FINAL

OLD ENGINE PROCESSING FACILITY, BUILDING 101 HEALTH THREAT EVALUATION

NAVAL AVIATION DEPOT (NADEP) NAVAL AIR STATION JACKSONVILLE, FLORIDA

OCTOBER 1992

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON, SOUTH CAROLINA
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FINAL

HEALTH THREAT EVALUATION

OLD ENGINE PROCESSING FACILITY, BUILDING 101,
NAVAL AVIATION DEPOT (NADEP)
JACKSONVILLE NAVAL AIR STATION
JACKSONVILLE, FLORIDA

CONTRACT TASK ORDER NO. 068
NAVY CLEAN - DISTRICT 1
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Submitted by:

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Tallahassee, Florida 32301

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1.0 INTRODUCTION

In accordance with the Statement of Work and Contract Task Order 0068, ABB Environmental Services, Inc. (ABB-ES) has prepared this Health Threat Evaluation (HTE) of the Old Engine Processing Facility, Building 101, NAS Jacksonville. This HTE is based on information obtained during the September, 1992 site investigation and the analytical results of samples taken at the former electroplating shop.

1.1 OBJECTIVE. The objective of the HTE is to assess and recommend the level of personal protection equipment (PPE) required during the removal of wastes and other electroplating shop materials to protect individuals from any harmful effects.

2.0 SCOPE OF WORK

This document will present the analytical results of air samples taken inside the Old Engine Processing Facility and compare these values to current Occupational Safety and Health Act (OSHA) Permissible Exposure Limits (PELs) which are the relevant regulatory guidelines for occupational exposure to chemicals in the air. This document will also provide the analytical results of the contents of the tanks identified within the facility as well as the results of the asbestos inspection. Finally, it will include diagrams of where all samples were taken as well as any known physical impairments to a clean-up effort (i.e., holes in floors, hazards, etc.).

3.0 SITE HISTORY

The site, a former electroplating shop, is located in a building that is contained within another building (101) at the Naval Aviation Depot (NADEP) facility at Naval Air Station (NAS) Jacksonville. The shop, contains 90 tanks and 15 additional containers (drums and small containers), most of which contain plating materials or debris. Six pre-treatment tanks, associated with the plating shop operations are located outside the building at the southeast corner of Hanger 101, adjacent to Building 101A. These 6 pre-treatment tanks all contain liquids. The electroplating shop building has become dilapidated with numerous holes in the ceiling allowing rainwater to collect in all areas of the shop. The building has been scheduled for demolition.

The electroplating shop is divided into three separate rooms: the east room, the chrome room (central) and the west room (see Figure 3-1). On Thursday, August 27, 1992, a noxious odor was reported emanating from the west room of the facility. Base fire department personnel entered the building using self-contained breathing apparatus (SCBAs) and, using Dräger tubes, attempted to identify the source of the fumes. However, they were unable to identify the contents or source of the fumes.

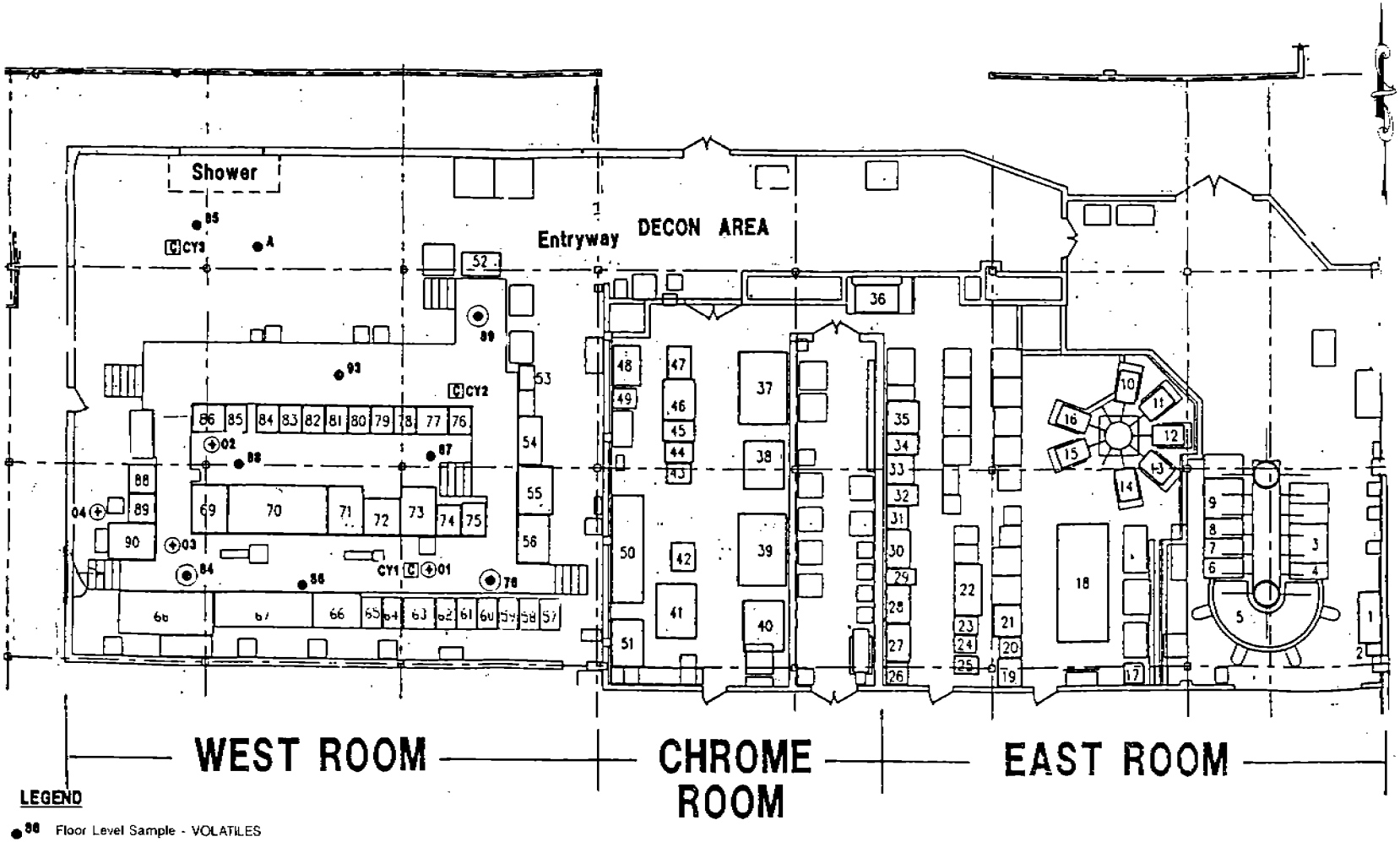

FIGURE 3-1
SAMPLE LOCATIONS,
AIR SAMPLES FOR
FUME ASSESSMENT

OLD PLATING SHOP
TANK LAYOUT

NAS JACKSONVILLE
JACKSONVILLE, FLORIDA

pre-treatment facility outside Building 101 was performed on September 23, 1992. All samples were analyzed for Hazardous Waste Characteristics (HWC), volatiles and metals.

On September 17, 1992, ATEC Associates, Inc., a USEPA-accredited asbestos inspector, subcontracted by ABB-ES, inspected the facility and collected samples for the presence of asbestos.

Field log book copies detailing all sampling operations are included in Appendix A.

4.0 AIR SAMPLING

4.1 AIR SAMPLING RESULTS

4.1.1 Volatile Organic Compounds The analytical results of the air sampling conducted by ABB-ES on September 11, 1992 are presented in Table 4-1. Samples taken at eight sample points (Figure 3-1) and analyzed for volatile organic compounds using USEPA Method 8240. The results show that low levels of eight volatile organic chemicals were detected in the air at the site. Acetone at levels ranging from 0.22 to 0.30 mg/m^3 was detected in five of the eight samples while carbon tetrachloride was detected at two locations at concentrations of 0.60 and 0.61 mg/m^3. Both reported levels were slightly above the detection levels. 2-Butanone (methyl ethyl ketone) was detected in all eight sample locations at levels from 0.20 to 0.38 mg/m^3. Dichlorofluoromethane and 1,1-dichloroethylene were detected in all sample locations with ranges of 0.064 to 0.078 mg/m^3 and 0.073 to 0.081 mg/m^3, respectively. Methylene chloride was detected in seven sample locations at 0.54 to 0.66 mg/m^3. Toluene was detected in all sample locations ranging from 1.6 to 2.0 mg/m^3. 1,1,1-Trichloroethane was detected in all sample locations at 1.1 to 1.4 mg/m^3. The concentrations of all these analytes were fairly uniform throughout the west room and did not indicate any specific potential source.

4.1.2 Acids Samples for acid analysis were taken at four locations based on available information on previous tank usage. The analytical procedures quantitated the anions of hydrochloric, hydrofluoric, and phosphoric acid using the USEPA method described in EPA/600/4-79-020.

The results of the acid sampling are presented in Table 4-2. Also provided are the molecular weights of the acids and their anions and the sampled air volumes used to calculate acid concentrations in air.

Only one positive result for chloride was reported - 110 μg at sample location 01. The calculated air concentration of hydrochloric acid for sample location 01 is 5.61 mg/m^3. Detection limits for negative samples are also provided in Table 4-2.

4.1.3 Cyanide Samples collected in three locations were also analyzed for the presence of cyanide. The sampling locations were selected based upon reports of cyanide usage when the facility was in operation. No cyanide was detected in any sample. Detection limits for all three samples are presented in Table 4-3.

Table 4-1
Air Sample Results for Volatile Organic Chemicals

Building 101 Health Threat Evaluation
Naval Air Station Jacksonville
Jacksonville, Florida

ANALYTE	SAMPLE POINTS							
	ATI-176	ATI-184	ATI-185	ATI-186	ATI-187	ATI-188	ATI-189	ATI-193
Acetone	0.20U	0.25	0.22	0.20U	0.20U	0.23	0.25	0.30
2-Butanone	0.20	0.38	0.38	0.31	0.22	0.33	0.32	0.38
Carbon tetrachloride	0.061	0.060	0.06U	0.06U	0.06U	0.06U	0.06U	0.06U
Dichlorodifluoromethane	0.074	0.078	0.066	0.064	0.071	0.07	0.072	0.078
1,1-Dichloroethylene	0.079	0.081	0.073	0.077	0.076	0.085	0.071	0.08
Methylene chloride	0.60	0.14U	0.58	0.56	0.57	0.54	0.6	0.66
Toluene	1.6	2.0	1.7	1.7	1.6	1.6	1.9	1.8
1,1,1-Trichloroethane	1.4	1.3	1.2	1.2	1.2	1.2	1.1	1.3

Notes: All sample concentrations are in milligrams per cubic meter (mg/m^3).
U = Sample analysis result is negative at the indicated detection limit.

Table 4-3
Air Sample Results for Cyanide

Building 101 Health Threat Evaluation
Naval Air Station Jacksonville
Jacksonville, Florida

CHEMICAL (as ANALYTE)	MW ACID/MW ANALYTE	SAMPLE LOCATION	ANALYTE (μg)	AIR VOLUME (L)	AIR LEVEL (mg/m^3)
Hydrogen cyanide (as cyanide)	27.0256/26.0177	CY-1	2.0U	6204	3.35×10^{-4}U
		CY-2	2.0U	6732	3.09×10^{-4}U
		CY-3	2.0U	5644	3.68×10^{-4}U

Notes: MW = Molecular weight, daltons. μg = micrograms. L = liters. mg/m^3 = milligrams per cubic meter.
U = Sample analysis result is negative at the indicated detection limit.

