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REVISED FINAL QUALITY ASSURANCE PROJECT PLAN FOR RISK BASED CLOSURE OF HANGAR 1000 NAS JACKSONVILLE FL

10/1/1991

ABB ENVIRONMENTAL

REVISED FINAL

QUALITY ASSURANCE PROJECT PLAN FOR RISK BASED CLOSURE OF HANGAR 1000 UNDERGROUND STORAGE TANKS OGC CONSENT ORDER NO. 88-0738

CONTRACT TASK ORDER NO. 003
NAVY CLEAN - DISTRICT I
CONTRACT NO. N62467-89-D-0317

OCTOBER 1991

QUALITY ASSURANCE PROJECT PLAN
FLORIDA DEPARTMENT OF ENVIRONEMNTAL REGULATION
FORM 17-160.900

FOR
RISK BASED CLEAN CLOSURE OF HANGAR 1000
UNDERGROUND STORAGE TANKS

OGC Consent Order
No. 88-0738

Prepared by:

ABB ENVIRONMENTAL SERVICES, INC.
2571 EXECUTIVE CENTER CIRCLE, EAST
TALLAHASSEE, FLORIDA 32301-5001
(904) 656-1293

Prepared for:

U.S. NAVY
U.S. NAVAL AIR STATION
PUBLIC WORKS DEPARTMENT, ENVIRONMENTAL DIVISION
JACKSONVILLE, FLORIDA 32212-5000
(904) 772-2717

Capt. Cramer, U.S. Navy	Date
Raymond A. Allen, III, CPSS, Primary Consultant Manager	Date
John McVoy, Primary Consultant QA Officer	Date
Tom Stephens, Savannah Laboratory Director	Date
Elizabeth Schneider, Savannah Laboratory QA Officer	Date

DER Oversight:

DER Project Manager	Date
DER QA Manager	Date

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Quality Assurance Elements
Quality Assurance Project Plan
Form 17-160.900

FIGURES

TABLES

3.0 PROJECT DESCRIPTION

3.1 Site Identification and History

Site Name: Hangar 1000 Underground Storage Tanks

Site Address: Naval Air Station
Street

Jacksonville, Duval, FL 32212-5000
City, County, and Zip Code

3.1.1 Site History. The site consists of two underground storage tanks (Tanks A and B) located in the of vicinity of Hanger 1000. The tanks were used from the early 1970's through November 1987 to collected waste solvents and other substances through drain lines from a washrack and manhole, and from several shops inside Hangar 1000. No sludge, sediment, or liquid was allowed to accumulate in the washrack, manhole, or any of the piping. Substances removed from the tanks were pumped out on an "as needed" basis and were managed as hazardous waste, with clean-outs always less than 90 days. The drain lines are no longer in use and are plugged or capped.

Garver and Garver, P.A. conducted a Contamination Assessment of the site from January through July 1990. The assessment consisted of two rounds of soil sampling which included vertical soil boring samples from the tank area and sediment from an adjacent stormwater ditch. Laboratory analytical data indicated the presence of volatile organics, semivolatile organics, and metals in selected samples.

3.1.2 Summary of Historical Data - see Table 3-1

3.2 Project Scope and Purpose

3.2.1 Purpose of this Project. This plan is being submitted as a requirement of Consent Order OCG No. 88-0738. The purpose of this project is to collect sufficient data to develop a regulatory approved risk-based clean closure of the two underground storage tanks at Hanger 1000, NAS Jacksonville.

3.2.2 Intended End Use of the Data

- ___ Permit Compliance
- ___ Feasibility Study
- _✓_ Consent Order Compliance
- ___ Remedial Action
- ___ Contamination Assessment
- ___ Water Quality Data Base (specify which data base: ____________)
- ___ Facility Operating Report
- ___ Other: ____________

Table 3-1
Summary of Soil Sample Analytical Data
Sample Analysis - May and July, 1990

Parameter	Concentration Range	
1. Cadmium	1.6 - 25.3	mg/kg
2. Chromium	1.2 - 9.13	mg/kg
3. Lead	1.59 - 9.55	mg/kg
4. Barium	1.74 - 55.8	mg/kg
5. 1,1-Dichloroethane	21 - 1,850	µg/kg
6. Toluene	80 - 11,350	µg/kg
7. Xylene	78 - 14,750	µg/kg
8. Bis(2-ethylhexyl) phthalate	785 - 955	µg/kg
9. Naphthalene	1040	µg/kg
10. 1,1,1-Trichloroethane	151 - 52,000	µg/kg
11. Trichloroethylene	36 - 6,300	µg/kg
12. 1,1-Dichloroethylene	7.26 - 1,883	µg/kg
13. Ethylbenzene	8.8 - 2,000	µg/kg
14. Tetrachloroethylene	1,400 - 31,450	µg/kg
15. Trichlorotrifluoroethane	235 - 783	µg/kg

3.2.3 Project Schedule and Scope of Work

December 20, 1990
Beginning Date

December 1993 (Closure Complete)
Projected Ending Date

Major Project Tasks

Specific Project Activity	Scheduled Date
Phase I	
1. Piezometer installation (completion)	February 4, 1991
2. QAPP delivered to FDER	March 25, 1991
3. Groundwater monitoring Plan to FDER	April 29, 1991
4. FDER Approval of QAPP and Groundwater Monitoring Plan	June 24, 1991

3.3 Project Organization

3.3.1 **Field Operations.** The field operations for this project will be conducted by: ABB Environmental Services, Inc. (ABB-ES) using Comprehensive QA Plan No.: 870515G15 .

The organization and personnel duties of the field consultant are described in Section 4.0 , page 4-1 to 4-6 , revised April 28, 1991 .

3.3.2 **Laboratory Analytical Work.** The laboratory analytical work will be performed by Savannah Laboratory and Environmental Services, Inc. using Comprehensive QA Plan No.: 890142G.

The laboratory organization and personnel duties are described in Section 4.0 , page 4-1 to 4-9 , revised April 11, 1991 .

3.3.3 **Project Organization.** Refer to Figure 3-1 for the specific organization of this project.

3.3.4 **Modifications or Additions.** The following personnel and their duty descriptions are not included in the referenced CompQAPs.

