04	0.15	0.47	4.3	1.87
cis-1,2-dichloroethene	2.00	2.39	2.06	2.08	2.10	2.13	2.07	2.17	2.14	0.12	0.36	5.5	2.01
bromochloromethane	2.00	2.11	1.86	1.86	1.65	1.99	1.83	2.01	1.90	0.15	0.47	4.2	1.99
chloroform	2.00	2.55	1.85	2.14	2.17	2.44	2.30	2.27	2.25	0.23	0.71	2.8	2.23
freon 113	2.00	2.04	1.85	1.98	1.81	1.89	2.20	2.08	1.98	0.14	0.44	4.6	2.13
methacrylonitrile	2.00	1.85	1.64	1.83	1.98	1.92	1.60	1.60	1.77	0.16	0.50	4.0	1.42
butyl acetate	2.00	1.47	1.14	1.07	0.94	1.22	1.12	1.32	1.18	0.17	0.54	3.7	0.91
1,1,1-trichloroethane	2.00	2.33	2.11	2.09	2.03	2.15	2.18	2.21	2.16	0.10	0.30	6.6	2.12
heptane	2.00	2.94	2.22	2.57	2.27	2.69	2.62	1.72	2.43	0.40	1.26	1.6	2.52
n-propyl acetate	2.00	2.24	1.97	1.61	2.00	1.92	1.58	1.45	1.82	0.28	0.89	2.3	1.84
2-nitropropane	2.00	2.33	1.80	1.97	1.65	2.16	2.03	1.83	1.97	0.23	0.73	2.8	2.13
tetrahydrofuran	2.00	0.86	0.54	0.34	0.32	0.40	0.72	0.25	0.49	0.23	0.71	2.8	0.43
2-Chloroethyl Vinyl Ether	2.00	9.28	7.71	7.53	7.22	8.39	7.12	8.48	7.96	0.79	2.47	0.8	8.40
n-butyl alcohol	100.00	130.34	115.58	109.45	111.32	119.00	120.57	119.08	117.91	6.89	21.65	4.6	117.26
cyclohexane	2.00	2.08	1.95	2.00	1.80	1.90	2.00	2.05	1.97	0.10	0.30	6.7	1.98
carbon tetrachloride	2.00	2.37	2.04	2.05	1.89	2.10	2.06	2.13	2.09	0.14	0.45	4.4	1.99
1,1-dichloropropene	2.00	2.53	2.29	2.23	2.10	2.43	2.37	2.32	2.32	0.14	0.44	4.6	2.26
isopropyl acetate	2.00	2.17	1.99	1.69	1.90	1.97	2.01	2.02	1.96	0.15	0.46	4.4	2.08
benzene	2.00	2.75	2.38	2.37	2.20	2.46	2.34	2.44	2.42	0.17	0.53	3.8	2.24
1,2-dichloroethane	2.00	2.47	2.02	2.17	2.00	2.29	2.14	2.29	2.20	0.17	0.52	3.8	2.17
trichloroethene	2.00	2.82	2.50	2.52	2.33	2.44	2.55	2.53	2.53	0.15	0.47	4.3	2.44
methyl methacrylate	2.00	1.99	1.66	1.45	1.70	1.74	1.51	1.77	1.69	0.18	0.56	3.6	1.67
1,2-dichloropropane	2.00	2.80	2.38	2.46	2.35	2.55	2.56	2.00	2.44	0.25	0.77	2.6	2.42

Accutest Laboratories Annual Method Detection Limit Determination
Method: SW846 8260B Matrix: Water
Determination Date: 1/14/99