4.2 COMPARISON OF AIR SAMPLING RESULTS TO AIR STANDARDS.

4.2.1 Volatile Organic Chemicals The concentrations of chemicals detected in the air were compared to the Permissible Exposure Limits (PELs) and American Conference of Governmental and Industrial Hygiene (ACGIH) Threshold Limit Values (TLVs). Detection limits for the acids and cyanides were also compared to PELs and TLVs to ensure that the air sampling was adequate to address potential health threats to personnel.

PELs are legally enforceable limits promulgated by OSHA in the 29 CFR Part 1910.1000, Table Z1 to Z3. PELs are designed "to protect workers against a wide variety of health effects that could cause impairment of health or functional capacity. This includes protection against catastrophic effects such as cancer, cardiovascular, lung, liver, and kidney diseases, as well as more subtle effects resulting in central nervous system damage, respiratory effects, and sensory irritation" (29 CFR 1910.1000).

TLVs are guidelines or recommendations provided by the ACGIH to aid in the control of potential health hazards to exposed workers. Although not legally enforceable, TLVs represent a consensus opinion of governmental and industrial hygienists based on current evaluations of available human and animal data.

While air concentrations are important in determining the health threat posed by inhalation exposure, so is the time of exposure. Three exposure times are commonly used in describing exposure levels. Both the PEL and the TLV describe the allowable 8 hour average levels that a worker may be exposed. Air concentrations may exceed the PEL or TLV for a portion of the workday as long as the average exposure for the work shift does not exceed the PEL or TLV.

Some chemicals also have a value called a Short Term Exposure Limit (STEL). This value, usually higher than the PEL or TLV, is the limit that a worker may be exposed to for a brief period, usually 15 minutes. Finally, some chemicals, such as acids, may not have a PEL, but rather have a ceiling limit. A ceiling limit is a level which is not to be exceeded at any time during the workday. The PELs, TLVs, STELs, and ceiling limits for the volatile organic chemicals, acids, and cyanide detected in Building 101 are summarized in Table 4-4.

Since the air samples taken at Building 101 contained a number of different volatile organic chemicals, the method described in 29 CFR Part 1910.1000 to determine the PEL equivalent exposure for a mixture was used. "In case of a mixture of air contaminants an employer shall compute the equivalent exposure as follows:

$$E_m = (C_1 \div L_1 + C_2 \div L_2) + \ldots (C_n \div L_n)$$

Where: E_m is the equivalent exposure for the mixture.
C is the concentration of a particular contaminant.
L is the exposure limit for that substance specified in Subpart Z of 29 CFR Part 1910.

The value of E_m shall not exceed unity (1)."

Table 4-4
Permissible Exposure Limits and Threshold Limit Values for Building 101 Volatile Organic Chemicals, Acids, and Cyanide

Building 101 Health Threat Evaluation
Naval Air Station Jacksonville
Jacksonville, Florida

CHEMICAL	PEL			TLV		
	8-TWA	STEL	C	8-TWA	STEL	C
VOLATILE ORGANIC CHEMICALS						
Acetone	1,800	2,370	-	1,780	2,370	-
2-Butanone	590	885	-	590	885	-
Carbon tetrachloride	12.6	-	-	30	-	-
Dichlorodifluoromethane	4,950	-	-	4,950	-	-
1,1-Dichloroethylene	4	-	-	20	80	-
Methylene chloride	1,737	-	-	175	-	-
Toluene	375	560	-	375	560	-
1,1,1-Trichloroethane	1,900	2,450	-	1,900	2,450	-
ACIDS						
Hydrochloric acid	-	-	7	-	-	7
Hydrofluoric acid	2.5	5	-	-	-	2.5
Phosphoric acid	1	3	-	1	3	-
CYANIDE						
Hydrogen cyanide	-	5	-	-	-	11

Notes: All PEL and TLV concentrations are in milligrams per cubic meter (mg/m^3).
PEL = Permissible Exposure Limit
TLV = Threshold Limit Value
8-TWA = 8-hour Time Weighted Average
STEL = Short-Term Exposure Limit
C = Ceiling

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The same computational method is used to determine the TLV equivalent exposure, except that the 8-hour Time Weighted Average or Ceiling TLV is used as L.

The PEL and TLV equivalent exposures for the volatile organic chemicals detected in the west room are provided in Tables 4-5 and 4-6, respectively. The PEL equivalent ranged from 2.44×10^{-2} to 3.18×10^{-2} while the TLV equivalent ranged from 9.49×10^{-3} to 1.18×10^{-2}. The difference between the TLV and PEL equivalents is due to differences in the PELs and TLVs of 1,1-dichloroethylene and methylene chloride. Based on both PEL and TLV equivalent exposures, no human health hazard would be expected for workers exposed to a mixture of volatile organic chemicals in the concentrations found in the west room.

4.2.2 Acids Only one sample, 01, was positive for acids. Hydrochloric acid at 5.61 mg/m^3 was detected at this sample point. This value was below the PEL and TLV ceiling value of 7 mg/m^3. Detection limits at the other three sample points were 3.92, 4.08, and 7.42 mg/m^3 for hydrochloric acid. The detection limit at sample point 04, 7.42 mg/m^3, was higher than the PEL of 7 mg/m^3 and, thus, it is possible that the PEL could be exceeded at this sample point without acid being detected. The higher detection limit for this sample point was a consequence of less air being drawn through the sample tube at this location.

Analytical results for hydrofluoric and phosphoric acids were negative at all four sample locations. Detection limits for hydrofluoric acid ranged from 0.20 to 0.38 mg/m^3. When compared to the PEL of 2.5 mg/m^3, the detection limits for hydrofluoric acid appear adequate to ensure that undetected exceedances were not occurring. For phosphoric acid, the detection limits also appear adequate, ranging from 0.15 to 0.29 mg/m^3 compared to the PEL of 1 mg/m^3. Therefore, it is reasonable to conclude that no health threat, due to exposure to either hydrofluoric or phosphoric acid, is anticipated at this site.

4.2.3 Cyanide Three samples collected in the west room were analyzed for the presence of cyanide. All three samples were negative with detection limits ranging from 3.09×10^{-4} to 3.68×10^{-4} mg/m^3. These levels were well below the PEL (STEL) of 5 mg/m^3 and TLV (Ceiling) of 11 mg/m^3.

5.0 TANK AND CONTAINER CONTENT SAMPLES

5.1 GENERAL INORGANICS

Locations of samples taken within Building 101 are presented in Figure 5-1 and sample locations outside of Building 101 are in Figure 5-2. A summary of the media sampled at each location is provided in Table 5-1. All of these samples were analyzed for ignitability, pH, and presence of reactive sulfide or cyanide. None of the samples showed ignitability at less than 200° Fahrenheit, the upper limit of the test. The pH of the samples ranged from 0.8 to 10.4 with twelve samples having a pH of less than 6.0 and seventeen samples with a pH between 8 and 10.4.

Table 4-5
PEL Equivalent Exposures of Volatile Organic Chemicals
By Sampling Station

Building 101 Health Threat Evaluation
Naval Air Station Jacksonville
Jacksonville, Florida

ANALYTE	ATI-176	ATI-184	ATI-185	ATI-186	ATI-187	ATI-188	ATI-189	ATI-193
Acetone	-	$1.39x10^{-4}$	$1.22x10^{-4}$	-	-	$1.28x10^{-4}$	$1.39x10^{-4}$	$1.67x10^{-4}$
2-Butanone	$3.39x10^{-4}$	$6.44x10^{-4}$	$6.64x10^{-4}$	$5.25x10^{-4}$	$3.73x10^{-4}$	$5.59x10^{-4}$	$5.42x10^{-4}$	$6.44x10^{-4}$
Carbon tetrachloride	$4.84x10^{-3}$	$4.76x10^{-3}$	-	-	-	-	-	-
Dichlorodifluoromethane	$1.49x10^{-5}$	$1.58x10^{-5}$	$1.33x10^{-5}$	$1.29x10^{-5}$	$1.43x10^{-5}$	$1.41x10^{-5}$	$1.45x10^{-5}$	$1.58x10^{-5}$
1,1-Dichloroethylene	$1.98x10^{-2}$	$2.03x10^{-2}$	$1.83x10^{-2}$	$1.93x10^{-2}$	$1.90x10^{-2}$	$2.13x10^{-2}$	$1.78x10^{-2}$	$2.00x10^{-2}$
Methylene chloride	$3.45x10^{-4}$	-	$3.33x10^{-4}$	$3.22x10^{-4}$	$3.28x10^{-4}$	$3.10x10^{-4}$	$3.45x10^{-4}$	$3.79x10^{-4}$
Toluene	$4.27x10^{-3}$	$5.33x10^{-3}$	$4.53x10^{-3}$	$4.53x10^{-3}$	$4.27x10^{-3}$	$4.27x10^{-3}$	$5.07x10^{-3}$	$4.80x10^{-3}$
1,1,1-Trichloroethane	$7.37x10^{-4}$	$6.84x10^{-4}$	$6.32x10^{-4}$	$6.32x10^{-4}$	$6.32x10^{-4}$	$6.32x10^{-4}$	$5.79x10^{-4}$	$6.84x10^{-4}$
PEL EQUIVALENT EXPOSURE	**$3.03x10^{-2}$**	**$3.18x10^{-2}$**	**$2.45x10^{-2}$**	**$2.53x10^{-2}$**	**$2.46x10^{-2}$**	**$2.72x10^{-2}$**	**$2.44x10^{-2}$**	**$2.67x10^{-2}$**

Table 4-6
TLV Equivalent Exposures of Volatile Organic Chemicals
By Sampling Station

Building 101 Health Threat Evaluation
Naval Air Station Jacksonville
Jacksonville, Florida

ANALYTE	ATI-176	ATI-184	ATI-185	ATI-186	ATI-187	ATI-188	ATI-189	ATI-193
Acetone	-	1.40×10^{-4}	1.24×10^{-4}	-	-	1.29×10^{-4}	1.40×10^{-4}	1.69×10^{-4}
2-Butanone	3.39×10^{-4}	6.44×10^{-4}	6.64×10^{-4}	5.25×10^{-4}	3.73×10^{-4}	5.59×10^{-4}	5.42×10^{-4}	6.44×10^{-4}
Carbon tetrachloride	2.03×10^{-3}	2.00×10^{-3}	-	-	-	-	-	-
Dichlorodifluoromethane	1.49×10^{-5}	1.58×10^{-5}	1.33×10^{-5}	1.29×10^{-5}	1.43×10^{-5}	1.41×10^{-5}	1.45×10^{-5}	1.58×10^{-5}
1,1-Dichloroethylene	9.88×10^{-4}	1.01×10^{-3}	9.13×10^{-4}	9.63×10^{-4}	9.50×10^{-4}	1.06×10^{-3}	8.88×10^{-4}	1.00×10^{-3}
Methylene chloride	3.43×10^{-3}	-	3.31×10^{-3}	3.20×10^{-3}	3.26×10^{-3}	3.09×10^{-3}	3.43×10^{-3}	3.77×10^{-3}
Toluene	4.27×10^{-3}	5.33×10^{-3}	4.53×10^{-3}	4.53×10^{-3}	4.27×10^{-3}	4.27×10^{-3}	5.07×10^{-3}	4.80×10^{-3}
1,1,1-Trichloroethane	7.37×10^{-4}	6.84×10^{-4}	6.32×10^{-4}	6.32×10^{-4}	6.32×10^{-4}	6.32×10^{-4}	5.79×10^{-4}	6.84×10^{-4}
TLV EQUIVALENT EXPOSURE	**1.18×10^{-2}**	**9.83×10^{-3}**	**1.02×10^{-2}**	**9.87×10^{-3}**	**9.49×10^{-3}**	**9.75×10^{-3}**	**1.07×10^{-2}**	**1.11×10^{-2}**