A. Field Personnel

1. Phillip Georgariou, Task Order Manager - oversees technical and project management activities.

2. Tracie Vaught, Field Operations Leader - responsible for day-to-day management and coordination of field activities.

3. Harry Hooper, Engineering Technician - responsible for performance of field activities.

B. Laboratory Personnel

1. Not applicable (N/A)
2. N/A
3. N/A

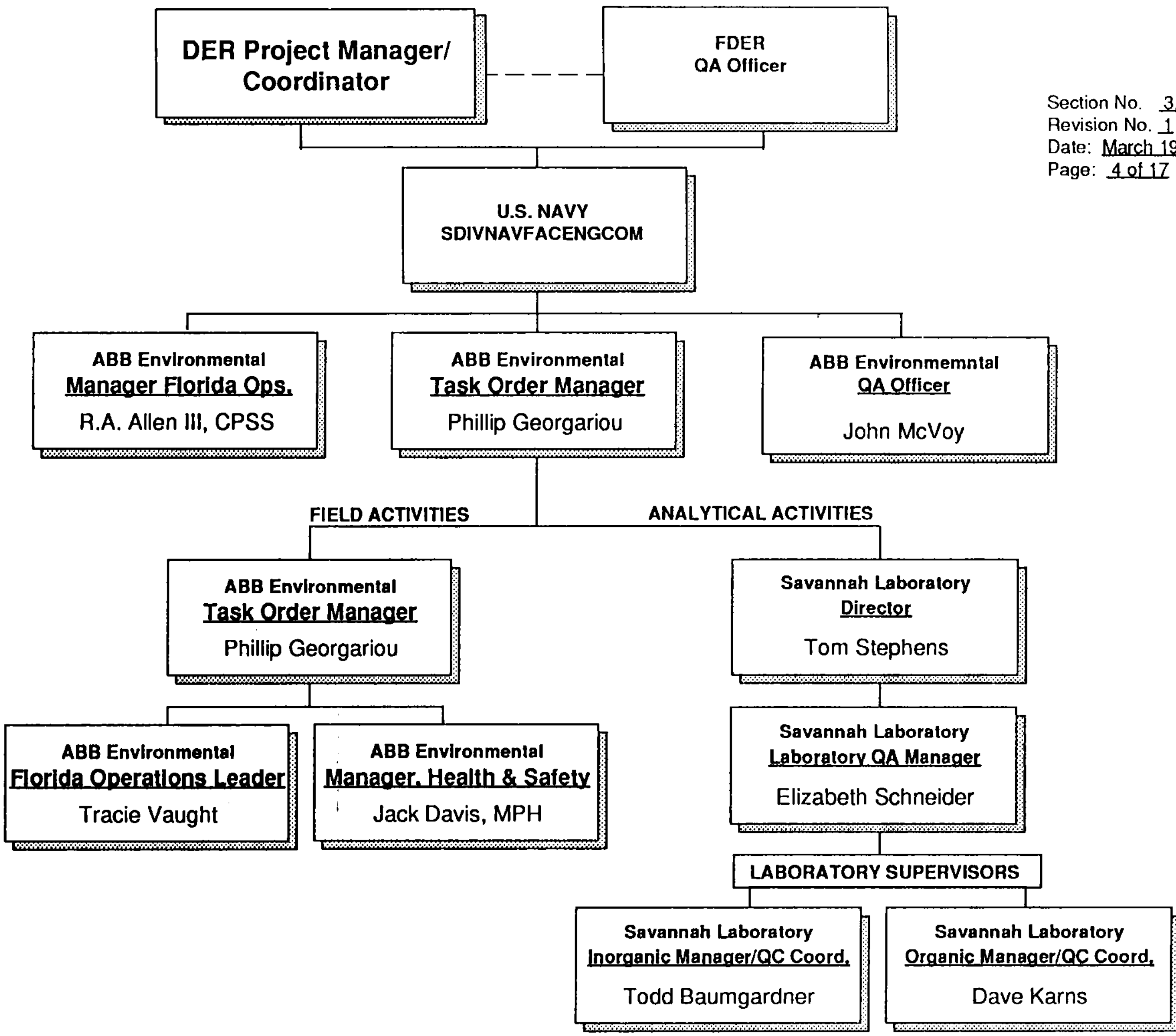


FIGURE 3-1
PROJECT ORGANIZATION

3.4 Project Objectives

3.4.1 Data Quality Objectives. The standards criteria outlined in DER Rule 17-730, FAC are the detection limit criteria for this project. The detection limits reported for this project shall at least meet, or be lower than the standards.

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

___ The minimum detection limits to be achieved for this study differ from the routine detection limits specified in the laboratory CompQAP and are included as a part of Table 3-3.

___ The precision and accuracy requirements differ from the routine targets specified in the laboratory CompQAP and are included as a part of Table 3-3.

3.4.2 Proposed Samples for Project

A. See Table 3-2 of this section for a summary of the sampling and analysis activities.

B. See Figures 3-2 and 3-3 for location and site maps of the project site.

3.4.3 QA Targets for Precision, Accuracy and Minimum Detection Limits

Field Analytical Measurements

Field measurements to be performed by ABB-ES personnel. Field measurements will be for site screening only.

Parameter	Method No.
1. N/A	N/A
2.	

Refer to CompQAP No. 870515G15, Section 8.2, page 8-1 to 8-2, revised March 11, 1991.

The following deviations from the stated CompQAP objectives for field measurements are noted as follows.

Method Number	Precision	Accuracy
1. N/A	N/A	N/A

Laboratory Analyses

Laboratory Analyses to be performed by Savannah Laboratories and Environmental Services, Inc. are listed on Table 3-3 by specific citation.

Table 3-2
Proposed Samples for the Project (Summary)

Event	Frequency	Sample Matrix	Sample Source	Analytical Method No.	No of Samples	Quality Control Summary*				Other
						FB	TB	EB	FD	
Initial Subsurface Soil Sampling	1	Soil	Subsurface Soil Borings	6010	8	1	0	1	1	
				7131	8	1	0	1	1	
				7421	8	1	0	1	1	
				8240	8	1	1	1	1	
				8270	8	1	0	1	1	
Initial Groundwater Sampling	1	Water	Groundwater	6010	4	1	0	1	1	
				7131	4	1	0	1	1	
				7196	4	1	0	1	1	
				7421	4	1	0	1	1	
				8240	4	1	1	1	1	
				8270	4	1	0	1	1	
Additional De-lineation Soil Sampling	1	Soil	Subsurface Soil Borings	6010	10	1	0	1	1	
				7131	10	1	0	1	1	
				7421	10	1	0	1	1	
				8240	10	1	1	1	1	
				8270	10	1	0	1	1	
Appendix IX Screening of Most Contaminated Well	1	Water	Groundwater from well with highest analyte concentrations	6010	1	1	0	1	1	
				7041	1	1	0	1	1	
				7061	1	1	0	1	1	
				7131	1	1	0	1	1	
				7191	1	1	0	1	1	
				7470	1	1	0	1	1	
				7740	1	1	0	1	1	
				7841	1	1	0	1	1	
				8010	1	1	1	1	1	
				8011	1	1	1	1	1	
				8020	1	1	1	1	1	
				8080	1	1	0	1	1	
				8141	1	1	0	1	1	
				8150	1	1	0	1	1	
				8240	1	1	1	1	1	
				8270	1	1	0	1	1	
				8280	1	1	0	1	1	
				9010	1	1	0	1	1	
				9030	1	1	0	1	1	

Notes: FB = Field blank.
TB = Trip blank.
EP = Equipment blank.
FD = Field duplicate.
Other = state type.

* = The client for this project requires that data collected meet NEESA Level C requirements in addition to quality control required by FDER. Quality control samples may therefore include additional samples.