Compound Name	Spike ug/l	R1 ug/l	R2 ug/l	R3 ug/l	R4 ug/l	R5 ug/l	R6 ug/l	R7 ug/l	X-Bar ug/l	Std Dev ug/l	MDL ug/kg	Spike/MDL Ratio	R8 ug/l
di-isobutylene	2.00	2.08	1.93	2.08	1.79	1.95	2.15	2.15	2.02	0.13	0.42	4.8	2.17
dibromomethane	2.00	2.25	1.83	1.88	1.88	1.79	1.93	1.79	1.91	0.16	0.50	4.0	1.97
1,4-dioxane	50.00	8.31	7.70	16.80	10.27	3.46	2.78	2.95	7.47	5.07	15.93	3.1	5.63
bromodichloromethane	2.00	2.10	1.86	1.82	1.75	1.91	1.78	1.90	1.87	0.12	0.36	5.5	1.90
cis-1,3-dichloropropene	2.00	1.76	1.53	1.59	1.47	1.74	1.63	1.61	1.62	0.10	0.33	6.1	1.61
4-methyl-2-pentanone	2.00	7.85	7.40	6.93	7.06	6.97	7.79	8.01	7.43	0.45	1.43	1.4	8.27
toluene	2.00	2.62	2.22	2.18	2.20	2.33	2.15	2.37	2.30	0.16	0.52	3.9	2.29
trans-1,3-dichloroproper	2.00	1.55	1.39	1.31	1.18	1.37	1.23	1.31	1.33	0.12	0.38	5.3	1.33
ethyl methacrylate	2.00	1.93	1.59	1.65	1.66	1.67	1.59	1.61	1.67	0.12	0.37	5.4	1.62
1,1,2-trichloroethane	2.00	2.28	1.96	2.02	2.01	2.11	1.88	2.05	2.04	0.13	0.40	5.0	1.97
2-hexanone	2.00	9.30	7.62	6.99	7.05	7.52	6.67	7.11	7.47	0.87	2.74	0.7	6.69
cyclohexanone	20.00	5.12	4.77	4.66	4.73	4.86	4.24	3.91	4.61	0.41	1.28	15.7	4.49
tetrachloroethene	2.00	4.30	3.82	3.94	3.79	4.01	3.92	3.92	3.96	0.17	0.53	3.8	3.93
1,3-dichloropropane	2.00	2.11	1.93	1.99	1.95	2.05	2.09	2.16	2.04	0.09	0.27	7.4	2.03
dibromochloromethane	2.00	1.61	1.47	1.41	1.53	1.47	1.43	1.45	1.48	0.07	0.21	9.3	1.47
1,2-dibromoethane	2.00	1.66	1.54	1.55	1.60	1.58	1.57	1.59	1.58	0.04	0.12	16.1	1.59
chlorobenzene	2.00	3.40	3.19	3.21	3.05	3.26	3.20	3.09	3.20	0.11	0.36	5.6	3.14
1,1,1,2-tetrachloroethan	2.00	2.01	1.92	1.71	1.82	1.88	1.80	1.82	1.85	0.10	0.30	6.6	1.87
ethylbenzene	2.00	2.29	2.16	2.06	2.02	2.17	2.09	2.10	2.13	0.09	0.28	7.1	2.04
m,p-xylene	4.00	4.86	4.56	4.37	4.21	4.65	4.41	4.39	4.49	0.21	0.67	5.9	4.32
o-xylene	2.00	2.37	2.20	2.14	2.14	2.23	2.20	2.19	2.21	0.08	0.24	8.2	2.15
styrene	2.00	1.96	1.79	1.76	1.78	1.89	1.82	1.89	1.84	0.07	0.23	8.7	1.83
bromoform	2.00	1.26	1.15	1.10	1.11	1.13	1.08	1.13	1.14	0.06	0.18	10.8	1.05
isopropylbenzene	2.00	2.71	2.32	2.24	2.30	2.46	2.34	2.35	2.39	0.16	0.49	4.1	2.30
bromobenzene	2.00	2.49	2.07	2.17	2.15	2.19	2.14	2.17	2.20	0.13	0.42	4.7	2.20
1,1,2,2,-tetrachloroethar	2.00	1.84	1.56	1.54	1.78	1.78	1.66	1.68	1.69	0.11	0.36	5.5	1.67

Accutest Laboratories Annual Method Detection Limit Determination
Method: SW846 8260B Matrix: Water
Determination Date: 1/14/99