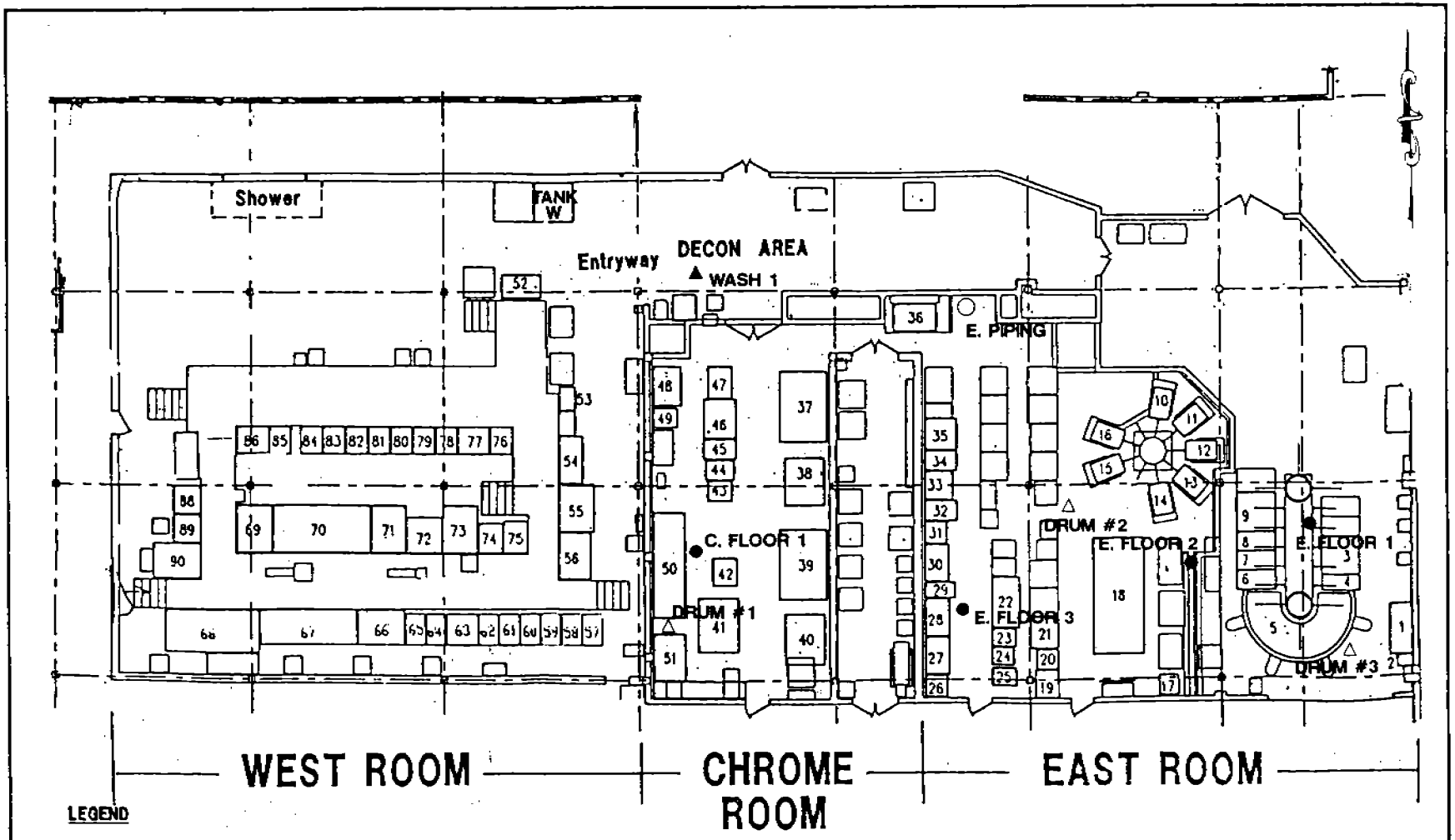

FIGURE 5-1
SAMPLE LOCATIONS,
FLUIDS/SOLIDS INSIDE
BUILDING 101

OLD PLATING SHOP
TANK LAYOUT

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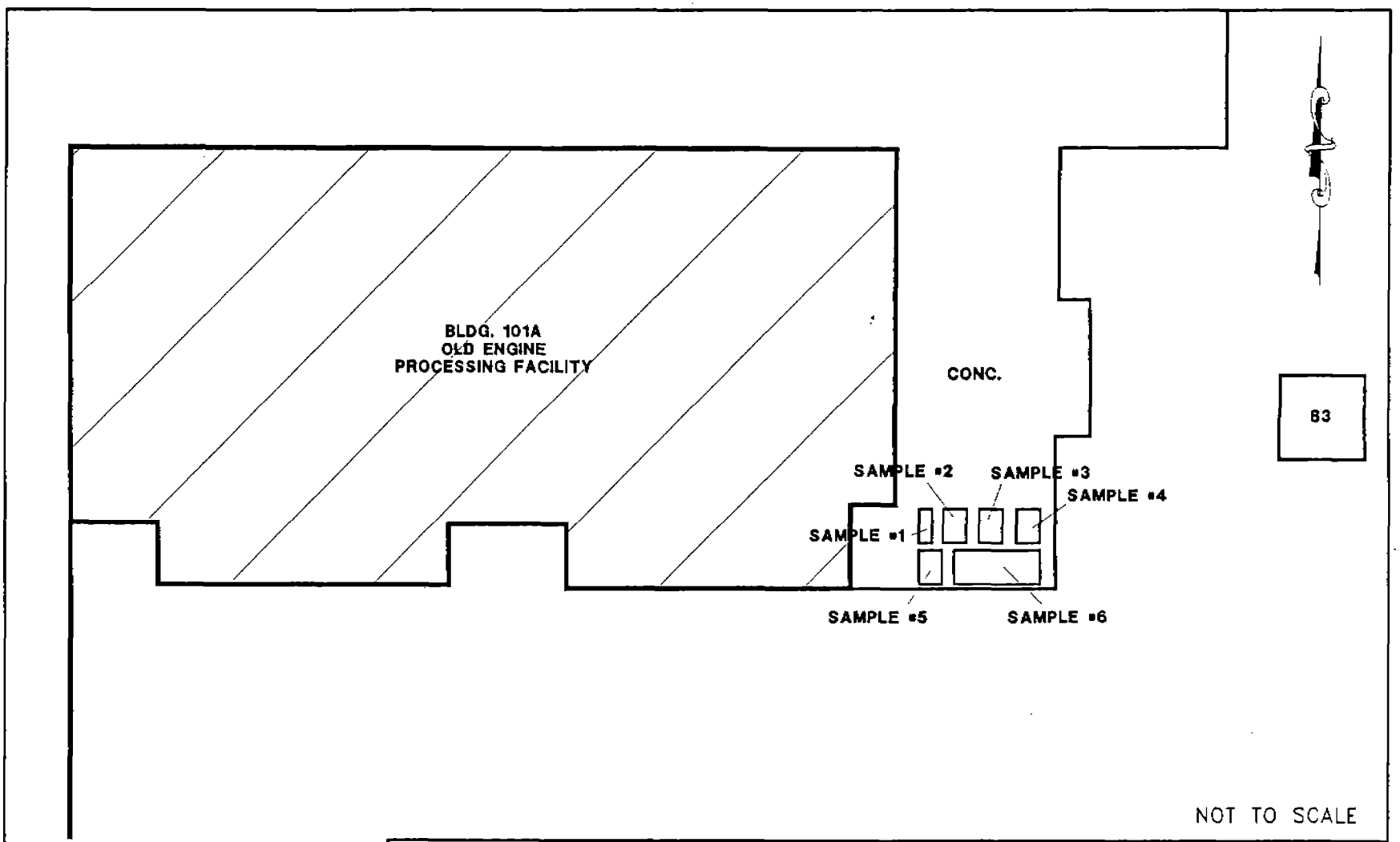

FIGURE 5-2
SAMPLE LOCATIONS, FLUIDS/SOLIDS OUTSIDE BUILDING 101

OLD PLATING SHOP TANK LAYOUT

NAS JACKSONVILLE
JACKSONVILLE, FLORIDA

Table 5-1
Tank Contents Sample Types and Locations

Building 101 Health Threat Evaluation
Naval Air Station Jacksonville
Jacksonville, Florida

Location	Container Number	Type of Sample	Location	Container Number	Type of Sample	Location	Container Number	Type of Sample
East Room	Tank 1	Sludge	East Room	Drum[1]	Liquid	West Room	Tank 57	Debris
East Room	Tank 2	Sludge	East Room	Drum 3[2]	Liquid	West Room	Tank 59	Liquid
East Room	Tank 5	Liquid	East Room	E. Floor 1	Liquid	West Room	Tank 61	Liquid
East Room	Tank 6	Liquid	East Room	E. Floor 2	Sludge	West Room	Tank 62	Debris
East Room	Tank 9	Sludge	East Room	E. Floor 3	Debris	West Room	Tank 64	Debris
East Room	Tank 11	Sludge	Chrome Room	Tank 38	Debris	West Room	Tank 68	Debris
East Room	Tank 12	Debris	Chrome Room	Tank 39	Liquid	West Room	Tank 68A	Debris
East Room	Tank 14	Liquid	Chrome Room	Tank 40	Liquid	West Room	Tank 69	Sludge
East Room	Tank 15	Debris	Chrome Room	Tank 41	Liquid	West Room	Tank 70	Debris
East Room	Tank 16	Debris	Chrome Room	Tank 42	Liquid	West Room	Tank 71	Debris
East Room	Tank 17	Liquid	Chrome Room	Tank 43	Debris	West Room	Tank 72	Debris
East Room	Tank 20	Debris	Chrome Room	Tank 44	Sludge	West Room	Tank 74	Sludge
East Room	Tank 22	Debris	Chrome Room	Tank 45	Liquid	West Room	Tank 77	Debris
East Room	Tank 23	Debris	Chrome Room	Tank 46	Debris	West Room	Tank 82	Sludge
East Room	Tank 24	Liquid	Chrome Room	Tank 47	Liquid	West Room	Tank 84	Sludge
East Room	Tank 25	Liquid	Chrome Room	Tank 49	Debris	West Room	Tank 85	Debris

Table 5-1 (Continued)
Tank Contents Sample Types and Locations

Building 101 Health Threat Evaluation
Naval Air Station Jacksonville
Jacksonville, Florida

Location	Container Number	Type of Sample	Location	Container Number	Type of Sample	Location	Container Number	Type of Sample
East Room	Tank 29	Sludge	Chrome Room	Tank 50	Liquid	West Room	Tank 88	Debris
East Room	Tank 33	Sludge	Chrome Room	Drum 1[2]	Liquid	West Room	Tank 92	Sludge
East Room	Tank 34	Debris	Chrome Room	C. Floor 1	Liquid	West Room	Tank W	Sludge (Wax?)
East Room	E. Piping	Debris	West Room	Tank 55	Debris	Decon Room	Wash 1	Liquid[4]

[1]Drum 2 is a 55 gallon drum marked Caustic Soda
[2]Drum 3 is a 15 gallon drum located between Tanks 4 and 5.
[3]Drum 1 is located between Tanks 50 and 51.
[4]Decontamination/rinsate water.