Table 3-3
Method Identification and QA Objectives

Event	Method No.	Matrix	Component	CompQAP Section No.	CompQAP Rev. Date	CompQAP Page No.	Precision[1]	Accuracy[1]	MDL[1]
Initial Subsurface Soil Sampling	6010	Soil	Barium	5	6/26/91	112	Precision, accuracy, and MDLs not different than reference values in CompQAP.		
			Chromium, total	5	6/26/91	113			
	7131	Soil	Cadmium	5	6/26/91	112			
	7421	Soil	Lead	5	6/26/91	113			
	8240	Soil	Volatile Organics	5	6/26/91	140-144			
	8270	Soil	Extractable Organics (including PCBs)	5	6/26/91	145-156			
Initial Groundwater Sampling	6010	Water	Barium	5	6/26/91	5			
			Chromium, total	5	6/26/91	6			
	7131	Water	Cadmium	5	6/26/91	5			
	7196	Water	Chromium (VI)	5	6/26/91	6			
	7421	Water	Lead	5	6/26/91	7			
	8240	Water	Volatile Organics	5	6/26/91	80-85			
	8270	Water	Extractable Organics (including PCBs)	5	6/26/91	86-99			
Additional Delineation Soil Sampling	6010	Soil	Barium	5	6/26/91	112			
			Chromium, total	5	6/26/91	113			
	7131	Soil	Cadmium	5	6/26/91	112			
	7421	Soil	Lead	5	6/26/91	113			
	8240	Soil	Volatile Organics	5	6/26/91	140-144			
	8270	Soil	Extractable Organics (including PCBs)	5	6/26/91	145-146			

Table 3-3 (Continued)
Method Identification and QA Objectives

Event	Method No.	Matrix	Component	CompQAP Section No.	CompQAP Rev. Date	CompQAP Page No.	Precision[1]	Accuracy[1]	MDL[1]
Appendix IX Screening of Most Contaminated Well	6010	Water	Barium	5	6/26/91	5	Precision, accuracy, and MDLs not different than reference values in CompQAP.		
			Beryllium	5	6/26/91	5			
			Cobalt	5	6/26/91	6			
			Copper	5	6/26/91	6			
			Lead	5	6/26/91	7			
			Nickel	5	6/26/91	7			
			Silver	5	6/26/91	8			
			Tin	5	6/26/91	9			
			Vanadium	5	6/26/91	9			
			Zinc	5	6/26/91	9			
	7041	Water	Antimony	5	6/26/91	5			
	7061	Water	Arsenic	5	6/26/91	5			
	7131	Water	Cadmium	5	6/26/91	5			
	7191	Water	Chromium	5	6/26/91	6			
	7470	Water	Mercury	5	6/26/91	7			
	7740	Water	Selenium	5	6/26/91	8			
	7841	Water	Thallium	5	6/26/91	8			
	8010	Water	Volatile halocarbons	5	6/26/91	52-55			
	8020	Water	Benzene	5	6/26/91	58			
			Ethylbenzene	5	6/26/91	58			
			Methyl tert-butyl ether	5	6/26/91	58			

Table 3-3ethod Identification and QA Objectives

Event	Method No.	Matrix	Component	CompQAP Section No.	CompQAP Rev. Date	CompQAP Page No.	Precision[1]	Accuracy[1]	MDL[1]
Appendix IX Screening of Most Contaminated Well	8020	Water	Toluene	5	6/26/91	58	Precision, accuracy, and MDLs not different than reference values in CompQAP.		
			Xylenes	5	6/26/91	58			
	8011	Water	Volatile pesticides (EDB, DBCP)	5	6/26/91	30			
	8080	Water	Organochlorine pesticides and PCBs to include:	5	6/26/91	64-67			
			Chlorobenzilate	5	6/26/91	130			
			Methoxychlor	5	6/26/91	132			
			Isodrin	5	6/26/91	132			
			Kepone	5	6/26/91	132			
	8141	Water	Organophosphorus pesticides to include:	5	6/26/91	71-74			
			Famphur	5	6/26/91	137			
			Thionazin	5	6/26/91	138			
	8150	Water	Chlorinated herbicides to include:	5	6/26/91	75-76			
			Dinoseb	5	6/26/91	139			
	8240	Water	Acetone	5	6/26/91	80			
			Acetonitrile	5	6/26/91	80			
			Acrolein	5	6/26/91	80			
			Acrylonitrile	5	6/26/91	80			
			2-Butanone (MEK)	5	6/26/91	80			
			Carbon disulfide	5	6/26/91	80			
			Chloroprene (2-chloro-1,3-butadiene)	5	6/26/91	81			

Table 3-3 (Continued)
Method Identification and QA Objectives

Event	Method No.	Matrix	Component	CompQAP Section No.	CompQAP Rev. Date	CompQAP Page No.	Precision[1]	Accuracy[1]	MDL[1]
Appendix IX Screening of Most Contaminated Well	8240	Water	3-Chloropropene (Allyl chloride)	5	6/26/91	81	Precision, accuracy, and MDLs not different than reference values in CompQAP.		
			trans-1,4-Dichloro-2-butene	5	6/26/91	82			
			Ethyl methacrylate	5	6/26/91	83			
			2-Hexanone	5	6/26/91	83			
			Iodomethane	5	6/26/91	83			
			Isobutyl Alcohol	5	6/26/91	83			
			Methylacrylonitrile	5	6/26/91	83			
			Methylmethacrylate	5	6/26/91	83			
			4-Methyl-2-pentanone	5	6/26/91	83			
			Pentachloroethane	5	6/26/91	83			
			Propionitrile	5	6/26/91	83			
			Styrene	5	6/26/91	83			
			Vinyl acetate	5	6/26/91	84			
	8270	Water	Acenaphthene	5	6/26/91	86			
			Acenaphthylene	5	6/26/91	86			
			Acetophenone	5	6/26/91	86			
			2-Acetylaminofluorene	5	6/26/91	86			
			4-Aminobiphenyl	5	6/26/91	86			
			Aniline	5	6/26/91	86			
			Anthracene	5	6/26/91	86			
			Benzidine	5	6/26/91	86			
			Benzoic Acid	5	6/26/91	86			