Compound Name	Spike ug/l	R1 ug/l	R2 ug/l	R3 ug/l	R4 ug/l	R5 ug/l	R6 ug/l	R7 ug/l	X-Bar ug/l	Std Dev ug/l	MDL ug/kg	Spike/MDL Ratio	R8 ug/l
trans-1,4-dichloro-2-bute	2.00	0.24 a	0.10	0.22	0.10	0.21	0.10	0.10 b	0.15	0.06	0.20	10.1	0.22
1,2,3-trichloropropane	2.00	2.23	1.58	1.65	1.89	1.92	1.71	1.89	1.84	0.22	0.68	2.9	1.82
n-propylbenzene	2.00	2.43	2.10	1.99	1.93	1.95	1.94	1.93	2.04	0.18	0.57	3.5	2.03
2-chlorotoluene	2.00	2.46	2.25	1.90	2.51	2.73	2.26	2.35	2.35	0.26	0.81	2.5	2.46
4-chlorotoluene	2.00	2.32	2.14	2.17	2.12	2.43	2.18	2.41	2.25	0.13	0.41	4.9	2.38
1,3,5-trimethylbenzene	2.00	2.74	2.32	2.29	2.21	2.44	2.39	2.45	2.41	0.17	0.54	3.7	2.41
tert-butylbenzene	2.00	2.60	2.31	2.32	2.17	2.32	2.32	2.38	2.35	0.13	0.41	4.9	2.24
1,2,4-trimethylbenzene	2.00	2.71	2.40	2.31	2.34	2.54	2.39	2.42	2.44	0.14	0.43	4.6	2.39
sec-butylbenzene	2.00	2.54	2.27	2.27	2.12	2.50	2.22	2.37	2.33	0.15	0.48	4.2	2.23
1,3-dichlorobenzene	2.00	2.54	2.23	2.24	2.17	2.24	2.18	2.28	2.27	0.13	0.39	5.1	2.20
p-isolpropyltoluene	2.00	2.57	2.30	2.23	2.21	2.34	2.27	2.28	2.31	0.12	0.38	5.3	2.25
1,4-dichlorobenzene	2.00	2.42	2.22	2.08	2.27	2.35	2.18	2.18	2.24	0.11	0.36	5.6	2.19
1,2-dichlorobenzene	2.00	2.33	2.17	2.04	2.03	2.26	2.16	2.59	2.23	0.19	0.61	3.3	2.27
n-butylbenzene	2.00	2.59	1.99	2.17	2.15	2.16	1.91	2.28	2.18	0.22	0.69	2.9	2.32
1,2-dibromo-3-chloropro	2.00	3.92	3.56	2.14	3.81	5.90	3.10	11.97	4.91	3.31	10.41	0.2	3.48
1,2,4-trichlorobenzene	2.00	1.88	1.65	1.54	1.60	1.61	1.53	1.68	1.64	0.12	0.37	5.4	1.54
hexachlorobutadiene	2.00	2.47	1.67	1.88	1.92	1.98	1.91	2.02	1.98	0.24	0.77	2.6	1.87
naphthalene	2.00	1.55	1.31	1.20	1.29	1.38	1.24	1.24	1.32	0.12	0.37	5.4	1.31
1,2,3-trichlorobenzene	2.00	2.29	1.85	1.70	1.75	1.88	1.66	1.69	1.83	0.22	0.69	2.9	1.85
epichlorohydrin	10.00	6.61	4.99	4.15	3.88	3.97	4.73	4.32	4.66	0.95	2.98	3.4	5.06
3-methyl-1-butanol	40.00	22.71	17.50	17.40	17.00	14.10	13.96	17.16	17.12	2.90	9.13	4.4	17.89
hexachloroethane	2.00	2.40	2.16	2.04	2.02	2.20	2.18	2.10	2.16	0.13	0.40	5.0	2.02

Accutest Laboratories Annual Method Detection Limit Determination
Method: Alcohols by Direct Injection   Matrix: Aqueous
Determination Date: 3/4/99

Compound	Spike ug/l ppb	R1 ug/l	R2 ug/l	R3 ug/l	R4 ug/l	R5 ug/l	R6 ug/l	R7 ug/l	X-Bar ug/l	Std Dev ug/l	MDL ug/l	Spike/MDL Ratio
Methanol	500	536	511	497	537	526	508	486	514	19.47	61	8
Ethanol	500	561	486	488	485	495	487	495	500	27.40	86	6
Tert-Butyl Alcoh	500	570	502	446	479	513	476	488	496	38.84	122	4
1-Propanol	500	569	479	463	489	489	512	490	499	34.27	108	5
2-Propanol	500	545	474	455	500	493	501	509	497	28.23	89	6
Isobutanol	500	545	538	442	489	492	531	498	505	36.07	113	4
1-Butanol	500	568	551	453	515	488	565	538	525	42.71	134	4
2-Butanol	500	567	457	423	512	489	482	514	492	45.83	144	3