Reactive cyanide and sulfide were analyzed by USEPA Methods 9012 and 9030, respectively. Levels of reactive cyanide ranged from 0.95 to 28.2 mg/kg in eleven samples while reactive sulfide ranged from 2.38 to 21.2 mg/kg. These concentrations are insufficient to generate significant levels of either hydrogen cyanide or hydrogen sulfide if the tank contents should become mixed with acid.

5.2 VOLATILE ORGANIC COMPOUNDS

Samples were analyzed of volatile organic chemicals (VOCs) using USEPA Method 8240. Only three samples were positive for VOCs (Table 5-2). Trichloroethylene (1,000 mg/kg) was detected in the sample collected at East Floor 2. A sample collected from Tank 92 also showed trichloroethylene at 0.14 mg/kg while a liquid sample collected at Central Floor 1 was found to contain 0.38 mg/L trichloroethylene.

Samples were also analyzed by TCLP methodology for VOCs. Ten samples showed positive results for trichloroethylene or chloroform using this method (Table 5-2).

5.3 SEMIVOLATILE ORGANIC COMPOUNDS

Based on a list of the types of organic chemicals used in Building 101, the laboratory was requested to focus on F001-F005 waste components during the analysis of volatile and semivolatile organic chemicals in tank samples. As a result, the following compounds were analyzed for:

Pyridine	Hexachlorobutadiene
1,4-Dichlorobenzene	2,4,5-Trichlorophenol
2-Methylphenol	2,4,6-Trichlorophenol
3/4-Methylphenol	2,4-Dinitrotoluene
Hexachloroethane	Hexachlorobenzene
Nitrobenzene	Pentachlorophenol

None of the semivolatile organic chemicals on this list were detected in any aqueous sample. Samples analyzed by TCLP for the same constituents also failed to detect these chemicals.

For the solid samples, the list of semivolatile organic compounds was further condensed to:

Pyridine
2-Methylphenol
3/4-Methylphenol
Nitrobenzene

Low estimated concentrations of pyridine and nitrobenzene were detected in every sample. Pyridine concentrations ranged from 0.33 to 0.52 mg/kg while nitrobenzene concentrations ranged 0.12 to 0.19 mg/kg. Pyridine has a pungent unpleasant odor, which makes it a potential candidate as the odor source. However, the odor was described as "acetic acid-like" rather than pungent.

Table 5-2
Volatile Organic Compounds Detected in Tank Contents

Building 101 Health Threat Evaluation
Naval Air Station Jacksonville
Jacksonville, Florida

SAMPLING LOCATION	TRICHLOROETHYLENE	CHLOROFORM
East Floor 2	1,000 mg/kg	
Tank 92	0.14 mg/kg	
Central Floor 1	0.38 mg/L	
	By TCLP	**By TCLP**
East Floor 2	37.0 mg/L	
Tank 55	0.026 mg/L	
Tank 57	0.056 mg/L	
Tank 70	0.080 mg/L	
Tank 72	0.028 mg/L	
Tank 82	0.099 mg/L	
Tank 84	0.037 mg/L	
Tank 85		0.66 mg/L
Tank 88		0.071 mg/L
Tank 92	0.037 mg/L	

Notes: mg/kg = milligrams/kilogram. mg/L = milligrams/liter. TCLP = Toxic Characteristic Leaching Procedure.

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Five samples were not analyzed because they contained only building debris, such as nails. One drum not sampled was labeled as caustic soda.

5.4 METALS

Metals were analyzed in twenty-eight aqueous samples taken from Building 101. The results of these analyses are summarized in Table 5-3. The metals encountered most frequently were chromium, lead, cadmium, and arsenic. One sample, taken from Tank 47, was too thick to be treated as a liquid had to be treated as a solid. The sample from this tank was found to contain 433,000 mg/kg of chromium.

Twenty-two aqueous samples tested positive for chromium with ranges of 5.2 to 127,000 mg/L. Similarly, cadmium ranged from 1.1 to 61,800 mg/L. Lead ranged from 0.3 to 13,900 mg/L.

Metals in the tank contents are not expected to pose a toxic hazard. Although the concentrations of many of these metals are elevated, they pose neither an inhalation nor a dermal hazard to persons working in the area.

6.0 ASBESTOS SAMPLES

An asbestos inspection was conducted by an USEPA-accredited asbestos surveyor from ATEC Associates on September 17, 1992. Samples were taken at twenty-three points within Building 101 (Figure 6-1) and analyzed for asbestos utilizing polarized light microscopy and dispersion staining techniques in accordance with USEPA Bulk Analysis Method EPA 600/M4-82-020 (Table 6-1). The asbestos surveyor noted that the building has a slab-on-grade foundation with metal and cement asbestos board walls. The roofing system is deteriorated with debris on the ground. Thermal system insulation consisting of pipe covering, elbow and valve coverings, tank covering, and debris was observed throughout the site, including in the loft area. The overall building condition is characterized as poor.

The surveyor attempted to obtain one sample of each type of suspect material accessible in Building 101. These samples were analyzed to determine whether they were asbestos-containing materials (ACMs). The surveyor also assessed each suspect material for friability, condition, and potential for disturbance. Friable materials by USEPA definition are those which can be crumbled, pulverized, or reduced to powder by hand pressure. Friable ACMs are usually more hazardous because they have greater potential to release airborne asbestos fibers. Material condition is rated as good, damaged, or significantly damaged. The higher the degree of damage, the more likely a material is to be capable of releasing fibers. Potential for fiber release is based on evidence of deterioration due to physical damage, water damage, air erosion, or high vibration.

Utilizing evaluations of each suspect material's condition and potential for disturbance, the asbestos surveyor assessed the potential hazard of each ACM using the State of Florida, Department of Labor and Employment Security (DLES), Hazard Assessment Decision Tree.

Table 5-3
Metals Detected in Tank Contents

Building 101 Health Threat Evaluation
Naval Air Station Jacksonville
Jacksonville, Florida

Metal	Number of Positive Detections	Average of Detected Concentrations (mg/L)	Range of Detected Concentrations (mg/L)
Arsenic	11	1.84	0.058-10.6
Cadmium	20	3,140	1.1-61,800
Chromium	22	9,990	5.2-127,000
Lead	20	1,510	0.3-13,900
Mercury	1	-	0.56
Selenium	1	-	0.36
Silver	2	20.7	18.8-22.6
		By TCLP	
Barium	34	0.77	0.29-2.1
Cadmium	26	47.9	0.014-1,090
Chromium	21	87.9	0.014-1,730
Lead	21	127	0.050-808
Mercury	17	0.13	0.00083-1.5
Silver	14	4.67	0.024-54.0

Notes: mg/L = milligrams/liter. TCLP = Toxic Characteristic Leaching Procedure.

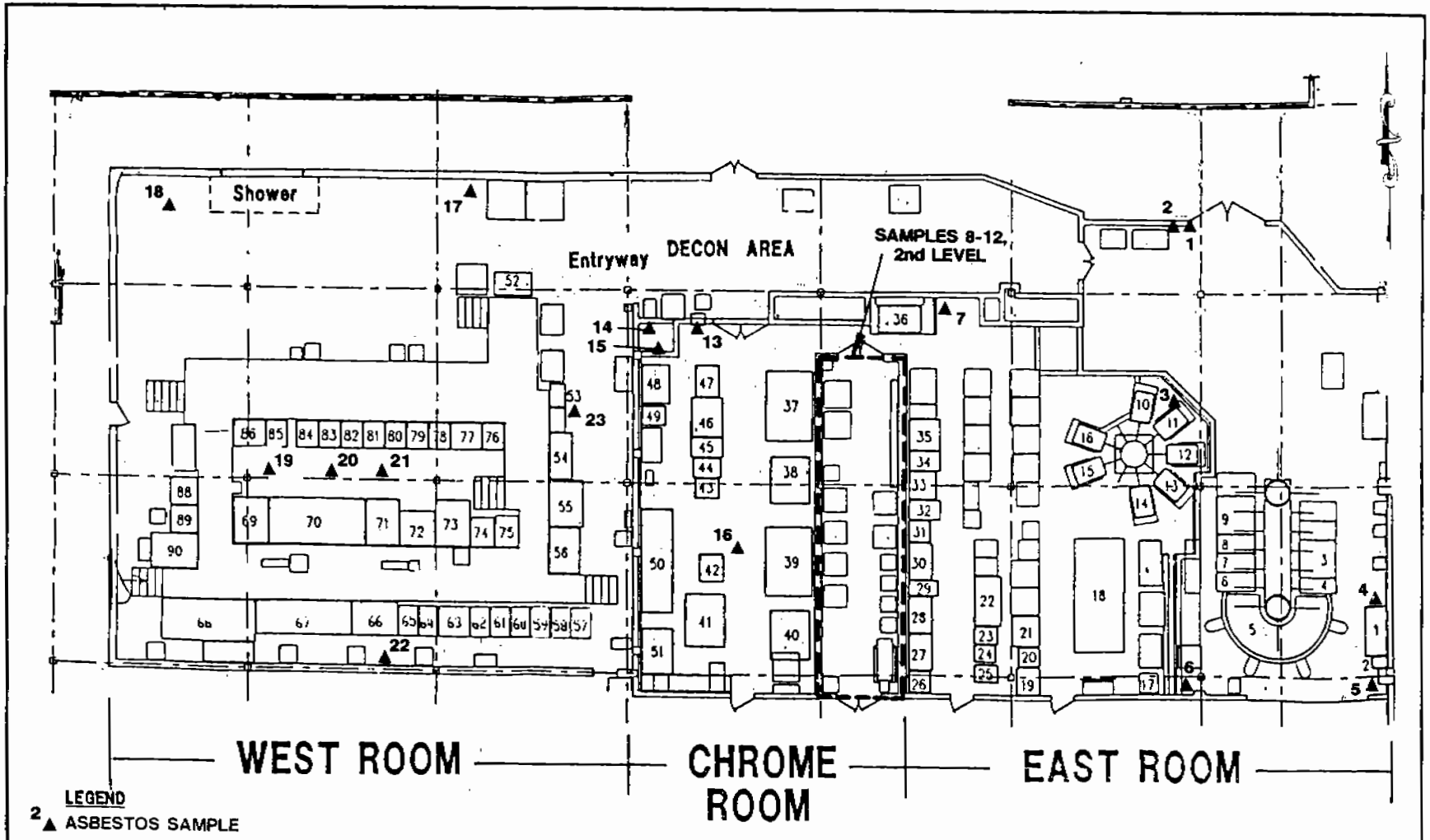


FIGURE 6-1
SAMPLE LOCATIONS,
ASBESTOS

OLD PLATING SHOP
TANK LAYOUT

NAS JACKSONVILLE
JACKSONVILLE, FLORIDA

Table 6-1
Asbestos Sampling Results

Building 101 Health Threat Evaluation
Naval Air Station Jacksonville
Jacksonville, Florida