Table 3-3 (Continued)
Method Identification and QA Objectives

Event	Method No.	Matrix	Component	CompQAP Section No.	CompQAP Rev. Date	CompQAP Page No.	Precision[1]	Accuracy[1]	MDL[1]
Appendix IX Screening of Most Contaminated Well	8270	Water	Benz(a)anthracene	5	6/26/91	86	Precision, accuracy, and MDLs not different than reference values in CompQAP.		
			Benz(b)anthracene	5	6/26/91	86			
			Benz(k)anthracene	5	6/26/91	86			
			Benzo(g,h,i)perylene	5	6/26/91	86			
			Benzo(a)pyrene	5	6/26/91	87			
			Benzyl alcohol	5	6/26/91	87			
			Benzyl chloride	5	6/26/91	87			
			bis (2-chloroethoxy) methane	5	6/26/91	87			
			bis (2-chloroethyl) ether	5	6/26/91	87			
			bis (2-chloroisopropyl) ether	5	6/26/91	87			
			bis (2-ethylhexyl) phthalate	5	6/26/91	87			
			4-Bromophenyl phenyl ether	5	6/26/91	88			
			Butyl benzyl phthalate	5	6/26/91	88			
			p-Chloroaniline	5	6/26/91	88			
			4-Chloro-3-methyl-phenol	5	6/26/91	88			
			1-Chloronaphthalene	5	6/26/91	88			
			2-Chloronaphthalene	5	6/26/91	88			
			2-Chlorophenol	5	6/26/91	88			
			4-Chlorophenyl phenyl ether	5	6/26/91	88			
			Chrysene	5	6/26/91	88			
			m-Cresol	5	6/26/91	89			
			o-Cresol	5	6/26/91	89			

Table 3-3 (Continued)
Method Identification and QA Objectives

Event	Method No.	Matrix	Component	CompQAP Section No.	CompQAP Rev. Date	CompQAP Page No.	Precision[1]	Accuracy[1]	MDL[1]
Appendix IX Screening of Most Contaminated Well	8270	Water	p-Cresol	5	6/26/91	82	Precision, accuracy, and MDLs not different than reference values in CompQAP.		
			Diallate	5	6/26/91	89			
			Dibenz(a,h) anthracene	5	6/26/91	89			
			Dibenzofuran	5	6/26/91	89			
			1,2-Dibromo-3-chloropropane	5	6/26/91	89			
			Di-n-butyl phthalate	5	6/26/91	89			
			3,3'-Dichlorobenzidine	5	6/26/91	90			
			2,4-Dichlorophenol	5	6/26/91	90			
			2,6-Dichlorophenol	5	6/26/91	90			
			Dimethyl phthalate	5	6/26/91	90			
			p-(Dimethylamino) azabenzene	5	6/26/91	90			
			7,12-Dimethylbenz(a) anthracene	5	6/26/91	90			
			3-3'-Dimethylbenzidine	5	6/26/91	90			
			a,a-Dimethylphenethylamine	5	6/26/91	90			
			2,4-Dimethylphenol	5	6/26/91	90			
			Dimethylphthalate	5	6/26/91	91			
			m-Dinitrobenzene	5	6/26/91	91			
			4,6-Dinitro-2-methyl phenol	5	6/26/91	91			
			2,4-Dinitrophenol	5	6/26/91	91			
			2,4-Dinitrotoluene	5	6/26/91	91			
			Di-n-octylphthalate	5	6/26/91	91			
			1,4-Dioxane	5	6/26/91	91			

Table 3-3 (Continued)
Method Identification and QA Objectives

Event	Method No.	Matrix	Component	CompQAP Section No.	CompQAP Rev. Date	CompQAP Page No.	Precision[1]	Accuracy[1]	MDL[1]
Appendix IX Screening of Most Contaminated Well	8270	Water	Diphenylamine	5	6/26/91	91	Precision, accuracy, and MDLs not different than reference values in CompQAP.		
			N-Nitrosodipropylamine	5	6/26/91	91			
			1,2-Diphenyl hydrazine	5	6/26/91	91			
			Ethyl methane sulfonate	5	6/26/91	92			
			Ethyl parathion	5	6/26/91	92			
			Fluoranthene	5	6/26/91	92			
			Fluorene	5	6/26/91	92			
			Hexachlorobenzene	5	6/26/91	92			
			Hexachlorobutadiene	5	6/26/91	93			
			Hexachlropentadiene	5	6/26/91	93			
			Hexachloroethane	5	6/26/91	93			
			Hexachloropropene	5	6/26/91	93			
			Indeno(1,2,3-cd)pyrene	5	6/26/91	93			
			Isophorone	5	6/26/91	93			
			Isosatrole	5	6/26/91	93			
			Methapyrilene	5	6/26/91	93			
			3-Methylcholanthrene	5	6/26/91	93			
			Methyl methane sulfonate	5	6/26/91	93			
			2-Methylnaphthalene	5	6/26/91	94			
			1-Methylnaphthalene	5	6/26/91	94			
			Methylparathion	5	6/26/91	94			
			Naphthalene	5	6/26/91	94			

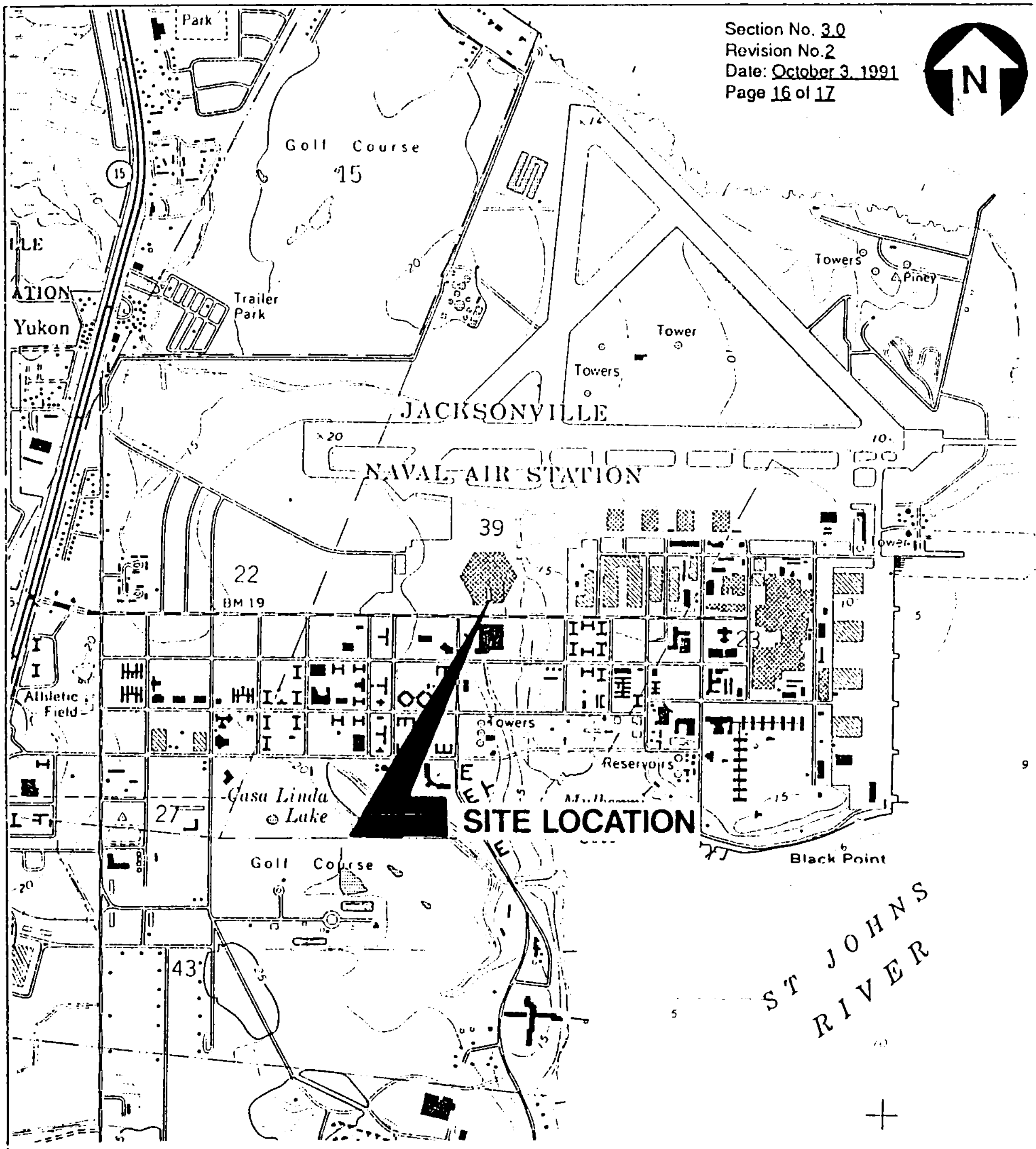
Table 3-3 (Continued)
Method Identification and QA Objectives

Event	Method No.	Matrix	Component	CompQAP Section No.	CompQAP Rev. Date	CompQAP Page No.	Precision[1]	Accuracy[1]	MDL[1]
Appendix IX Screening of Most Contaminated Well	8270	Water	1,4-Naphthoquinone	5	6/26/91	94	Precision, accuracy, and MDLs not different than reference values in CompQAP.		
			1-Naphthylamine	5	6/26/91	94			
			2-Naphthylamine	5	6/26/91	94			
			2-Nitroamiline	5	6/26/91	94			
			3-Nitroaniline	5	6/26/91	94			
			4-Nitroaniline	5	6/26/91	94			
			Nitrobenzene	5	6/26/91	94			
			2-Nitrophenol	5	6/26/91	94			
			4-Nitrophenol	5	6/26/91	94			
			4-Nitroquinoline-1-oxide	5	6/26/91	95			
			N-Nitroso-di-n-butylamine	5	6/26/91	95			
			N-Nitroso-diethylamine	5	6/26/91	95			
			N-Nitroso-dimethylamine	5	6/26/91	95			
			N-Nitroso-di-n-propylamine	5	6/26/91	95			
			N-Nitrosomethylethyl amine	5	6/26/91	95			
			N-Nitrosomorpholine	5	6/26/91	95			
			N-Nitrosopiperidine	5	6/26/91	95			
			N-Nitrosopyrrolidine	5	6/26/91	95			
			5-Nitro-o-toluidine	5	6/26/91	95			
			o,o,o-triethyl phosphorothionate	5	6/26/91	95			
			Pentachlorobenzene	5	6/26/91	96			

Table 3-3 (Continued)
Method Identification and QA Objectives

Event	Method No.	Matrix	Component	CompQAP Section No.	CompQAP Rev. Date	CompQAP Page No.	Precision[1]	Accuracy[1]	MDL[1]
Appendix IX Screening of Most Contaminated Well	8270	Water	Pentachloroethane	5	6/26/91	96	Precision, accuracy, and MDLs not different than reference values in CompQAP.		
			Pentachloronitrobenzene	5	6/26/91	96			
			Phenacetin	5	6/26/91	96			
			Phenanthrene	5	6/26/91	96			
			Phenol	5	6/26/91	96			
			2-Picoline	5	6/26/91	97			
			Pronamide	5	6/26/91	97			
			Pyrene	5	6/26/91	97			
			Safrole	5	6/26/91	97			
			Sulfotepp	5	6/26/91	97			
			1,2,4,5-Tetrachlorobenzene	5	6/26/91	97			
			2,3,4,6-Tetrachlorophenol	5	6/26/91	97			
			o-Toluidine	5	6/26/91	97			
			Thionazin	5	6/26/91	97			
			1,2,4-Trichlorobenzene	5	6/26/91	98			
			2,4,5-Trichlorophenol	5	6/26/91	98			
			1,3,5-Trinitrobenene	5	6/26/91	98			
	8280	Water	Polychlorinated dibenzo-p-dioxins and dibenzofurans	5	6/26/91	99			
	9010	Water	Cyanide	5	6/26/91	117			
	9030	Water	Sulfide	5	6/26/91	119			

[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 or are not included in the CompQap.



SOURCE: USGS QUADRANGLE ORANGE PARK, FLORIDA
1964, PHOTOREVISED 1981.