Sample Location	Sample Description	Asbestos Content (%)			Other Fibrous Material (%)		Other
		CHRY	AMOS	CROC	FBGL	CELL	
01	White Elbow Joint	15-20	15-20			10-15	45-60 Binder
02	White Pipe Run		35-40				60-65 Binder
03	Pale Green Insulation				30-35		40-45 Binder 20-25 Aggregate
04	Gray Pipe Insulation		25-30			5-10	60-65 Binder 3-5 Aggregate
05	White Pipe Insulation		20-25			10-15	40-45 Binder 15-20 Asphalt
06	Black/Green Insul. Wrap						60-65 Vinyl 15-20 Paint 15-20 Mastic
07	White Pipe Insulation		30-35			5-10	55-60 Binder
08	White Pipe Insulation		35-40	5-10		10-15	35-40 Binder
09	Gray Transite	35-40					25-30 Binder 30-35 Aggregate
10	Gray Insulation				35-40		60-65 Binder
11	White Pipe Insulation		20-25			5-10	65-70 Binder
12	Green/Gray Transite Wall	40-45					30-35 Binder 20-25 Aggregate
13	White Pipe Insulation		30-35	5-10			55-60 Binder
14	White Pipe Insulation				75-80	5-10	5-10 Binder 2-3 Mastic 2-3 Foil
15	White Pipe Insulation		20-25			15-20	55-60 Binder

HTE101.JAX
DRD.09.23.92

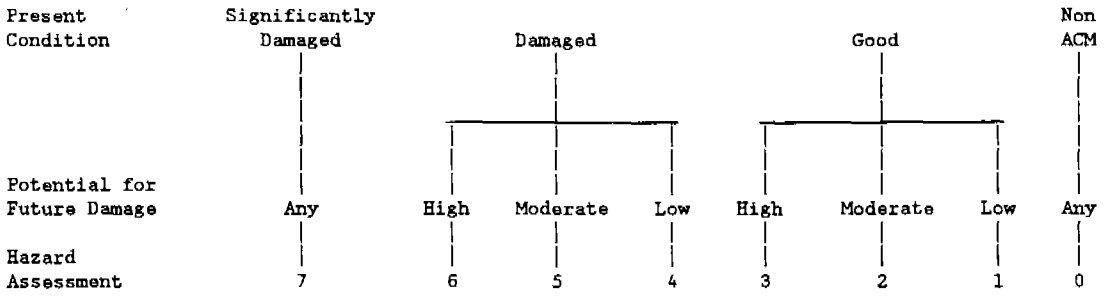
Table 6-1 (Continued)
Asbestos Sampling Results

Building 101 Health Threat Evaluation
Naval Air Station Jacksonville
Jacksonville, Florida

Sample Location	Sample Description	Asbestos Content (%)			Other Fibrous Material (%)		Other
		CHRY	AMOS	CROC	FBGL	CELL	
17	Gray Pipe Insulation		30-35				65-70 Binder
18	Black Roofing Debris					30-35	10-15 Aggregate 50-55 Asphalt
19	White/Gray Center Quad		30-35				65-70 Binder
20	Gray Pipe Insulation		30-35				60-65 Binder 3-5 Aggregate
21	Gray Elbow Joint	5-10			5-10	3-5	75-80 Binder
22	Gray Insulating Material	55-60				5-10	30-35 Binder
23	Gray TSI		35-40			3-5	55-60 Binder

Notes: CHRY = Chrysotile asbestos. AMOS = Amosite asbestos. CROC = Crocidolite asbestos.
FBGL = Fiberglass. CELL = Cellulose.

MATERIAL HAZARD ASSESSMENT DECISION TREE



The higher numbers on this decision tree are associated with a higher hazard potential typically requiring a response to immediately isolate and evaluate the affected area and to remove the ACMs.

Nineteen samples of thermal system insulation and insulation debris were taken in Building 101. Of these, fifteen samples (Samples 001, 002, 004, 005, 007, 008, 011, 013, 015, 017, 019, 020, 021, 022, and 023) were found to contain varying amounts of chrysotile, amosite, and/or crocidolite asbestos (Table 6-1). The asbestos surveyor observed that much of this material is significantly damaged, resulting in a hazard assessment of "7" despite a low potential for disturbance.

Two samples from the Transite wall board and wall board debris (Samples 009 and 012) were taken. These were both found to contain 35 to 45 percent chrysotile asbestos. This material is in damaged condition with a low potential for disturbance; the hazard assessment for this material is a "4".

Two other samples of black roofing debris (Samples 016 and 018) were negative for asbestos.

7.0 HEALTH THREAT EVALUATION AND PERSONAL PROTECTION EQUIPMENT RECOMMENDATIONS

Three types of potential hazards have been identified on the basis of available data:

1. an inhalation hazard due to acids,
2. an inhalation hazard due to asbestos disturbed during cleanup, and
3. a contact hazard due to corrosive acids and bases.

Hydrochloric acid was detected at one sample point at 5.61 mg/m^3. Although this value is below the PEL of 7 mg/m^3, it is common industrial hygiene practice to recommend that respiratory protection be instituted at an action level of half the PEL. This recommendation is intended to protect workers against possible excursions over this value.

Based on the air sampling and results of analyses of tank contents, organic vapors and cyanide are not expected to pose potential hazards at Building 101. Only low levels of volatile organic compounds were found during the air sampling, and analyses of tank contents showed mostly low levels of trichloroethylene and chloroform only. Cyanide was not detected in air samples, and analyses of tank contents showed only relatively low concentrations of reactive cyanide and sulfide.

The asbestos surveyor noted the presence of significantly damaged ACMs. Asbestos dust and debris on the floor of Building 101 are likely to be disturbed during removal of the tank contents. These materials have a potential for causing an inhalation hazard for which protection must be provided. Finally, the contents of the tanks have been shown to range in pH from 0.8 to 10.4. If splashed on a worker during removal of tank contents, these materials could cause injury.

On the basis of these hazards, ABB-ES recommends that the level of personal protective equipment appropriate for workers in this area is Level C. MSA GMC-H cartridges or their equivalent are recommended for respirator use. These cartridges provide protection against hydrogen chloride and a number of other common organic chemicals. GMC-H cartridges also incorporate a HEPA filter adequate to protect against airborne asbestos fibers.

A corrosive-resistant impermeable Tyvek, such as Saranex, is also recommended for splash suits. Workers should be advised to securely tape junctions, such as glove-and-suit and collars, to prevent possible skin contact with corrosives. In view of possible external contamination of the suits by asbestos and corrosives, the cleanup contractor should be advised to provide a rigorous decontamination line.

ABB-ES recommends that a limited asbestos pre-cleaning be conducted before removal of tank contents begins. Overhead asbestos should be secured where feasible with plastic coverings to prevent dust or debris from falling onto workers or into tanks. The floors should be cleaned of dust and debris to avoid contaminating drums, equipment, or tank contents with asbestos. Finally, the walls should be sprayed with a product, such as BWE 5000 (a 15 percent sodium silicate solution). Sodium silicate will encapsulate the asbestos, preventing the release of fibers if a drum should scrape the wall, without interfering with subsequent asbestos removal operations. The level of protection recommended for cleanup workers is also appropriate for asbestos pre-cleanup workers.

ABB-ES considered other options before recommending the pre-cleanup as an engineering control. If waste removal is conducted prior to any asbestos cleanup, it is possible that disturbances of asbestos debris and dust on the floor may cause contamination of tank contents, removal containers, or other equipment. On the other hand, removal of asbestos prior to removal of the tank contents is almost certain to result in gross contamination of tank contents.

Any wooden flooring within the building should be considered potentially hazardous in a physical sense. Wooden flooring should be covered with metal plates or grates or new wooden grating prior to the start of cleanup.

APPENDIX A
Field Log Book Copies

07577-03

NAS Jacksonville

Logbook # 1

HANGAR 101

Old Chrome plating Area

East Room

West Room

Chrome Room

TELEDYNE

430

9-14-92 MONDAY

I (RANDY HOLLOWAY) will be making the notes in this logbook unless otherwise noted. Myself and Phil Georgariou are the ABB personnel on site today. Also on site as a sub-contractor of ABB is Environmental Recovery Group (ERG) from Atlantic Beach Florida. ERG will be doing all the sampling and wearing level "B" protection unless otherwise noted. ERG will be using two people at one time to do the sampling. Two others will be on decon with two supervisors stationed just outside the decon area. All ABB personnel are outside the decon AREA also. Samples will be collected as follows. Liquids from the 55 gal drums will be collected

9-14-92 MONDAY

in ONE Quart MASON jars with Aluminum foil ~~on~~ RWH placed over the top of the jar And then the CAP will be screwed ON over the foil. The jars will be decowed And placed in coolers for transport to CH_2M Hill Laboratory in Gainsville Florida. The Liquids will be collected in 2 1 quart jars and the Sludge in 1 one Quart jar. ERG Supervisors ARE Terry DENNIS AND Chuck NEVIN. ERG Samplers AND decon teams (which will switch out) ARE John Reed, Jim LAZAR, Kenneth Toler, And Steve Reynolds. The Sampling crew is writing ON top of the jars, with a Sharpe. They are writing the NAVY tank or Vat I.D. Number on top of the jars.

9-14-92 MONDAY

ABB has a ~~Corresponding~~ RWH Numbering System Slightly different from the NAVY's And I will be labeling the bottles for analysis using the ABB RWH

0900 Set up decon, HEALTH AND SAFETY meeting And Level "B" preparation.

1000 Phil Georgarion recieved the Air Sampling data And talked with the ERG Supervisors And decided to go to A heavy level "B" protection.