APPROX. SCALE
0 1,000 2,000 4,000 FT

FIGURE 3-2

SITE LOCATION MAP

HANGAR 1000
UNDERGROUND STORAGE TANKS
NAVAL AIR STATION
JACKSONVILLE, FLORIDA

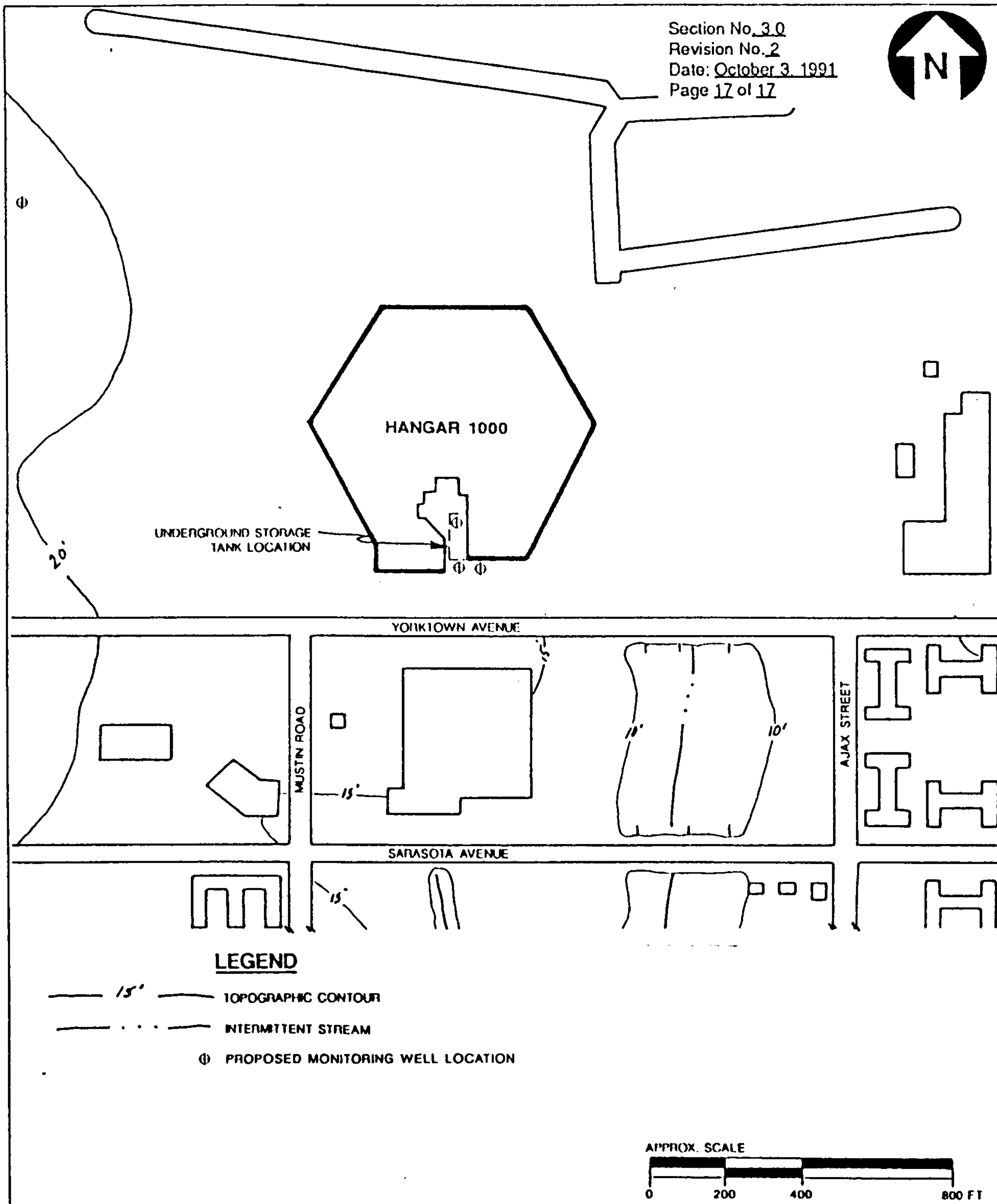


FIGURE 3-3
PROPOSED MONITORING WELL LOCATIONS

HANGAR 1000
UNDERGROUND STORAGE TANKS
NAVAL AIR STATION
JACKSONVILLE, FLORIDA

4.0 FIELD PROCEDURES AND QUALITY CONTROL

CompQAP citations in this section refer to CompQAP No. 870515G15 unless otherwise specified.

4.1 Sampling Equipment

The following is a list of the equipment to be used for this project.

Equipment Description	Construction Materials	Use
Purging Equipment		
1. Submersible pump	stainless steel	purging wells
2. Peristaltic pump	Teflon™ tubing	purging wells
3. Bailer	Teflon™	purging wells
Sampling Equipment		
1. Bailers	Teflon™	collect groundwater samples
2. Split spoons	stainless steel	collect soil samples
3. Hand auger	stainless steel	collect soil samples
4. Trowel/spatula	stainless steel	collect soil samples
Field Measurement Equipment	(Not Applicable)	
1. pH/conductivity/temperature meter		
2. Organic Vapor Analyzer		
3. Portable Gas Chromatograph		
4. Water level indicator		

Refer to CompQAP Section 6.0, page 6-1 to 6-83, revised April 28, 1991 for specific discussions on construction and use. Additional equipment not addressed in the CompQAP will include the following.

Equipment Description	Construction Materials	Use
1. N/A		
2.		
3.		
4.		

4.2 Sampling Protocols (see Table 4-1)

Table 4-1

Sampling Protocols

These citations refer to CompQAP No. 870515G15

Topic	Section	No. of Pages	Revision Date
1. Equipment Decontamination	6.3	6-6 - 6-16	4/28/91
2. Field filtration protocols	6.3.1	6-16	4/28/91
3. Groundwater sampling protocols	6.5.1	6-23 - 6-28	4/28/91
4. Surface water sampling protocols	6.5.3	6-28 - 6-31	4/28/91
5. Soil sampling protocols	6.5.5	6-34 - 6-43	4/28/91
6. Sediment sampling protocols	6.5.6	6-43 - 6-48	4/28/91

4.3 Field Equipment Cleaning and Decontamination Procedures

Refer to Table 4-2 for specific references

4.4 Sample Containers

Sample containers will be provided by Savannah Laboratories and Environmental Services, Inc.. Container preparation procedures are found in CompQAP No. 890142G, Section 6.0, page 6-9 to 6-10, revised October 1, 1990.

4.5 Preservation Protocols

Preservatives will be provided by Savannah Laboratories and Environmental Services, Inc.. Documentation for reagents are found in CompQAP No. 890142G, Section 6.0, page 6-12 to 6-20, revised October 1, 1990.

Preservation will be done by ABB-ES personnel following protocols listed in CompQAP No. 870515G15, Section 6.7, page 6-64 to 6-70, revised March 11, 1991.

4.6 Sample Dispatch

Procedures for transporting the samples to the laboratory are listed in CompQAP Section 6.8, page 6-70 to 6-81, revised March 11, 1991.

Table 4-2
Equipment Decontamination and Cleaning Procedures

These citations refer to CompQAP No. 870515G15

Equipment Category	Cleaning Location	Section No.	Page No.	Revision Date
Purging Equipment				
Submersible Pump	Office	6.3	17	3/11/91
	Field	6.3	21	3/11/91
Peristaltic Pump	Office	6.3	12	3/11/91
	Field	6.3	21	3/11/91
Bailer	Office	6.3	8	3/11/91
	Field	6.3	21	3/11/91
Sampling Equipment				
Bailer	Office	6.3	8	3/11/91
	Field	6.3	21	3/11/91
Split Spoon	Office	6.3	9	3/11/91
	Field	6.3	21	3/11/91
Trowel/Spatula	Office	6.3	9	3/11/91
	Field	6.3	21	3/11/91
Field Measurement Equipment				
pH/Conductivity/Temperature Meter	Office	6.3	15	4/28/91
	Field	6.3	15	4/28/91
Organic Vapor Analyzer	Office	6.3	15	4/28/91
	Field	6.3	15	4/28/91
Portable Gas Chromatograph	Office	6.3	15	4/28/91
	Field	6.3	15	4/28/91
Water Level Indicator	Office	6.3	18	3/11/91
	Field	6.3	18	3/11/91

4.7 Waste Disposal

Procedures for handling wastes from equipment cleaning and from sampling are listed in CompQAP Section 6.10, page 6-82 to 6-83, revised April 28, 1991.

All wastes generated in the field (purge water, decon water, soil cuttings, and PPE) will be containerized separately, characterized, and properly disposed. Containerized wastes will be stored at NAS JAX until results of associated samples are received.

If no RCRA hazardous constituents are found, purge and decon water will be disposed in the facility sewage system, soils will be disposed on-site or in a facility dumpster, and PPE will be disposed in a facility dumpster.

If any type of field-generated waste contains a RCRA-listed hazardous waste, that field-generated waste is also considered to be a RCRA hazardous waste. If field-generated wastes are found to be contaminated with RCRA-listed hazardous constituents, the wastes will be characterized and disposed by a hazardous waste contractor requirements.