1030 First Sampling Crew enters the Chrome plating room of Hangar 101.

1045 Sampled TANK 49 (dry debris)

9-14-92 Monday

1100 Sampled Tank 50 (liquid)

1115 Sampled unlabeled drum located between Tank 50 and 51. (liquid)

1130 Sampled Tank 46 (dry debris) Taking a break and will switch Samplers.

1210 Sampled Tank 47 (liquid)

1215 Sampled Tank 51 (liquid)

1225 Sampled Tank 45 (liquid)

1230 Sampled Tank 44 (Very thick Sludge)

1235 Sampled Tank 43 (debris)

1240 Sampled Tank 42 (liquid)

1245 Sampled Tank 41 (liquid)

9-14-92 Monday

1250 Sampled Tank 38 (debris)

1255 Sampled Tank 39 (liquid)

1300 Sampled Tank 40 (liquid)

1310 Break for lunch, bag ice, buy coolers.

1430 Arrive back at Hangar 10. Began putting labels on Sample jars.

1425 Sampled Tank 30 (Sludge)

1430 Sampled Tank 33 (Sludge)

1435 Sampled Tank 34 (debris)

1440 Sampled Tank 29 (Sludge)

1445 Sampled Tank 25 (liquid)

1450 Sampled Tank 24 (Liquid)

9-14-92 MONDAY

1455 Sampled TANK 23 (debris)

1500 Sampled TANK 22 (debris)
Switching out Sampling Crew

1525 Sampled TANK 14 (liquid)

1530 Sampled TANK 17 (liquid)

1535 Sampled 55 gal drum marked Caustic Soda.

1540 Sampled TANK 11 (Sludge)

1545 Sampled TANK 15 (debris)

1550 Sampled TANK 16 (debris)

1553 Sampled TANK 5 (liquid)

1555 Sampled TANK 6 (liquid)

1557 Sampled TANK 9 (Sludge

9-14-92 MONDAY

1559 Sampled TANK 2 (Sludge)

1600 Sampled TANK 1 (Sludge)

1603 Sampled Drum 3 (liquid)
15 GAL. drum located between TANK 4 AND 5.

1605 Sampling Crew is going through decon. Sampling Completed for today.

1630 Looking up Chrome plating Area of Hangar 101

1645 All Personnel off Site.

9-14-92 Randy Halloway

9-15-92 Tuesday

0700 R.H. Arrives At ABB Trailer at 0411 to bag ICE for todays Sampling at Hangar 101.

0750 Kevin Gartland came by ABB Trailer. Wants us to give him a key to the trailer. I only had the one trailer key so he requested that when I get back to Tallahassee that I have one made and send it to him.

0800 Arrive at Hangar 101. ERG people should be here around 0830.

0805 Called Phil Georgariou and he has gone over the Air Sampling

9-15-92 Tuesday

0805 Analysis with the ABB Toxicologists and have determined that Supplied Air will not be needed in the west room of Hangar 101. This room will be Sampled in a heavy level "C" protection, Same as yesterday. This Consists of Acid resistant Splash Suits, booties and gloves, with a full face mask respirator. All openings are taped with duct tape.

0830 ERG Arrives on site and begins to set up decon and get into protective clothing.

0855 John Zandar from Dept. 657 came through our taped off Hallway with two ~~Forklifts~~ Forklifts

Rwh

9-15-92 Tuesday

And began to drive in front of our door to the decon room. I stopped him and said this was a secured area. He said he had to remove some boxes and that it would not take long. I asked that he not do it but he did anyway. At that time I went to the OSHA office, RWH to talk to Gail or Tony but Neither was in. One of the OSHA Personnel knew where Tony was and called. Tony said he would put a Stop to it.

0915 RWH John Zandar and the Forkfits are finished moving boxes before Anyone can Stop them.

9-15-92 Tuesday

0914 RWH We replaced our yellow Caution Ribbon at the end of the Hallway and proceeded with our preparations.

0945 ERG is entering the East Room again to Check on the Tanks that were not Sampled Monday and to See if they could get a Sample of the dust or Sludge under the flooring.

1005 Sampled Tank 12 (debris)

1010 Sampled Tank 20 (debris)

1020 RWH Sampled Took a Composite Sample from the floor of the East Room. Liquid Sample called E. Floor 1

9-15-92 Tuesday

1025 Took a composite sample from the floor of East Room called E. Floor 2. Sludge Sample.

1030 Took a sample of what appears to be Asbestos from the piping in the East Room. Called E. Piping.

1035 ERG samplers coming out of East Room. All East Room Sampling Complete.

1040 ERG Samplers are being deconed AND the New Sampling Crew is suiting up to Sample the West Room.

1140 Sampled Tank 85 (debris)

9-15-92 Tuesday

1145 Sampled Tank 84 (Sludge)

1150 Sampled Tank 82 (sludge)

1155 Sampled Tank 77 (debris)

1200 Sampled Tank 55 (debris)

1215 Break for Lunch

1300 Sampled Tank 74 (Sludge)

1305 Sampled Tank 72 (debris)

1310 Sampled Tank 71 (debris)

1315 Sampled Tank 70 (debris)

1320 Sampled Tank 69 (sludge)

1325 Sampled Tank 57 (debris)

1330 Sampled Tank 59 (liquid)

9-15-92 Tuesday

1340 Sampled TANK 68 (debris)

1345 Sampled 15 gal drum located INSIDE TANK 68 AND called it 68A

1350 Sampled ~~AN~~ RWH. A TANK with NO Number on it. TANK WAS located ON the North WALL of the West ROOM. Called TANK W.

1355 Sampled TANK 62 (debris)

1400 Sampled TANK 61 (liquid)

1405 Sampled TANK 91 (liquid)

1410 Sampled TANK 64 (debris)

1415 Sampled TANK 92 (sludge)

1420 Sampled TANK 88 (debris)

9-15-92 Tuesday

1500 Took a composite sample of the chrome room floor. Called it C-FLOOR 1 (liquid)

1545 Took a sample from the drum where we disposed of our decon water. Called WASH 1. (liquid)

1630 Labled the decon drums and locked area. OFF site.

9-15-92
Randy Holloway

9-16-92 Wednesday

1400 I (Randy Holloway) met Doug Pearson (a subcontracted asbestos Sampler from ATEC) at the ABB trailer on Child Street. We gathered some supplies and talked about how to Sample at Hangar 101.

1425 R.H. and D.P. Arrive at Hangar 101 And Carry our equipment inside.

1430 R.H. meets with Gail (Fallon) in the OSHA office and gets permission to secure the Area in the Same manner as the last 2 days.

1445 Area has been secured with caution tape and

9-16-92 Wednesday

Sawhorses.

1450 Doug Pearson enters the Chrome room and looks for light switches. Doug is dressed in a Heavy level "C" Protection.

1500 Doug begins to look over the East room and collect Samples. Location of Samples taken will be logged in this book at the end of the day. Each because Doug is locating them on a map of the rooms.

1540 East room sampling comes mainly from the piping and is complete.

1545 Doug enters the Chrome room for Sampling.

9-16-92 Wednesday

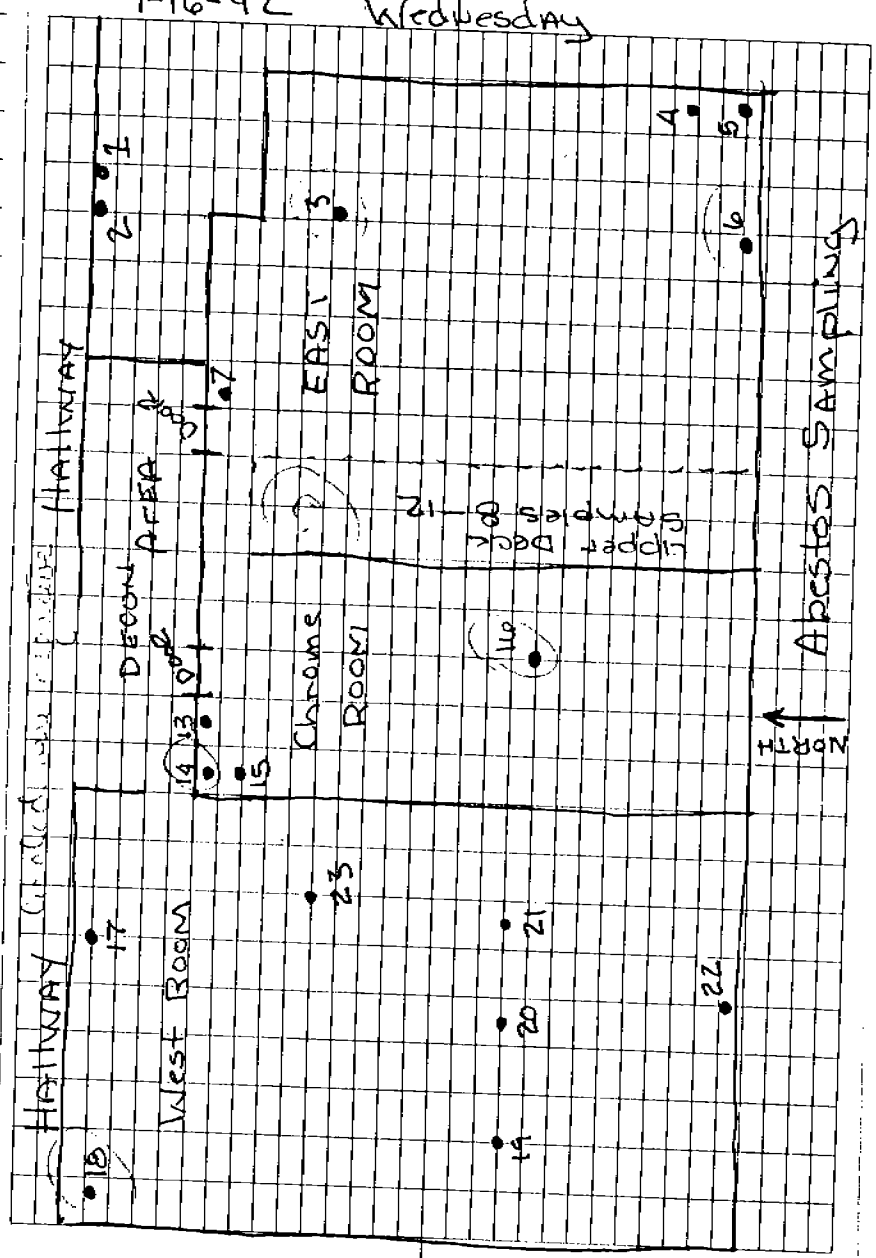
Note: R.H. is standing IN the doorway watching Doug collect samples in all rooms.