4.8 Field Sampling Custody

Procedures for sample custody are found in CompQAP Section 7.2, page 7-1 to 7-11, revised March 11, 1991. Further discussions on the field documentation and notebooks are included in CompQAP Section 6.6, page 6-64.

Deviations or modifications to the field custody procedures are listed below:

1. N/A
2.
3.

4.9 Field Measurements

Field measurements are listed in Section 3.4.3 of this QAPP. Deviations or modifications to the procedures listed are as follows:

1. No modifications anticipated at this time.
2.
3.

Other Field measurements that will be made are:

1. None
2.

4.10 Field Calibration Procedures

Calibration protocols for field analytical measurements are listed in CompQAP Section 9.5, page 9-3 to 9-12, revised April 28, 1991.

Deviations to the procedures outlined in the above reference are shown below.

Calibration Procedure	Deviation
1. N/A	
2.	

Project specific field measurement equipment not mentioned in the above reference are as follows.

1. N/A
2.

4.11 Preventative Maintenance

Field equipment preventative maintenance protocols are discussed in CompQAP Section 10.0, page 10-1 to 10-3, revised March 11, 1991.

The following additions or modifications to field equipment maintenance procedures are as follows.

1. N/A
2.

4.12 Field Quality Control Checks and Routines to Assess Precision and Accuracy

The proposed schedule of field QC checks are summarized on Table 3-2 of Section 3.4.

Routines to assess the Precision and Accuracy of field Measurement are found in CompQAP Section 11.0, page 11-1 to 11-7, revised March 11, 1991.

4.13 Data Reduction, Validation Reporting

Field activities relative to this section are found in CompQAP Section 12.0, page 12-1 to 12-4, revised March 11, 1991.

5.0 LABORATORY PROCEDURES AND QUALITY CONTROL

References in this section refer to the Savannah Laboratories and Environmental Services, Inc. Laboratory CompQAP No. 890142G.

5.1 Laboratory Custody Procedures

Laboratory sample custody procedures and documentation are found in CompQAP Section 7.0, page 7-3 to 7-6, revised October 1, 1990.

Deviations or modifications to the laboratory procedures are listed below.

1. None
2.

5.2 Laboratory Analytical Procedures

5.2.1 Laboratory Glassware Cleaning Protocols

Refer to CompQAP Section 9.0, page 9-1 to 9-2, revised October 1, 1990.

Deviations or modifications to the referenced protocols are listed below.

1. None
2.

5.2.2 Method Modifications and/or Deviations

Deviations or modifications to the listed analytical procedures are as follows.

1. None
2.

5.3 Waste Disposal

Waste disposal practices in the laboratory are listed in CompQAP Section 7.0, page 7-5 to 7-5, revised October 1, 1990.

5.4 Calibration Procedures and Frequency

Laboratory calibration protocols are listed in CompQAP Section 8.0, page 8-1 to 8-7, revised October 1, 1990.

Deviations to the procedures outlined in the above reference are shown below.

Calibration Procedure	Deviation
1. N/A	
2.	

Project specific measurement and/or analytical equipment not mentioned in the above reference are as follows.

1. N/A
2.

Calibration procedures for the above equipment are outlined on Table 5-1 -- not required.

5.5 Preventative Maintenance

Laboratory instrument preventative maintenance protocols are discussed in CompQAP Section 13.0, page 13-1 to 13-5, revised January 31, 1989.

The following modifications to or deviations from the referenced protocols are listed below.

1. N/A
2.

5.6 Quality Control Checks, Routines to Assess Precision and Accuracy, and Calculation of Method Detection Limits

5.6.1 Laboratory Quality Control Measures

The types of laboratory control checks outlined in Table 5-2 will be used when analyzing samples for this project.

5.6.2 Routine Procedures to Assess Precision and Accuracy

Routine procedures to assess the Precision and Accuracy of laboratory parameters are found in CompQAP Section 5.0, page 5-1 to 5-4, revised October 1, 1990, and Section 14.0, page 14-1 to 14-2, revised April 30, 1990.

Table 5-2
Laboratory Quality Control Checks

Refer to Laboratory CompQAP No. 890142G for frequency and description

QC Check	Section	No. of Pages	Revision Date
Organics			
Calibrations	11	3	4/30/90
Method Blanks	11	3	4/30/90
Check Standards	11	3	4/30/90
Surrogates	11	3	4/30/90
Matrix Spikes	11	3	4/30/90
Matrix Spike Duplicates/Sample Duplicates	11	4	4/30/90
Inorganic and General Chemistry			
Calibrations	11	4	4/30/90
Method Blanks	11	4	4/30/90
Digestion Blanks	11	4	4/30/90
Check Standards	11	4	4/30/90
Matrix Spikes	11	4	4/30/90
Duplicates	11	4	4/30/90

Deviations (or additions) to the types of laboratory QC checks or frequency are listed below.

1. N/A
2.

Deviations to the referenced procedures to assess precision and accuracy are as follows.

1. N/A
2.

5.6.3 Method Detection Limits

Laboratory activities relative to this section are found in CompQAP Section 10.0, page 10-1 to 10-11, revised October 1, 1990.

Deviations or revisions to the above reference are as follows.

1. N/A
2.

5.7 Data Reduction, Validation, and Reporting

Laboratory activities relative to this section are found in CompQAP Section 10.0, page 10-1 to 10-11, revised October 1, 1990.

Deviations or revisions to the above reference are as follows.

1. N/A
2.

6.0 QUALITY ASSURANCE MANAGEMENT

6.1 Corrective Actions

6.1.1 Field Corrective Action

Protocols to initiate corrective actions by field personnel are listed in CompQAP No. 870515G15, Section 13.0, page 13-1 to 13-8, revised March 11, 1991.

Revisions to these procedures are listed below:

1. N/A

6.1.2 Laboratory Corrective Action

Protocols to initiate corrective actions by laboratory personnel are listed in CompQAP No. 890142G, Section 15.0, page 15-1 to 15-2, revised April 30, 1990.

Revisions to these procedures are listed below:

1. N/A
2.

ALL INVOLVED PARTIES WILL INITIATE ANY CORRECTIVE ACTION DEEMED NECESSARY BY DER.

6.2 Performance and Systems Audits

6.2.1 Field Activities

A. Routine performance and systems audits are discussed in CompQAP No. 870515G15, Section 14.0, page 14-1 to 14-32, revised March 11, 1991.

B. Specific audits planned for this project are: None

Audit Type	Frequency/Date	Description
1. N/A		
2.		

6.2.2 Laboratory Activities

A. Routine performance and systems audits are discussed in CompQAP No. 890142G, Section 12.0, page 12-1 to 12-1, revised April 30, 1990.

B. Specific audits planned for this project are: None

Audit Type	Frequency/Date	Description
1. N/A		

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

6.3 Quality Assurance Reports

6.3.1 Field Activities

Field QA Reports will be submitted to ABB-ES QA Manager, and the ABB-ES Project Manager at a frequency of once at completion of project.

6.3.2 Laboratory Activities

Laboratory QC Reports will be submitted to the laboratory QA officer and ABB-ES, at a frequency of once at completion of project.

7.0 RESUMES

7.1 Field Activities

Refer to CompQAP No. 870515G15, Section 16.0, page 16-1 to 16-12, revised March 11, 1991.

Additional (or new) resumes are as follows:

1. Phillip Georgariou
2. Tracie Vaught
3. Harry Hooper

7.2 Laboratory Activities

Refer to CompQAP No. 890142G, Section 17.0, page 17-1 to 17-45, revised April 30, 1990.

Additional (or new) resumes are as follows:

1. N/A
2.

PHILIP N. GEORGARIOU, Task Order Manager

EXPERIENCE SUMMARY

Philip Georgariou has more than 22 years of program management experience in a variety of fields, from production management and scheduling, to project managment for DOD-related, areospace equipment development and fielding. Over ten years logistics experience in both military and commercial aviation. Over five years experience with defense systems acquisition and procurement as well as having provided instruction on procurement on a continuing basis with Embry-Riddle Aeronautical University. Has taught a variety of under-graduate and post-graduate business courses for the past six years.

SPECIALIZED SKILL AREAS

Project/Program Management
Financial Management/Planning
Systems Engineering
Federal Acquisition and Procurement
Logistic Support Analysis
Production Managment

EXPERIENCE

ABB ENVIRONMENTAL SERVICES, INC., Tallahassee, FL. August 1991 to present
Task Order Manager

png/Associates, Inc., Orlando, FL, January 1990 - August 1991. As owner of a small consulting firm, provided a variety of consulting services in Government contracting and aerospace logistics. Wrote, or assisted in writing, such documents as Configuration Management Plans and Logistic Support Analysis Plans. Additionally, developed cost tracking software programs for environmental services companies.

NAVAL AIR SYSTEMS COMMAND, Washington D.C. June 1985 to January 90 As Support Equipment Program Manager, developed the initial $1.98B life-of-program support equipment budget for Defense Review Board Approval of the V-22 and managed an average yearly budget for all aircraft of $100M. Formalized procedures for support equipment identification, budgeting, design, and development for equipment ranging from simple slings and adapters to complex memory loading devices.

EMBRY-RIDDLE AERONAUTICAL UNIVERSITY, September 1985 - August 89 As an Adjunct Professor, taught four different graduate-level business courses in the MS degree curriculum for Aeronautical Business Administration: (a) Management of Supply and Distribution Systems, (b) Management of Aerospace Research and Development Programs, (c) Aircraft Production and Procurement, and (d) Aviation Maintenance Management

COMMANDER NAVAL AIR FORCES, Pacific Fleet June 1982 - June 1985 As the Marine Liaison Officer, managed maintenance advisory team, responsible for visiting all Pacific-fleet commands to ensure compliance with aircraft maintenance regulations. Planned Marine Air Wing deployments aboard Navy ships: entailed ensuring the readiness and availability of all necessary aircraft, personnel, training, and supply support. Developed database management software program to track completion of predeployment milestones.

THIRD MARINE AIR WING March 1974 - June 1982 As the Intermediate-level Maintenance Officer for three years, was responsible for all facets of aircraft component scheduling and repair. Assistant Aircraft Maintenance Officer for three years controlling the day-to-day maintenance efforts of a 27 aircraft RF-4B squadron. For three years, was Maintenance Control Chief for a 20 aircraft A-4M squadron.

EDUCATION

UNIVERSITY OF SOUTHERN CALIFORNIA, Los Angeles, CA
M.S. Systems Management, 1985

PEPPERDINE UNIVERSITY, Malibu, CA
B.A. Human Resources Management, 1978

PROFESSIONAL AFFILIATIONS

American Finance Association
Southern Finance Association

TRACIE L. VAUGHT, Junior Scientist

Qualifications Summary

Ms. Vaught has three years experience in business administration and geology. Her background includes experience in management, direct customer relations, various computer software programs, and subsurface geologic mapping.

Education

M.S./Geology and Remote Sensing, 1985, East Texas State University
B.S./General Business, Geology, 1983 East Texas State University

Relevant Experience

Associate Scientist/Project Assistant--As an associate scientist/project assistant with C-E Environmental, Inc., Ms. Vaught's duties are varied. As Project Assistant she assists Project Managers to coordinate, schedule, and track projects to keep them up to date with actual information on various projects to facilitate budgeting manhours and dollars. Ms. Vaught is also implementing PROMIS and Lotus 1-2-3 software systems, tools used to perform analyses. Ms. Vaught assists the Health and Safety Coordinator with health and safety projects and standardizing safety plans including administrative duties concerning health and safety for projects. Ms. Vaught also assists in conducting field studies gathering and compiling data, and producing project reports.

Geomap, Plano, Texas--In this position, Ms. Vaught checked the accuracy of subsurface maps, researched plats, total depths and lease maps and checked with other geologists throughout the state to confirm data. This position required teamwork and the ability to effectively plan the work in an organized approach. She corresponded with clients nationally, utilizing good problem solving and business interpersonal communication skills.

East Texas State University, Commerce, Texas--Ms. Vaught was lab instructor responsible for teaching earth science to sophomore and freshman students in both a classroom and self paced environment.

Additional Experience

A Woman's Touch, Dallas, Texas--Ms. Vaught personally owned and operated this business which was oriented to help a person make a house a home.

Markman Company, Dallas, Texas--As a sales support staff assistant, Ms. Vaught assisted in various capacities on the sales support staff department including contracting, communications and computers.

HARRY B. HOOPER II, Senior Engineering Technician

Qualifications Summary

As a technician in the Remedial and Engineering Services Department, Mr. Hooper's responsibilities encompass a wide rage of duties including project initiation which involves researching and developing site plans and specifications, attaining cost estimates and bids, and scheduling. Mr. Hooper supervises each project from inception to completion. During the project, he maintains a liaison with his superiors and clients. At completion, Mr. Hooper prepares the project closeout including as-builts, reports, and billings. Mr. Hooper's area of expertise also includes 15 years of QA/QC on commercial and government construction sites. He maintains open communication with appropriate on-site personnel.

Education

AA/Geology, 1968, Miami Dade County Community College, Miami, Florida

Relevant Experience

As Engineering Technician, Mr. Hooper has 9 years of experience in Tallahassee and Miami, Florida. He performs quality control testing on construction materials in the laboratory and on project sites. He supervises geotechnical and geological investigations. He also has done work in Georgia, Alabama, and West Virginia.

Mr. Hooper was manager of construction materials testing and inspection services for a geotechnical engineering firm in north Florida. His duties included developing testing requirements, marketing project bids, supervising up to four technicians, contractor/client liaison, and preparing reports and billings.

Additional Experience

Mr. Hooper has performed Sampling and Evaluations of Airborne Asbestos dust (NIOSH S82) and is certified. He has performed air sampling and analysis for asbestos dust in private and public facilities in north Florida. Mr. Hooper is trained in and has provided field inspection services in the installation of geogrid membranes on construction sites.