1645 Sampling in the Chrome room is completed. Again the samples taken were mainly from the piping.

1650 Doug enters the west room for sampling.

1720 West room sampling complete. Old Tyvek and gloves are placed in drums and sealed.

1730 Lock up area and proceeding to Front desk to leave key for GAIL FALLON.



9-16-92 Wednesday

1745 Doug And Randy Arrive at ABB Trailer to unload Supplies.

1800 OFF Site

9-16-92 Randy Holloway

9-23-92 Wednesday

0800 I (Randy Holloway) Arrived at the ABB Trailer on Child Street. Picked up Supplies for todays sampling.

0850 Read top of Staff gauges at OU1.

0930 Called Tony Mackay to Show me where the Outside tanks are located.

0940 Aquired 1 day NADEP Pass.

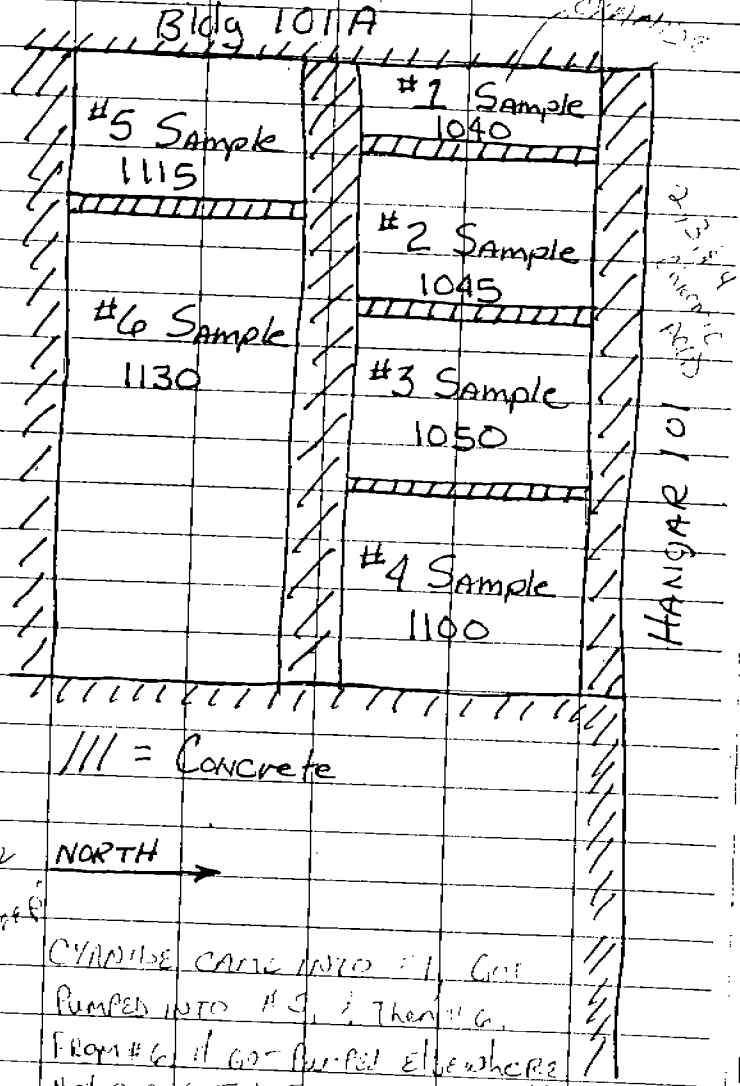
0945 Met Tony Mackay in front of Hangar 101.

0950 Arrived at Hangar 101 Outside tanks. Tanks Are Covered with interlocking grating.

1010 Tony gets Navy personel to remove the grating.

9-23-92 Wednesday

1030 Grating removed.



9-23-92 Sampled

CYANIDE CAME INTO #1, GOT PUMPED INTO #5, & THEN #6. FROM #6 IT GOT PUMPED ELSEWHERE NOT CURRENTLY FUNCTIONING, other than storage.

9-23-92 Wednesday

1040 Took Sample from the first Compartment using a 10 foot piece of 1¼" P.V.C. tubing with a MASON JAR duct taped to the end.

Note: All Samples taken in the above manner, using a Clean MASON JAR at each Compartment.

1045 Sampled 2nd Compartment

1050 Sampled 3rd Compartment

1100 Sampled 4th Compartment

1115 Sampled 5th Compartment

1130 Sampled 6th Compartment

NOTE: Compartments 1, 2, 3, each had approx. 5'-6' of liquid.

9-23-92 Wednesday

NOTE: Compartments 4, 5, 6 each had approx 1"-2" of liquid with trash/debris

1140 Sampling complete and Cleaning up.

1150 Delivered Air Sampling Analysis to Gail Fallow's office.

NOTE Delivered Tony Mackey's Air Sampling Analysis from Phil Georgariou ON Hangar 101 to him around 1000.

1200 Leaving Hangar 101 And headed to ABB Trailer to finish the C.O.C. And pack Samples for delivery to CH_2M Hill Lab.

1300 Depart ABB Trailer AND headed to NADEP to return

9-23-92 Wednesday

my pass.

1315 Leaving NADEP and going to CH_2M Hill Lab in Gainsville to delivery the Samples. End of Day

9-23-92 Randy Holloway

07552-02
07576-01 HEE

15:50 9/8/92

Environmental Recovery Group 904-241-2200
FAX 904-241-4732
chuck Nevin

10:00 main gate

Environmental Remediation (904) 268-9993
FAX 904-268-9951
Charlie Owens

RSDI Environmetal 904-725-8055 FAX
904-725-1555

Richard
Mr Morarti
Dr. ~~Owens~~ Owete

9/10/92

0810 Met with Environmental Recovery Group at front gate

0820-0900 viewed site

Lt Puglisi (John)
JDey Teague } ERG
Chuck Nevin
- Terry Dennis
- Tommy Thompson
Lt Sue Globakar
- Gail Fallon
- Phil Georgariou
Ken Busen

NADEP has staging area for handling Haz Waste

Video 0909 Aug/26/92
Fireman had level B PPE
Tank 69 had liquid

Discussion on venting

TASK I
Fume Assessment

1. Enter in Level B ~~w/acid splash suit~~ and do a survey of the site

Tom Emenhiser 12:00
Use FID + Draeger tubes
set sample canister on ground.

Acids - hand pump thru a sorbent material (sorbent tube)
Summa for Volatiles Target Compound Tests of Volatile Compds by GC/MS
fuming Acids analysis for HCl + HNO_3, + Acetic suitable sorbent tube spectrophotometric tech.
Cyanide analysis

Haz. Waste Characteristics
- Metals
- Volatiles
- ignitability
- corrosivity
- reactivity
- water pH
- chloride
- nitrate
- ~~acetic acid~~

Pest

pure solvents or pure organic phases
characterize:
- chl v volatile solvent
- flash point
- boiling point

Outline

Sampling and Analysis Plan

1.1 Preliminary Activities

- Site Reconnaissance (preliminary survey) primarily west room but also chrome room + east room
- Scan with OVA w/FID and draegen tubes for

	Measuring Range	Threshold Limit Value
Acetic Acid	5-60 ppm	10 ppm
Acid Compounds in Air	Qualitative	—
Cyanide	2-15 mg/m³	5 mg/m³
Hydrochloric Acid	0.5-25 ppm	5 ppm
Hydrocyanic Acid	2-150 ppm	10 ppm
Nitric Acid	1-50 ppm	2 ppm
Sulfuric Acid	1-5 mg/m³	1 mg/m³
~~1,1,1-Trichloroethane~~ Trichloroethylene	50-600 ppm	~~350 ppm~~ 50 ppm
	2-200 ppm	

- check structural integrity of site
- look for obvious fume sources (leaking tanks, spill areas, etc.)

1.2 Air Sampling

- after preliminary survey collect air samples at strategic locations within west room

8 samples will be collected at strategic locations in the west room, ~~to be~~ based on results of preliminary survey, to ~~define~~ assess the probable location of the fume source.

~~Air~~ Samples will be collected on the sub-floor and mezzanine to obtain a three dimensional assessment.

The ~~soil~~ air sampler will include:

- Samples will be collected for volatile target compound list (TCL) for gas chromatograph/mass spectrophotometry (GC/MS) analysis. These samples will be collected ~~on~~ in stainless steel SUMMA canisters that are negatively pressured.
- Samples will be collected for fuming acids using suitable sorbent tubes and an air pump. These samples will be analyzed for hydrochloric ~~acid~~ ~~(HCl)~~, nitric acid, and acetic acid
- Samples will be collected for cyanide using proper laboratory air sampling techniques and analysis.

15 black carboys - may have come with

SAP Phase II

MSDS
Material Safety Data Sheets

and evaluation of

Upon receipt of the laboratory analysis of the Phase I investigation, the Phase II investigation will commence.
The Phase II investigate will consist of the sampling of the contents of any of the 90 tanks and ~~the~~ approximately 15 other assorted containers within the confines of the plating shop. Samples will be collected from those tanks and containers that contain liquids, sludges, ~~or~~ cakes, or ~~mixtures~~ multi-phased ~~components~~ ~~waste~~ constituents.

Representative samples will be collected from each tank and container that has been found to contain plating waste materials using appropriate sampling equipment for the phase(s) of the material. The samples will will be ~~analyzed~~ sent to CH2M-Hill Laboratories in Gainesville, Florida for analyses of the following:

TCLP Hazardous Waste Characteristics for Volatiles + Metals

ignitability
corrosivity
reactivity
pH for liquids
chlorides
nitrates
acetic acid

for pure solvents or organic liquid phases
characterization of the sample
for chlorinated ~~&~~ Non-chlorinated solvents
flash point
boiling point

APPENDIX B
RCRA Waste Classifications for Tank Contents

APPENDIX B
RCRA WASTE CLASSIFICATIONS AND ESTIMATED VOLUMES
OF TANK CONTENTS

Building 101 Health Threat Evaluation
NAS Jacksonville, FL

Sample Location	Result	Waste Code	Estimated Volume (Gallons)	Remarks
Tank 1	-	-	3.7	White powder
Tank 2	-	-	1.2	Brown powder
Tank 5	1.3 mg/L Cadmium	D006	230	Liquid
Tank 6	-	-	170	Brown liquid
Tank 9	-	-	12	Gray powder
Tank 11	8.8 mg/L Lead (TCLP)	D008	6.2	Gray powder
Tank 12	5.3 mg/L Cadmium (TCLP)	D006	Trace	Plumbing pipes and debris
Tank 14	4.1 mg/L Cadmium 17.1 mg/L Chromium 15.1 mg/L Lead	D006 D007 D008	75	Liquid
Tank 15	-	-	Trace	Thin layer of gray powder
Tank 16	-	-	25	Brown powder
Tank 17	61800 mg/L Cadmium 17.5 mg/L Chromium 217 mg/L Lead	D006 D007 D008	0	Tank empty when inspected on 10/21/92
Tank 20	-	-	-	Plumbing pipes and debris
Tank 22	0.8 pH	D002	18	Rust colored powder/sludge
	318 mg/L Lead (TCLP)	D008		
Tank 23	76.6 mg/L Lead	D008	2.5	Gray powder/sludge
	14.2 mg/kg Reactive Cyanide	F008		

APPENDIX B (Continued)
RCRA WASTE CLASSIFICATIONS AND ESTIMATED VOLUMES OF TANK CONTENTS

Building 101 Health Threat Evaluation
NAS Jacksonville, FL

Sample Location	Result	Waste Code	Estimated Volume (Gallons)	Remarks
Tank 24	27 mg/L Cadmium 78.6 mg/L Chromium 13900 mg/L Lead	D006 D007 D008	20	Brown liquid
Tank 25	6.0 mg/L Arsenic 45.6 mg/L Cadmium 473 mg/L Chromium 1200 mg/L Lead 0.56 mg/L Mercury 18.8 mg/L Silver	D004 D006 D007 D008 D009 D011	2.5	Brown liquid
Tank 29	54 mg/L Silver (TCLP) 3.3 mg/kg Reactive Cyanide	D011 F008	-	Tank not located on 10/21/92 inspection
Tank 30	0.57 mg/kg Reactive Cyanide	F008	9.4	Gray powder/sludge
Tank 33	9.6 mg/L Cadmium (TCLP)	D006	Trace	Tank empty when inspected on 10/21/92
Tank 34	-	-	Trace	Tank empty
Tank 37	-	-	20	Liquid and debris
Tank 38	1.3 mg/L Cadmium (TCLP) 429 mg/L Lead (TCLP)	D006 D008	37	Brown powder/debris
Tank 39	1.1 mg/L Cadmium 1960 mg/L Chromium 421 mg/L Lead	D006 D007 D008	480	Brown liquid
Tank 40	8.2 mg/L Cadmium 6560 mg/L Chromium 87.4 mg/L Lead	D006 D007 D008	30	Liquid

APPENDIX B (Continued)
RCRA WASTE CLASSIFICATIONS AND ESTIMATED VOLUMES OF TANK CONTENTS

Building 101 Health Threat Evaluation
NAS Jacksonville, FL

Sample Location	Result	Waste Code	Estimated Volume (Gallons)	Remarks
Tank 41	1.9 mg/L Cadmium 1310 mg/L Chromium	D006 D007	280	Liquid/sludge/debris
Tank 42	-	-	200	Liquid/sludge/debris
Tank 43	-	-	7.5	White powder
Tank 44	45.4 mg/L Chromium (TCLP) 17.2 mg/L Lead (TCLP)	D007 D008	7.5	White powder
Tank 45	14.1 mg/L Cadmium 1240 mg/L Chromium 2140 mg/L Lead	D006 D007 D008	4.2	Green liquid
Tank 46	791 mg/L Lead (TCLP)	D008	Trace	Tank empty when inspected on 10/21/92
	14.9 mg/kg Reactive Cyanide	F008		
Tank 47	89.8 mg/kg Cadmium 433000 mg/kg Chromium	D006 D007	28	Black liquid
Tank 49	-	-	Trace	Tank empty when inspected on 10/21/92
Tank 50	97.4 mg/L Chromium	D007	500	Brown liquid
Tank 51	12.8 mg/L Cadmium 69700 mg/L Chromium 272 mg/L Lead	D006 D007 D008	72	Liquid
Tank 55	-	-	Trace	Tank empty when inspected on 10/21/92
Tank 57	7.8 mg/kg Reactive Cyanide	F008	6.2	White powder

APPENDIX B (Continued)
RCRA WASTE CLASSIFICATIONS AND ESTIMATED VOLUMES
OF TANK CONTENTS

Building 101 Health Threat Evaluation
NAS Jacksonville, FL

Sample Location	Result	Waste Code	Estimated Volume (Gallons)	Remarks
Tank 59	10.6 mg/L Arsenic 693 mg/L Cadmium 315 mg/L Chromium 393 mg/L Lead 22.6 mg/L Silver	D004 D006 D007 D008 D011	5.0	Debris/liquid
Tank 61	13.7 mg/L Cadmium 8.4 mg/L Chromium 13.7 mg/L Lead	D006 D007 D008	0.12	Liquid
Tank 62	-	-	Trace	Dried material peeling off tank sides
Tank 64	11.1 mg/kg Reactive Cyanide	F008	5.0	White powder
Tank 68	2.7 mg/L Cadmium (TCLP)	D006	Trace	Powder
	15.5 mg/kg Reactive Cyanide	F008		
Tank 68A	0.95 mg/kg Reactive Cyanide	F008	Trace	Powder
Tank 69	1.0 pH	D002	30	Liquid/sludge
	2.2 mg/L Cadmium (TCLP) 1730 mg/L Chromium (TCLP)	D006 D007		
Tank 70	50.4 mg/L Chromium (TCLP)	D007	15	Powder
	-	-		
Tank 71	-	-	20	Dried cake material

APPENDIX B (Continued)
RCRA WASTE CLASSIFICATIONS AND ESTIMATED VOLUMES OF TANK CONTENTS

Building 101 Health Threat Evaluation
NAS Jacksonville, FL

Sample Location	Result	Waste Code	Estimated Volume (Gallons)	Remarks
Tank 72	4 mg/L Cadmium (TCLP)	D006	20	Powder
Tank 74	1.3 mg/L Cadmium (TCLP)	D006	38	Sludge
Tank 77	0.4 mg/L Mercury (TCLP)	D009	Trace	Powder/debris
Tank 82	21 mg/L Cadmium (TCLP)	D006	0.12	Sludge
	1.3 mg/kg Reactive Cyanide	F008		
Tank 84	1.1 mg/L Cadmium (TCLP) 5.7 mg/L Lead (TCLP)	D006 D008	10	Green sludge
Tank 85	55.2 mg/L Cadmium (TCLP) 808 mg/L Lead (TCLP) 1.5 mg/L Mercury (TCLP)	D006 D008 D009	Trace	Powder/debris
Tank 87	-	-	9.4	Liquid
Tank 88	26.2 mg/L Cadmium (TCLP) 194 mg/L Lead (TCLP)	D006 D008	Trace	Thin layer of sludge/powder on tank bottom
	28.2 mg/kg Reactive Cyanide	F008		
Tank 91	5.1 mg/L Lead	D008	Trace	Liquid

APPENDIX B (Continued)
RCRA WASTE CLASSIFICATIONS AND ESTIMATED VOLUMES OF TANK CONTENTS

Building 101 Health Threat Evaluation
NAS Jacksonville, FL

Sample Location	Result	Waste Code	Estimated Volume (Gallons)	Remarks
Tank 92	1.4 pH	D002	Trace	Sludge
	1090 mg/L Cadmium (TCLP)	D006		
	7.6 mg/L Chromium	D007		
	9 mg/L Lead	D008		
	0.14 mg/kg Trichloroethylene	F001		
	18.5 mg/kg Reactive Cyanide	F008		
Tank W	-	-	25	Appears to be wax
Drum 1	12.4 mg/L Cadmium	D006	20	2 10-gallon plastic bottles full of liquid
	127000 mg/L Chromium	D007		
Drum 2	-	-	30	Caustic soda drum
Drum 3	34.3 mg/L Cadmium	D006	5	15-gallon plastic drum, 1/3 full of green liquid
	29.4 mg/L Chromium	D007		
E. Floor 1	63.7 mg/L Chromium	D007	1000 (East Floor Total)	Liquid
E. Floor 2	1000 mg/kg Trichloroethylene	F001		Building debris, powder, dust under flooring (Depth of debris approximated)
	37 mg/L Trichloroethylene (TCLP)			
	6.1 mg/L Cadmium (TCLP)	D006		
	6.9 mg/L Lead (TCLP)	D008		
E. Floor 3	15 mg/L Cadmium (TCLP)	D006		Sludge/powder/debris (Depth of debris approximated)
	22.1 mg/kg Reactive Cyanide	F008		

APPENDIX B (Continued)
RCRA WASTE CLASSIFICATIONS AND ESTIMATED VOLUMES OF TANK CONTENTS

Building 101 Health Threat Evaluation
NAS Jacksonville, FL

Sample Location	Result	Waste Code	Estimated Volume (Gallons)	Remarks
C. Floor 1	0.38 mg/L Trichloroethylene	F001	680	Liquid/sludge/debris under flooring
Outside Tank 1	-	F006	780	Liquid
Outside Tank 2	11 mg/L Chromium	D007 F006	800	Liquid
Outside Tank 3	10.2 mg/L Chromium	D007 F006	980	Liquid
Outside Tank 4	1.4 mg/L Cadmium 5.2 mg/L Chromium	D006 D007 F006	57	Liquid/sludge
Outside Tank 5	4.2 mg/L Cadmium 18.7 mg/L Chromium 20.6 mg/L Lead	D006 D007 D008 F006	62	Liquid/sludge
Outside Tank 6	5.3 mg/L Cadmium 40.5 mg/L Chromium 15.9 mg/L Lead	D006 D007 D008 F006	340	Liquid/sludge

APPENDIX B (Continued)
RCRA WASTE CLASSIFICATIONS AND ESTIMATED VOLUMES OF TANK CONTENTS

Building 101 Health Treat Evaluation
NAS Jacksonville, FL

Sampled 13-14 November 1992

Sample Location	Result	Waste Code	Estimated Volume (Gallons)	Remarks
Drum-163	1.2 mg/L Barium 0.77 mg/L Chromium 7.3 mg/L Silver 0.0064 mg/L Selenium 88.4 mg/kg Sulfide, Reactive	D011, F007,F008	FILTER	Solid 18.8% water pH = 11.4
Drum-164	2.0 mg/L Barium 1,220 mg/L Cadmium 0.0036 mg/L Mercury 1.1 mg/L Silver 0.062 mg/L Carbon tetrachloride (TCLP) 0.26 mg/L Trichloroethene (TCLP) 1.7 mg/kg Trichloroethene (TCL)	D002,D006 F007,F008	FILTER	Solid pH = 13.0
Drum-166	0.10 mg/L Barium 0.087 mg/L Chromium	Not a RCRA regulated waste	WOOD BOX WITH WHITE POWDER	Solid 43.2% water pH = 1.60
Drum-167	0.65 mg/L Barium 0.22 mg/L Cadmium 0.11 mg/L Chromium 0.010 mg/L Silver 120 mg/kg 1,1,1-Trichloroethane (TCL) 26 mg/kg Trichloroethene (TCL)	F001,F002 D040	FILTER-CARBON	Solid 21.7% water pH = 9.90
Drum-168	0.67 mg/L Barium 0.13 mg/L Cadmium 0.083 mg/L Chromium 0.014 mg/L Mercury 2.2 mg/L Silver 0.025 mg/L Carbon tetrachloride (TCLP) 573 mg/kg Cyanide,Reactive 119 mg/kg Sulfide,Reactive	F007,D003	FILTER	Solid 14.4% WATER pH = 11.1
Drum-169	3.7 mg/L Arsenic 0.51 mg/L Barium 0.017 mg/L Selenium 3.1 mg/kg 1,1,1-Trichloroethane (TCL) 0.68 mg/kg Trichloroethene (TCL)	F001,F002 D040	FILTER-CARBON	Solid 19.7% water pH = 3.60

APPENDIX B (Continued)
RCRA WASTE CLASSIFICATIONS AND ESTIMATED VOLUMES OF TANK CONTENTS

Building 101 Health Threat Evaluation
NAS Jacksonville

Sampled 13-14 November 1992

Sample Location	Result	Waste Code	Estimated Volume (Gallons)	Remarks
Drum-165	0.55 mg/L Arsenic 1,830 mg/L Cadmium	D006 F007,F008	FILTER	Aqueous pH = 11.6
Drum-170	ND		55	Aqueous pH = 9.0
Drum-171	10.2 mg/L Chromium 0.11 mg/L Selenium	D007,F007,F008	FILTER	Aqueous pH 6.40
Drum-172	122 mg/L Chromium	D002,D007	FILTER	Aqueous pH<2
Drum-173	0.056 mg/L Arsenic 8.7 mg/L Chromium 38.7 mg/L Silver	D007,D011 F007,F008	MINIMAL	Aqueous
Drum-174	24.2 mg/L Cadmium 124,000 mg/l Chromium	D002,D006,D007	JUG NO VOLUME LISTED	Aqueous pH<2
Drum-175	18.7 mg/L Chromium	D007	JUG NO VOLUME LISTED	Aqueous pH = 5.7
Drum-176	3.2 mg/L Arsenic 91.1 mg/L Cadmium 284,000 mg/L Chromium 0.27 mg/L Mercury	D006,D007,D009	BUCKET NO VOLUME LISTED	Aqueous
Drum-177	0.059 mg/L Arsenic 233 mg/L Barium 135 mg/L Chromium 641 mg/L Lead	D005,D007,D009	NO VOLUME LISTED	Aqueous pH = 7.9
OUTK-007	2.1 mg/L Cadmium 10.5 mg/L Chromium 5.3 mg/L Lead	D006,D007,D008 F006,F019	130	Aqueous pH = 7.0